Oracle® Real User Experience Insight

User's Guide

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Preface

Oracle Real User Experience Insight (RUEI) provides you with powerful analysis of your network and business infrastructure. You can monitor the real-user experience, set Key Performance Indicators (KPIs) and Service Level Agreements (SLAs), and trigger alert notifications for incidents that violate them.

Audience

This guide is intended for all users of RUEI. These can be Administrators, Security Officers, and Business and IT users. These roles are explained in Section 1.4, "Understanding User Roles".

This guide is directly relevant to the following users:

- Administrators responsible for maintaining the RUEI installation. This includes monitoring the system's health status, performing configuration backups, and for defining the scope of network operations that will be monitored. They are also responsible for creating and maintaining user authorizations.
- The Security Officer responsible for managing security-related issues. These include defining which sensitive information (such as credit card details) are omitted from logging, and the installation and management of SSL keys to monitor encrypted data.
- All other system users. These can be defined as business or IT users (or both), and their assigned privileges determine the access available to them. This is fully explained in Section 1.4, "Understanding User Roles".

Prerequisites

Although no specific technical knowledge is required, some familiarity with network and Web technology is assumed. However, some organizational knowledge is required. In particular:

- Administrators should have a firm understanding of network topology, and a good operational knowledge of their organization's network and application environment. In addition, individuals assigned to this role should have a good understanding of RUEI.
- Security Officers should possess a firm understanding of security-related issues. Moreover, they should be able to accurately assess the impact of network organizational changes.
- As explained earlier, different levels of business and IT users can be defined. Their assigned permissions determine both the level of data to which they have access, and the configuration tasks they can perform. This could include identifying the

monitored Web pages, and specifying how visitors to the Web site are identified. Additional activities could include configuring RUEI to reflect the monitored Web site's functional architecture, the definition of Key Performance Indicators (KPIs), and the creation of custom reports. In all cases, the permissions assigned to users should reflect both the appropriate access they require, and their organizational knowledge.

Using This Guide

This guide is organized as follows:

- Chapter 1 introduces you to RUEI. It explains the roles and permissions used within RUEI, the appearance of the RUEI interface, and how you can customize it. It should be read by all users.
- Chapter 2 describes the standard report library provided with RUEI, as well as describing how you can create and modify your own reports. It should be read by all users who work with reports.
- Chapter 3 describes the use of the data browser. It is directly relevant to both business and IT users authorized to access it.
- Chapter 4 describes the use of KPI overviews and alert lists.
- Chapter 5 describes how to set up KPIs and SLAs, and how to define alert schedules and notifications for them.
- Chapter 6 describes how to define the pages that will be monitored, how to define the Web pages for which you want additional information to be available, the logical sequence of pages in transactions to be monitored, and those pages that should be monitored for the occurrence of specific text strings.
- Chapter 7 describes how to manage the basic Web site configuration used for monitoring. This includes the required Web sites, the page naming to be used, and the page content and site error checks to be implemented.
- Chapter 8 describes how to configure and manage the security-related settings used by RUEI. It is directly relevant to Security Officers.
- Chapter 9 describes how to monitor the status of the system, perform backups and upgrades, issue messages to system users, manage users, and export data from RUEI. This chapter is directly relevant to Administrators.
- Appendix A provides a detailed description of the page tagging schemes supported for use with RUEI.
- Appendix B provides an overview of the cookie technologies that RUEI supports.
- Appendix C highlights the most common problems encountered when using RUEI, and offers solutions to quickly locate and correct them.
- Appendix D presents a brief explanation of the dimension labels used in RUEI.
- Appendix E provides an extended explanation of the HTTP result codes, generated by the Web server, that can be send to visitors as replies to requests.
- Appendix F provides a detailed explanation of the support available within RUEI for the use of XPath queries.
- Appendix G provides a detailed discussion of the character encoding standards supported by RUEI when monitoring network traffic. Restrictions to the identification of such things as domain names, custom headers, and functional errors are highlighted. The operation of data masking and user ID matching when working with international character sets is also discussed.

- Appendix H provides a detailed discussion of the support available for the accurate monitoring of WebLogic Portal-based applications.
- Appendix I provides a detailed discussion of the support available for the accurate monitoring of Oracle Application Development Framework (ADF)-based applications.
- Appendix J provides information about how accurate network traffic reporting can be obtained if the RUEI system is placed in front of a Network Address Translation (NAT) device.
- Appendix K contains licensing information about certain third-party products included with RUEI.

More information

- Information on a wide variety of topics is available via the Oracle Web site (http://www.oracle.com/enterprise_manager/user-experience-management.html). It is recommended that you visit it regularly for support announcements.
- In addition, detailed technical information is available via the Support Web site (https://metalink.oracle.com). This includes FAQs, training material, tips and tricks, and the latest version of the product documentation. A valid user name and password is required to access this Web site.

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Related Documents

For more information, see the following documents in the Oracle Real User Experience Insight (RUEI) documentation set:

- *Oracle Real User Experience Insight Installation Guide.*
- *Oracle Real User Experience Insight Accelerator for Oracle E-Business Suite Guide*.
- *Oracle Real User Experience Insight Accelerator for Siebel Guide*.
- *Oracle Real User Experience Insight Accelerator for PeopleSoft Guide*.
- *Oracle Real User Experience Insight Accelerator for JD Edwards EnterpriseOne Guide*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

1

Getting Started

This chapter introduces you to RUEI. It explains how RUEI can provide you with powerful analysis of your network and business infrastructure. The roles used within RUEI, the appearance of the Reporter interface, and how you can customize it, are also highlighted.

RUEI should already have been successfully installed within your organization's network, and the Initial Setup Wizard run to provide information about the network infrastructure. The procedure to do this is described in the *Oracle Real User Experience Insight Installation Guide*.

1.1 What is RUEI?

While organizations are increasingly looking to explore Internet opportunities, they require accurate and up-to-date information regarding their Web traffic to assess the effectiveness of their Internet operations. What is required is a solution that records every user session, and translates complex Web data into meaningful and understandable statistics which can then be the basis of effective business and operational decisions.

RUEI is a powerful Web-based utility to report on real-user traffic requested by, and generated from, your network. It measures the response times of pages and transactions at the most critical points in your network infrastructure. Powerful session diagnostics allow Application Managers and IT technical staff to perform root-cause analysis.

It enables you to view server and network times based on the real-user experience, monitor your Key Performance Indicators (KPIs) and Service Level Agreements (SLAs), and trigger alert notifications on incidents that violate their defined targets.

You can implement checks on page content, site errors, and the functional requirements of your transactions. Based on this information, you can verify your business and technical operations. You can set custom alerts on the availability, throughput, and traffic of everything identified in RUEI.

RUEI comes with a library of powerful reports that provide both business-orientated and technical-orientated users with the information they need to make effective decisions. In addition, authorized users can quickly create their own reports or modify existing reports. Using these reports, they can directly interact with the Web data to gain a deep understanding of online usage behavior, as well as the overall status of Web applications. They can view these reports interactively, or receive them by e-mail.

Using RUEI's dynamic drill-down capabilities, you can quickly focus on any desired level of Web results.You can sort, filter, and export information. In addition, you can

correlate any data across a wide variety of criteria, including time, client location, transaction, and user name.

The session diagnostics facility enables you to perform root-cause analysis of operational problems. It offers you the ability to assess any individual session, and review all the user's activity within that session.

1.2 Requirements

The workstations that will access the RUEI user interface must have one of the following browsers installed:

- Mozilla Firefox 3.0.
- Internet Explorer 6 SP2.
- Internet Explorer 7.

Note that JavaScript must be enabled. No other plug-ins are required.

In addition, the workstation should have a screen resolution of 1024 * 768 (or higher).

Note: Ensure that any pop-up blocker within the browser has been disabled.

1.3 Before You Start

In order for RUEI to start data monitoring and reporting, it must be configured with some information about your network infrastructure. Once completed, user traffic reporting is available. The following actions should have been performed *before* you start to use RUEI:

1. If the monitored traffic includes SSL-based sessions, the Collector will not be able to decrypt the SSL traffic unless the SSL keys are made available to the system. This is described in Section 8.3, "Managing SSL Keys". Of course, non-SSL traffic is unaffected by this requirement.
2. It is recommended that you specify the cookie structures used within your Web environment. Otherwise, session tracking is based on IP address and browser. This is described in Section 7.1, "Specifying Cookie Technology".
3. Within RUEI, user identification is first based on the HTTP Authorization field. After that, it is derived from the supplied POST argument specified in the application's definition. When this is not configured, the SSL client certificate is used (when available). The common name (CN) portion of it is used. Therefore, if you are using arguments within URLs, the item within these used for user identification must be specified in order to provide reliable results. This is described in Section 6.2.9, "Defining User Identification".
4. Page identification within RUEI is based on applications. Essentially, an application is a collection of Web pages. Note that information about any pages that could not be identified using application and page definitions is discarded and, therefore, not available through reports and the Data Browser. This is described in Section 6.1, "Naming Pages" and Section 6.2, "Defining Applications".
5. Transactions give you greater insight into how visitors experience your Web pages. This facility is described in Section 6.5, "Building Transactions".
6. Check the status of the Collector(s) by selecting **System**, then **Status**, and then **Collector status**. This is described in Section 9.2, "Viewing the Status of the

Collectors". In addition, you can obtain an overview of the monitored network traffic by selecting **System**, then **Status**, and then **Data processing**. This is described in Section 9.7, "Viewing a Traffic Summary".

1.4 Understanding User Roles

RUEI uses predefined roles and permissions to determine the actions that users can perform. For each of these roles, RUEI provides a set of reports and analyze tools to help them quickly and effectively meet their information requirements. These roles are explained in Table 1–1:

Table 1–1 Roles

Role	Description
Administrator	This user performs the initial configuration of RUEI, and maintains the basic network-related configuration (such as mail settings and Collector attachments) used by the system. In addition, users assigned Administrator privileges act as first-level support for the system, and are responsible for such things as performing backups of the current configuration, the configuration of advanced system settings, and the administration of the other users authorized to work with the system.
Security Officer	This user is responsible for managing all system settings that are affected by the organization's network security policy. In particular, they: ■ Import the security certificates and private keys used to decrypt HTTPS transactions, and keeps them up-to-date. ■ Decide the scope of what is monitored within the organization's network. They can set up network filters to prevent the capturing of specific networks or hosts, or Virtual Local Area Networks (VLANs), or to reduce overall network traffic. ■ Implement and maintain security-related measures for private data passed in Web traffic.
Business users	These users are concerned with evaluating visitor behavior according to business goals. As such, they use the business intelligence that the system offers them to monitor a wide variety of issues, such as identifying the most popular paths taken to your Web site, or how engaged visitors are on particular pages or sections. They may be concerned with improving customer satisfaction, retention, and loyalty, increasing conversion rates, or monitoring the effectiveness of Web site-based marketing activities. Based on assigned permissions, they use the dashboard functionality, as well as on-demand and mailed reports, to maintain an overview of the organization's operations. They can also use these reports and data exports as the basis for further analysis by IT specialists.
IT users	These users are concerned with supporting the IT and other technical information the system needs to monitor the Web environment. Typically, they are responsible for deeper analysis of failed SLAs or KPIs. They use the reporting and Data Browser facilities to their fullest to locate the reported anomaly or failure. For example, they might identify that failed user sessions are only occurring for users from a particular network domain.

Depending on the configuration required by your organization, users can be authorized to perform combinations of these roles. There is no limit to the number of users who can be defined.

Super Administrator Versus Authorized Administrators

Be aware that there is one predefined RUEI user: the Super Administrator. Unlike all other users, their initial password is set using the `set-admin-password.sh` script, and is always locally authenticated. Depending on your operational requirements, other users can be assigned Administrator privileges. However, these users remain under the control of the Super Administrator. For clarity, when it is necessary to distinguish the Super Administrator from other users assigned Administrator privileges, the Super Administrator is referred to as the `admin` user.

1.4.1 Permissions

Within RUEI, report categories and views within the Data Browser have a status assigned to them. This status can be Business-related, IT-related, or both. In this way, business and IT users can immediately locate the information that is relevant to them. For example, on entry to the Report library, the list of displayed reports for a business users is filtered to reflect the reports with which they will want to work.

For each user, other than Administrators, their Business and IT access permissions define the level of access they have to these items. These permissions are incremental. That is, each level contains all access permissions beneath it, as well as new ones. These are described in Table 1–2:

Table 1–2 Business and IT Access Permissions

Access Level	Business User	IT User
None	The user has no access.	The user has no access.
Overview[1]	The user can view their dashboards, the KPI overview, and alert history.	The user can view their dashboards, the KPI overview, and alert history.
Inquiry	The user has read-only access to reports, and can create PDF downloads.	The user has read-only access to reports, and can create PDF downloads.
Analytical	■ Has access to the Data Browser. ■ Can create new reports, and modify (public or own) reports.	■ Has access to the Data Browser. ■ Can create new reports, and modify (public or own) reports.
Full	■ Define and modify KPIs. ■ Edit the service level schedule. ■ Edit alert schedules. ■ Define and modify transactions. ■ Define and modify site-wide errors.	■ Define and modify KPIs. ■ Edit the service level schedule. ■ Edit alert schedules. ■ Define and modify applications. ■ Define and modify named Web servers. ■ Define and modify named clients. ■ Define and modify site-wide errors.

[1] A user who is not authorized to at least Overview level as either a Business or IT user cannot log on.

The creation and management of user roles and permissions is described in Section 9.16, "Managing Users and Permissions".

1.4.2 Access to the Data Browser

Each view within the Data Browser is either Business or IT-related (or both). Access to a view is only available for users with the relevant Analytical level permission. These are shown in Table 1–3.

Table 1–3 Analytical Level Permissions for Data Browser Views

Category	View	Business	IT
Applications	**Overall**		
	All pages	X	X
	All sessions	X	X
	All transactions	X	X
	Key pages	X	X
	URL diagnostics		X
	Problem analysis		
	Failed URLs		X
	Failed pages	X	X
	Slow URLs		X
	Suites		
	E-Business Suite[1]	X	X
	E-Business Suite URL diagnostics[1]		X
	JD Edwards[1]	X	X
	JD Edwards URL diagnostics[1]		X
	Oracle ADF	X	X
	Oracle ADF diagnostics		X
	PeopleSoft[1]	X	X
	PeopleSoft URL diagnostics[1]		X
	Siebel[1]	X	X
	Siebel URL diagnostics[1]		X
	WebLogic Portal	X	X
	WebLogic Portal URL diagnostics		X
Services	**Overall**		
	All functions		X
	Problem analysis		
	Failed functions		X

[1] The group's associated accelerator package must be installed for it to be available. In addition, at least one suite for the group must have been defined.

1.5 Starting RUEI

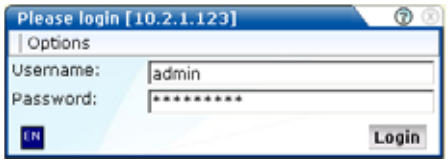
To start your RUEI session, point your browser at the following URL:

`https://`***`Reporter`***`/ruei`

Note: If you have not already received this information, contact your Administrator for the required IP address or host name part of the URL.

The Logon dialog box shown in Figure 1–1 appears:

Figure 1–1 Login Dialog Box



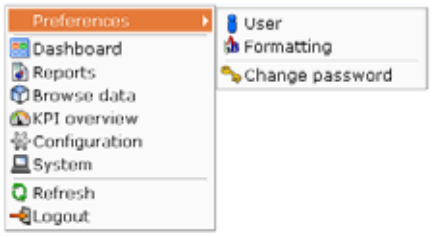
Enter your user name and password, and click **Login**. If you have not already been assigned a user name, contact the Administrator.

> **Note:** If you experience problems logging on, ensure that any pop-up blocking facility within your browser has been disabled.

1.6 Customizing Your Environment

From the **System** menu, select **Preferences** (shown in Figure 1–2) to customize your personal settings:

Figure 1–2 Preferences Menu



The following options are available:

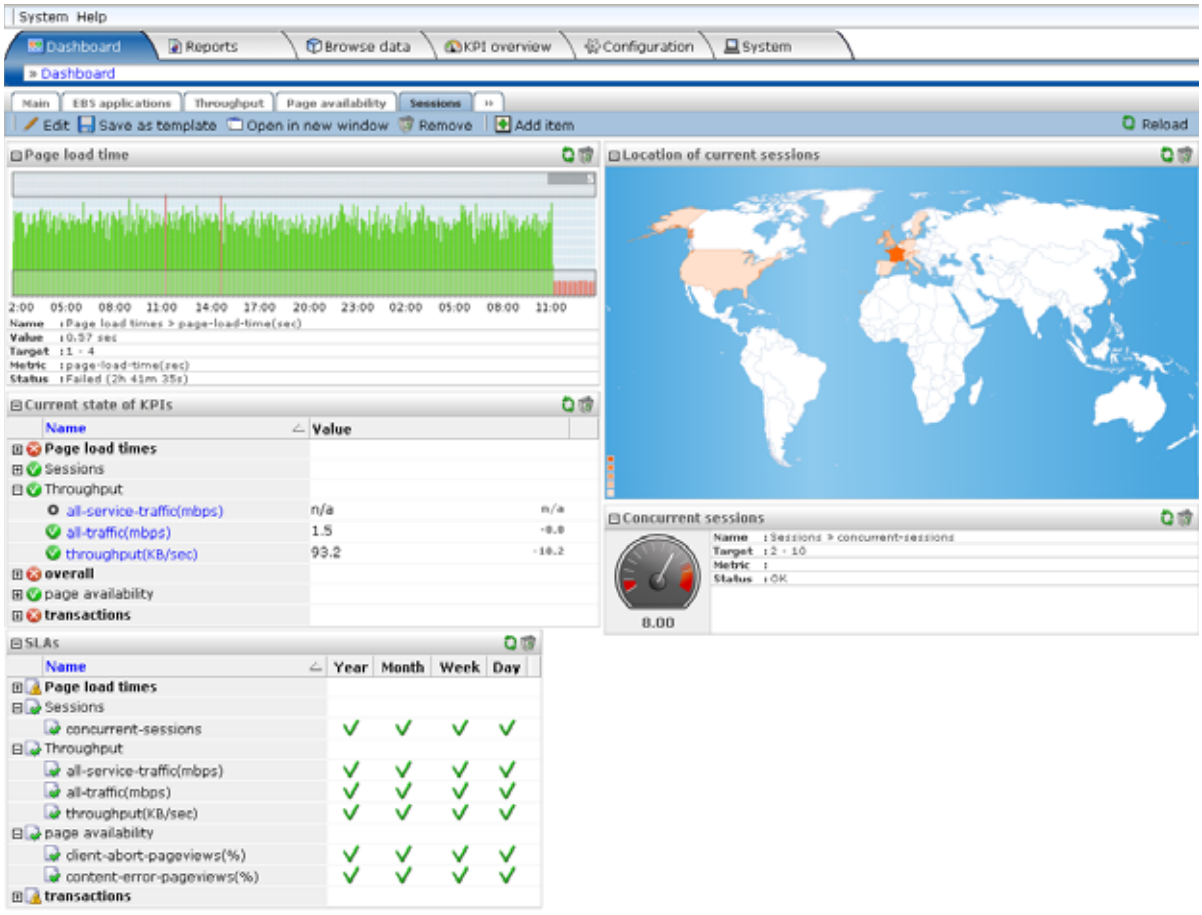
- **User**: allows you to specify the settings that will be used for your sessions. You can control the national language used during your sessions, whether the reports you receive are sent in multiple e-mails or bundled into a single e-mail, and the module in which you want to start your sessions (for example, reports, favorites, or user management). These settings are explained in Section 9.16.3, "Modifying a User's Settings".
- **Formatting**: allows you to specify how numeric values will be formatted in reports. You can specify the decimal point indicator, the character used as the thousand separator, and the date format (05 Feb 2008 or Feb 05, 2008).
- **Change password**: allows you to change your system password. You are required to enter your current password, and to confirm the new password that you want to use.

Note: According to your organization's security policies (described in Section 9.16.4, "Enforcing Password Security Policies"), you are required to regularly change your password. You will receive a warning each time you logon seven days prior to password expiration. If, during this time, you have not reset your password, your account will be locked. If you will be out of the office for more than seven days prior to your password expiring, it is strongly recommended that you reset your password prior to your absence.

1.7 Working with Dashboards

RUEI allows you to create a set of your own customized dashboards. A dashboard is a visual display of the most important information required to achieve an objective, consolidated and arranged on a single screen so that the information can be monitored at a glance. An example is shown in Figure 1–3.

Figure 1–3 Example Dashboard



Each of your currently defined dashboards is available via tabs at the top of the screen. The last tab (**»**) provides an overview of the templates available to you to use as the basis for creating new dashboards.

Designing Effective Dashboards

When designing your dashboards, it is recommended you carefully consider the dashboard's appropriate content in terms of which data to report, and what visualizations to use. In particular, it is recommended you carefully consider the following points:

- Is the dashboard's information content overloaded? Ideally, it should help you visually identify trends, patterns, and anomalies.
- Which visualizations provide the clearest, most meaningful presentation of the data in the least amount of space?
- Does the displayed information need to be refreshed in real-time and, if so, how often? Do the objectives it serves require real-time information?
- Does the dashboard quickly point out something that deserves your attention, and might require action?

Dashboards and Templates

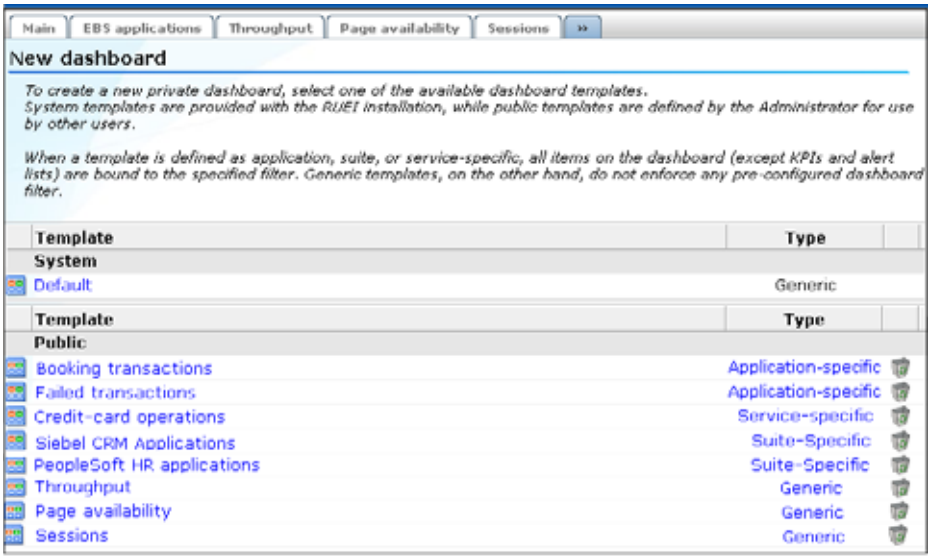
Dashboards are created based on templates. There are two types of templates: system and public. System templates are provided with the product installation, and cannot be modified. Public templates, on the other hand, are dashboard templates created and maintained by Administrators. They cannot be modified by any other user.

1.7.1 Creating New Dashboards

To create a new dashboard, do the following:

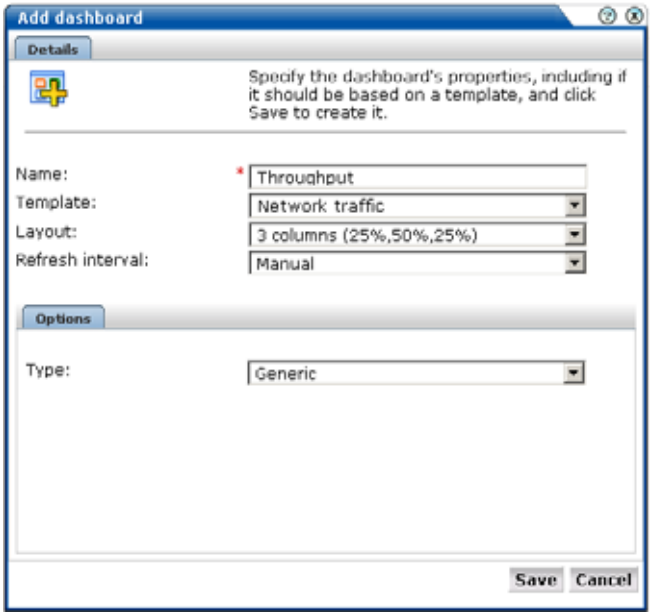
1. Click the **Dashboard** tab, and then click the last (») tab. The templates currently available to you are listed. An example is shown in Figure 1–4.

Figure 1–4 Example of Available Templates



2. Click the template you want to use as the basis for the new template. A dialog similar to the one shown in Figure 1–5 appears.

Figure 1–5 Add Dashboard Dialog



3. Specify a name for the new dashboard. This must be unique across your dashboards, and is limited to a maximum length of 30 characters.
4. Select the template upon which the dashboard should be based. Alternatively, select the option "(none)" for the dashboard to be created from scratch. Note there is no link between the newly created dashboard and the template upon which it is based. That is, any future changes to the template are not applied to any dashboards created from it.
5. Select the dashboard's format. This can be based on one, two, or three columns. The percentages indicate the amount of available screen space allocated to each dashboard column.
6. Select the refresh interval. This can either be manual (that is, the dashboard is only refreshed when you click the **Reload** icon on the taskbar), or automatic (every 5, 10, or 15 minutes).
7. Within the **Options** tab, the **Type** menu specifies if the dashboard will be bound to a specific application, suite or Web service, or if it will be generic. The options within these menus depends on your assigned access permissions. The use of dashboard filters is described in Section 1.7.3, "Using Template Filters".

   When ready, click **Save**.

> **Note:** You can have a maximum of 10 dashboards at any one time.

Viewing Dashboards

Each of your currently defined dashboards is available by clicking its associated tab within the **Dashboard** tab. You can also click the **Open in a new window** icon on the taskbar. This is useful for viewing dashboards in a full-screen display, or for viewing several dashboards at the same time through resized and aligned windows.

Modifying Dashboards

You can modify a dashboard's properties by clicking the **Edit** icon within the dashboard taskbar. A dialog similar to the one shown in Figure 1–5 appears. Use this dialog to modify the dashboard's underlying template, name, layout, and refresh interval. The dashboard's layout and filter (described in Section 1.7.3, "Using Template Filters") are also reported.

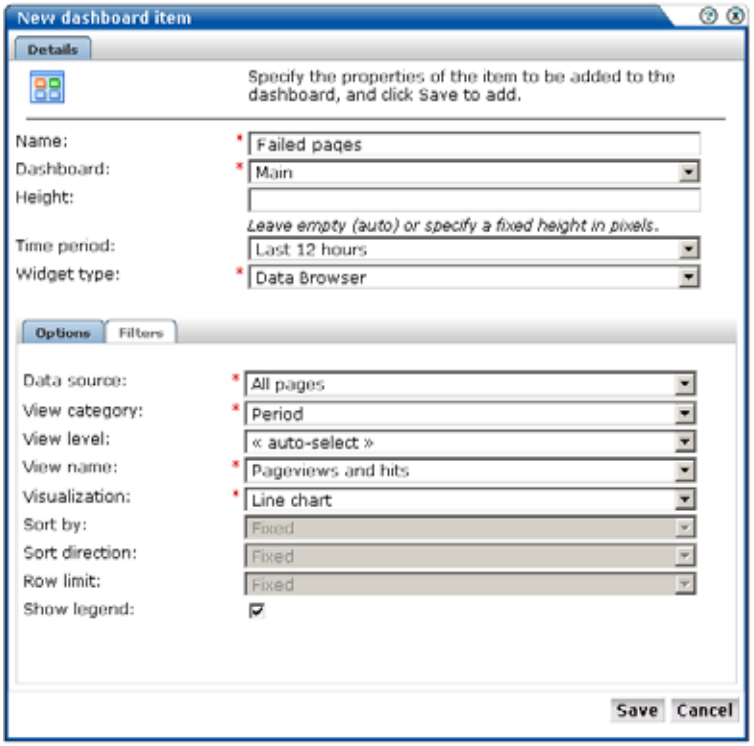
You can also add or remove items to and from a dashboard, as well as modify existing items. This is described in the following section.

1.7.2 Modifying a Dashboard's Contents

To add an item to a dashboard, do the following:

1. Select the required dashboard, and click the **Add item** icon on the taskbar. A dialog similar to the one shown in Figure 1–6 appears.

Figure 1–6 New Dashboard Item



2. Specify a name for the new item. This must be unique to items within the selected dashboard.
3. Select the dashboard upon which the new item will appear. By default, this is the currently selected dashboard.
4. Optionally, you can specify the item's height in pixels. If you leave this field blank, the item is automatically sized within the available dashboard space.
5. Select the widget type to be shown. This can be one of the following:
   - **Alert log**: specifies the item represents a rolling list of the latest generated alerts. If this option is selected, you can use fields within the **Options** tab to specify how you want the alerts sorted, the order in which they should appear,

and the maximum number of alerts that should be reported within the list. You can use the fields within the **Filters** tab to specify the category of KPI alerts listed, their status, and severity.

- **Data browser**: specifies the item represents a data source within the Data Browser. If this option is selected, you can use the fields within the **Options** tab to specify the group from which the item should be derived (for example, All sessions or Failed pages), as well as its category and dimension level. The visualization (for example, values list or pie chart) and view level (for example, 5-minutes or year) can also be specified. In the case of a graphical visualization, you can use the **Show legend** check box to specify if In the case of a value list, you can specify the maximum number of listed values. The available options depend on the selected data source.

  You can use the fields within the **Filters** tab to specify filters (based on selected dimensions) that should be applied to the selected data source. This widget is only available if you have been granted Analytical or Full access permissions (see Table 1–2).

- **Map**: specifies the item should appear as a map highlighting the location of the selected data item (for example, client sessions). This is shown with a color coding scheme to represent the locations from where the selected data source originates. Hence, a bright red color indicates a country with a high level, while one with a white color indicates no selected data source activity originating from there. More detailed views are also available for Europe, USA, and Asia.

  You can use the fields within the **Filters** tab to specify filters (based on selected dimensions) that should be applied to the reported data source. This item is only available if you have IT Analytical or Full access permissions (see Table 1–2).

- **Single KPI**: specifies the item should report the current status of a specific KPI. If this option is selected, you can use the fields within the **Options** tab to specify the required KPI and a visualization for the item (gauge or graph).

- **Multiple KPIs**: specifies the item should report the status of a selected number of defined KPIs. If you select this option, you can use the fields within the **Options** tab to specify the number and order of the reported KPIs, and the **Filters** tab to specify the KPI categories and statuses that should be reported.

- **Multiple SLAs**: specifies the item should report whether selected categories of SLAs have achieved their yearly, monthly, weekly, and daily defined percentage levels. If you select this option, you can use the **Options** tab to specify how you want the reported SLAs sorted, and the **Filters** tab to specify the categories that should be reported. Note that if the **Category** field is left empty, all categories are reported.

6. If the new item is a single KPI with a graph visualization, an alert list, a Data Browser item, or a map, you can use the **Time period** menu to specify the period for which the reported data should refer. This can be the last five minutes, or the last 1, 6, 12, 24, or 36 hours. For all other item types, (a single KPI with a gauge visualization, or a multiple KPIs item) this menu is disabled, and the period reported for the item is derived from the KPI's defined sampling interval. This is described in Section 5.2, "Defining KPIs and SLAs".

7. When ready, click **Save**. The defined item is added to the top left-hand corner of the selected dashboard. You can drag and drop the item to finalize its position within the dashboard.

Note: You can define a maximum of 35 items for a dashboard.

Drilling-Down Into The Data Browser

In the case of Data Browser dashboard items, you can click the **Browse** icon located in the top right-hand corner of the item to obtain a complete view of the data from which the item is derived. The use of the Data Browser is described in Chapter 3, "Working With the Data Browser". Note this icon is only available if you have IT Analytical or Full access permissions (see Table 1–2).

Modifying Dashboard Items

You can click a dashboard item's title to edit it. A dialog similar to the shown in Figure 1–6 allows you to modify its properties. Depending on whether an item is derived from an application, service, or suite-specific template, and your access permissions, some of the fields within the dialog may be disabled. Note an item can be deleted by clicking the **Remove** icon within its title area.

1.7.3 Using Template Filters

Templates can either be defined as generic, or as application, service, or suite-specific. In the case of the later, all items on the dashboard (except KPIs and alert logs) are bound to a specified source. Generic dashboards do not have this restriction.

If a source-specific template is defined, each item on the dashboard is filtered on the specified source. If this filter cannot be applied for some reason (for example, because a specified application has since been deleted), or because the user does not have the necessary access level permissions, the item is replaced with a warning that the requested data could not be displayed.

The use of template filters has a number of advantages:

- It minimizes template maintenance. For example, imagine that a dashboard template contains 20 items, all of which refer to the same application. Instead of having to modify all 20 items when you want to create the same template for another application, you only have to modify the template filter.
- System users can be authorized to view data within a dashboard that they would not normally be able to view. For example, imagine that a user has only Business and IT Overview access level permissions. In this case, they do not have access to the Data Browser. However, through their user account definitions (described in Section 9.16, "Managing Users and Permissions"), they can be authorized to view selected data items for a specific application, service, or suite. However, they would be prevented from being able to view information derived other data sources.

Detection of Template Filters

Note that after an application, service, or suite has been configured, it must still be detected at least once in the monitored traffic before it can be used as a template filter.

1.7.4 Adding a Data Browser or KPI View to a Dashboard

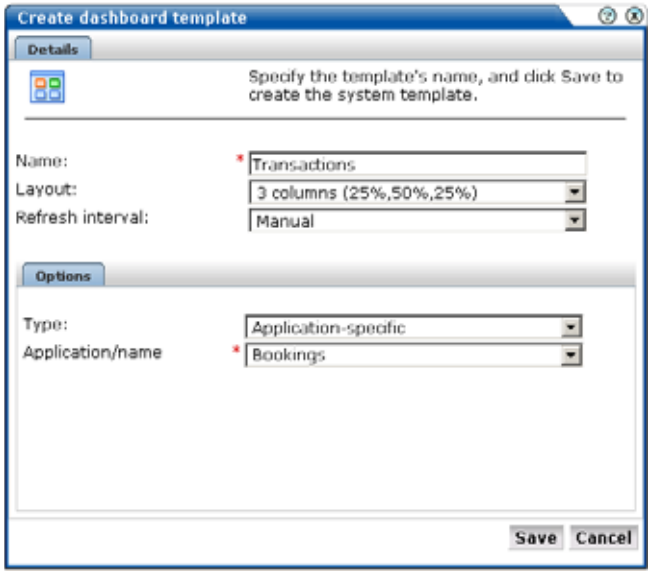
You can add the current view within the Data Browser or the currently viewed KPI within the KPI overview facility to a dashboard by clicking the **Add to dashboard** icon. A dialog similar to the one shown in Figure 1–6 appears. You can use this dialog to finalize how the data source should be reported within the dashboard.

1.7.5 Creating Public Templates

As explained earlier, public templates are created by Administrators for use by others users as the basis for their dashboards. To create a public template, do the following:

1. Click the **Dashboard** tab, then click an existing dashboard tab, and then click the **Save as template** icon on the taskbar. Note this option is only available to Administrators. The dialog shown in Figure 1–7 appears.

Figure 1–7 Create Dashboard Template Dialog



2. Specify a name for the new template. This must be unique across system templates.
3. Specify the template's format and refresh interval.
4. Within the **Options** tab, use the **Type** menu to specify whether the template should be bound to a specific application, service, or suite. The use of filters is described in Section 1.7.3, "Using Template Filters".

   In the case of an application or service-specific template, specify the application or service to which it should be bound. In the case of a suite-specific template, specify the suite type (for example, PeopleSoft), and the configured suite. Note the options available within the **Suite type** menu depends on the accelerator packages installed on your system.

   Note that users with Business and IT access permissions below Inquiry level need to be authorized to view information about specific applications, services, and suites. This is described in Section 9.16, "Managing Users and Permissions".

   When ready, click **Save**. The newly created template immediately appears within the list of public templates. Access to the items on the template depends on the user's individual access permissions.

Modifying System Templates

System templates cannot be edited directly. If you need to modify a system template, it is recommended that you select the **Disable** option from the system template's context menu to make it unavailable to other users. You should then modify an existing dashboard (or create a new one) with your required modifications, save this as a

public template, and then advice users to use the public template as an alternative to the system template.

1.7.6 Modifying a Template's Properties

After creating public templates for use by other system users, you can edit their properties by doing the following:

1. Click the **Dashboard** tab, and then click the last (») tab. The currently available public templates are listed. Select the **Edit** option from the required template's context menu. A dialog similar to the one shown in Figure 1–7 appears.
2. Use the fields available within the dialog to modify the templates name, layout, refresh interval, and data source as described Section 1.7.5, "Creating Public Templates". When ready, click **Save**.

As explained earlier, there is no direct link between a template and the dashboards created based upon it. Hence, any changes you make to a template are not reflected in existing dashboards created from it.

1.8 Ending Your Session

To finish your session, select **Logout** from the **System** menu.

2

Working With Reports

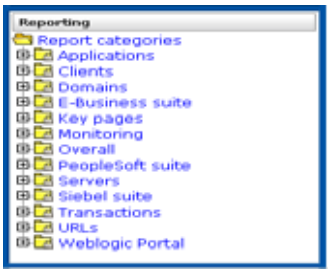
This chapter describes the standard reports that are available to you, how to use reports, control the report mailings you receive, as well as how to modify and create your own reports. The use of the two report modes, inline and print layout, is also explained.

2.1 Introducing the Report Tree

Reports provide you with the insight you need to assess the performance of your network infrastructure. They also allow you to see whether defined KPIs and SLAs are being achieved. They enable you to quickly identify any problem areas and, together with the use of alerts, ensure that the necessary corrective action is taken promptly and accurately where required.

RUEI comes with an extensive library of predefined (standard) reports that provides you instant and powerful insight into your organization's monitored operations. These reports are available through the report tree, which you can view by clicking the **Reports** icon. This is shown in Figure 2–1:

Figure 2–1 Report Tree



2.1.1 The Standard Report Library

The report tree is made up of categories (or folders) containing reports dedicated to particular aspects of the monitored traffic. This enables you to quickly locate the information most relevant to you. The information available in each report category is outlined in Table 2–1:

Table 2–1 Report Categories

Category	Description
Applications	Provides information about monitored application pages. This includes page views, the objects that appear on the pages, and their loading and reading times.

Table 2–1 (Cont.) Report Categories

Category	Description
Clients	Provides information about monitored application pages. This includes page views, the objects that appear on the pages, and their loading and reading times.
Domains	Provides information about the monitored domains, including traffic, page views, and loading and reading times.
E-Business Suite[1]	Provides information about EBS-enabled applications.
JD Edwards Suite[1]	Provides information about JD Edwards-enabled applications.
Key pages	Provides information about pages that have been chosen to receive special attention. For these pages, additional information is recorded.
Monitoring	Provides daily or weekly information on dashboard items (such as SLAs and KPIs).
Oracle ADF suites[2]	Provides information about Oracle ADF-based applications.
Overall	Provides cumulative information about the monitored Web site, such as failures, total traffic, sessions, and page views.
Servers	Provides information about client sessions based on assigned IP ranges.
Siebel[1]	Provides information about Siebel-based applications.
Transactions	Provides client information about all defined Web application transactions. For example, how many transactions were initiated by visitors, how long did they take, and how many were completed and aborted.
URLs	Provides information about failed or slow hits, and performance killers.
WebLogic Portal[2]	Provides information about WebLogic Portal-based applications.

[1] These categories are only available if their associated accelerator package has been installed.
[2] These categories are only available if suite instances for them have been defined.

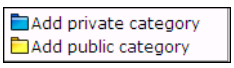
2.1.2 Customizing the Report Library

You can modify the standard report tree to better suit your organization's requirements. Using menus, you can rename, remove, or add a report category or subcategory.

It is not possible to modify or delete any standard report. Nor is possible to change their associated permissions. As such, these reports are available to authorized users on a read-only basis. If you want to use a modified version of a standard report, you should use the standard report as the basis for a custom report. The procedure to do this is described in Section 2.9, "Creating New Reports".

To add a category to the main report tree, right click the **Report categories** item. The context menu shown in Figure 2–2 appears:

Figure 2–2 Report Categories Menu



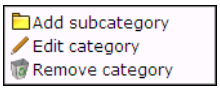
The following options are available:

- **Add public category** to make the new category available to all users.
- **Add private category** to make the new category only available to you.

After selecting the required option, you are prompted to specify a unique name for the new category. Report categories are ordered alphabetically, and private categories appear below public ones.

To add a subcategory, or to rename or remove a category, right click the appropriate category. The menu shown in Figure 2–3 appears:

Figure 2–3 Report Category Sub-Menu



The following options are available:

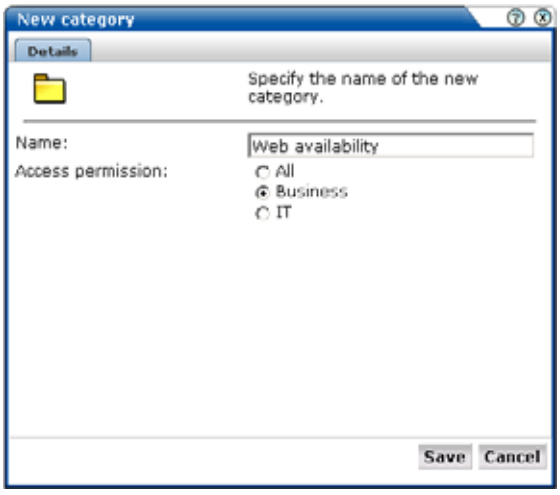
- **Add subcategory** to create a new subcategory under the selected category. This new subcategory will be available to all users.
- **Edit Category** to rename or move the category to another location.
- **Remove category** to delete the category. You are prompted to confirm the deletion.

Report Permissions and Power Users

Each user-created report and report category is assigned a usage type. This is either Business or IT, or both. This distinction is also the basis for the user rights explained in Section 1.4, "Understanding User Roles". If you have been assigned Analytical or Full access level rights as both a Business and IT user (that is, you are a so-called power user), you should be aware that access to the reports you create is controlled on individual report level, and not report category level.

For example, if you create a new public category with the usage type Business, such as the one shown in Figure 2–4, any IT-related reports that are saved to this category cannot be accessed by Business users.

Figure 2–4 Creation of New Public Business Category

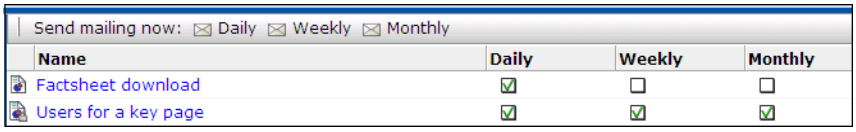


For this reason, it is recommended that you do not mix reports aimed at different types of users within categories.

2.2 Using the Mailing Facility

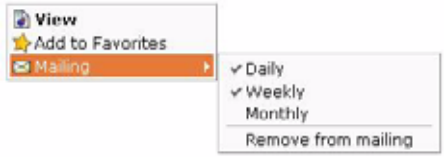
You can use the **Mailing** facility to obtain a ready overview of the reports you receive through automatic E-mails, and the frequency (daily, weekly, or monthly) with which they are sent to you. An example is shown in Figure 2–5.

Figure 2–5 Example Mailing Profile



Use the check boxes to the right of a report to specify the frequency with which you want to receive a report. Alternatively, right click a report and select **Mailing** and the report frequency (**Daily**, **Weekly**, or **Monthly**). You can also select **Remove from mailing** to stop receiving the selected report.

Figure 2–6 Report Menu

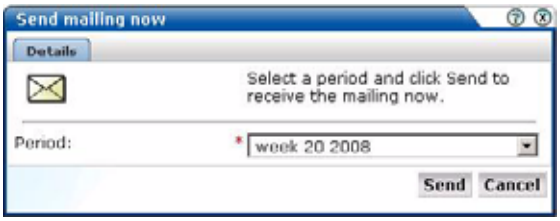


You can use the **Daily**, **Weekly**, or **Monthly** command buttons in the **Send mailing now** panel to request previous reports. If a command button is unavailable, it means that there are no reports in the mailing list with that frequency.

Note: The report mailing facility is scheduled to run at 6 am (Reporter system time) every day.

For example, if you click **Weekly**, a list (shown in Figure 2–7) allows you to select a particular week, and you will receive all the weekly reports for the selected week that are currently checked in your mailing profile.

Figure 2–7 Send Mailing Now Dialog



2.3 Using the Favorites Facility

To help you quickly locate the reports you work with most often, click the **Favorites** option. This facility allows you to create shortcuts to them.

To add a report to your **Favorites** section, right click the required report, and select **Add to Favorites** from the menu shown in Figure 2–6. To open the report, click the

shortcut, or select **View** from the menu. To review or change the report´s current mailing frequency, select **Mailing** and the required option.

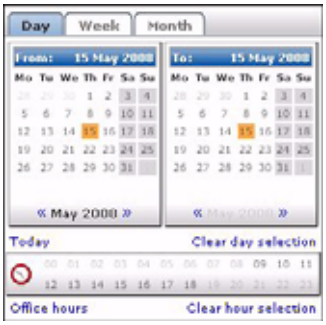
To delete a shortcut from your Favorites, right click it, and select **Remove from Favorites** from context menu the shown in Figure 2–8:

Figure 2–8 Favorites Context Menu

2.4 Using the Calendar

A report provides information about a particular date or period. Hence, it is necessary to specify the period for which you want information. Use the **Calendar**, shown in Figure 2–9, to specify the required date or period.

Figure 2–9 Calendar



2.4.1 Controls

The Calendar contains the following parts:

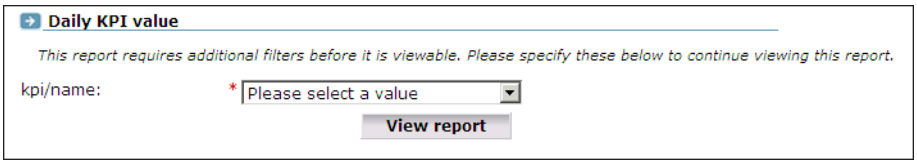
- The **From** and **To** sections provide a mechanism to specify the period for which you want information. This can be specified in terms of days, weeks, or months. The selected date(s) are shown in highlight. To de-select a date, simply click it again. Use the arrow keys at the bottom of the displayed columns to move backwards and forwards by months or years. You can click **Clear day selection** to quickly de-select all current selections. By default, the current date is selected. This can also be selected by clicking **Today**.
- The **Day** tab allows you to specify the required period in terms of specific days. Note that if you select a single day, an additional panel allows you to restrict the report to specific hours within the selected day. You can click hours to select and de-select them, or click **Office hours** to immediately select 09 to 18. You can also quickly de-select any selected hours by clicking **Clear hour selection**.
- The **Week** and **Month** tabs allow you to request information specified in terms of complete weeks or months.

Note that while viewing a report, you are free to change your period selection at any time. Simply use the controls described above, and the report is immediately updated to reflect your new period selection.

2.5 Using Report Filters

If you open a report created with a report filter (described in Section 3.6.3, "Using Report Filters"), you are prompted to specify a filter for the report. For example, if the report concerns the daily values of defined KPIs, you are prompted for the KPI you want to view. This is shown in Figure 2–10:

Figure 2–10 Example Report Filter



Select the required value from the displayed list, and click **View report**. The report then opens.

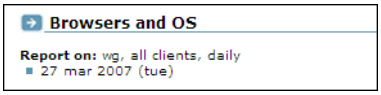
2.6 Browsing Reports

Each report consists of a **header**, an **Information screen**, and a number of **sections**. These report parts are described in the following sections.

2.6.1 The Report Header

The report header contains general information about the report you are viewing. This includes the report's title, an indication of the reported metrics, and the date or period to which the report refers. An example is shown in Figure 2–11.

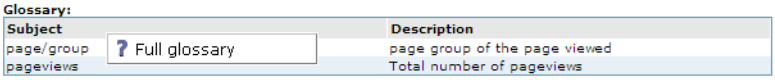
Figure 2–11 Example Report Header



2.6.2 The Information Screen

The information screen provides a glossary of the terms used in the report. This is useful when you (or other report users) need an explanation of the metrics used in a report. An example is shown in Figure 2–12.

Figure 2–12 Example Report Glossary



Note you can also obtain a complete list of all terms used in reports, together with an explanation of them, by right-clicking within the glossary and selecting **Full glossary**.

2.7 Report Sections

Typically, a report contains several sections, and the number of available sections varies between reports. For example, a daily traffic report would contain two sections:

one reporting traffic in terms of page views for the requested period, and the other reporting traffic in terms of bytes.

You can move between report sections by using the icons in the toolbar at the top of the report panel. In addition, they allow you to view the report's information screen, and switch between a graphic and table (value) view of the report's data. These icons are shown in Figure 2–13 and explained in Table 2–2.

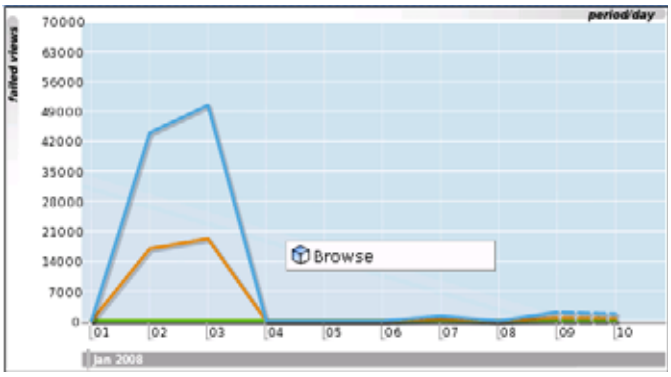
Figure 2–13 Inline Layout Icons

Table 2–2 Inline Layout Icons Explained

Icon	Description
	Glossary. Provides a brief explanation of the metrics currently shown in the report.
	Graph. Displays the standard graphic visualization (pie chart, line chart, or bar chart) for the report section. The graphic form depends on the underlying data.
	Values. Shows the underlying data values for the data in the report.
	Previous and **Next** section. Use these controls to move between the report's sections. The number of available sections varies between reports.
(1/3)	Indicates the current section in the report.
	Preview. Opens the report in print layout mode. This is the mode to use when you want to customize the report, or create a new report based on it.
	Download PDF. Create an Adobe PDF file of the report's current contents.

In addition to the options shown in Figure 2–13, you can also use **Browse** option (shown in Figure 2–14) within each section's context menu to obtain a complete view of the data from which the report section is derived. This is described in Chapter 3, "Working With the Data Browser."

Figure 2–14 Report Section Menu



2.7.1 Interpretation of Reported Values

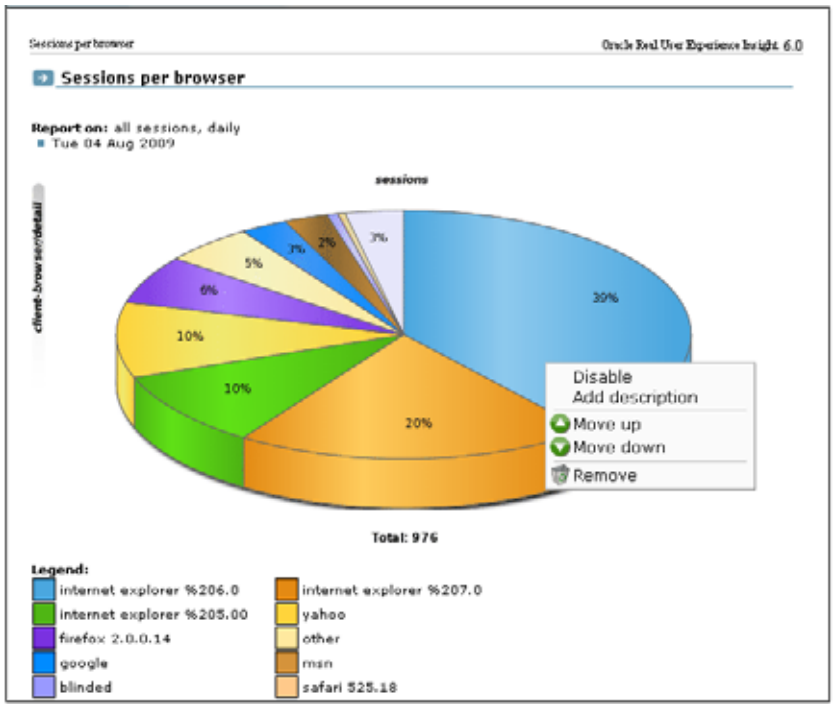
When using reports (and the Data Browser described in Chapter 3, "Working With the Data Browser"), a value list may sometimes contain the text "n/a" rather than a reported value. This is caused by no measured data being available. With line graphs and bar charts, this situation is indicated by a 0 (zero) value. This can arise in the following situations:

- Averages for a selected period are always calculated on the basis of available data. Therefore, if you have requested information about an average value over the last 24 hours, but only 20 hours of data is available, the average would be calculated on the basis of 20 hours, and not 24 hours.
- Period-based reports might contain automatically inserted "n/a" rows to ensure that the order and range between rows is consistent.
- The use of filters may lead to data becoming unavailable for the active period. This will also lead to the insertion of "n/a" values. Note that for columns reporting totals, these values are interpreted as 0.

2.8 Working With Print Layout Mode

When a report is opened, it is shown in inline mode. This offers a high-level overview of the report's contents, and provides ready access to more detailed information available through the report. When browsing a report, this is the mode that you will use. However, when you want to customize reports, or create new ones, a more powerful editing mode is required: this is called **print layout**. An example is shown in Figure 2–15.

Figure 2–15 Example Report in Print Layout



This layout can be thought of as the report's template: it defines the report's structure and appearance. To view a report in print layout, select **Preview** from the taskbar at the top of the report panel (shown in Figure 2–13). The report's print layout is shown in a new window.

The first major difference you will notice between the two layouts is that, in print layout, all report sections (including the Information screen) are shown. This provides you with a complete overview of the report's contents. The other major difference is that the report's data is shown in both graphic and value (table) form.

You can use the context menu (shown in Figure 2–15) available under each section to modify the section to your requirements. It allows you to add descriptions to sections, enable and disable report sections (explained in Section 2.9.1, "Enabling and Disabling Report Parts"), remove sections from the report, and change the order in which sections appear in the report.

2.8.1 Working With Value Lists

By default, data in report sections is shown in graphic form. However, sometimes you want to see "hard" numbers, rather than a graphic visualization. In addition, you may be planning to distribute the report to users whose printing or display facilities are limited. Therefore, you can use the **Values** and **Graph** icons in the toolbar at the top of the report panel (see Figure 2–13) to switch between the two views. An example of a value table is shown in Figure 2–16.

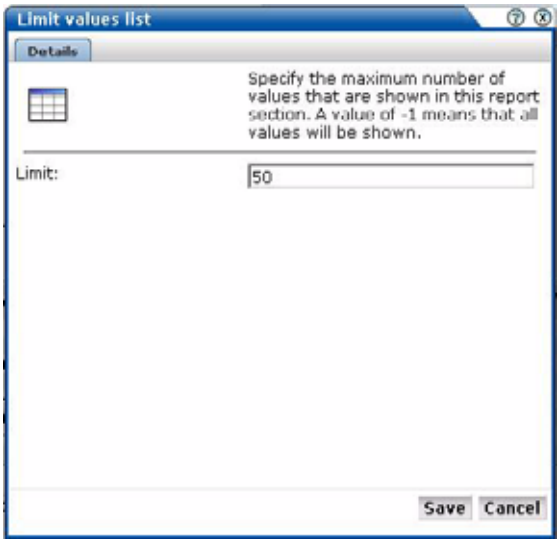
Figure 2–16 Example Value Table

object-url/group	reply-content-s	reply-header-si	request-conten	request-header
/download/	1855790	333	0	537
/back/	535458	399	0	478
/beate3/	393508	347	0	576
/0004/	266152	726	0	737
/beate5/	256579	352	5	620
/000-vbo/	251334	351	0	786
/beate4/	247174	348	0	631
/passage/	192079	456	183	651

2.8.2 Limiting Value Lists

Within a value list, you can select **Limit value lists** from the menu to specify the number of values that are shown in the selected section. The dialog shown in Figure 2–17 appears.

Figure 2–17 Set Value Limit Dialog



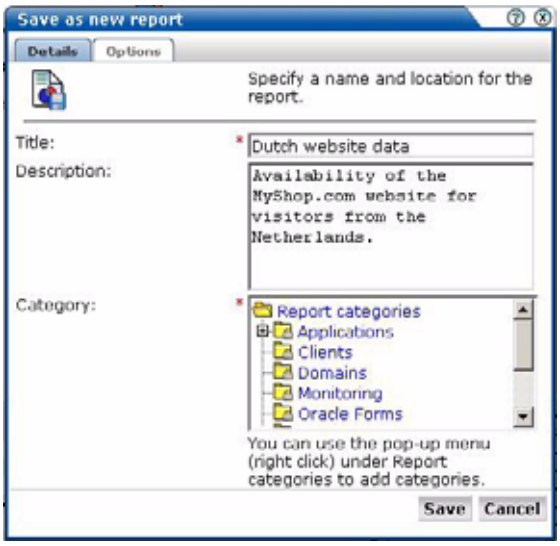
If you specify a value of -1, all available values will be shown. It is recommended that you use this facility with care because of potentially very large value lists. The default is 100.

2.9 Creating New Reports

In addition to the standard reports provided in the report tree, you can also create new reports. To do so, you should use an existing report as the basis for your new report, and then modify it to meet your requirements. To save the new report, do the following:

1. When you are ready to create the new report, select **Save as new** from the **File** menu. The dialog shown in Figure 2–18 appears:

Figure 2–18 Save As New Report Dialog



2. Specify a title and brief description for the new report, and the category to which it should be saved. As mentioned earlier, if you save the report to a private category, it will only be available to you. The **Options** tab allows you to specify whether the glossary is included in the report. When ready, click **Save**.

   Note that if the report you created is not immediately visible in the report tree, click the **Reports** icon to refresh the displayed structure.

2.9.1 Enabling and Disabling Report Parts

Each section within a report can be enabled or disabled. When disabled, a section is shown as collapsed, and must be enabled to make it visible again. An example of a disabled report section is shown in Figure 2–19:

Figure 2–19 Disabled Report Section

It is important to understand that this facility is used to control the content of the final (saved) report. For example, if the existing report that you are using as the basis for your new report contains sections that are not relevant to the new report, you can use this feature to remove them from the final report.

2.9.2 Modifying Existing Reports

You can use the facilities described in Section 2.9.1, "Enabling and Disabling Report Parts" to modify a report. Note that it is not possible to modify standard reports (described in Section 2.1.1, "The Standard Report Library"). Your ability to create new reports depends on your assigned user permissions. If you create a public report, it is editable by users with the necessary permissions, and is available on a read-only basis to all other users.

2.10 Exporting Reports to PDF

You can click the **Download report as PDF** icon or select **Download report as PDF** from the **File** menu to create an Adobe PDF file of the report's current contents. Note

that sections that are disabled in print layout are not included in the generated PDF file.

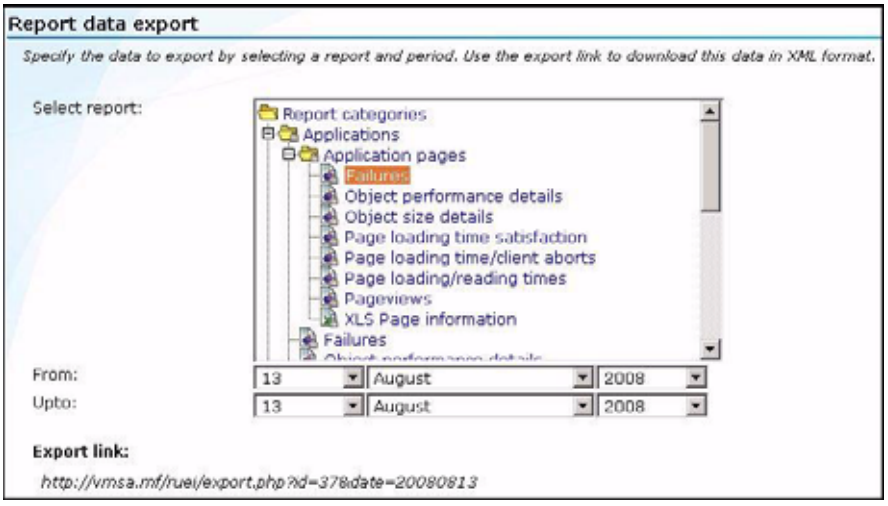
> **Note:** In order to view the generated PDF files, the Adobe Acrobat Reader must be installed. It is available for download from the Adobe Web site (`www.adobe.com`).

2.11 Exporting Report Data

The report data within RUEI is available for export to host or client systems. For example, to a Business Intelligence (BI) system. The exported data is in Unicode (UTF-8) format. Access to the data is controlled through configuration of a system file. To use this facility, do the following:

1. Select **System**, and then **Report data export**. The window shown in Figure 2–20 appears.

Figure 2–20 Report Data Export



2. Select the required report from the list, and specify the period for which data should be available. A URL to the report data appears. Copy and send this to all relevant hosts.
3. Configure the access control file (described below) file to manage access to the `export.php` file for the required users or systems. By default, access to the file is denied to any HTTP request.

Configuring Access Control

This section presents a brief overview of how to secure access to the `export.php` file and, therefore, manage access to the exported data. A complete description of Apache Web server access control file functionality is available at `http://httpd.apache.org/docs/2.2/howto/auth.html#gettingitworking`.

By default, all access to the export file is blocked by the following entry in the `/etc/httpd/conf.d/uxinsight.conf` file:

```
<Files export.php>
    Deny from all
</Files>
```

To grant access to the export facility, the `Deny from all` entry must be overridden with an `.htaccess` file. By default, the `.htaccess` file is not present, but can be created in the `/opt/ruei/gui` directory. Below is an example for access to authenticated users only:

```
<Files export.php>
Order deny,allow
AuthUserFile /opt/ruei/.credentials
AuthName "Exports"
AuthType Digest
# Uncomment line below in case of IE6
# BrowserMatch "MSIE" AuthDigestEnableQueryStringHack=On
Require valid-user
Allow from all
</Files>
```

The third line contains a reference to a credential file. This files contains a list of user name and password combinations which the Apache Web server uses to validate each login attempt. It can be created using the `htdigest` utility.

```
$ htdigest -c /opt/ruei/.credentials "Exports" <username>
Adding password for <username> in realm Exports.
New password: password
Re-type new password: password
```

3

Working With the Data Browser

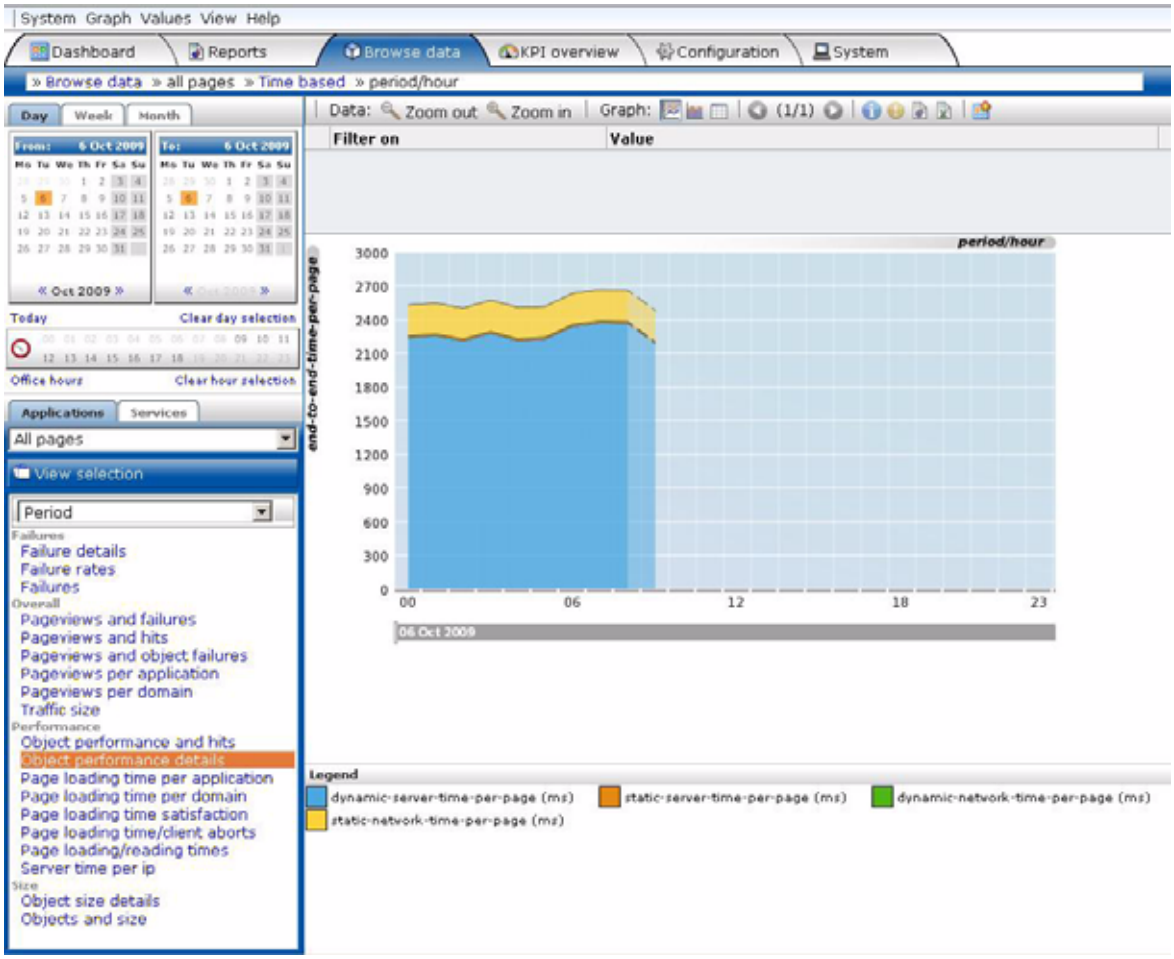
This chapter explains the use of the Data browser. This is at the heart of RUEI, and provides direct access to the information gathered during monitoring. Through it, you can drill down, search, and filter information in an intuitive and user-friendly manner.

3.1 Introducing the Data Browser

The information shown in each report is derived from a multi-dimensional data structure that contains all the information captured during monitoring. Through this structure, you can explore Web data by simply clicking down through increasing levels of detail, and view by different dimensions (such as period, referrer, visitor type, and so on). This data structure can be viewed through the **Data browser** tab.

You can use the Data browser to understand the context of the data shown in a report, and to drill down, rank, sort, and filter information to gain insight into causes, effects, and trends. To open the Data browser from within a report, select the **Browse** option from the report menu. To open the Data Browser from elsewhere, click the **Browse data** tab. A window similar to one shown in Figure 3–1 appears:

Figure 3–1 Data Browser



3.1.1 The Data Browser Toolbar

The toolbar icons at the top of the Data browser screen are shown in Figure 3–2, and are described in Table 3–1:

Figure 3–2 Data Browser Toolbar

Table 3–1 Data Browser Icons

Icon	Description
	Graph. Displays the standard graphic visualization (pie chart, line chart, or bar chart) for the data. The graphic form depends on the underlying data.
	Additional visualizations. In addition to the standard graphical visualization, depending on the underlying data, additional visualizations may be available, and can be selected by clicking the appropriate icon. You can also use the **Type** option from the **Graph** menu to select a visualization.

Table 3–1 (Cont.) Data Browser Icons

Icon	Description
	Values. Shows the underlying data values for the data in the browser. See Section 3.3, "Working With Value Lists" for more information about working with value lists.
	Previous and **Next** page. Use these controls to move between pages in the displayed data set.
	Glossary. Provides a brief explanation of the metrics currently shown within the Data Browser. This includes both the dimensions shown in the graph or values table, and any filters that have been applied to it. The use of filters is explained in Section 3.6, "Working With Filters".
	Search. Allows you to search for strings within in the currently displayed data set. The use of the search facility is described in Section 3.4, "Searching in the Data Browser".
	Zoom in and **Zoom out**. Allows you to change the level of displayed detail. When zooming in and out, you change the dimension of the viewed data. The new dimension depends on the currently selected dimension. For example, if you are viewing yearly data, zooming in will change the view to a monthly one. If you are viewing client location by country, zooming in will change the displayed dimension to providers within the client location country. To quickly return to the original dimension, select **Reset view** from the **View** menu.
	Open as report. Opens a new window with the currently shown data in report print layout mode. The creation and customization of reports is described in Chapter 2, "Working With Reports."
	Open as export. Opens a new window in which you can further customize the currently shown data prior to exporting it to a wide variety of applications (such as Microsoft Excel). This facility is described in Section 3.7, "Exporting Data".
	Add to dashboard. Adds the current view to a selected dashboard. This facility is described in Section 1.7.4, "Adding a Data Browser or KPI View to a Dashboard".

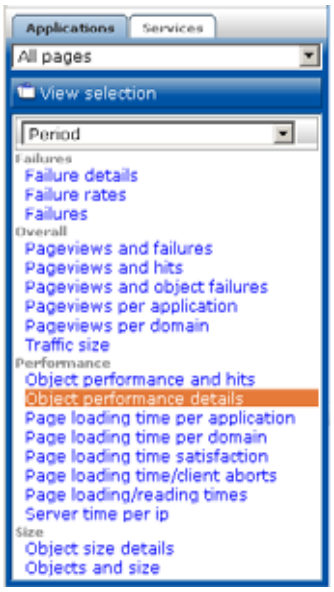
3.2 Understanding the Data Structure

The information available within the Data Browser is divided across **groups**. At the highest level, there are two types of groups: application-related groups and services-related groups. Each group provides a number of perspectives, or **view**s, on the collected data. These views can be selected from the **View selection** panel, located on the left-hand side of the Data Browser window (Figure 3–1).

Each main group within the **View selection** panel relates to a broad category of information. There are groups available about the pages visited on the monitored Web environment, visitor sessions, transactions, failed URLs and pages, and key pages.

Within each of these groups, sub-groups offer information about a specific aspect of the selected category. More specifically, they offer information across specific dimensions. These dimensions are indicated in the name of the sub-group. For example, within the All sessions group, views are available across the dimensions domain, period, user ID, and client browser, language, location, and operating system. This is shown in Figure 3–3:

Figure 3–3 Data Structure Selection Panel



Individual views are grouped according to a standard classification (failure, performance, overall, and size) that reflects the type of information they provide. Within these, you can select the active dimension you want to use to explore the underlying data.

In addition to the standard dimensions discussed in this section, it is also possible to extend the information available within the Data Browser through the use of custom dimensions. These are described in Section 3.8, "Working With Custom Dimensions".

The Session diagnostics facility is described in Section 3.9, "Working With the Session Diagnostics Facility".

3.2.1 Real-Time and Session-Based Data

Within RUEI, two types of information are available: information derived from all active sessions detected during a 5-minute period, and information derived from finished (closed) sessions. Each of these are described in the following sections.

Active Sessions-Derived Information

Nearly all information reported in RUEI is based on the open (active) sessions detected within a 5-minute period. There are three exceptions to this: the All transaction group, and the reporting of multiple-day periods within the All sessions group. These are discussed in the next session.

Be aware that the properties reported for a session within the 5-minute period, such as IP address and user ID, are effectively snapshots taken at the end of the 5-minute period. While the value of these properties can potentially change during the 5-minute period, it is their values at the end of the period that are reported.

Closed Sessions-Derived Information

Information reported within the All transactions groups, as well as for multiple-day periods within the All sessions group, is derived from finished (closed) sessions. As a result, this information has a delay associated with it. The delay arises from the

defined session idle time. This specifies the period of inactivity after which a visitor session is regarded as terminated. By default, this is 15 minutes.

As a result of how this information is derived, it is not possible to drill-down to the level of 5-minute intervals. In addition, imagine a visitor session starting at 9 AM, and finishing at 5 PM. The session is active throughout the day, except for lunch, from 12 AM to 1 PM. This session would normally be reported as one session. However, within the All transactions groups, as well as for multiple-day periods with in the All sessions group, it would be reported as two sessions because of the inactive period.

Why are There Sometimes Differences in Reported Data?

It is possible that small differences arise between the data reported for a single-day period and a multiple-day period. For example, the number of reported visitors in the All pages view for a day may be slightly different to that reported for the same day when viewed within a two-day period in the All session view. In order to understand why these differences arise, it is necessary to understand how data for a single day and for a multiple-day period is processed.

Note that the total number of reported sessions between a single-day period and a multiple-day period can differ. In order to prevent, you should ensure that the specified session idle time matches that of the monitored application.

3.2.2 Problem Analysis Groups

The Problem analysis category of views (shown in Table 1–3) provides, for applications, in-depth information about failing or problematic page views and hits. It contains the following views:

- **Failed URLs**

  Reports on the objects (hits) within failed pages. For example, those pages that contain broken images and unavailable downloads. Note that it logs a maximum of 5000 objects per 5-minute period. All technical errors (described in Appendix E, "Explanation of Failure Codes") for that object are reported. Because this view is does not use application information, it can still report possible reasons for failed pages when no applications have been configured.

- **Failed pages**

  Reports on the server, network, Web site, and content errors experienced with application pages.

- **Slow URLs**

  Reports on the slowest 5000 objects per 5-minute period detected by the system, based on the object's end-to-end time. Note that objects must have an end-to-end time of at least five seconds to be reported in this view. Applications do not need to be configured for this view.

For services, it contains the following view:

- **Failed functions**

  Reports on the server, network, Web site, and content errors experienced with function calls.

Note: The period for which information about failed URLs, pages, and service calls is available is determined by the Reporter system's data retention policies. These are described in Section 9.6.1, "Defining Reporter Retention Policies".

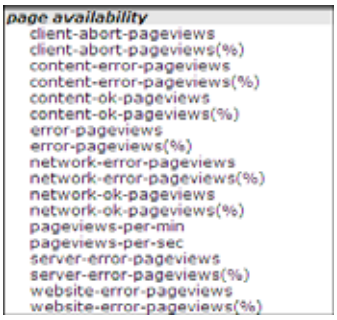
3.2.3 Page Delivery Dimension

The page delivery dimension is available within the Failed pages, All pages, Key pages views, and reports which errors have been detected on a monitored Web site. All errors reported in the page delivery dimension are also available through the Session diagnostics replay facility (see Section 3.9, "Working With the Session Diagnostics Facility").

Note if a page or object experienced several types of errors (for example, both a network and a Web service error), the page or object error is not recorded multiple times. Instead, it is reported according to the following order: Web site, server, network, and content. For example, an object that experienced both a Web site and a network error, is recorded as a Web site error rather than a network error.

The errors reported in this dimension are also available as the basis for KPIs as metrics expressed both as counters and percentages. This is shown in Figure 3–4.

Figure 3–4 Page Availability Metrics



3.2.4 The URL Diagnostics Group

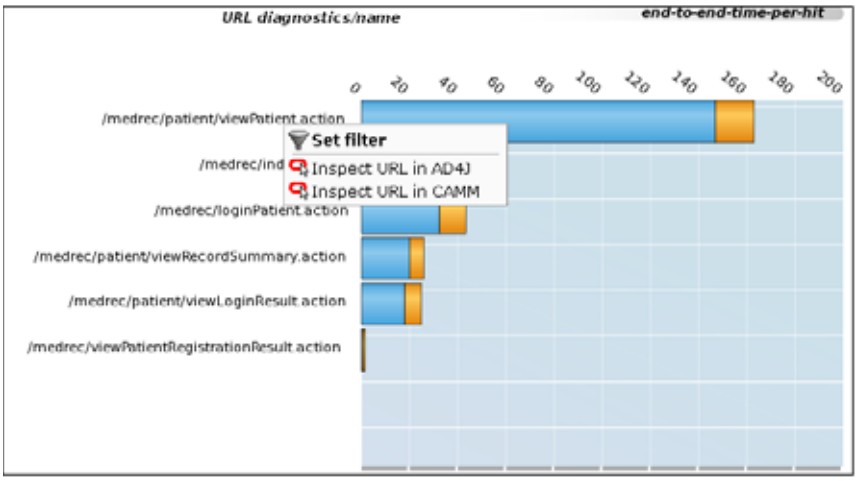
Hit-based information is available via the Failed URLs and Slow URLs groups. These groups contain extensive information about images and other static objects, as well as dynamic objects. As a result, the URLs reported in these groups can contain a large amount of session and unique information (such as user IDs and any identifiers shared between different objects). An additional consideration is that these groups are limited to 5000 objects per 5-minute interval. This can make it difficult to isolate the specific hit-related information within a reported URL.

The URL diagnostics group is specifically orientated towards the separate recording of dynamic objects within pages (such as portlets and frames). Instead of reporting the literal URLs associated with particular hits, the URL diagnostics group reports *functional* URLs. These are customizable reporting schemes where session and unique information is typically stripped from the reported URLs. The information available within this group enables you to access dynamic server-interacting URLs independently of pages. This approach has the advantage that relevant hit-based information is more quickly located. For example, you could specify that you are only interested in the monitoring of Java or PHP-based calls. This is supplemented by a powerful clickout facility that provides dedicated support for Java diagnostic utilities, such as CAMM and AD4J.

The configuration of URL diagnostics is specified at application level, and is described in Section 6.2.15, "Controlling Reporting Within the URL Diagnostics Group". Note that URL diagnostics information about suites is available within suite diagnostic groups (described in Section 3.2.5, "Suite Groups").

The context menu for a URL allows you to clickout to the configured external utilities. An example is shown in Figure 3–5.

Figure 3–5 URL Diagnostics Group

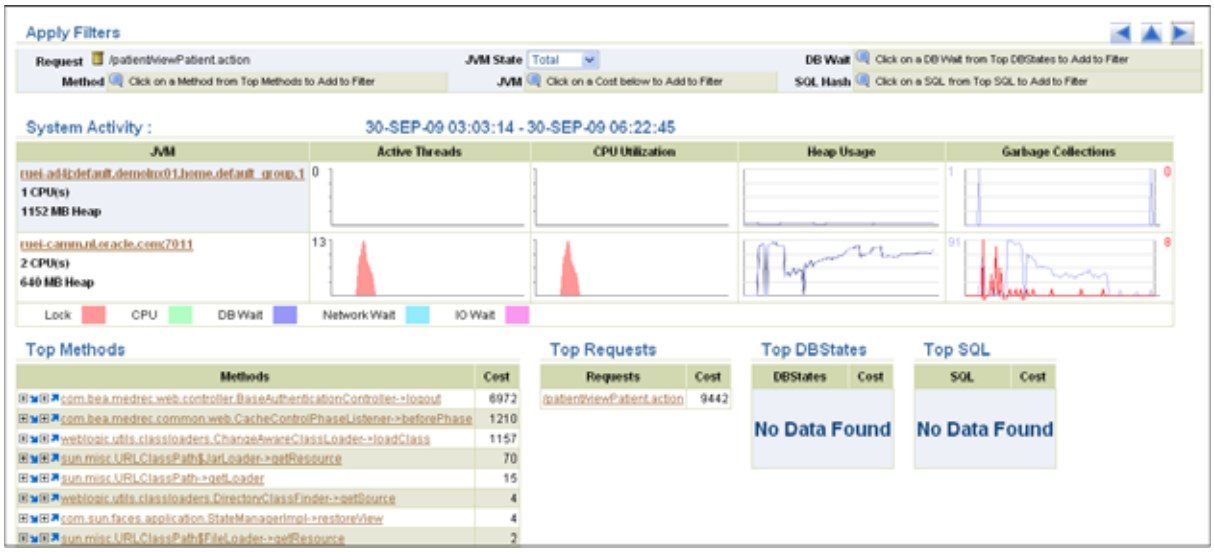


CAMM and AD4J Clickout Support

Oracle Composite Application Monitor and Modeler (CAMM) is a utility that allows you to monitor highly distributed Java EE and SOA applications running within an organization. Using it, application bottlenecks, performance trends, and overall application efficiency can be quickly identified. Oracle Application Diagnostics for Java (AD4J) is part of the Oracle diagnostics pack for Oracle middleware, and provides low-overhead monitoring and diagnostics functionality to improve Java application availability and performance.

The ability to clickout from RUEI to external diagnostics utilities provides critical insight into the internal calls used to generate hits, and the relevant Java layer methods employed within the Web server. An example of a clickout to AD4J from a selected URL is shown in Figure 3–6.

Figure 3–6 Example URL Clickout to AD4J



The procedure for configuring external utilities for clickout from within RUEI is described in Section 7.7, "Configuring Clickouts to External Utilities".

3.2.5 Suite Groups

The suites category of views (shown in Table 1–3) provides in-depth information about the operation of monitored suites. The availability of individual suite groups depends on the accelerator packages installed on your RUEI installation. In addition, at least one suite must be configured for each suite to be available.

For each installed and configured suite, a diagnostics group is available that provides for the suite the equivalent information available for applications through the URL diagnostics group. Note that, unlike applications, the scheme used to report suite URLs diagnostics is preconfigured, and cannot be modified.

A major difference between the two type of suite groups is that session-related information is only available through suite groups, and not through suite diagnostics groups. In addition, session-related information is primarily reported through suite groups.

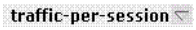
3.3 Working With Value Lists

When working with value lists, you can add additional columns to the displayed list. Select **Show percentage** or **Show growth** from the **Values** menu to add indicator columns to the displayed data. Note that availability of these options depends on the currently viewed list, and the columns are also carried forward when you view the list as a report (by selecting **Open as report** from the **View** menu).

3.3.1 Changing the Sort Order

You can also change the sort order by selecting a column header at the top of the Values list. The view changes to reflect the selected column sorted in ascending order. Click it again, and the sort order becomes descending. The order symbol within a column heading indicates the current order. An example is shown in Figure 3–7:

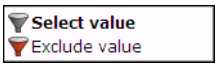
Figure 3–7 Sort Order



3.3.2 Inclusive and Exclusive Filters

Within value lists, you can also right click items to open the context menu shown in Figure 3–8:

Figure 3–8 Values Context Menu



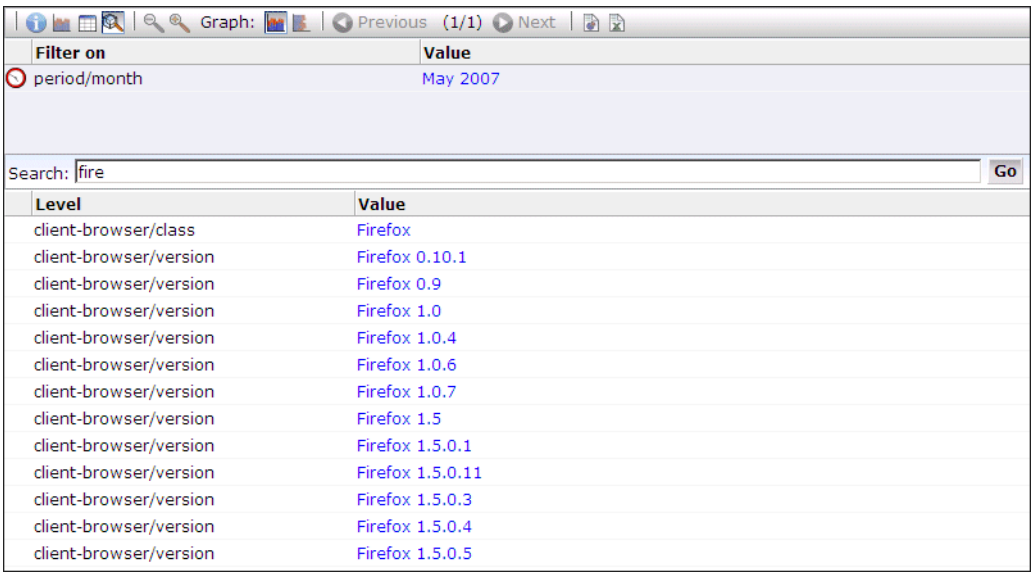
The following options are available:

- **Select value**: adds the selected value as an inclusive filter to the Filters panel. That is, only values that match the selected value are displayed in the browser.
- **Exclude value**: adds the selected value as an exclusive filter to the filters panel. That is, only values not matching the selected value are displayed in the browser.

3.4 Searching in the Data Browser

You can use the **Search** facility to locate the incidence of strings in the currently displayed data set. This is shown in Figure 3–9.

Figure 3–9 Search Tab



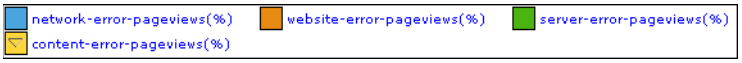
The search facility will try to match any search pattern you specify either as a full match or as a substring. Hence, the search pattern "fire" will match the occurrences of "firefox", "x-fire", and "sefirewall", as well as, of course, all occurrences "fire". As mentioned earlier, the search is restricted to the currently displayed data. To extend the search further, you will need to modify the current view, or remove applied filters, and repeat the search. If the search did not find any matches, a pop-up dialog informs you that "No results were found".

Note: The search facility does not support the use of wildcard characters (such as *). All characters are treated as literals. The results list is a values list and has the same functionality (see Section 3.3, "Working With Value Lists").

3.5 Sorting Data

To sort data in a graphic visualization, select the corresponding dimension from the legend beneath the graph. This is shown in Figure 3–10:

Figure 3–10 Legend



For information on sorting within a value list, see Section 3.3.1, "Changing the Sort Order".

In addition, you can use the **Sorting** option within the **Data** menu to undo any specified sorting specifications (**Remove sorting**), or swap the current sorting specification (**Invert sorting**).

3.6 Working With Filters

You can use the **Filter** panel at the top of the Data Browser window to tighten the profile of the information you want to view. An example is shown in Figure 3–11:

Figure 3–11 Example Filter Panel

Filter on	Value
period/year	2007
client-location/country	Liechtenstein
client-browser/version	Firefox 0.10.1

The first item shown in the Filter panel is always the date or period for which information is required. In the example shown in Figure 3–11, this is the year period 2007. This can be thought of as the highest-level filter, and can be changed through the calendar (explained in Section 2.4, "Using the Calendar").

After that, additional filters can be set. There are two kinds of filters: **inclusive** and **exclusive**. Inclusion filters specify that only data items that match the data value in the filter should be shown. Exclusive filters specify that only data items that do *not* match the data value in the filter should be shown.

For example, the filter profile in Figure 3–11 specifies that only information should be displayed for the year 2007 in which the client location was Liechtenstein, and the client browser was not Firefox.

3.6.1 Defining Filters

You can define any data item within the Data Browser window as a filter by right clicking it to open the menu shown in Figure 3–8. After you have defined a filter, you are free to modify it by clicking it and using the context menu shown in Figure 3–12:

Figure 3–12 Filter Context Menu

The following options are available:

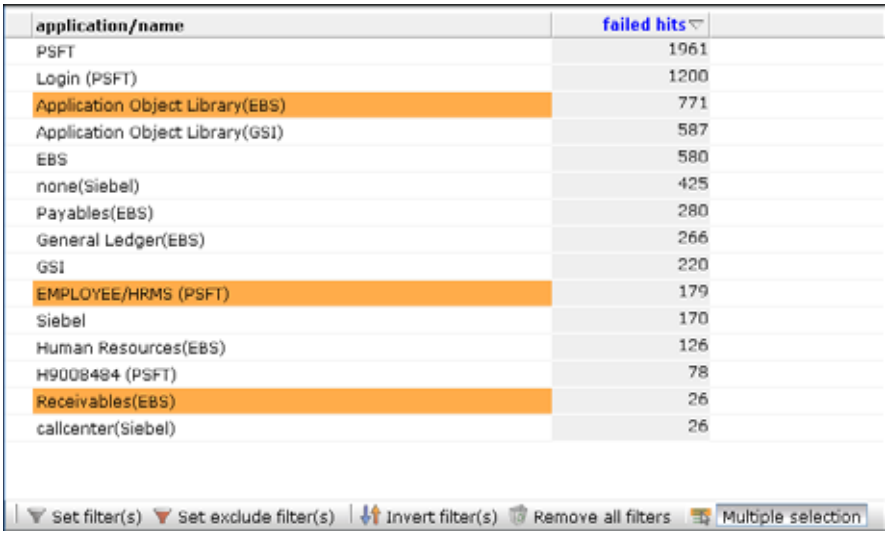
- **Invert**: changes an inclusive filter into an exclusive filter, and vice versa.
- **Mark as report filter**: the use of this option is described in Section 3.6, "Working With Filters".
- **Remove**: deletes the selected filter.

> **Note:** Filters are applied in the order in which you define them. Once defined, it is not possible to change the order in which they appear in the Filter panel. To re-order them, you must remove and redefine them in the required order.

3.6.2 Working With Multiple Filters

Within value lists, you can select multiple values by clicking the **Multiple section** command button, and then clicking each required value outside of the its associated link. The selected item(s) are then highlighted. An example is shown in Figure 3–15.

Figure 3–13 Multiple Value Selection



After selecting the required values, you can use the toolbar at the bottom of the screen to specify whether the values should be inclusive or exclusive filters. You can also use the toolbar to invert all currently defined filters, or to remove them.

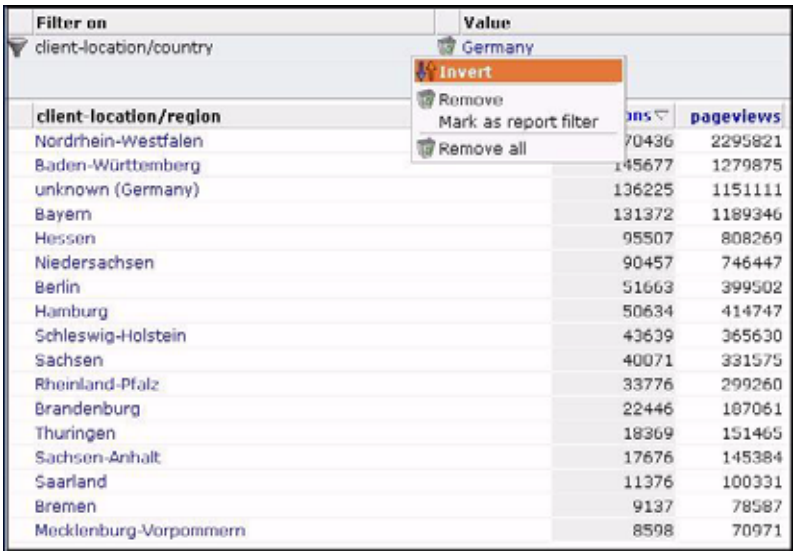
3.6.3 Using Report Filters

Report filters can be used with reports that you create from the Data Browser. When you specify a report filter for information you include in a report, the user opening the report can use the defined filter when viewing the report's contents.

For example, if you are viewing client location information (via the All sessions groups, and the client-location sub-group), you could create a report that allowed its users to select on client location. To define the filter, do the following:

1. Select a value from the displayed list of locations, and define it as a filter.
2. When displayed in the filter panel, right click it, and select **Mark as report filter** from the menu. An example is shown in Figure 3–14:

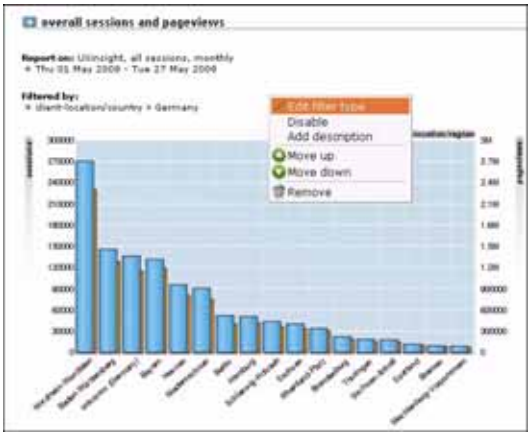
Figure 3–14 Example Report Filter



> **Note:** Only one report filter can be defined for each dimension. However, it is possible to define multiple report filters across different dimensions. Care should be taken when designing reports with multiple filters because it can make the report difficult to view.

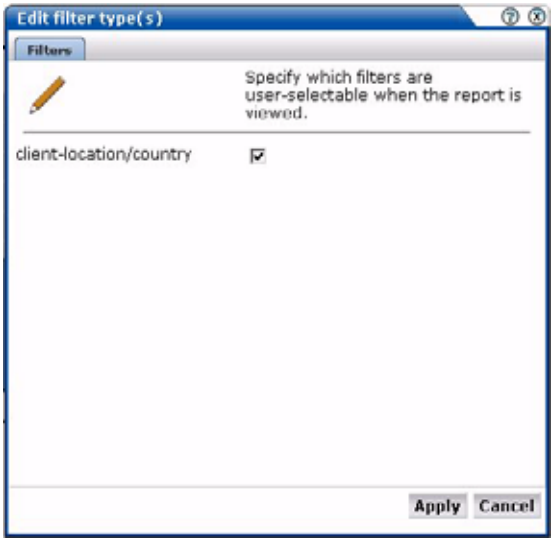
3. Select **Open as report** from the **View** menu, and finalize the structure of the required report. Notice that the selected filter is now shown within the report. An example is shown in Figure 3–15:

Figure 3–15 Report With Filter



4. Highlight the filter by placing the mouse pointer over it, and select **Edit filter type** from the menu. A dialog similar to the one shown in Figure 3–16 appears:

Figure 3–16 Edit Filter Type(s) Dialog



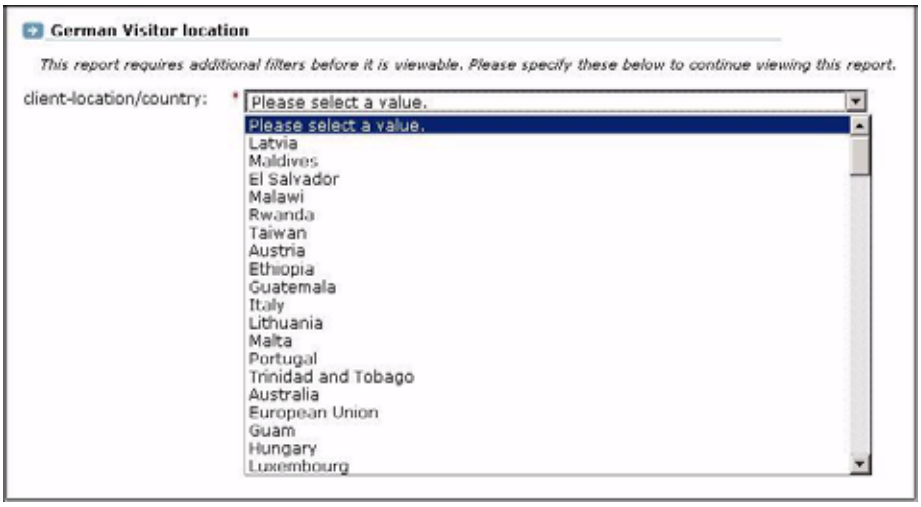
5. Use the check box(s) shown in the Edit filter type(s) dialog to control which filters can be selected by a user when the report is run. There will be a check box for each defined report filter. When ready, click **Apply**.

6. Save the report, as described in Section 2.9, "Creating New Reports".

Running the Report

When the report is opened, and a report filter has been enabled, the value selected as the report filter becomes the default selection in a list of dimension values. An example is shown in Figure 3–17:

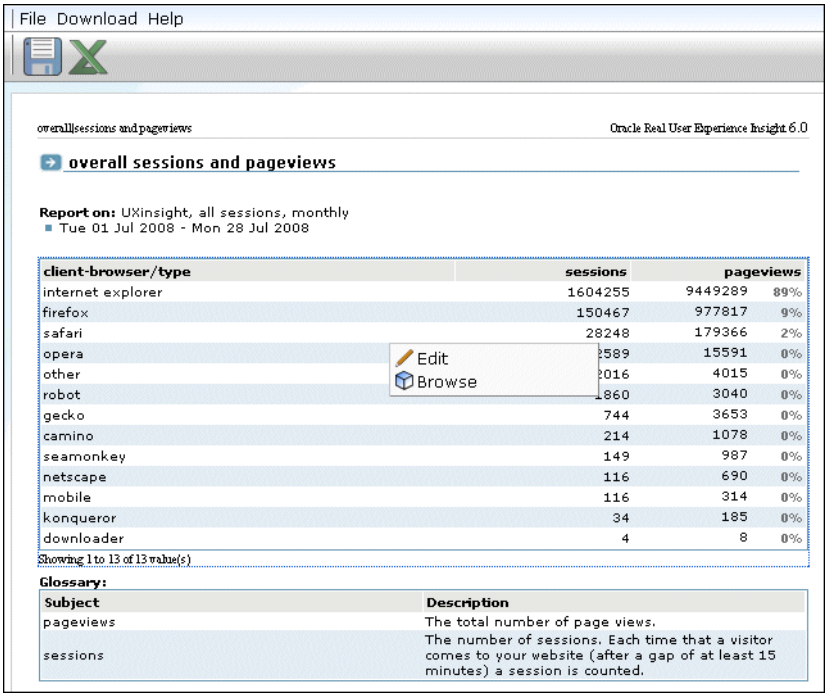
Figure 3–17 Report Using a Filter



3.7 Exporting Data

You can export the data currently shown in the Data Browser to a wide variety of applications, such as spreadsheets. To start working with export data, open the Export window by clicking the **Open as export** icon, or selecting **Open as export** from the **View** menu. A new window with the current data is opened. An example is shown in Figure 3–18:

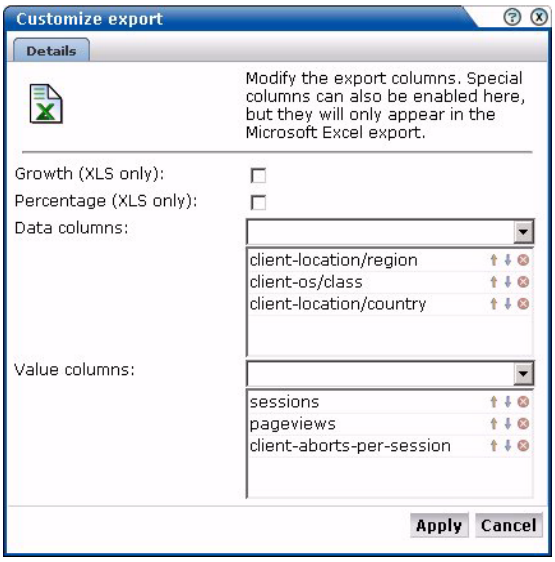
Figure 3–18 Export Window



3.7.1 Modifying the Exported Data

The Export window (Figure 3–18) shows the raw data that is available for export. However, you can customize how the data should be exported. To do so, right click within the export window, and select **Edit**. A dialog similar to the one shown in Figure 3–19 appears:

Figure 3–19 Customize Export Dialog



This dialog allows you to modify the order of data columns, the order in which values appear in those columns, and specify additional columns that will appear in the Microsoft Excel export.

Within the **Data columns** and **Value columns** fields, you can use the lists to add additional primary (index) columns, and the data columns that should appear within them. The exact selection of data and value columns that are available within each list depends on the view group with which you are working. For example, if you are viewing data from the All clients group, the selection of Web site / page data columns is limited to domain and Web site. However, if you are working in All pages group, additional data columns are available for such things as page-content and page-transaction. For a complete description of the data and value columns that are available for export within each view group, see Appendix D, "Summary of Data Items."

The **Percentage** check box allows you to specify whether an additional column, showing the percentage make up from the reported values, is added to the Microsoft Excel export.

The **Growth** check box allows you to specify whether an additional column, showing the actual increase in the reported metric, is added to the Microsoft Excel export.

You can use the **Up**, **Down**, and **Remove** icons next to a data column selection to control the sort order hierarchy, or to remove a data column as an index to the data. Similarly, you can use these controls within the value column field to rearrange the order in which they appear in the export.

You can save the export to a new or existing file, or append it to an existing export.

3.7.2 Selecting the Export Format

In addition to controlling how the exported data will appear, you can also specify the format in which the data will be exported. To do so, select the **Download** menu. The following export formats are available:

- Comma-separated values (CSV).
- Tab-separated values (TSV).

- Microsoft Excel (2000 compatible) worksheets.
- Webquery format.

Be aware that the exported data is in Unicode (UTF-8) format.

3.8 Working With Custom Dimensions

Custom dimensions allow you to add your own user-defined dimensions to views in the Data Browser. These new dimensions are then also available for use within KPIs, as well as reports and exports. For example, you might want to add a dimension "supplier" so that you could more easily track and analyze your organization's suppliers. Using this facility, you could determine which suppliers have the highest conversion rates associated with them within key business operations, or which suppliers attract the most pageviews on the organization's Web site.

Note: Custom dimensions can be page, session, or function-based. Because KPIs are based on real-time data, session-based custom dimensions cannot be used as metrics within KPIs. However, page-based custom dimensions can be used as KPI filters.

Reporting of Custom Dimensions

Each custom dimension has a unique name, and is page, session, or function-based. This determines the Data Browser groups within which it is reported and, as explained in the following section, how dimension information is preserved between pageviews. The reporting of custom dimensions within Data Browser groups is highlighted in Table 3–2.

Table 3–2 Reporting of Custom Dimensions Within Data Browser Groups

Source	All pages	Key pages	All sessions	Failed pages	Failed URLs	Slow URLs	All functions	Failed functions	(named) Suite	URL diagnostics	All transactions
Page	X	X		X	X	X			X	X	
Page (session aware)	X	X		X	X	X			X		
Session		X	X	X	X	X					X
Function							X	X			

Be aware that when reviewing live session-based custom dimension information (that is, during the same day as the session), the reported user name can change. When viewing the same information the following day (after the session has been completed), the reported user name is based on the last one detected during the session.

Preserving Dimensional Information

As previously explained, the entity (page, session, or function) upon which a custom dimension is based, determines how information within the dimension is preserved between pageviews. This section provides a detailed explanation of how the selected scheme effects the reporting of custom dimension information. This is based on the

presentation of example visitor sessions. Each example session refers to a monitored Web site containing a sales catalog. To capture information about which collections within the catalog visitors are viewing, a custom dimension with three levels is defined. These three levels are derived from three arguments: a, b, and c.

When a custom dimension is specified as page-based, the values shown in Table 3–3 are reported.

Table 3–3 Page-Based Custom Dimension Information Retention

Input	Dimension level		
	1 (a)	2 (a » b)	3 (a » b » c)
a=men	men	men » none	men » none » none
a=men, b=coats	men	men » coats	men » coats » none
a=men, b=coats, c=winter	men	men » coats	men » coats » winter
a=men, b=hats	men	men » hats	men » hats » none
a=men, b=hats, c=trilby	men	men » hats	men » hats » trilby
a=children	children	children » none	children » none » none

Notice that when using this scheme, only the information available within the current pageview is used when reporting on the custom dimension levels. No information is inherited from previous pageviews.

When a custom dimension is specified as page (session aware)-based, the values shown in Table 3–4 are reported.

Table 3–4 Page (Session Aware)-Based Custom Dimension Information Retention

Input	Dimension level		
	1 (a)	2 (a » b)	3 (a » b » c)
a=men	men	men » none	men » none » none
(a=men,) b=coats	men	men » coats	men » coats » none
(a=men,) (b=coats,) c=winter	men	men » coats	men » coats » winter
(a=men,) b=hats	men	men » hats	men » hats » none
(a=men,) (b=hats,) c=trilby	men	men » hats	men » hats » trilby
a=children	children	children » none	children » none » none

Notice that now when custom dimension level information is not available on a pageview, the information is inherited from the previous pageview. This inheritance is indicated with the use of brackets. The information between the brackets is not available in the current pageview, and so is derived from the previous pageview.

When a custom dimension is specified as session-based, the values shown in are Table 3–5 are reported.

Table 3–5 Session-Based Custom Dimension Information Retention

Input	Dimension level		
	1 (a)	2 (a » b)	3 (a » b » c)
b=coats	none	none » coats	none » coats » none

Table 3–5 (Cont.) Session-Based Custom Dimension Information Retention

Input	Dimension level		
b=coats, c=winter	none	none » coats	none » coats » none
c=winter	none	none » none	none » none » winter
.....	none	none » none	none » none » none

Notice that no inheritance occurs for custom dimension information. In addition, be aware that only one pageview can be reported using this scheme. This is the first pageview for which custom dimension information is available. In this case, that is the first page in the viewing history (none » coats » none). All custom dimension information on other pageviews is discarded.

Translations for Custom Dimensions

Optionally, you can also define a set of translations for each unique source value reported for the dimension. For example, you could define the service-based custom dimension "server ID" with the associated translations shown in Table 3–6:

Table 3–6 Example Custom Dimension Translations

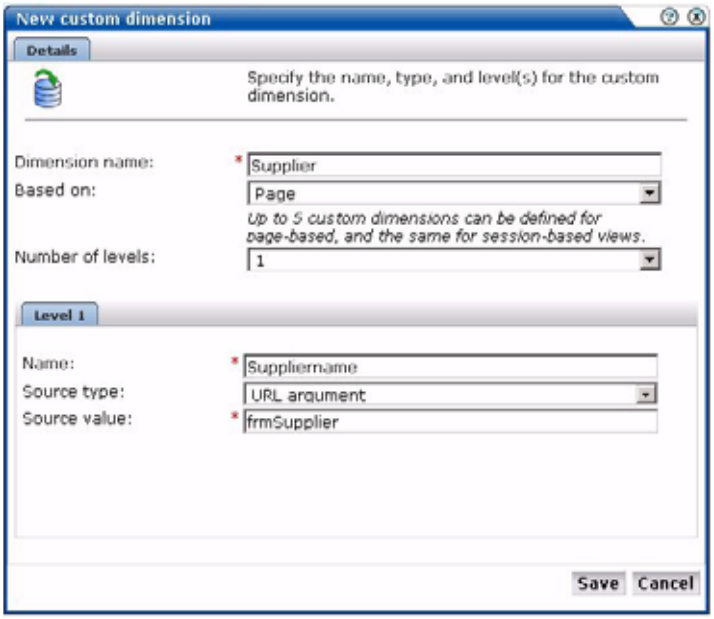
Value	Translation
178349	Business Partnerships
561808	Newsletter and Events
405969	Catalog
969533	Payment Handling

Defining Custom Dimensions

To define a custom dimension, do the following:

1. For function-based custom dimensions, select **Configuration**, then **Services**, and then **Custom dimensions**. For application-based custom dimensions, select **Configuration**, then **Applications**, and then **Custom dimensions**. A list of the currently defined custom dimensions appears. A maximum of five page or session-based custom dimensions can be defined. For function-based custom dimensions, the maximum is 10. Click the **New dimension** command button. The a dialog similar to the one shown in Figure 3–20 appears.

Figure 3–20 New Custom Dimension



2. Specify a unique name for the new dimension. Note that in displays (such as within the Data Browser or a report) that feature the defined custom dimension, the dimension's name is appended with an asterisk (*).

3. Use the **Based on** menu to specify the entity type upon which the dimension should be based. For function-based dimensions, this is automatically selected as function, and cannot be modified. For application-based dimensions, you can selected this to be page, page (session aware), or session. The use of these options is explained in a previous section. Note a maximum of five page or session-based custom dimensions, and a maximum of 10 function-based custom dimensions, can be defined.

4. Use the **Number of levels** menu to specify the level of dimension information that should be retained. By default, only one level of information is retained for the defined custom dimension. However, you can use this facility to build a hierarchy of retained session information. For example, you might want to capture information about the user's location using the three levels of country, region, and city.

5. Within the displayed **Level** tabs, specify a name for the dimension level. Use the **Source type** menu and **Source value** field to specify the scope of the search for the dimension, and whether the search should use an XPath expression, a header, the cookie, a URL argument (request), or a custom tag or function. More information about using XPath queries is available in Appendix F, "Working with XPath Queries". Note if the source is a URL argument, the raw (original) input is used. However, in the case of an HTTP header, only ASCII input is allowed. Non-ASCII characters are replaced by an underscore (_) character when reported. For more information encoding support, see Appendix G, "Working With National Language Support".

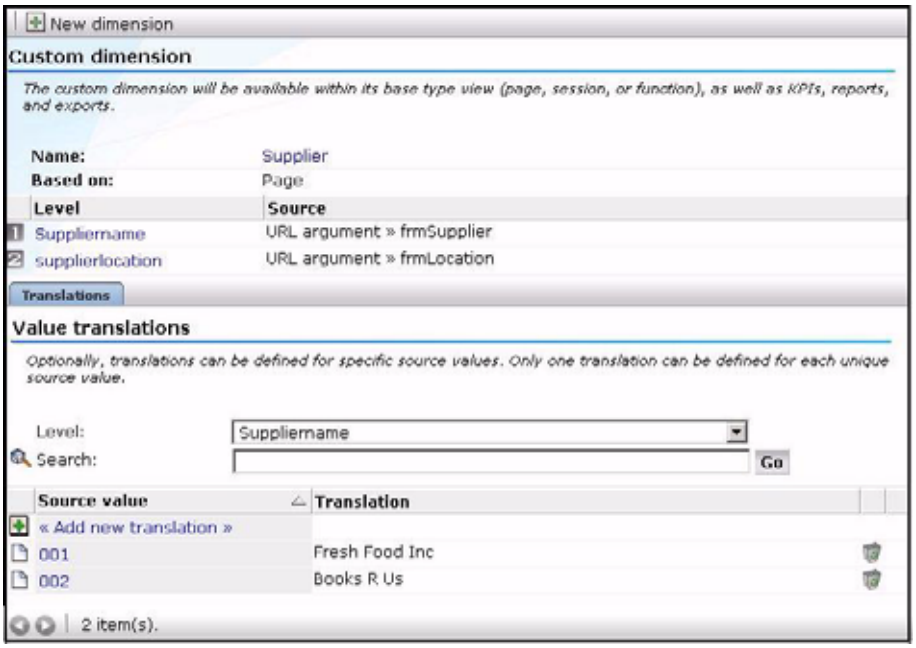
   If the custom tag or custom function options are selected, the tag or function name must be specified within the **Source value** field. Note that, in the case of a custom function, only the first parameter is used, and it *must* be enclosed in single or double quotes. For example:

   ```
   wiViewState('wi_menu_main_menu');
   ```

More information about how custom tags and functions are interpreted within pages is available in Appendix A, "Tagging Conventions".

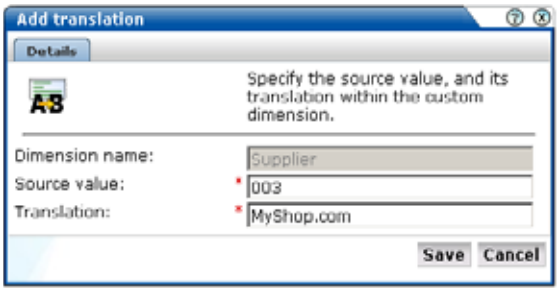
When ready, click **Save**. An overview of the defined custom definition (similar to the one shown in Figure 3–21) appears.

Figure 3–21 Custom Dimension Overview



6. Optionally, you can also define a set of translations for each unique source value reported for the dimension. To do so, click **« Add new translations »**. The dialog shown in Figure 3–22 appears.

Figure 3–22 Add Translation



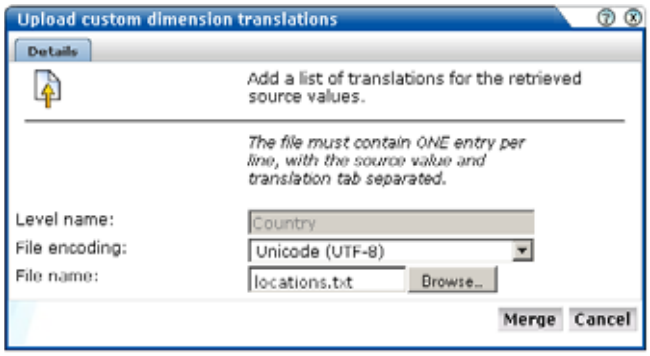
Specify the required source value and its translation. When ready, click **Save**.

Note that if the list of imported translations is very large, you can use the controls in the toolbar at the bottom of Figure 3–21 to scroll through the displayed list. In addition, you can use the search facility to locate a required translation. The search string can be specified in terms of either a source value or a translation. The use of wildcard characters (such as *) is not supported, and all characters are treated as literals.

Importing Lists of Translations

Instead of separately defining each translation, you can click the **Upload list** icon within the toolbar (at the bottom of Figure 3–21) to import a file containing a list of translations. The dialog shown in Figure 3–23 appears.

Figure 3–23 Upload Custom Dimension Translations



Use the **Browse** button to locate and select the required file. Optionally, use the **File encoding** menu to specify the file's character encoding. For more information on international character set support, see Appendix G. If an unsupported encoding is encountered, or the transcoding fails, an error is reported.The file may only contain one translation per line, with source values and translations tab separated. When ready, click **Merge**.

Note: You can also use the custom dimension facility to redefine the functionality of standard dimensions.

Fallback Values Reported For Custom Dimensions

Within custom dimensions, two fallback values can be reported:

- None: indicates that the source defined for the custom dimension was not found within the page or function call.
- Unknown: indicates that the defined source was defined after the cited period for the page or function call. For example, if a custom dimension is defined at 1 PM on a Monday, the daily view will show "unknown" for the period before 1 PM. Similarly, within the week and month views, it will be reported for the period before the custom dimension was defined.

3.8.1 Removing Custom Dimensions

To remove a custom dimension, do the following:

1. For application-based dimensions, select **Configuration**, then **Applications**, and then **Custom dimensions**. For function-based dimensions, select **Configuration**, then **Services**, and then **Custom dimensions**. A list of the currently defined custom dimensions appears. Right click the required custom dimension, and select **Remove** from the menu.
2. If the custom dimension is used as a filter in a KPI or a report, you are warned that deleting the custom dimension also results in the deletion of the associated KPI or report. Click **Yes** or **No**.

3.9 Working With the Session Diagnostics Facility

Session diagnostics provides a powerful facility for Application Managers and IT technical staff to perform root-cause analysis of operational problems. It supports session performance breakdown, including the impact of failing pages, hits, and functions on sessions, the full content of each failed page, and the relationship between objects, pageviews, and sessions.

When problems are identified, session diagnostics offers a means to drill-down into RUEI's rich data structure and both assess the impact of the problem on your Web site's visitors, and obtain direct insight into possible causes.

The Error Recording Facility

In addition to the information described above, RUEI also offers the opportunity to track exactly what error messages visitors to the monitored Web site receive and when. With this ability to recreate application failures, you can accurately and immediately eliminate annoying and problematic parts of your Web pages.

Understanding Session Reporting

Information about user sessions is reported within the Session Diagnostics facility as *user records*. It is important to understand that information is reported using a resolution of five minutes. The properties associated with it, such as IP address and user ID, are effectively snapshots taken at the end of the 5-minute period. Note that while the value of these properties can potentially change during the 5-minute period, it is their values at the end of the period that are reported.

Using the Diagnostics Facility

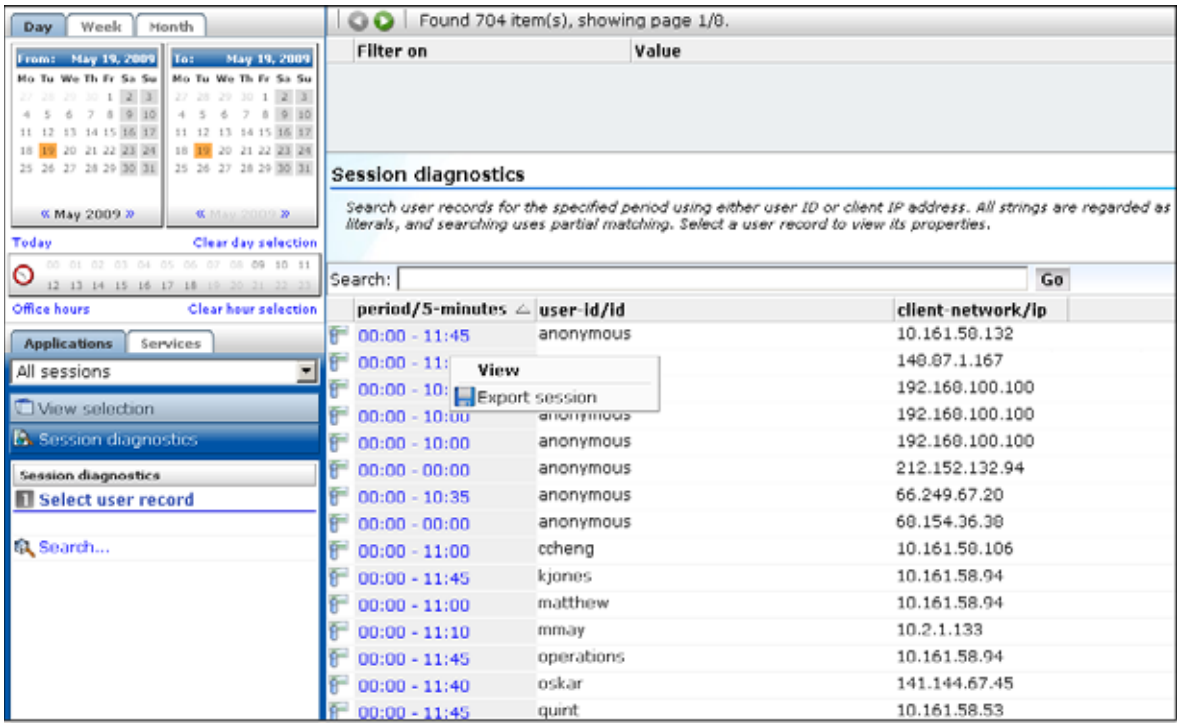
To locate the diagnostics information you require, do the following:

1. Select **Browse data**, and select the group from which you want to start. Diagnostics information is available from within the All sessions group, the Failed URLs, pages, and functions groups, as well as the accelerator-specific groups (such as Oracle E-Business Suite and Siebel). Click the required diagnostics option. Note the name of the option reflects the selected group. For example, **Page diagnostics** or **URL diagnostics**. A diagnostics panel similar to the one shown in Figure 3–24 appears.

Figure 3–24 Session Diagnostics Panel

2. Use the Calendar controls (described in Section 2.4, "Using the Calendar") to select the required period. The selected viewing range must be a single day (or less). If you attempt to search outside this limit, an error is reported. The availability of replay content is determined by the associated Collector retention policies (described in Section 9.6.2, "Defining Collector Data Retention Policies"). When ready, click **Search**. The results of the search are shown in the main part of the window. An example is shown in Figure 3–25.

Figure 3–25 Session Diagnostics Window



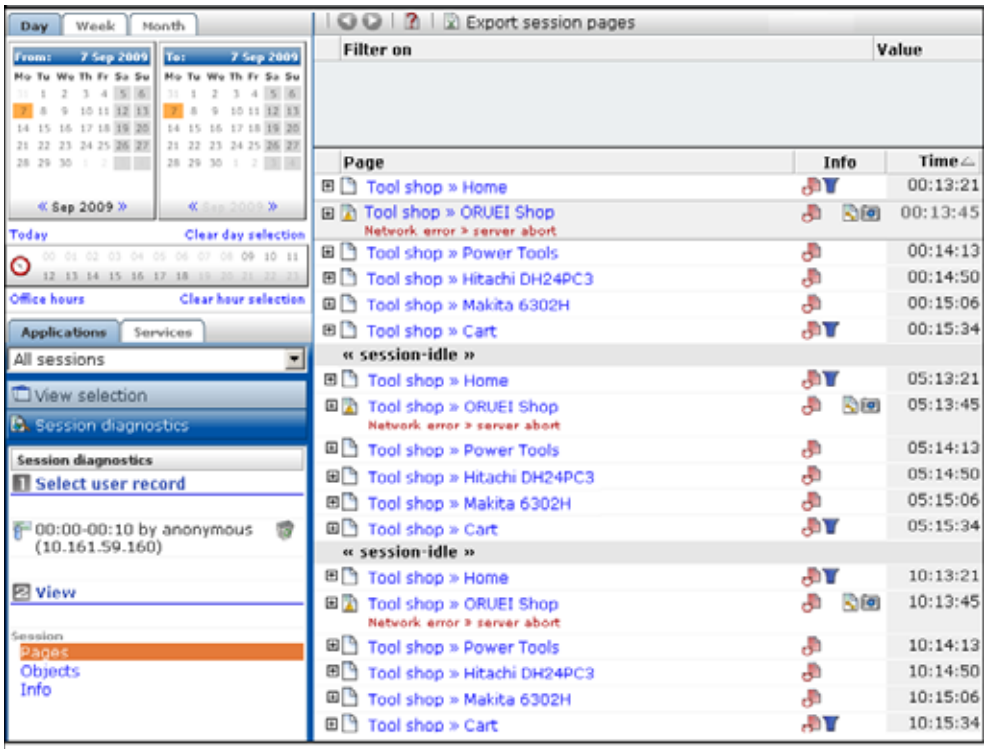
3. You can use the controls in the toolbar at the top of the window to scroll between result pages. A maximum of 100 user records are listed per page. You can select a specific user record from the displayed list by clicking it, or use the search facility to further restrict the displayed list.

   To use the search facility, specify a search pattern, and click **Go**. The specified search pattern must refer to the user's IP address or (in the case of the sessions and pages) to the user's ID. Note that the search's scope is restricted to the currently displayed user records, the search uses partial matching, and the use of wildcard characters (such as *) is not supported. All characters are treated as literals. You can also use the extensive search capabilities available within the **View selection** facility.

   Note that you can select the **Export session** option from the user record context menu shown in Figure 3–25. The use of this facility is described in Section 3.9.3, "Exporting Full Session Information".

4. After selecting a user record, the **View** part of the panel in the left-hand side of the window allows you to view information about the selected user record. Use the **Pages**, **Object**, and **Info** items under the **Session** part to view information concerning specific aspects of the selected user record. An example is shown in Figure 3–26.

Figure 3–26 Example Diagnostics Panel



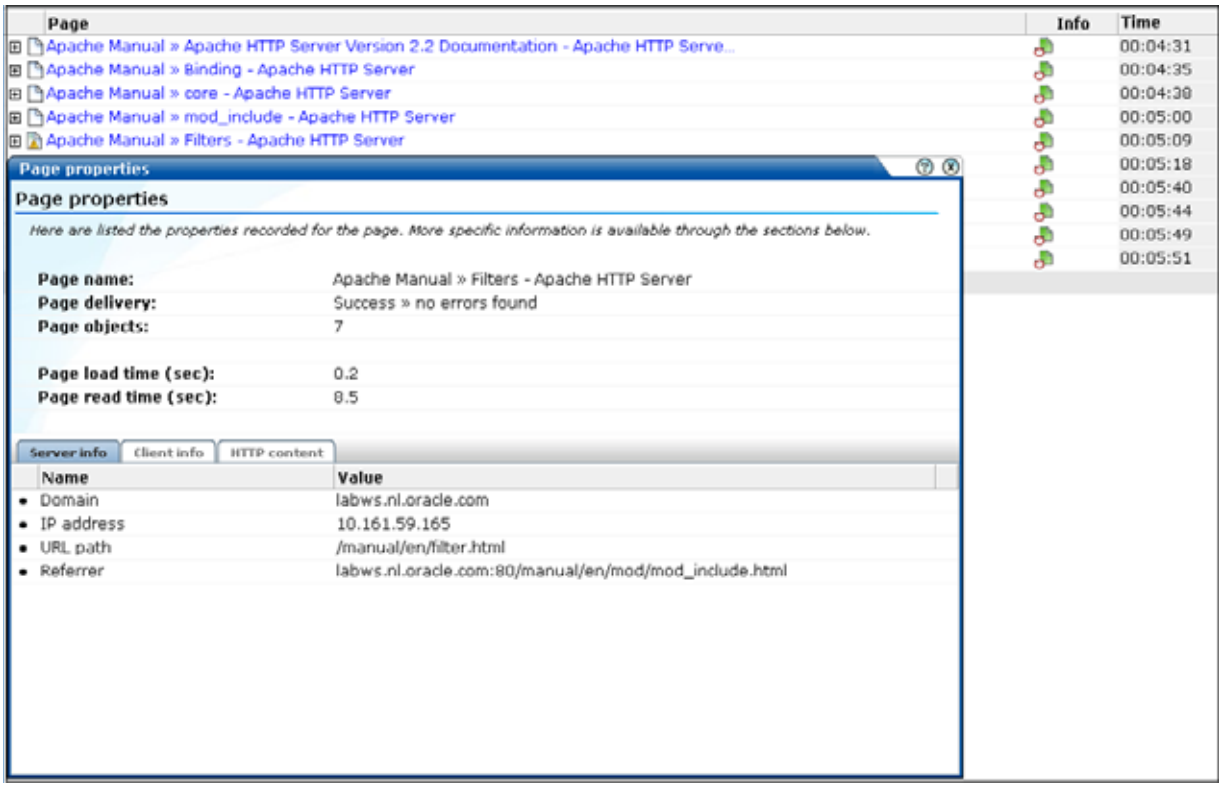
Session pages are grouped so that when expanded their associated objects can be viewed. The overview shows the pages (and their times) recorded within the selected user record. Icons indicate slow or failed objects, page loading satisfaction, whether the pages are transaction or key pages, and whether replay content for them is available. The use of the Replay viewer is described in Section 3.9.1, "Replaying User Sessions".

Note you can use the **Include/Exclude spurious objects** command button within the toolbar to control whether hits not directly associated with a reported page are included in its displayed list of objects. This facility is particularly useful in the identification of problem objects that have an extremely long load time. Normally, these objects would not have associated pages and, therefore, would not be listed in the session page report.

The **Export session pages** command button within the toolbar allows you to export a summary of the currently selected session to Microsoft Excel. The use of this facility is explained in Section 3.9.2, "Exporting Session Pages to Microsoft Excel".

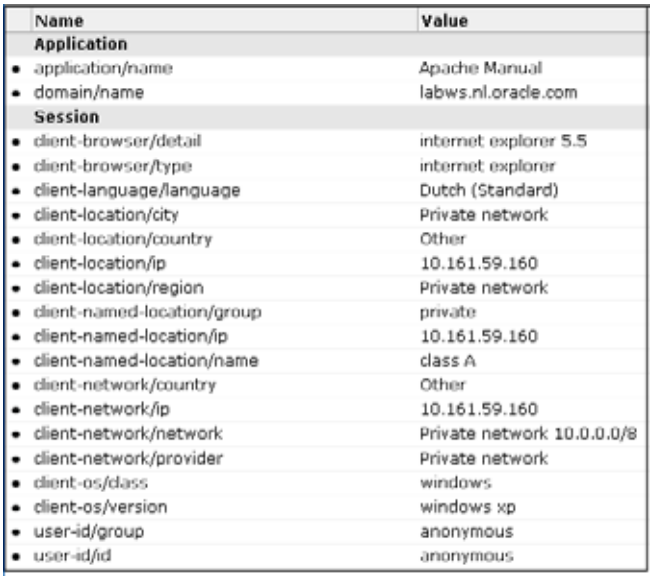
5. You can click the **Pages** or **Objects** option under the **Content** part of the panel to review a summary of pages viewed by the visitor or the objects within them. An example is shown in Figure 3–27.

Figure 3–27 Example Page Properties Dialog



Within the displayed page history, the full page content, as well as the underlying HTML code of the messages received by the server and client are also available. Be aware that the reported contents are subject to the currently defined masking options for HTTP protocol items. Detailed application and session-related information about the page or URL is available via the **Info** option. An example is shown is shown in Figure 3–28.

Figure 3–28 Example Session Information



Name	Value
Application	
application/name	Apache Manual
domain/name	labws.nl.oracle.com
Session	
client-browser/detail	internet explorer 5.5
client-browser/type	internet explorer
client-language/language	Dutch (Standard)
client-location/city	Private network
client-location/country	Other
client-location/ip	10.161.59.160
client-location/region	Private network
client-named-location/group	private
client-named-location/ip	10.161.59.160
client-named-location/name	class A
client-network/country	Other
client-network/ip	10.161.59.160
client-network/network	Private network 10.0.0.0/8
client-network/provider	Private network
client-os/class	windows
client-os/version	windows xp
user-id/group	anonymous
user-id/id	anonymous

6. When ready, you can click the **Remove** icon beside the selected user record. You are returned to the diagnostics window shown in Figure 3–25. From here, you can select and drill down into other user records.

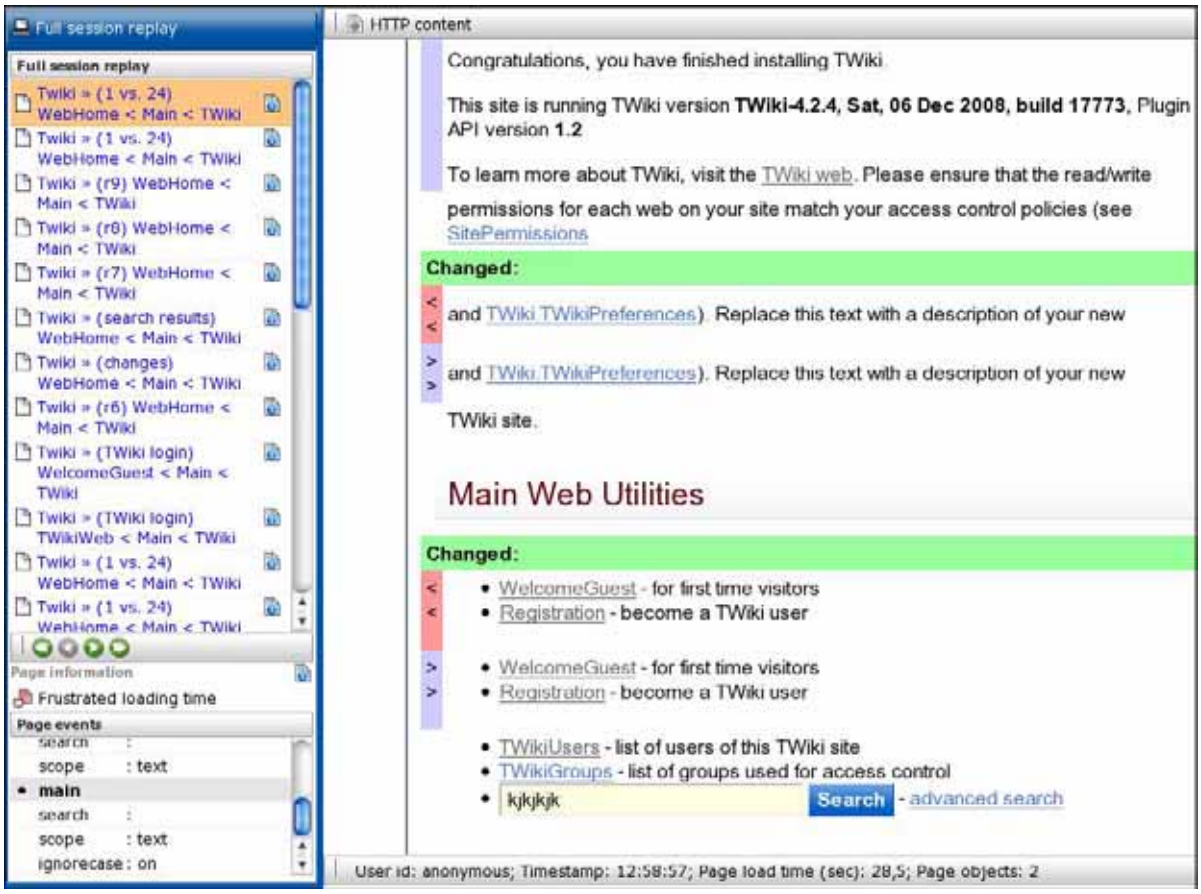
Masking Sensitive Information Within Session Diagnostics

As mentioned earlier, the availability of information (such as header or URL information) within the Session Diagnostics facility can be controlled through the appropriate HTTP protocol item masking facility. This is described in Section 8.4, "Masking User Information".

3.9.1 Replaying User Sessions

When available, you can click the **Replay** icon beside a viewed page to replay the complete user session. This provides the opportunity to review each page viewed by the visitor during the session, together with any reported error messages. An example is shown in Figure 3–29.

Figure 3–29 Example Session Replay



The replay details are shown in a new window which is the same size as the main window. Note that when selected from the main Session Diagnostics window (shown in Figure 3–25), the complete session page history is available on the left-hand side of the Replay window. However, if selected by clicking the **Replay** icon for a page within a selected user record, the displayed page history starts from the point of the selected page.

The controls below the page listing allow you to navigate through the page history. The **Page information** section indicates the currently highlighted page's loading satisfaction, whether it is key page, whether it is used in a transaction, and whether it contains an error.

Reporting Page Events

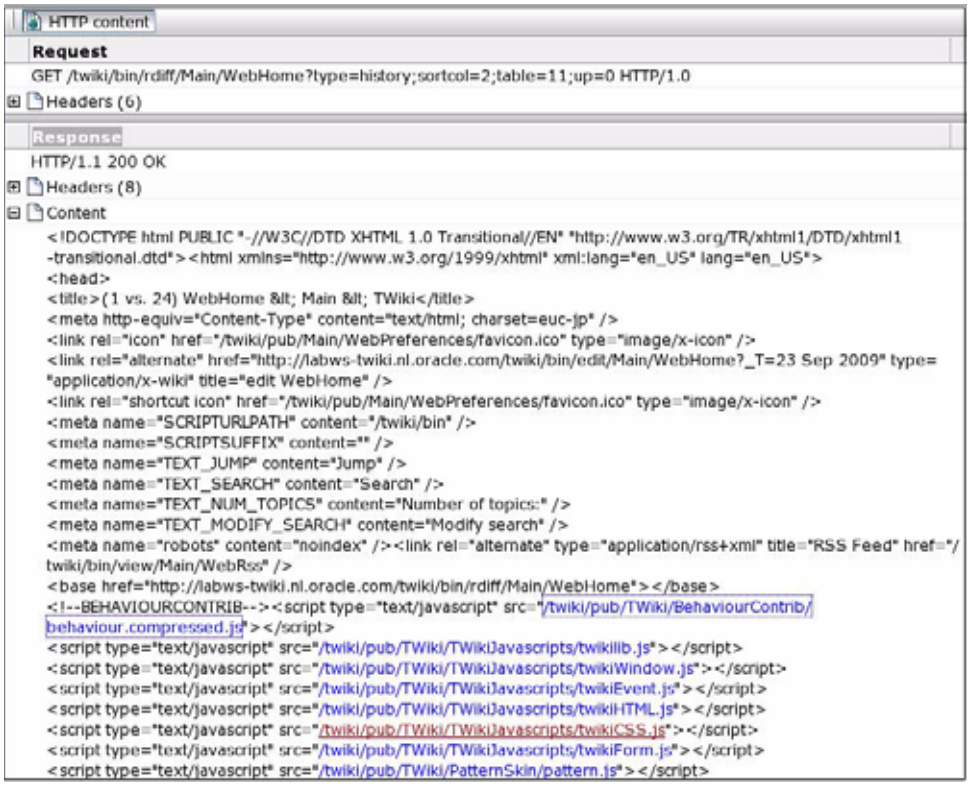
If a viewed page contained HTTP form elements, these and the visitor replies are reported in the **Page events** panel. Unnamed elements are reported as "NO_NAME_*number*" (where *number* is incremented for each unnamed element). Hidden form elements are also reported. Be aware that the replies made by a visitor to form elements is derived from the request body of the next page in the session page view history. Therefore, if the visitor switched context to another page between the request and response pages, the user response cannot be extracted and reported.

The status bar at the bottom of Figure 3–29 provides information about the session user ID, each page's recorded timestamp, loading time, number of objects and (in the case of static pages) an indication that reported pages are retrieved from the live source (such as the application server).

Viewing Page Content

The **HTTP content** command button on the toolbar allows you to view the actual request and response content of the currently selected page. An example is shown in Figure 3–30.

Figure 3–30 Example Page Content



Note that external JavaScript files can also be viewed by clicking the link within the page content. The reported content of these files is retrieved from the live source (for example, an application server).

Viewing Static Page Content

If no **Replay** icon is available beside a page in the displayed viewing history, this indicates that the page's contents are not available.This can be because the information is expired due to data storage constraints, or because the viewed page was a static page. In the case of the latter, you can still view the static page's content by highlighting the page immediately before or after the static page in the viewing history, and via this page, view the static page's content.

Be aware that the reported content for the static page is retrieved from the live source. Hence, if the live source is not available for any reason, the page's content cannot be reported. In addition, data masking and JavaScript execution rules are not applied to any page contents retrieved from the live source. The page contents are shown "as is". Finally, be aware the reported page contents reflect the live source's current content. Therefore, depending upon the configuration of the monitored Web site, this may have been modified since the visitor actually viewed the page. For example, a page listing current stock market prices. When live source data is reported, this is indicated in the Replay status bar.

JavaScript Execution Within the Replay Viewer

Pages viewed by visitors can contain inline JavaScript code. The application definition facility allows you to specify how execution of this JavaScript code should be handled within the replay facility. This is fully described in Section 6.2.16, "Controlling JavaScript Replay Execution". In addition, be aware that suites (such as Siebel and PeopleSoft) have preconfigured JavaScript execution rules that optimize their reporting within the Replay viewer.

3.9.2 Exporting Session Pages to Microsoft Excel

You can export a summary of the pages within the currently selected session to Microsoft Excel. To do so, do the following:

1. Select the required session using the procedure described earlier. Click the **Export session pages** command button. Depending on how your browser is configured, you are either prompted to specify the tool with which to open the file directly (by default, Microsoft Excel), or it is immediately saved to the defined default location.
2. Within Microsoft Excel, you can view and edit the generated file. An example is shown in Figure 3–31.

Figure 3–31 Example Microsoft Excel Session Pages Export

1	**Session pages:**							
2	**Page name**	**Error**	**Load time (sec)**	**Loading satisfaction**	**Key**	**Transa**	**Timesta**	**Page**
3	EBS.fnd » FNDSCSGN » Runform		0,2	Satisfied loading time			0:18:02	1
4	EBS.sysadmin » system_administrator »		3,9	Satisfied loading time			0:19:27	1
5	EBS.fnd » AppsLogin » other		30,2	Frustrated loading time			0:19:38	20
6	EBS.fnd » fnderror.jsp » other		1,5	Satisfied loading time			0:20:22	7
7	EBS.sysadmin » system_administrator »		0,6	Satisfied loading time			0:20:27	1
8	EBS.sysadmin » system_administrator »		0,6	Satisfied loading time			0:20:43	5
9	EBS.fnd » FNDFMFUN » Openform		0	Satisfied loading time			0:20:49	1
10	EBS.fnd » FNDSCSGN » Runform		6,3	Tolerated loading time			0:20:49	2
11	EBS.sysadmin » system_administrator »		2,9	Satisfied loading time			0:21:44	10
12	EBS.fnd » FNDSCAUS » Openform		0,2	Satisfied loading time			0:21:55	1
13	EBS.fnd » FNDSCMON » Openform		0,1	Satisfied loading time			0:22:08	1
14	EBS.fnd » FNDRSGRP » Openform		0,2	Satisfied loading time			0:22:24	1
15	EBS.fnd » FNDRSGRP »		0,1	Satisfied loading time			0:22:45	1
16	EBS.fnd » OALogout.jsp » other		2,1	Satisfied loading time			0:22:54	8
17	« session-idle »							
18								
19	**Session Info:**							
20	**Name**	**Value**						
21	Start time	21-9-2009 0:15						
22	End time	21-9-2009 0:25						
23	User id	mfg						
24	Client id	75.251.238.65						
25	Total pages	14						

The exported page view history and session summary can be used to compile sets of real-user sessions. For example, to be used as the basis for testing or performance analysis.

3.9.3 Exporting Full Session Information

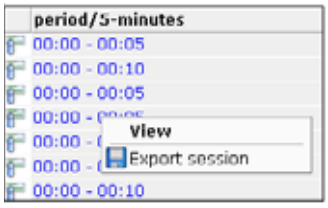
In addition to viewing session information, you can also export complete session contents to external utilities for further analysis or integration with other data. For example, this offers the opportunity to use complete real-user sessions as the basis for test script generation. Test platforms, such as Oracle Application Testing Suite (ATS), can easily be configured to generate automated test scripts for an application's most commonly encountered usage scenarios.

In addition, this facility can also be used to support powerful root-cause analysis. Complete user session information can be provided to application or operations specialists to help identify unusual or difficult to isolate issues. Sensitive information within the exported data is masked according to the actions defined in the HTTP protocol item masking facility. This is described in Section 8.4, "Masking User Information".

To export session information, do the following:

1. Locate the required session and select the **Export session** option from its context menu. This is shown in Figure 3–32.

Figure 3–32 User Record Context Menu



   Alternatively, within the Replay facility, select the **Session** menu, and then select the **Export session** option. In either case, a dialog appears prompting you to confirm exportation of the selected session.

   It is important to understand that the exported data may contain sensitive information. It is recommended that you carefully review the session's contents to ensure that sensitive information has been correctly masked. To confirm export of the selected session, click **Yes**.

2. Depending on how your browser is configured, you are either prompted to specify the location to which the zip file should be saved, or it is immediately saved to the defined default location.

Understanding the Structure of the Exported Data

The exported session zip file contains the following files:

- `data.tab`: contains the direct (raw) hit information for the selected session extracted from the Collector log file.
- `content_`*`hitno`*`.tab`: contains the complete (raw) content information for the indicated hit. There is a file for each hit within the `data.tab` file that has content. For example, if the third and sixth hits had content available for them, two files would be created: `content_3.tab` and `content_6.tab`. An example of a hit file is shown in Figure 3–33.

Figure 3–33 Example Hit Information File

```
589 68 313 221
POST /ruei/rpc.php HTTP/1.1
Host: vple
User-Agent: Mozilla/5.0 (X11; U; Linux i686; en-US; rv:1.9.0.13) Gecko/2009080315 Ubuntu/9.04 (jaunty) Firefox/3.0.13
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-us,en;q=0.5
Accept-Encoding: gzip,deflate
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.7
Keep-Alive: 300
Connection: keep-alive
Content-Type: application/x-www-form-urlencoded; charset=UTF-8
Referer: http://vple/ruei/
Content-Length: 68
Cookie: PHPSESSID=he5mt07ugepi4ith6d0t0cp2e6
Pragma: no-cache
Cache-Control: no-cache

frmHandler=rpc_login&frmAction=login&frmUser=admin&frmPass=XXXXXXXXX1.1 200 OK
Date: Wed, 19 Aug 2009 13:53:17 GMT
Server: Apache/2.2.3 (Oracle)
X-Powered-By: PHP/5.1.6
Expires: -1
Cache-Control: no-cache
Pragma: no-cache
Set-Cookie: PHPSESSID=170jg4h3u92cq7957t0gcd70n5; path=/
Content-Length: 221
Connection: close
Content-Type: application/json; charset=UTF-8

{"retval":true,"updates":[{"id":"wi_div_rpc","html":"","code":"window.open('main.php?frmInit=1&frmNode=','wi_main_10_16
```

The first line within the file (in this case, 589 68 313 221) contains four integers that indicate respectively the length (in bytes) of the request header, the request body, the response header, and the response body. In addition, note how the user's password has been masked in the file.

Note: The log files used as the basis for creating exported session files are also used internally by RUEI. The format and contents of these files is subject to change without notice.

4

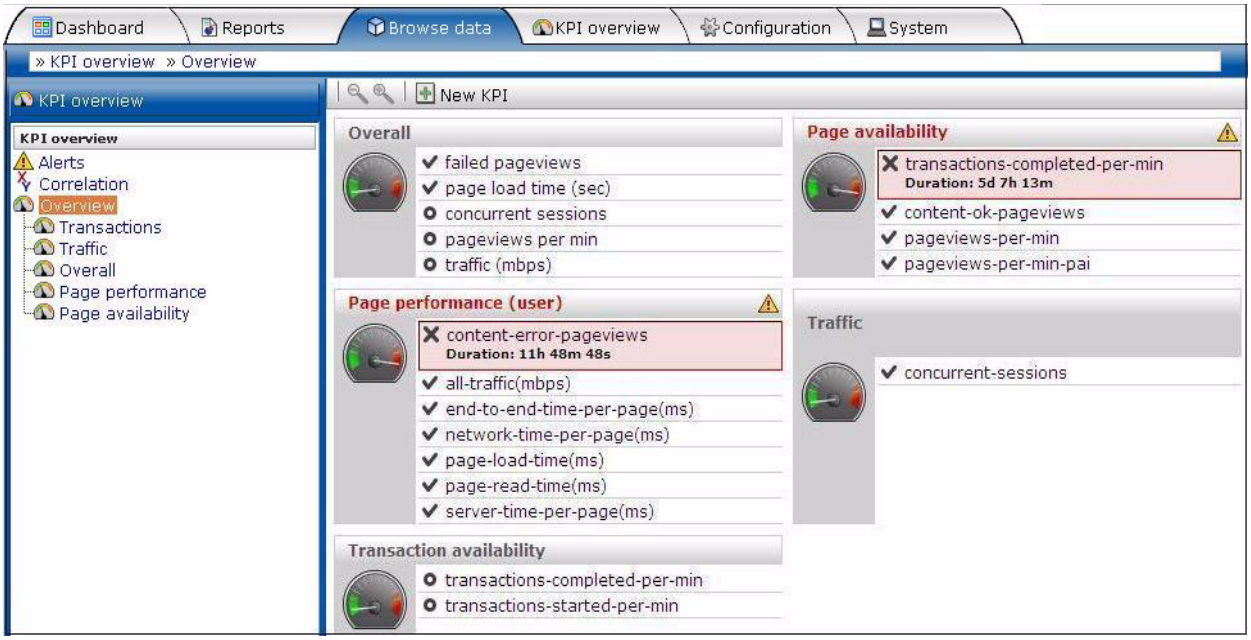
Working with KPI Overviews and Alert Lists

This chapter describes the use of KPI overviews. It explains how you can control their appearance, and drill-down through them for more information about their underlying KPIs and generated alerts. The use of KPI correlation and alert lists is also explained. Note that you must have at least Overview permission to view this tab. User permissions are described in Section 1.4.1, "Permissions".

4.1 KPI Overviews

You can view the current status of the currently defined KPIs and SLAs by clicking the **KPI overview** tab. This provides a snapshot of the current Web site activities in a format that is both intuitive and insightful. An example is shown in Figure 4–1.

Figure 4–1 Example KPI Overview



The overview provides a ready summary of the current status of the KPIs and SLAs within each category. You are free to configure your categories to reflect your organization's specific requirements, with each category containing relevant performance indicators. For example, you could have separate categories for such things as availability issues, performance, visitor traffic, and other specific aspects of your organization's operations. You can also click **New KPI** within the toolbar to

create additional KPIs. The procedure for creating KPIs is described in Section 5.2, "Defining KPIs and SLAs".

4.1.1 Viewing KPI Overviews

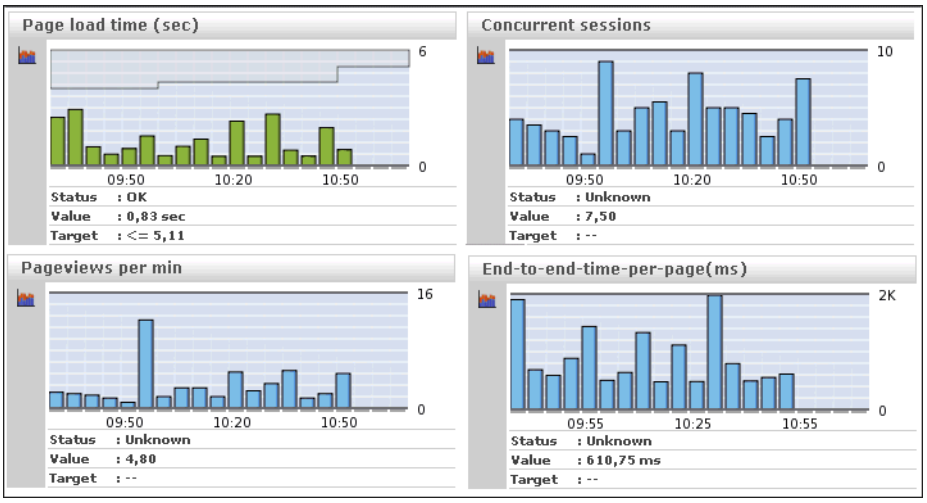
To see the defined categories, select the **KPI Overview** tab, and then **Overview**. The Overview category is a special viewing category that provides the highest level view of your KPIs. It provides both an instant summary of all the other KPI categories, and access to their individual KPIs by drilling-down through the displayed information.

To view a specific KPI category, click the required category. Alternatively, right click it, and select either **Open** or **Open in a new window** from the context menu. This last option is especially useful for viewing the graphs in a full-screen display, or for viewing several KPI categories at the same time through resized and aligned windows.

4.1.2 Presentation Style

Two types of KPI overview presentation are available: **meters** and **graphs**. Figure 4–1 is an example of a meter overview. This style provides an analog meter view of the selected KPIs. For a more detailed representation, with information about the KPI over the last 90 minutes, a graph style is available. An example is shown in Figure 4–2:

Figure 4–2 Example Graphic Overview

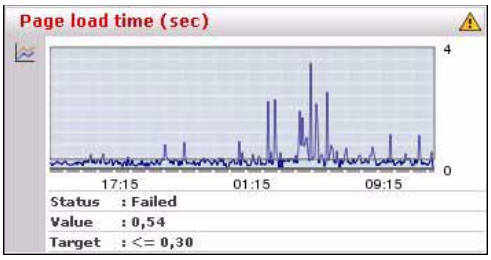


Note that in this presentation, the vertical axis is automatically scaled to appropriate ranges in order to provide optimal viewing. To select your preferred presentation style, select the **Presentation style** option from the **KPI overview** menu, and the preferred style.

4.1.3 Zooming In and Out

Within the graph presentation style, you can zoom in and out to view the displayed graphs over a longer period of time. Depending on the historical information that is available, you can zoom out to hourly and daily levels. Note that the graph style automatically changes from a bar chart to a line chart. An example is shown in Figure 4–3.

Figure 4–3 Zooming in on a KPI



4.1.4 KPIs and Targets

You can select the **Include KPIs without targets** option from the **KPI overview** menu to include or exclude KPIs without defined targets from the currently displayed category. Note that any targets that have been set for a KPI are shown in the graph presentation, with the minimum target running from the 0-reference line up to the set minimum target, and the maximum target running from the top of the KPI graph down to the set maximum target. An example is shown in Figure 4–3.

In addition, the following color scheme is used within graphs to provide information about targets:

- Blue: the KPI does not have any set targets.
- Green: the KPI was within a set target for the 5-minute period.
- Red: the KPI was outside its set target for the 5-minute period.

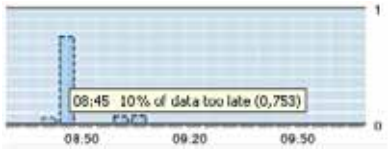
An example is shown in Figure 4–4.

Figure 4–4 Color Coding in Graphs

4.1.5 Working with Incomplete Data

Data gathered during monitoring is first written to log files stored on the Collector systems. These files are processed by the Reporter system to track KPIs. If, for any reason, one or more of these log files arrive too late for the Reporter system to process, the KPI overview indicates that the KPI is based on incomplete data. An example is shown in Figure 4–5.

Figure 4–5 KPI Based on Incomplete Data

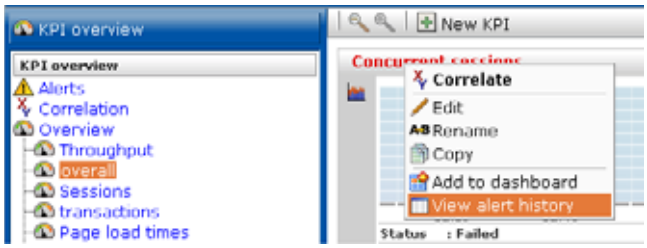


The periods that are based on incomplete data are indicated with a dotted border. In addition, mouse over text provides information about the level of missing data.

4.1.6 Drilling-Down Through Overviews

An overview is a summary of the KPIs within a category, and within each overview, you can drill-down into further information about the underlying KPIs by right clicking the KPI title and using the menu shown in Figure 4–6:

Figure 4–6 Drilling-down in Overviews



The following options are available:

- **Correlate**: allows you to compare the behavior of the selected KPI over a given period with other KPIs and performance metrics. This is explained in Section 4.2, "Comparing KPI Behavior".
- **Edit**: allows you to modify the definition of the KPI. The settings are explained in Section 5.2, "Defining KPIs and SLAs".
- **Rename**: allows you to rename or move the selected KPI to another category.
- **Copy**: allows you to copy the selected KPI. This is useful when you want to use an existing KPI as the basis for a new one. See Section 5.2.2, "Copying Existing KPIs" for more information.
- **Add to dashboard**: adds the currently selected KPI to a specified dashboard. This facility is described in Section 1.7, "Working with Dashboards".
- **View alert history**: opens a window highlighting the alerts that have been generated for the selected KPI. This is explained in Section 4.1.7, "Working with Alert Logs".

4.1.7 Working with Alert Logs

Click the required KPI, or select **View alert history** option from the menu, to open a window detailing the alert notifications that have been generated for the KPI. An example is shown in Figure 4–7.

Figure 4–7 Example Alert Log

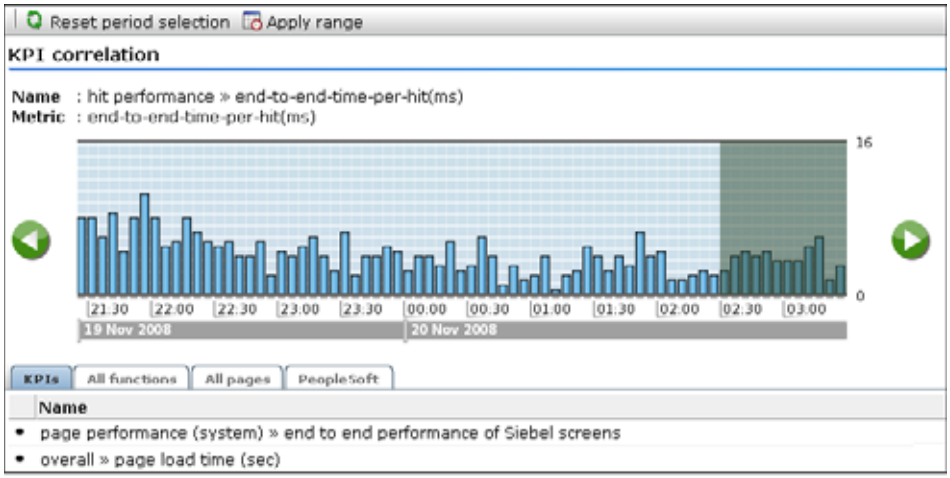
Information about specific alerts is available by clicking the appropriate alert. This provides information such as the persons notified in the alert and notification methods. It is based on the underlying alert profile, described in Section 5.5, "Defining Alert Schedules".

4.2 Comparing KPI Behavior

The KPI correlation facility allows you to compare the behavior of a selected KPI over a given period with other KPIs and performance metrics during that same period. In this way, you can gain insight into performance issues, identify any related symptoms, and their possible causes.

To use this facility, select a KPI from the **Correlation** structure, or select a KPI from the **Overview** structure and select **Correlate** from the context menu shown in Figure 4–6. A screen similar to the one shown in Figure 4–8 appears.

Figure 4–8 KPI Correlation



Use the **Backward** and **Forward** controls to change the displayed history, and then the graph overlay controls to specify the required period. This can range between 1 to 6 hours. Click **Apply range** to view the matched metrics.

The **KPIs** tab lists all currently defined KPIs whose behavior for the specified period matches that of the selected KPI. The other tabs (such as **All pages** and **Slow URLs**) list the metrics within their associated Data Browser groups that match the KPI's behavior for the selected period. The availability of these tabs depends on the selected KPI, and the installed suite packages. If the KPI's underlying metric is available in a Data Browser group (for example, Failed pages), than that group is available as a tab in the KPI correlation panel.

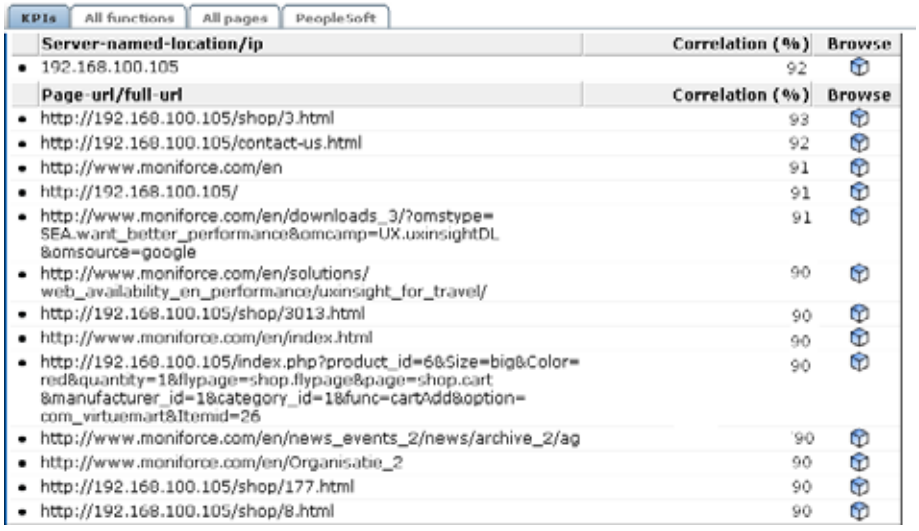
The period you specify is preserved when you select a new KPI. To specify a new period, click **Reset period selection**, use the time selection controls described above to specify the new required period, and click a tab to view the matches found.

As explained in Section 4.1.5, "Working with Incomplete Data", reported periods that are based on incomplete data are shown with a dotted border. However, unlike KPI overviews, mouse over text indicating the level of missing data is not available.

Drilling-Down Into Found Matches

As explained earlier, matches found for the selected KPI are reported in the appropriate Data Browser group tabs. Each match found must have a correlation of at least 90% for it to be reported. An example is shown in Figure 4–9.

Figure 4–9 Example All Pages Listing

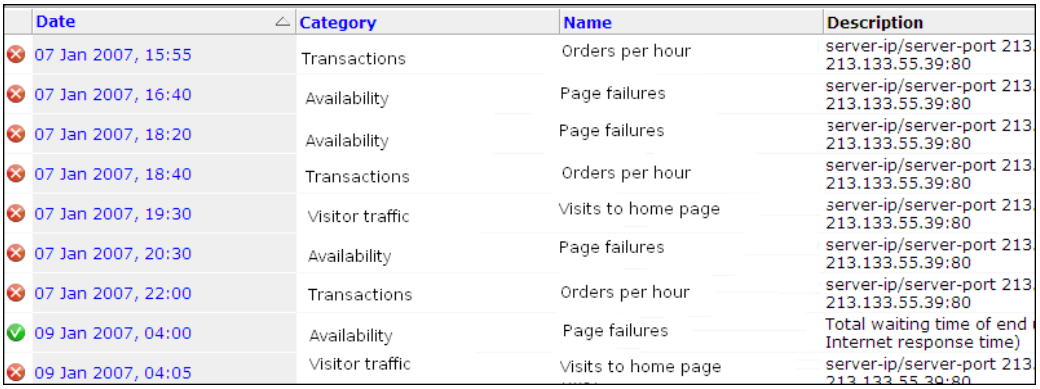


You can click the **Browse** icon to the right of the matched metric to open the Data Browser (described in Chapter 3, "Working With the Data Browser") to explore the underlying data. If no correlations are found for a metric, this is also reported.

4.3 Working With Alert Lists

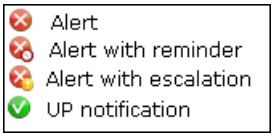
You can select **KPI overview** and then **Alerts** to view a complete list of all the alerts generated when KPIs moved outside their required ranges. For example, the number of visitors to your Home page fell to less than 100 per hour. An example is shown in Figure 4–10:

Figure 4–10 Example Alert List



The icons shown in the left-hand side of alert list are explained in Figure 4–11.

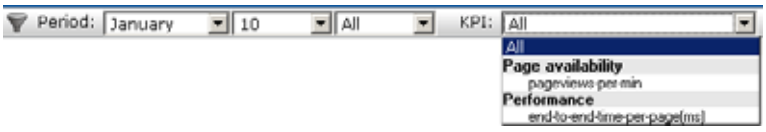
Figure 4–11 Alert List Icons



4.3.1 Filtering Alerts

You can use the controls above the alerts list to limit the displayed list. You can filter on a specific KPI, month, day, or hour. This is shown in Figure 4–12:

Figure 4–12 Filter Alerts

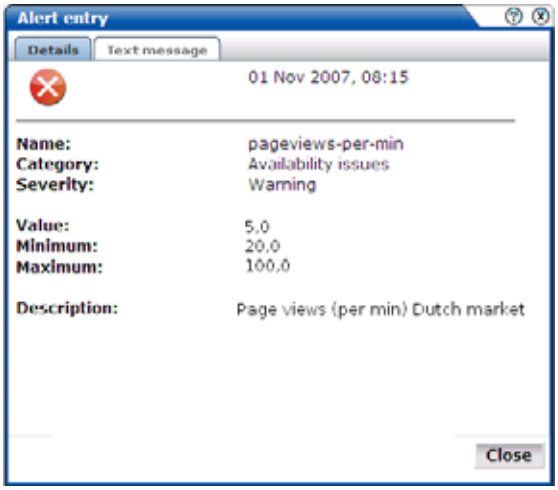


Note the list of metrics available in the **KPI** menu depends on the metrics specified for the KPIs for which alerts have been generated.

4.3.2 Viewing Alerts

You can click an alert in the displayed list to view its details. An example is shown in Figure 4–13.

Figure 4–13 Alert Details



This shows that the alert concerns the number of page views per minute for the Dutch market. The KPI has a range of 20 - 100 page views per minute, but this has fallen to 5. The **Text message** tab lists the users who were notified and the contact information used. Following notification, the appropriate staff members can start to research possible causes for the drop in client traffic.

5

Setting Up Performance Monitoring

This chapter describes how to define the KPIs and SLAs used to monitor your network's performance, and which you can review via dashboards and reports. This includes controlling how the SLAs used to track service levels should be applied. The management of the alerts used to notify staff members about incidents that impact service levels, such as who should be notified and when, is also highlighted.

5.1 Introduction

A Service Level Agreement (SLA) is an agreement between a provider and a customer that explains the terms of the provider's responsibility to the customer, and the level of service that the customer can expect. Typically, this agreement is expressed in terms of a number of Key Performance Indicators (KPIs). These are a way of measuring and benchmarking specific aspects of an organization's performance.

For example, an SLA for a given service might promise that it will be up and running 99.999 percent of the time. Because this is a commitment given to customers, the organization could make this a KPI. As such, service availability would be monitored, and whenever it fell below this level, the appropriate staff would be notified, and corrective action taken.

It is important to understand that an organization may also set KPIs for its own performance monitoring, independently of an SLA. Because KPIs provide insight into an organization's performance, they may also be tracked as part of a management dashboard.

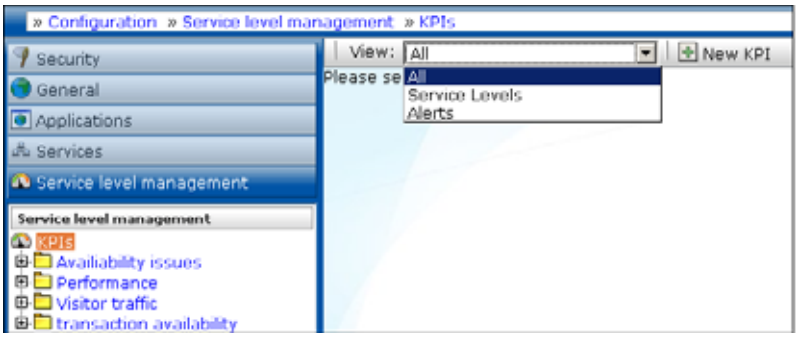
The creation and modification of KPIs can only be undertaken by users with Business or IT Analytical level access (see Table 1–2).

5.1.1 Filtering KPIs

KPIs are grouped into categories, which can be customized to contain related performance indicators. For example, separate categories could be defined for business and IT-related issues, such as transaction completion, visitor traffic, Web site availability, and so on.

Because you may need to handle large number of KPIs, you can use the **View** menu shown in Figure 5–1 to filter the displayed KPIs.

Figure 5–1 Filter KPIs



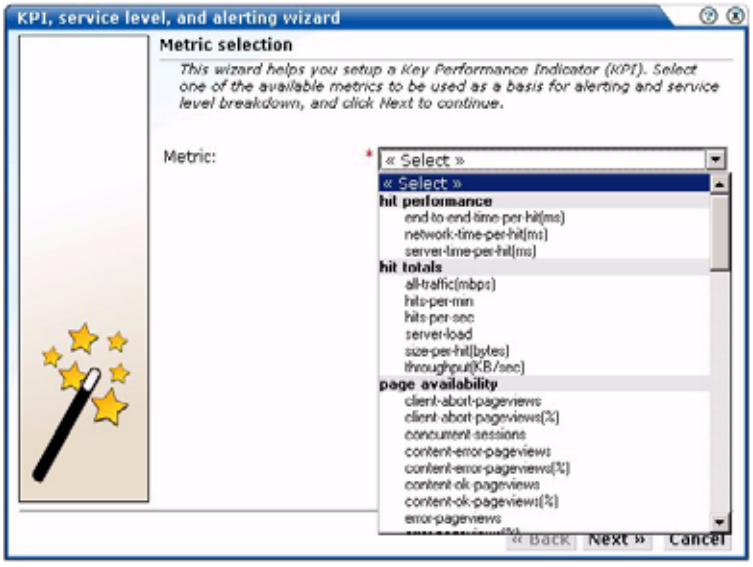
If you select the "Service Levels" option, the left-hand side **KPIs** listing is updated to show only those KPIs that have service levels associated with them. Folders that do not contain such KPIs are not shown. Similarly, you can select the "Alerts" option to filter the listing to show only those KPIs that have alerts associated with them. The "All" option shows all KPIs.

5.2 Defining KPIs and SLAs

To create a KPI and, optionally, use it as the basis for alerts and service levels, do the following:

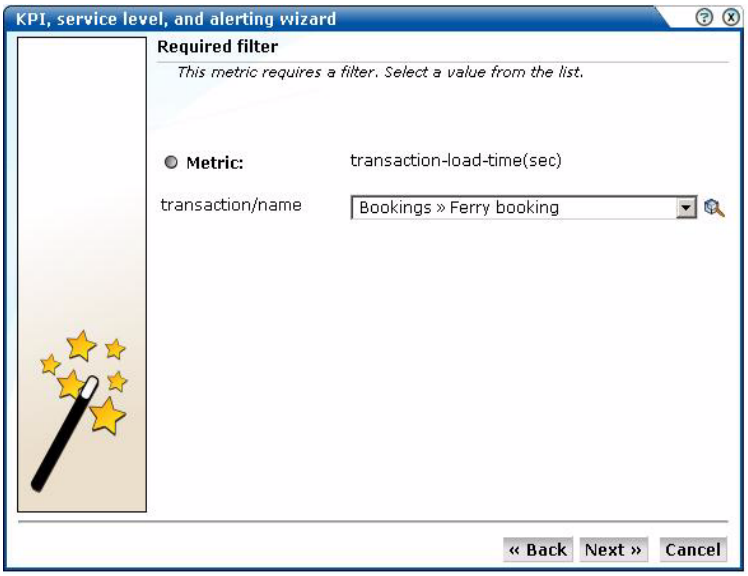
1. Select Configuration, then **Service level management**, then select **KPIs**, and click the **New KPI** button. The dialog shown in Figure 5–2 appears.

Figure 5–2 Metric Selection Dialog



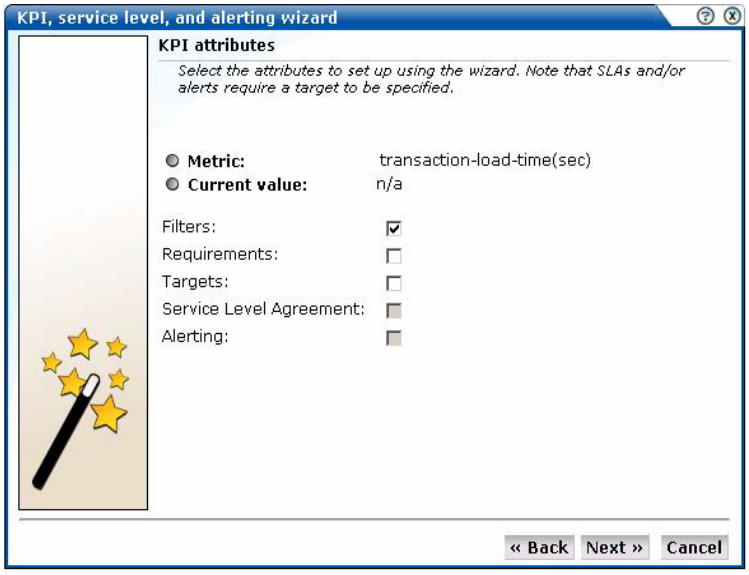
2. Use the **Metric** menu to select the metric to be used as the basis for monitoring. When ready, click **Next**. If the metric you selected requires a filter, the dialog shown in Figure 5–3 appears. Otherwise, the dialog shown in Figure 5–4 appears.

Figure 5–3 Required Filter Dialog



3. Use the menu to specify a filter for the selected metric. For example, if you selected the transaction-load-time(sec) metric, you need to specify the transaction to which it refers. If the required option is not in the displayed list, you can click the **Search** icon to locate it. For information on defining transactions, see Section 6.1, "Naming Pages". When ready, click **Next**. The dialog shown in Figure 5–4 appears.

Figure 5–4 KPI Attributes



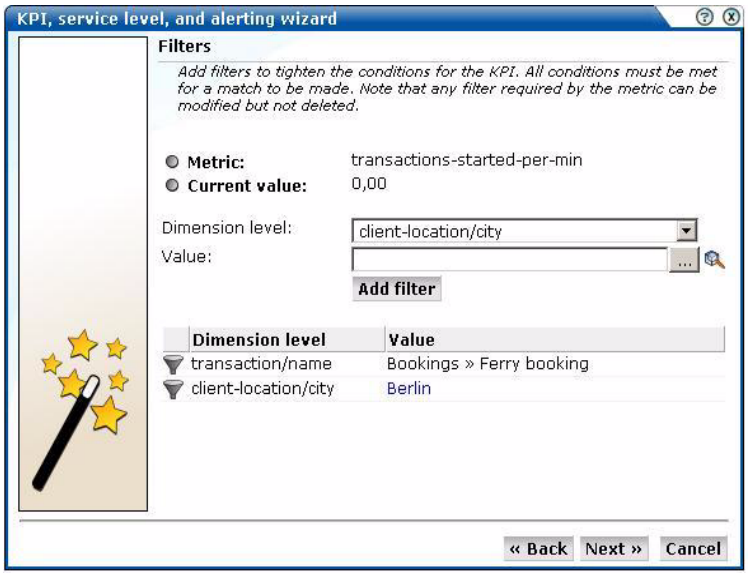
4. Use the following check boxes to specify the KPI's attributes:

   - **Filters**: specifies whether you want to add filters to the selected metric at this time. For example, you could define that a metric should apply to a particular domain.
   - **Requirements**: specifies any additional requirements for the selected metric. Using this facility, you can build compound KPIs.

- **Targets**: specifies whether targets are associated with the KPI. If so, you can define a minimum and maximum range for the KPI, and how it should be calculated.
- **Service Level Agreement**: specifies whether the KPI should be incorporated into an SLA. If so, you can configure the level of your committed agreement (in percentage terms) for specific time periods.
- **Alerting**: specifies whether an alert should be associated with the KPI. If so, you need to define the duration the KPI must be up (or down) before an alert is issued, the severity of the incident, and whether additional notification should be created when the KPI has returned to its set target range.

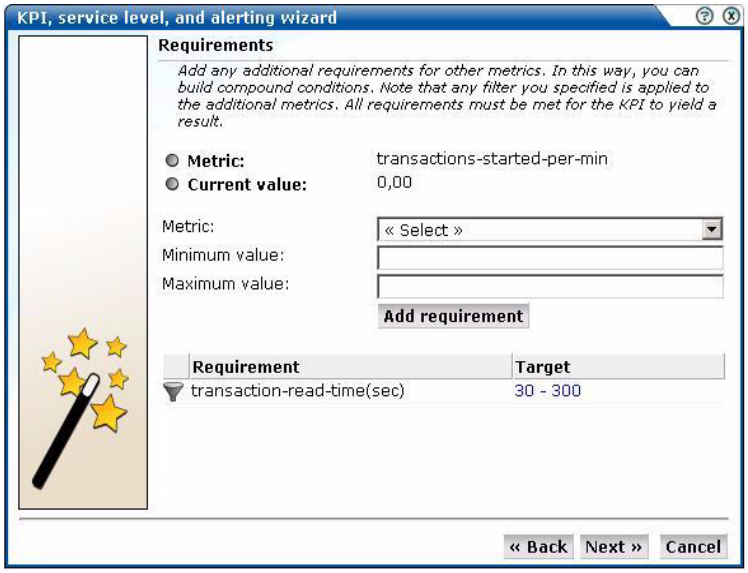
When ready, click **Next**. The dialog shown in Figure 5–5 appears.

Figure 5–5 Filters Dialog



5. Optionally, use this dialog to define a filter to tighten the conditions for the KPI. For example, you might specify a KPI that concerns transaction load time. Using the **Dimension level** list, you can specify that you only want the KPI to apply to a particular transaction step, or only to users coming from a particular location. Click **Add filter** for each filter that you want to apply. Note that you see the history of your filter selections in the lower part of the dialog. If you define multiple filters, *all* the conditions must be met for a match to be made. Note that this dialog only appears if you checked the **Filters** check box in Figure 5–4. When ready, click **Next**. The dialog shown in Figure 5–6 appears.

Figure 5–6 Requirements Dialog

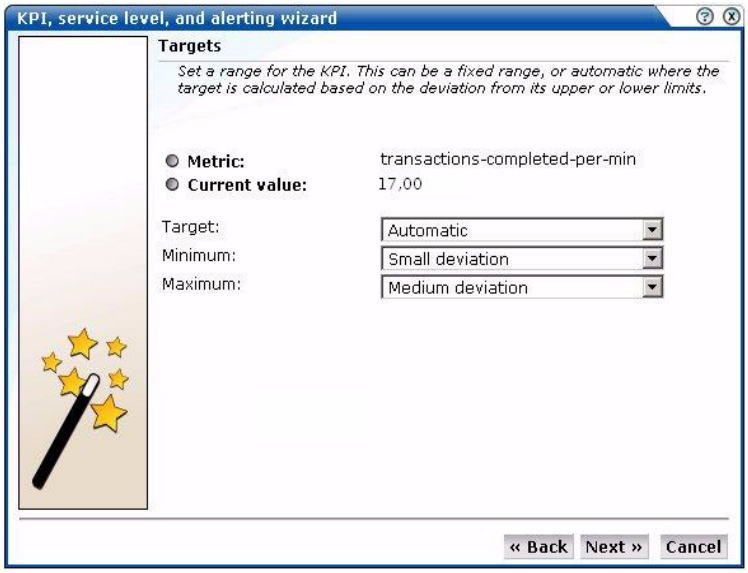


6. Use this dialog to specify additional requirements for the KPI. In this way, you can build compound metric conditions. For example, the monitored service should provide an end-to-end page time of between 3 and 5 seconds for 98% of requested pages, but this requirement should only apply when page views per minute are between 5 and 10. Click **Add requirement** to specify compound metrics.

Note: Any filter you specified in Figure 5–1 will also apply to any additional metrics. Therefore, you should ensure that the filter is relevant to the additional metrics. Also, if you specify additional (compound) metrics, *all* the defined requirements must be met for the KPI to yield a result that can be monitored.

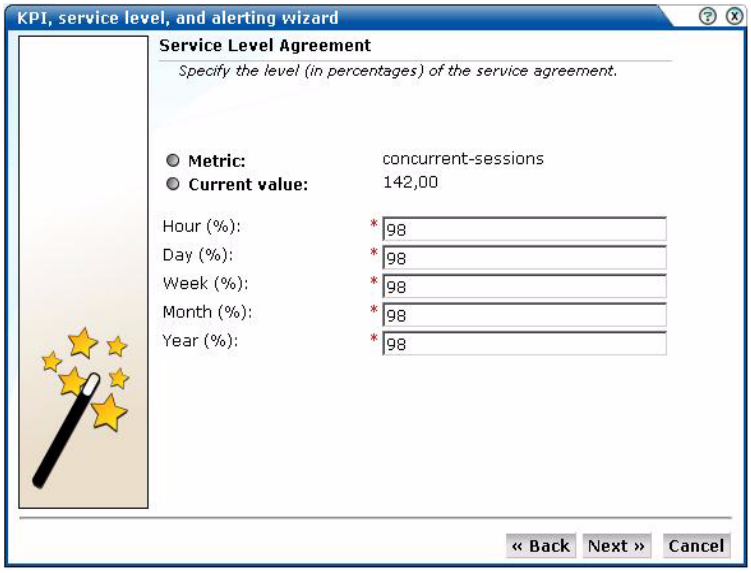
Note that this dialog only appears if you checked the **Requirements** check box in Figure 5–4. When ready, click **Next**. The dialog shown in Figure 5–7 appears.

Figure 5–7 Targets Dialog



7. Use this dialog to set a range for the KPI. You can define it in terms of a fixed range. For example, between 80 and 100. Alternatively, you can specify if the KPI should be sampled for small, medium, or large deviations from its auto-learnt target. For more information on the use of this facility, see Section 5.3.1, "Automatic and Fixed Targets". Note that this dialog only appears if you checked the **Targets** check box in Figure 5–4. When ready, click **Next**. The dialog shown in Figure 5–8 appears.

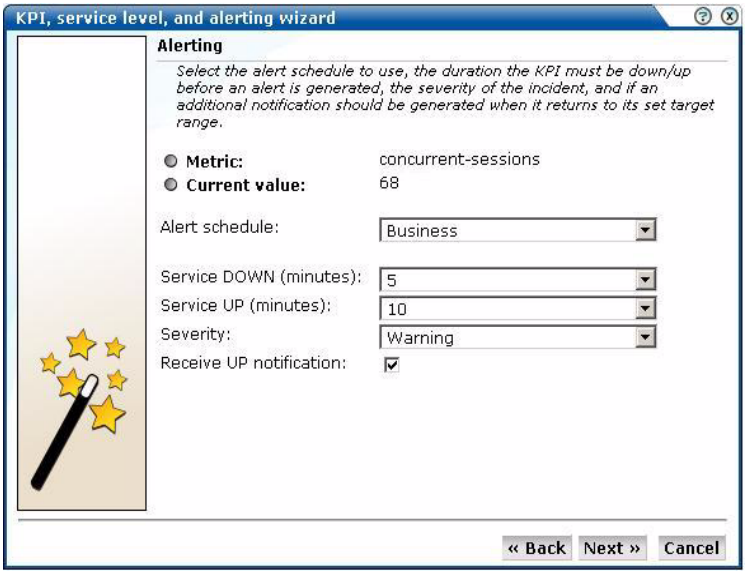
Figure 5–8 Service Level Agreement Dialog



8. Use this dialog to specify the level of your service agreement. For example, you undertake that the service will meet its specified objectives throughout 98% of the year. However, on an hourly basis, the commitment is 80%, and on a daily basis, 90%. All the period fields are mandatory.

Note that this dialog only appears if you checked the **Service Level Agreement** check box in Figure 5–4. When ready, click **Next**. The dialog shown in Figure 5–9 appears.

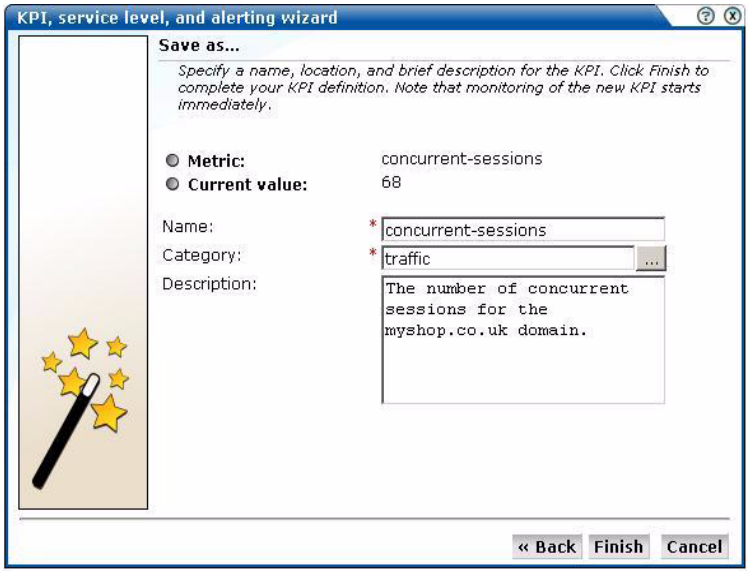
Figure 5–9 Alerting Dialog



9. Use this dialog to specify the alert schedule that should be used (Business, Technical, or both), and the duration that the KPI must be down (or up) before an alert is generated. You can also specify the severity (Harmless, Warning, Minor, Critical, or Fatal) of the incident, and whether an additional notification should be generated when the KPI returns to its set target range. It is recommended that you carefully review these settings to prevent excessive notifications.

Note that this is dialog only appears if you checked the **Alerting** check box in Figure 5–4. When ready, click **Next**. The dialog shown in Figure 5–10 appears.

Figure 5–10 Save As Dialog



10. Use this dialog to specify a name, category, and brief description for the monitored KPI. If you specify a new category name, this category will be automatically created. When ready, click **Finish** to complete your KPI definition. Note that monitoring of the new KPI starts immediately.

5.2.1 Renaming, Moving, and Deleting KPIs

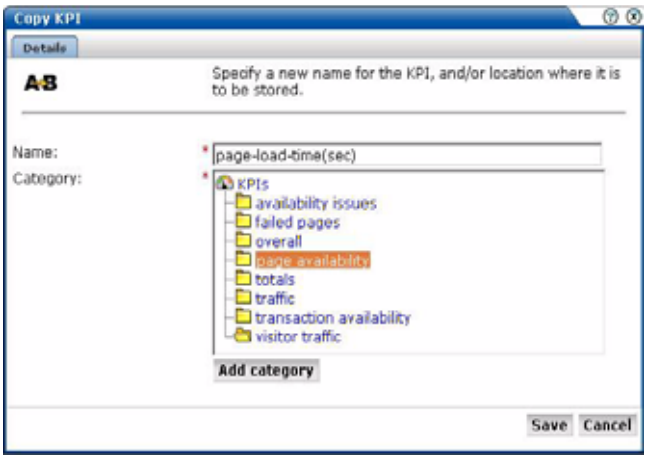
You can modify, rename (or move), or delete KPIs by right clicking them and selecting the **Rename** or **Remove** options from the menu. Select the **Edit** option to modify the KPI. The procedure to do this is described in Section 5.3, "Modifying Existing KPIs".

5.2.2 Copying Existing KPIs

In addition to creating new KPIs from scratch, as explained in Section 5.2, "Defining KPIs and SLAs", you can also create a copy of an existing KPI and use it as the basis for your new KPI. This is particularly useful when the new KPI is very similar to an existing one. For example, you already have an existing KPI that monitors transaction availability in the USA, but now want to create a new one for Canada. To use an existing KPI as the basis for a new one, do the following:

1. Select **Configuration**, then **Service level management**, then **KPIs**, and select the required KPI from the displayed listing. Click the **Copy KPI** button. The dialog shown in Figure 5–11 appears.

Figure 5–11 Copy KPI Dialog

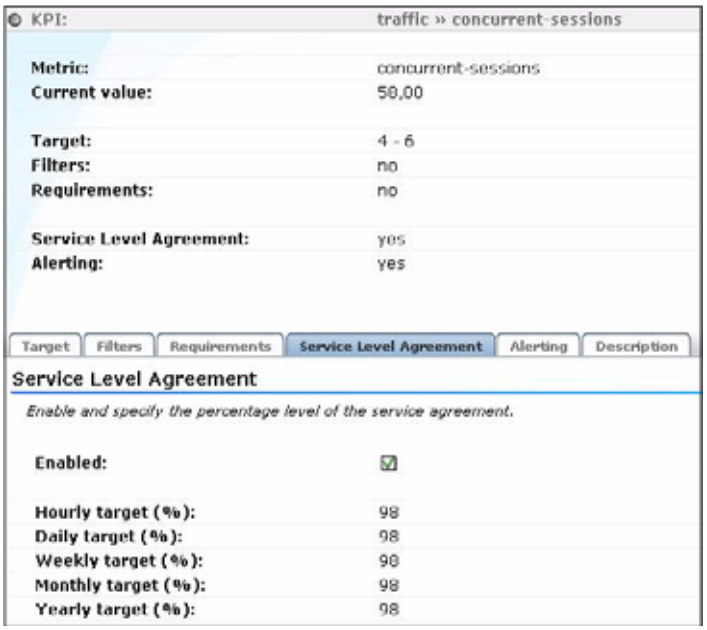


2. Specify a new name or location for the new KPI. Optionally, click **Add category** to create a new category. When ready, click **Save**.
3. Use the facilities described in Section 5.3, "Modifying Existing KPIs" to modify the new KPI to your requirements.

5.3 Modifying Existing KPIs

You can review and modify the definitions of existing KPIs by selecting **Configuration**, then **Service level management**, then **KPIs**, and selecting the required KPI from the displayed listing. A screen similar to the one shown in Figure 5–12 appears:

Figure 5–12 KPI Definition



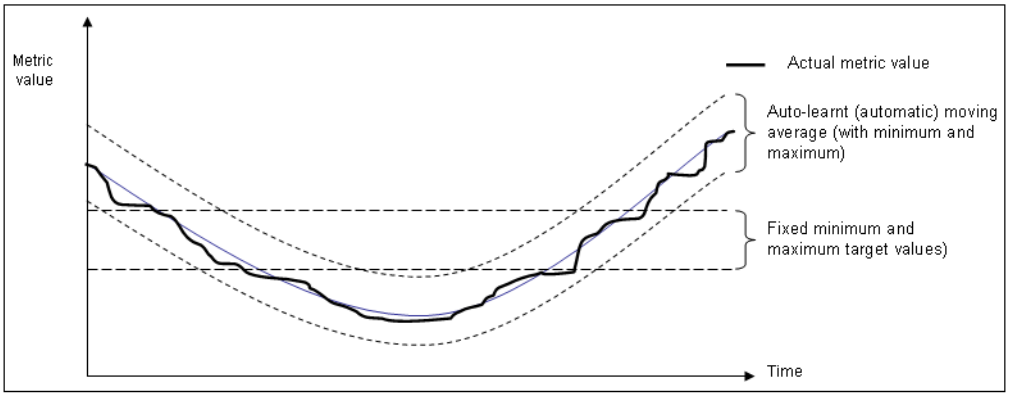
You can use the tabs to locate particular aspects to the selected KPI, and review and modify their definition. Their associated settings are equivalent to those described in Section 5.2, "Defining KPIs and SLAs".

5.3.1 Automatic and Fixed Targets

As mentioned earlier, you can specify a KPI should use automatic (or auto-learnt) targets. Because visitor traffic and usage patterns can differ widely during the course of a day, these auto-learnt minimum and maximum targets are calculated as moving averages for the current 5-minute period, based on the sampled metric value for that 5-minute period over the last 30 days. For example, when a KPI metric is sampled at 10.45 AM, the average against which it is compared is calculated from the last 30 days of samples at 10.45 AM. You can specify the minimum and maximum targets in terms of small, medium, or large deviations from these moving averages.

In contrast, a fixed KPI target essentially represents, either minimum or maximum, a straight line. This is shown in Figure 5–13.

Figure 5–13 Automatic and Fixed KPI Targets Contrasted



When using auto-learnt targets, be aware of the following points:

- Auto-learnt targets assume that a KPI has approximately the same value at the same time of day during each of the last 30 days. If this is not the case, it is recommended you use fixed targets.
- It requires a full day before the auto-learnt targets become available. Clearly, the more days of historical data that are available, the more reliable the calculated automatic targets. During the first day that a KPI is created with auto-learnt targets, these targets are automatically set to slightly above and below the actual recorded values in order to prevent the generation of alerts.
- Although auto-learnt targets can signal a problem if the metric value is too high or too low, if the problem persists over a long period, these abnormal values will become part of the auto-learnt targets and will, eventually, be assumed to be normal behavior.
- Auto-learnt targets can drop dramatically if the KPI value is unavailable every day at about the same time. For example, in the case of no network traffic after 18:00.

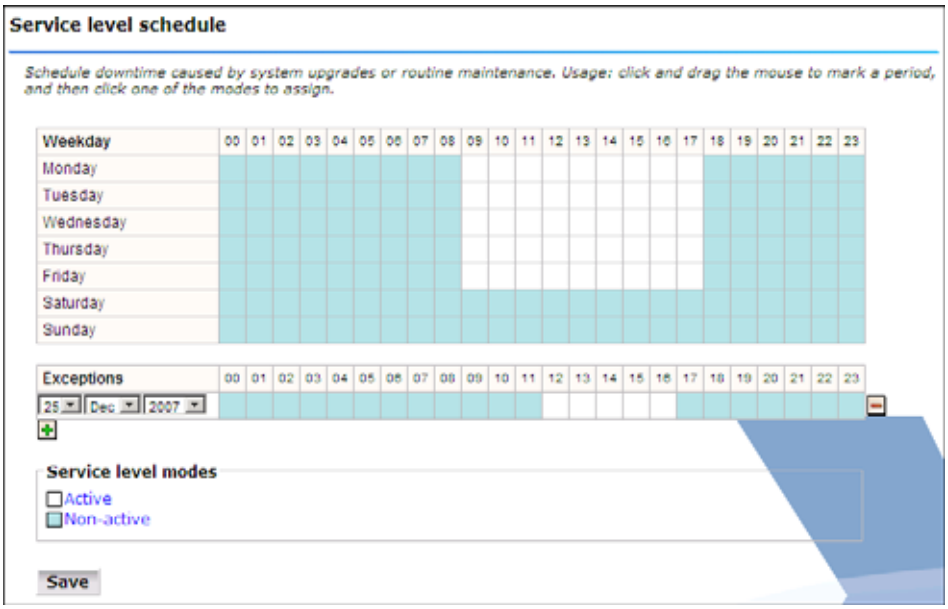
If you define a KPI to use automatic targets (see Figure 5–7), and later modify the KPI to use fixed targets, the previously calculated targets (derived by monitoring the KPI over time) are set as the new fixed targets. If you are in doubt about the fixed targets that should be set for a KPI, you can use this facility to obtain realistic initial values. Of course, you are free to modify these at any time.

5.4 Defining Service Level Schedules

In addition to defining the KPIs that will be used to track the service levels achieved by your organization, you also need to specify when these service levels should apply. Typically, an organization has a core time (for example, 9 am - 5 pm, Monday - Friday) when the committed service level should be achieved. However, you may need to define exceptions to this, such as for public holidays. For example, a limited service between 10 am and 4 pm may be required on Easter Monday. Finally, you will also need to take account of planned maintenance periods.

The scheduling of planned service levels is maintained through the **Service level schedule** (shown in Figure 5–14). To open it, select **Configuration**, then **Service level management**, and then select **Service level schedule**.

Figure 5–14 Service Level Schedule



You can mark a period within the Service level schedule by clicking and dragging over the required period of the week. Assign the selected period a status by clicking the **Active** or **Non-active** modes.

You can define exceptions by clicking the **Plus** (+) icon, and selecting the day, month, and year from the **Exceptions** list. You can remove exceptions by clicking the **Minus** (-) icon to the right of an exception.

Note that any changes you make are not put into effect until you click **Save**. On exit, any unsaved changes you made are discarded.

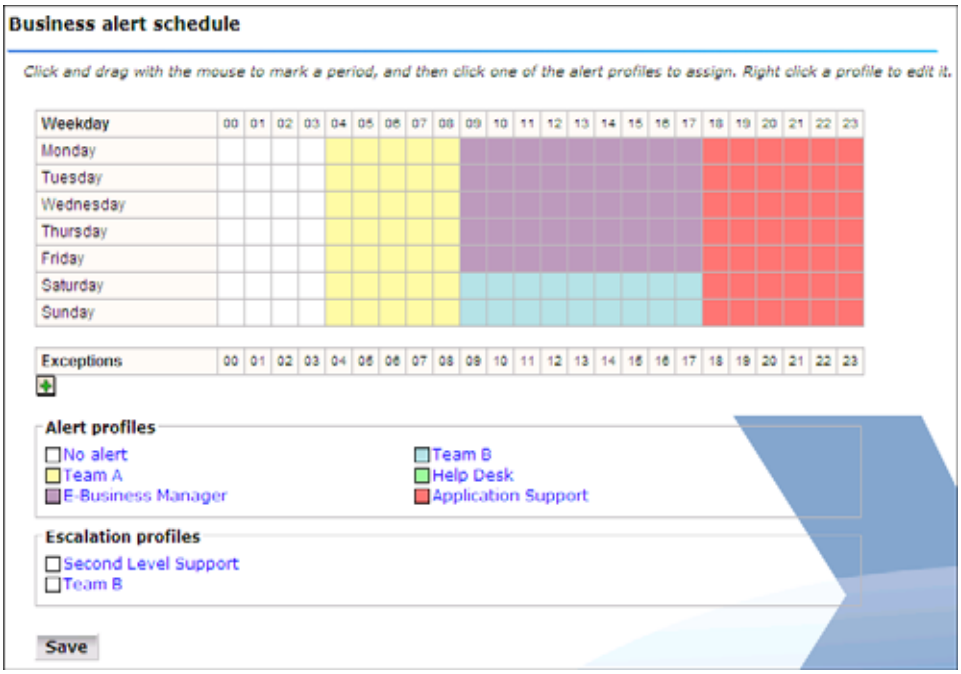
5.5 Defining Alert Schedules

If your organization uses alerts to notify staff members about incidents that impact service levels, you will need to specify who should be notified and when. Within RUEI, two types of alert schedule are available: **business** and **technical**.

When you define a KPI, you specify (in Figure 5–9) whether the KPI is a Business or Technical (or both) KPI. These two schedules enable you to extend this distinction, and specify groups of users, notification details, and the operative time frame. Exceptions to standard operating times can also be defined.

To open these schedules, select **Configuration**, then **Service level management**, then select **Alert schedule**, and then select **Business** or **Technical** from the **View** menu. Figure 5–15 shows an example of the Business alert schedule.

Figure 5–15 Business Alert Schedule



You can mark a period within the Business or Technical level schedule by clicking and dragging over the required period of the week. Assign the selected period by clicking one of the Alert profiles.

You can define exceptions by clicking the **Plus** (+) icon, and selecting the day, month, and year from the **Exceptions** list. You can remove exceptions by clicking the **Minus** (-) icon to the right of an exception.

Note that any changes you make are not put into effect until you click **Save**. On exit, any unsaved changes you made are discarded.

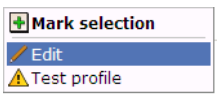
5.5.1 Alert Profiles

These define the users who will be notified if a Business or Technical KPI has been down (or up) for the specified duration required to generate an alert. Depending on how the KPI has been defined, these users will also be notified when the KPI returns to within its set target range.

For example, you might have defined a KPI for transaction-success-rate, and have specified that a success rate of least 70% is required for normal operation. If the KPI falls below this level within core business hours (9 am - 5 pm, Monday - Friday), all Web application Business Managers should be notified. If the failure occurs outside these hours, the Helpdesk should be notified.

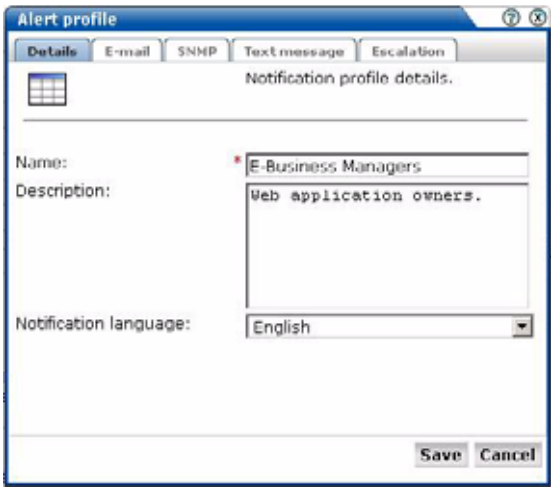
Each profile can be customized by right clicking it, and selecting **Edit** from the context menu. This is shown in Figure 5–16:

Figure 5–16 Alert Profile Context Menu



The dialog shown in Figure 5–17 appears.

Figure 5–17 Alert Profile Dialog



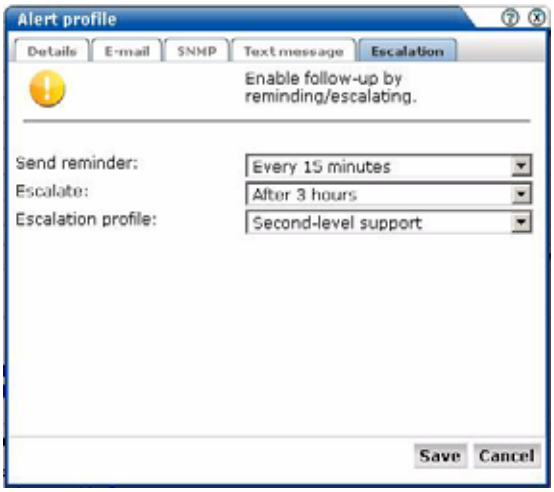
Use this dialog to specify the name and a brief description of the users to be notified. Use the other tabs in this dialog to specify the recipients of E-mail, SNMP, and text message notification. Use the **Enabled** check box for each method to activate notification.

Note: When receiving text message-based alerts, the timestamp of the message shown within your mobile telephone may not match that recorded within your RUEI installation. This is due to time zone differences on your mobile telephone.

5.5.2 Escalation Procedures

Within the **Escalation** tab, shown in Figure 5–18, you can set reminders to be sent to the alert's recipients if the KPI remains down. In addition, you can define an escalation procedure if the KPI is still down after a defined period. For example, if the KPI is still down after three hours, notify another group. This escalation group can be customized by right clicking it, and selecting **Edit** from the context menu.

Figure 5–18 Escalation Tab



5.5.3 Sampling and Notification Intervals

It is important to understand that there are two states associated with a KPI: the KPI state, and the alert state. The KPI state can change at each sampling interval. The alert state is controlled by the properties you define for the alert. For example, consider the case in which a KPI starts to fail, and you have defined a sample interval of 5 minutes (the default), and a DOWN duration of 15 minutes. Although after 5 minutes the KPI is considered to be failing, you will not be notified about it unless it has been continually down for 15 minutes.

Similarly, the reminder and escalation durations you specify in Figure 5–18 refer to the alert. Hence, specifying a reminder duration of every hour would generate a reminder notification every 60 minutes after the original alert was sent while the KPI is still failing. It is recommended that you carefully review the values you specify for these settings to meet your operational requirements.

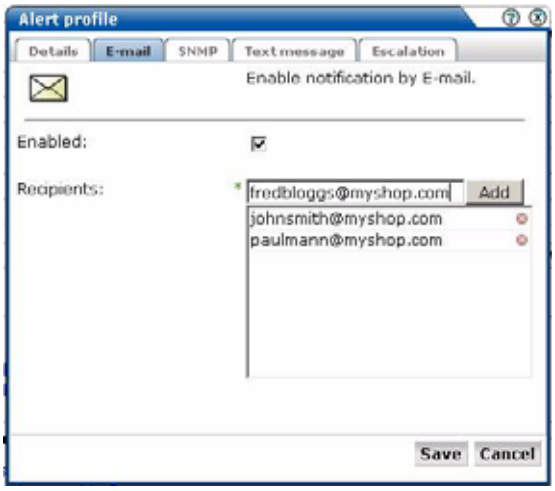
5.5.4 Testing Alert Messages

If you have enabled E-mail, SNMP, or text message notification, you can use the **Test profile** option in the context menu shown in Figure 5–16 to send a test alert to all specified recipients in an alert or escalation profile. This is useful for testing that the contact information has been entered correctly. You are prompted to confirm the test notification.

5.5.5 Using Mail Notifications

To define E-mail alert recipients, click the **E-mail** tab to open the dialog shown in Figure 5–19, and do the following:

Figure 5–19 E-mail Dialog

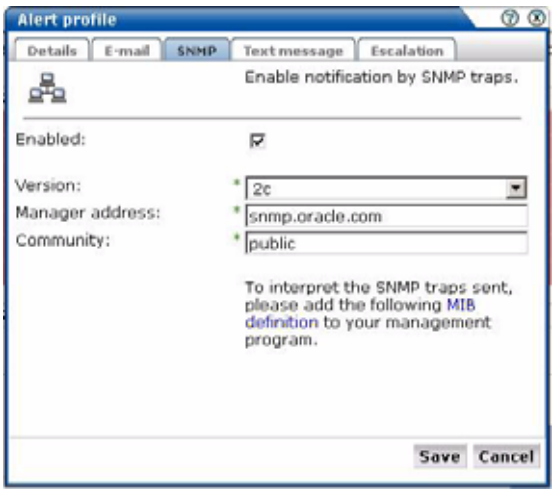


1. Use the **Recipients** fields to specify the E-mail addresses of the users to be notified. Click **Add** to include a user in the notification list. Note that you can remove a user from the list by clicking the **Remove** icon to the right of the user.
2. Check the **Enable** check box to activate E-mail notification. When ready, click **Save**.

5.5.6 Using SNMP Notifications

To define SNMP alert recipients, click the **SNMP** tab to open the dialog shown in Figure 5–20, and do the following:

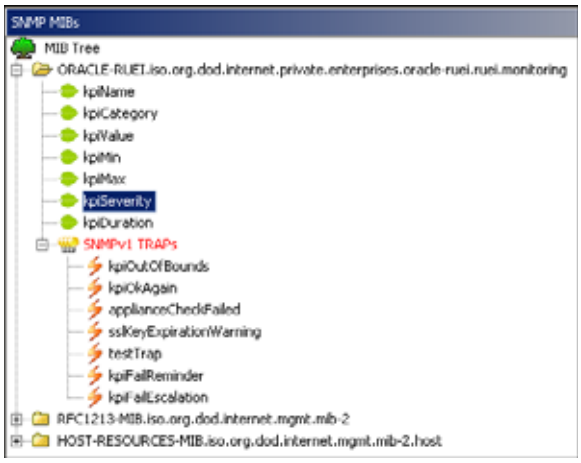
Figure 5–20 SNMP Dialog



1. Use the **Version** list to specify which version of the SNMP protocol is being used. The default is version 2c.
2. Use the **Manager address** field to specify the client software address. This must be a valid network address, and can either be an IP address or a host name.
3. Use the **Community** field to specify the group to which information is sent. This string acts as a password to control the clients' access to the server.
4. Check the **Enable** check box to activate SNMP notification.
5. Download the Management Information Base (MIB) definition and incorporate it into your address book of managed objects. It contains necessary information about how the received SNMP messages should be interpreted. The structure of the MIB file is shown in Figure 5–21[1].

[1] This screen features the iReasoning MIB Browser (http://www.ireasoning.com). This utility is not distributed as part of RUEI, and requires a separate license. It is intended only to illustrate the structure of the provided MIB file.

Figure 5–21 SNMP MIB Structure



The available KPI information and metrics in the MIB represent the most important properties of every KPI configured within the system, and can be used as the basis for filtering and alerting. They are explained in Table 5–1.

Table 5–1 KPI Information and Metrics Structure

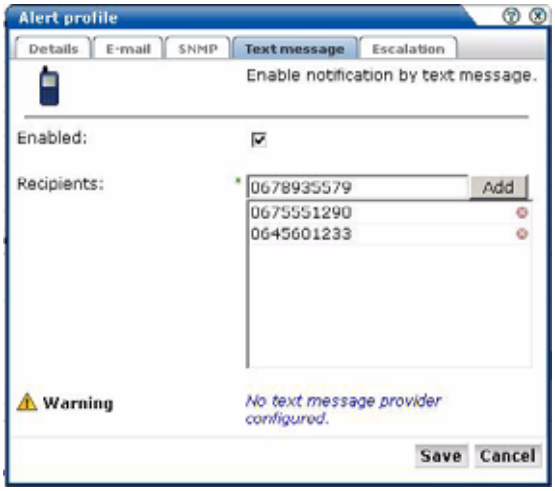
Object	Type
KPI Duration	Value
KPI Severity	Text
KPI Maximum	Value
KPI Minimum	Value
KPI Value	Value
KPI Category	Text
KPI Name	Text

Note that KPI names in SNMP alerts are sent in UTF-8 format. Any characters in the KPI name not in ISO-Latin-1 format will be replaced by a question mark (?) character. Also, be aware that not all SNMP managers fully support UTF-8. For further information, refer to your SNMP manager product documentation.

5.5.7 Using Text Message Notifications

To define text message notifications, click the **Text message** tab to open the dialog shown in Figure 5–22, and do the following:

Figure 5–22 Text Message Dialog



1. Use the **Recipients** field to specify the telephone numbers of the users to be notified. Click **Add** to include a user in the notification list. Note that you can remove a user from the list by clicking the **Remove** icon to the right of the user.
2. Check the **Enable** check box to activate text message notification. When ready, click **Save**.
3. If you have not already done so, you will need to configure an text message provider. If you are warned that one has not already been configured, click the warning link, and follow the instructions described in Section 9.10, "Configuring Text Message Providers".

6

Defining Pages and Transactions

This chapter describes how to identify the Web pages to be monitored. In particular, how to define the Web pages for which you want additional information to be available, the logical sequence of pages in transactions to be monitored, and those pages that should be monitored for the occurrence of specific text strings. In addition, the definition of Single Sign On (SSO) profiles and suites are also described. This can only be performed by users with Analytical level access.

6.1 Naming Pages

Page identification within RUEI is based on *applications*. Essentially, an application is a collection of Web pages. This is because pages on a Web site are typically bound to a particular application. Each page within an application has an assigned name, and belongs to a group. For example, "MyShop » Contact » About us" refers to the About us page in the Contact group, within the MyShop application.

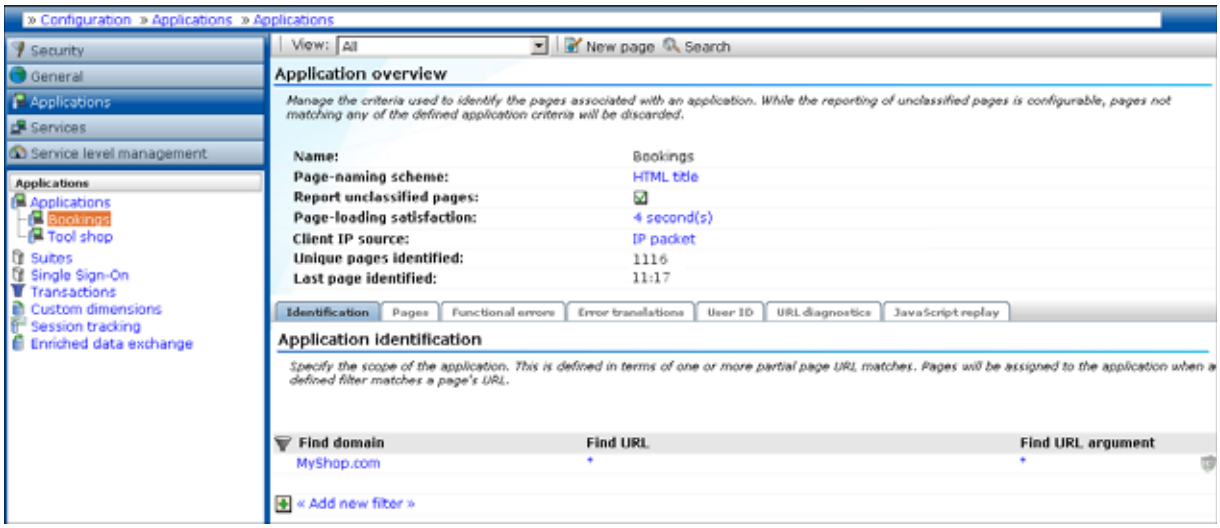
Each application has a page-naming scheme associated with it, which defines its scope. This can be specified in terms of a partial domain name, URL structure, or a combination of both of these. A page-naming scheme (such as page tagging or the title part of the HTML page) can also be specified to refine the application definition.

For each page that RUEI detects, it uses the available application definitions to assign a name to it. Note that information about any pages that could not be identified using these definitions is discarded and, therefore, not available through reports and the Data Browser.

In addition to automatic detection, application pages can also be defined manually. This is particularly useful in the case of an inconsistent URL structure, or where identified pages contain sub pages, or when you want to assign a different name to the one assigned automatically to it by the application. Note that these manually defined pages take precedence over pages identified automatically through application definitions.

The structure of the currently defined applications, their groups and pages, are visible by selecting **Configuration**, then **Applications**, and then **Applications**. An example is shown in Figure 6–1.

Figure 6–1 Example Application Overview

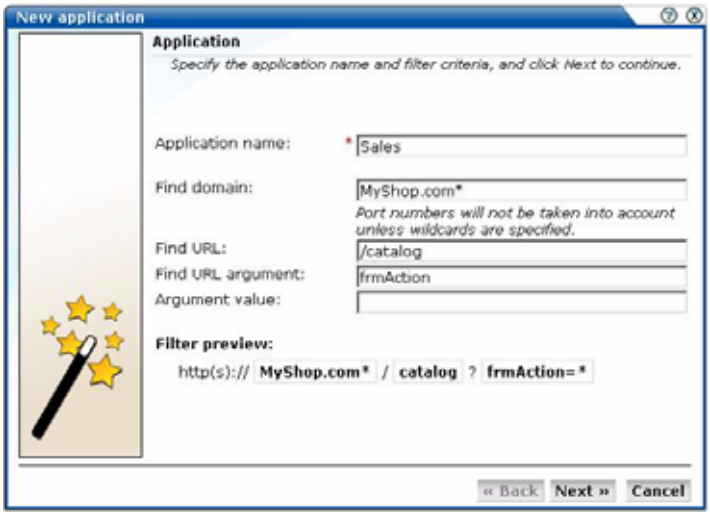


6.2 Defining Applications

To define applications, do the following:

1. Select **Configuration**, then **Applications**, then **Applications**, and click **New application**. The dialog shown in Figure 6–2 appears.

Figure 6–2 Configure New Application



2. Specify a name for the application. This must be unique across suites, services, SSO profiles, and applications. Note that applications cannot be renamed later.

3. Use the remaining fields to specify the scope of the application. This is defined in terms of page URLs. Note that as you enter this information, you can see the effect of your definition through the **Filter preview** column.

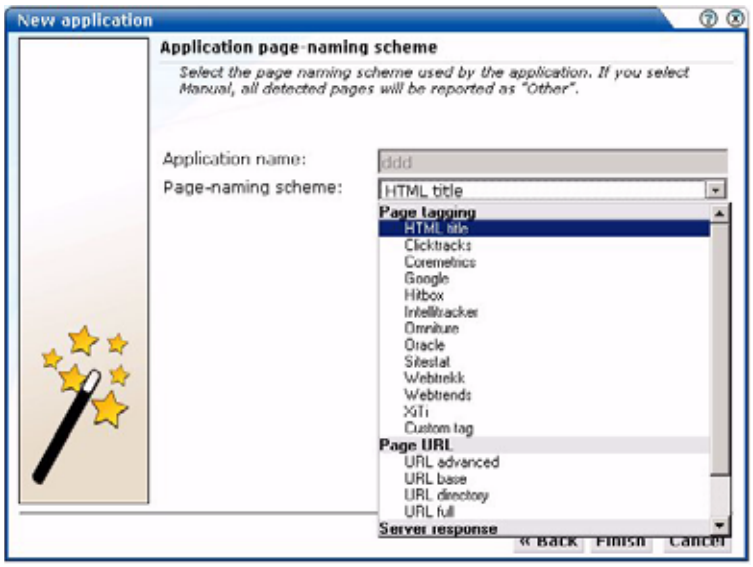
   The highest level filter is the domain. It is not possible to specify an application name and leave all the other fields blank. That is, a blank filter. Note that if a wildcard character (*) is not specified within the **Domain** field, network traffic arriving on a non-standard port (that is, other than ports 80/443), is not associated

with the application unless the port number is explicitly stated. In addition, be aware that while the use of a wildcard character is supported within fields, all other specified characters are interpreted as literals. Finally, it is not possible to specify the wildcard character and no other information for domain name and URL argument combinations.

Note: It is advised that filter definitions be mutually exclusive across applications, suites, SSO profiles, and services. For example, an application filtered on the domain `us.oracle.com` and then a second application filtered on `us.oracle.com/application_servlet`, can lead to unpredictable results. See Section 7.6, "Controlling Rule Ordering Within RUEI" for information about how you can influence the order in which matching rules are applied.

You can also specify a URL GET or POST argument that must be matched. Note that if you want to use this facility, both the argument name and argument value must be complete in order for them to be matched to found page URLs. This is, partial matching is not supported. When ready, click **Next**. The dialog shown in Figure 6–3 appears.

Figure 6–3 Application Page-Naming Scheme



4. This dialog allows you to specify the automatic page-naming scheme used for pages within the application. Only one scheme can be specified per application. The following option groups are available:

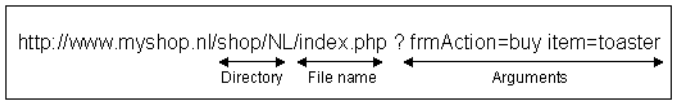
   - **Page tagging**: specifies that a either a standard scheme (such as Coremetrics) or a custom scheme is being used. In the case of a custom scheme, you are required to specify the name of the tag. The **HTML title** option specifies that the text found within the page's <title> tag should be used to identify the page. See Section 6.2.1, "Controlling the Handling of Pages and Objects" for information about the use of this option. The structure and processing of the generic page tagging schemes supported by RUEI are described in Appendix A, "Tagging Conventions."

- **Page URL**: specifies that pages are identified on the basis of their URL structure. The following options specify which portion of the URL is used:
  - **URL advanced**: page naming is based on advanced URL matching rules. The use of this facility is described in Section 6.2.2, "Using Advanced URL Matching Rules".
  - **URL-directory**: uses only the directory part of the URL. The various parts of the URL are highlighted in Figure 6–4.
  - **Base-URL**: uses the main directory and file name (without the file extension) parts of the URL.
  - **Full-URL**: uses the main directory, the file name (without the file extension), and the configured arguments within the URL. If you select this option, you are prompted for the arguments that you want included in the page name. Within the dialog box, multiple arguments should be separated with an ampersand (&) character. For example, if the `frmAction` parameter has been defined, the URL shown in Figure 6–4 will result in the page name myshop » shop » NL index buy.

  If you are using any of the above options (other than **URL advanced**), see Section 6.2.1, "Controlling the Handling of Pages and Objects" for important information.

  Be aware that URL argument names are processed in their raw (original) format, while argument values are transcoded. For further information on encoding support and handling, see Appendix G, "Working With National Language Support".

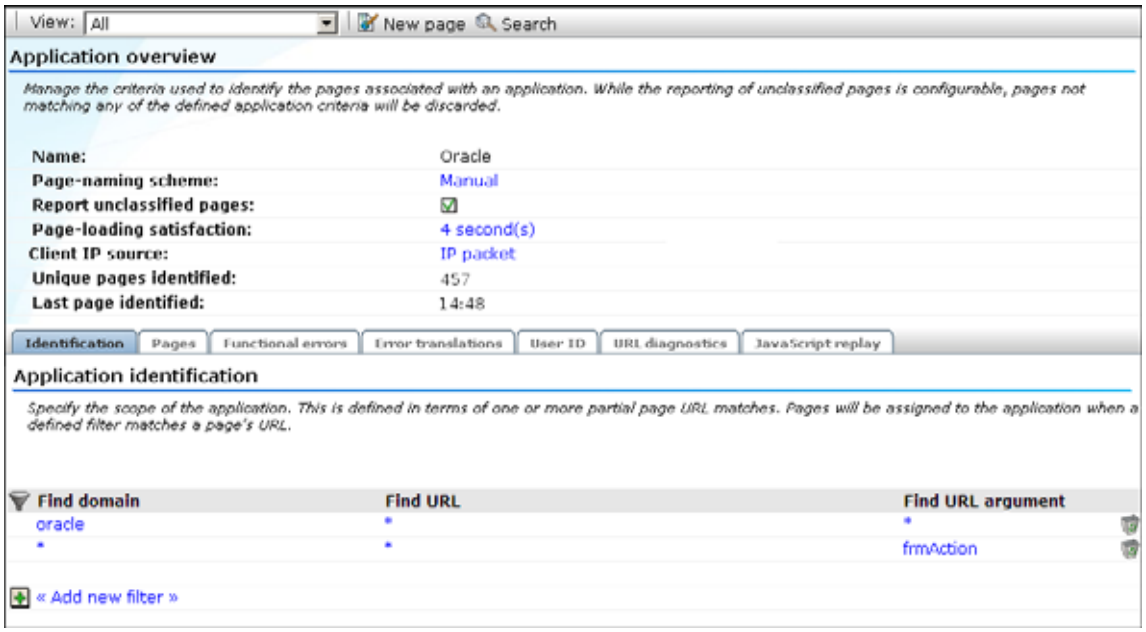
Figure 6–4 URL Structure



- **Server response**: specifies that pages are identified on the basis of an XPath expression applied to the server response. For more information on the use of XPath expressions, see Appendix F, "Working with XPath Queries".
- **Manual**: specifies that the application pages will be manually defined rather than through automatic detection. Note that if you select this option, all pages associated with the application that you want monitored must be manually defined. See Section 6.2.14, "Manually Identifying Pages" for information on manual page definition. This is the default option.

When ready, click **Finish**. The application definition you have specified is displayed. An example is shown in Figure 6–5.

Figure 6–5 Application Overview



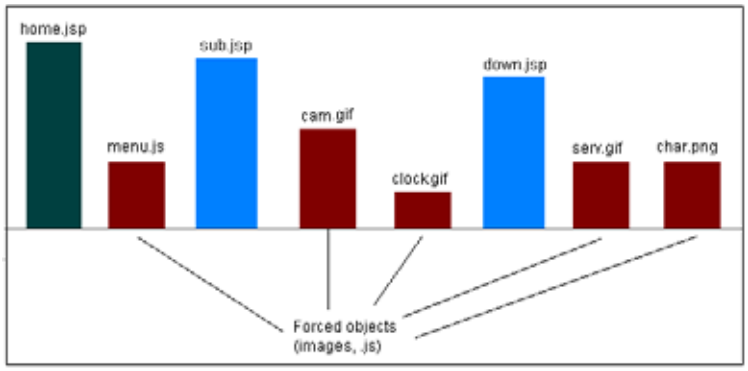
5. This overview provides a summary of the defined application. This includes the application's name, the page-naming scheme it uses, the report unclassified pages setting, the page-loading satisfaction assigned to each of the application's associated pages, the source from which the client IP address is fetched, the number of unique pages that have so far been matched to it, and the date of the most recent page identified for it. The **Identification** section summarizes the match criteria currently defined for the application. This is described in more detail in the following section.

6.2.1 Controlling the Handling of Pages and Objects

When using the **HTML title** option, the text found within the page's <title> tag is used to identify the page. Potentially, if not found, you may want the sub-headings <H1>, <H2>, and <H3> to be used. Therefore, you can use the **Include sub-headers** check box within the **Advanced** tab to control this facility. By default, the sub-headers are not used.

This check box is also available when using any of the **Page URL** options (other than **URL advanced**). In addition, you can use the **Disable time recognition** check box to control whether non-forced objects are used to identify the page. Consider the example shown in Figure 6–6.

Figure 6–6 Time-Based Recognition



In this case, there are three non-forced objects (`home.jsp`, `sub.jsp`, and `down.jsp`) that could potentially be used for page identification. If the **Disable time recognition** check box is unchecked (the default), only the first (`home.jsp`) object would be identified as a page if detected within one second of the last hit. However, if checked, each of the three objects would be identified as separate pages, regardless of detection time considerations. For further information on forced objects, see Section D.1.2, "Forced Objects".

6.2.2 Using Advanced URL Matching Rules

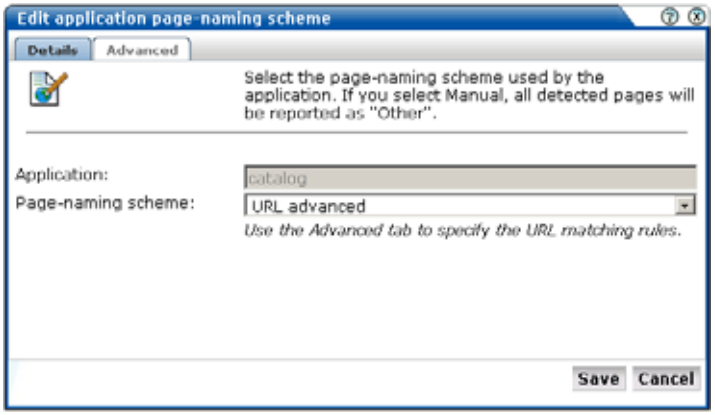
Each application definition requires you to specify the automatic page-naming scheme used for pages within the application. The **URL advanced** option specifies that pages are identified on the basis of their URL structure using advanced matching rules.

> **Note:** Because of the complex nature of URL matching rules, it is recommended this facility is only used by users with a sound understanding of URL structures. In addition, the selected application's underlying URL structure should be clearly understood.

To specify the use of advanced URL matching rules for a selected application, do the following:

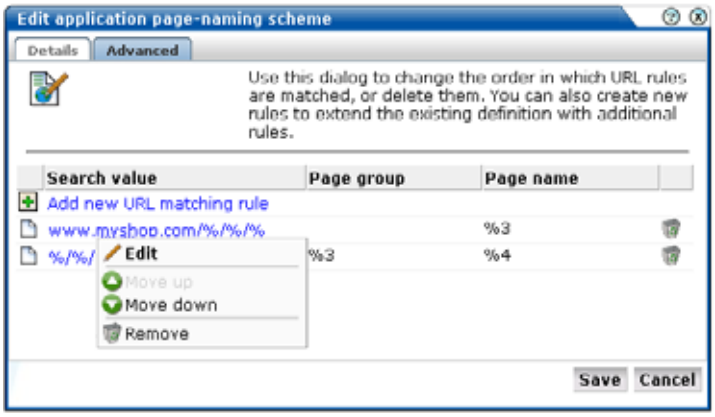
1. After you have initially defined your application (as described earlier), click the page-naming scheme setting shown in Figure 6–5. The dialog shown in Figure 6–7 appears.

Figure 6–7 Edit Application Page-Naming Scheme



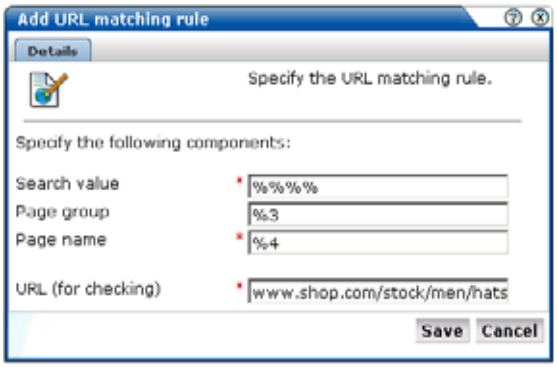
2. Use this dialog to either change the specified page-naming scheme, or click the **Advanced** tab to specify the URL matching rules, and the order in which they should be evaluated. The dialog shown in Figure 6–8 appears.

Figure 6–8 Advanced URL Matching Rules



3. Click the **Add new URL matching rule** item to define new matching rules. The dialog shown in Figure 6–9 appears. Use this dialog to define new rules or delete existing ones. You can also right click a rule and use the menu to modify the order in which they are applied, as well as edit and delete them. When ready, click **Save**.

Figure 6–9 Add URL Matching Rule



Each URL matching rule is expressed in terms of the following components:

- **Search value**: specifies the structure of the expected URL. Essentially, it provides a template for interpreting the received URL.
- **Page group**: specifies how the page group is identified from the received URL. Note if this is not specified, the page group is assigned the page name.
- **Page name**: specifies how the page name is identified from the received URL.
- **URL (for checking)**: specifies a definition of the URL that should be matched. Typically, this is expressed in terms of required parameters, and the sequences that should comprise them.

If you do not specify anything in the advanced rules, the page is discarded and not reported. The rules are matched in the order specified for them.

Search Constructions

In addition to the use of parameters, the elements shown in Table 6–1 can also be used in URL matching rules.

Table 6–1 Advanced Search Constructions

Usage	Description
%	Match zero or more characters and fill one placeholder. Allowed placeholders are %1 - %9.
%[!...]	Find one value corresponding to any of the supplied name(s) in the URL argument, and fill one each for the original and matched placeholders.
%[&...]	Find all values corresponding to the supplied name(s) in the URL argument, and fill one parameter placeholder for the original and specified number of placeholders.
%[|...]	Find zero or more values corresponding to the supplied name(s) in the URL argument, and fill one placeholder for the original and specified number of placeholders.
%[c#]	Find the specified number of characters.
%[d]	Find directory path of the URL, and fill one placeholder.
%[f]	Find file name path of the URL without the file extension, and fill one placeholder.
%[h]	Find domain part of URL, and fill three placeholders (for example, a.b.name.co.uk would be matched as %1=a.b, %2=name, and %3=co.uk).
%[t...]	Match until one of the following characters is matched, and fill one placeholder.
%[t^...]	Match until a character is found that does not match the specified list of characters.

Note the special characters specified in Table 6–1 must be preceded with a backslash if they should be interpreted literally. For example, \% specifies a literal % character, rather than a parameter. Also, be aware that a maximum of nine placeholders can be specified.

Examples

Search value: %[h]/%/%/%/%?%

Page group: %6 (electronics)

Page name: %7 (tv821)

URL (for checking):
www.mydomain.co.uk/shop/catalog/electronics/tv821?params=all

Search value: %[h]/%[&shop_cat]

Page group: %2 (pcShop)

page name: %5 (Cables)

URL (for checking): www.pcShop.com/home/applications/catalog?cust_id=123&shop_cat=Cables

Search value: %[h]/cart:%[c9]/articleid:%[c9]/%

Page group: %4 (00000ABCD)

Page name: %5 (000018201)

URL (for checking): www.myshop.com/cart:00000ABCD/articleid:000018201/shop.jsp?params=all

6.2.3 Reporting Unclassified Pages

By default, pages that have been identified as belonging to an application through its URL definition, but for which no classified name has been found, are discarded and not reported. However, if you want these unclassified pages to be reported in Data Browser groups, use the **Report unclassified pages** check box shown in Figure 6–5.

Because page identification is a time-based activity, it is possible that references to objects not booked as objects are incorrectly identified as unclassified pages. For this reason, it is recommended that you only enable the reporting of unclassified pages for testing purposes. Thereafter, you can disable it again, and define the identified problems pages manually. Note unclassified pages are reported in the appropriate Data Browser group under the category "other".

6.2.4 Obtaining the Client IP Address

When reporting on user visits, the client IP address is, by default, fetched from the IP packet. However, when the RUEI system is placed in front of a NAT device, it may be more useful for the client IP address to be obtained from a specific request header. This is explained in Appendix J, "Monitoring NATed Traffic".

6.2.5 Automatic Page Naming Assignment

As explained earlier, each page within RUEI has the form *application* » *group* » *name*. Automatically detected pages are assigned their group and page names based on the directory structure within the URL. The first directory in the URL is assigned to the group name, and the remaining sub-directories are assigned to the page name. Note that the domain part is not used in the assigned name. Note this only applies to applications defined with the URL base, directory, or full page-naming schemes.

For example, the page URL `http://MyShop.nl/catalog/menswear/sale.html` for the application "Clothing" would generate the RUEI page name Clothing » catalog » menswear sale. Note that slashes within the directory structure are converted to spaces.

If there are no sub-directories in the URL, then the default group "home" is assigned to the page. For example, the URL `http://MyShop.nl/sale.html` in the application Clothing is assigned the page name Clothing » home » sale.

6.2.6 Refining Your Application Definitions

Once you have defined your application, you can modify its associated page-naming scheme by clicking it and selecting a new scheme, as described earlier in this section.

Within the **Identification** section, you can click **« Add new filter »** to specify additional filters for the pages that should be associated with the application. You can also modify an existing filter definition by clicking it. In each case, you can select from the same filters as shown in Figure 6–2. The application overview is updated to reflect your additions or modifications.

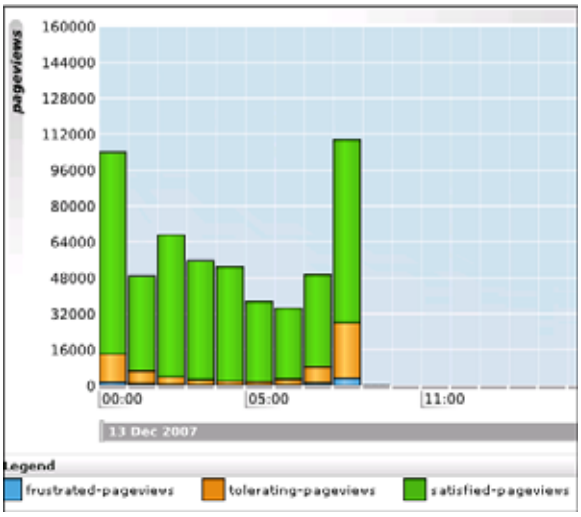
6.2.7 Specifying Page Loading Satisfaction

In order to assess the user's experience when viewing application pages in a session, RUEI assigns a satisfaction level for each page. These are:

- **Satisfied**: the page loads in the user browser within a specified threshold. This threshold is the page loading satisfaction threshold. For example, the page should load within five seconds.
- **Tolerable**: the page takes longer to load than the specified threshold.
- **Frustrated**: the page takes more than four times the specified threshold to load.

An example page load satisfaction report is shown in Figure 6–10:

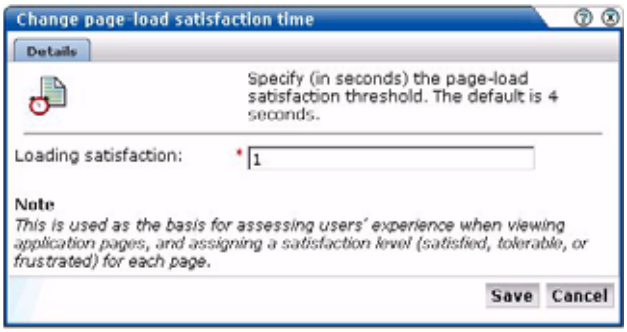
Figure 6–10 Page Loading Satisfaction Report



As stated above, this assessment is based on a threshold within which pages would normally be expected to load. This threshold can be modified to fine tune the reported page load satisfaction within the Data Browser. Do the following:

1. Select the required application, and click the setting defined for the **Page-loading satisfaction** item. The dialog shown in Figure 6–11 appears.

Figure 6–11 Page Load Satisfaction Time Dialog



2. Specify the duration (in seconds) within which page loads would normally be expected to be completed. The default is 4 seconds. When ready, click **Save**. Any change you specify takes effect immediately.

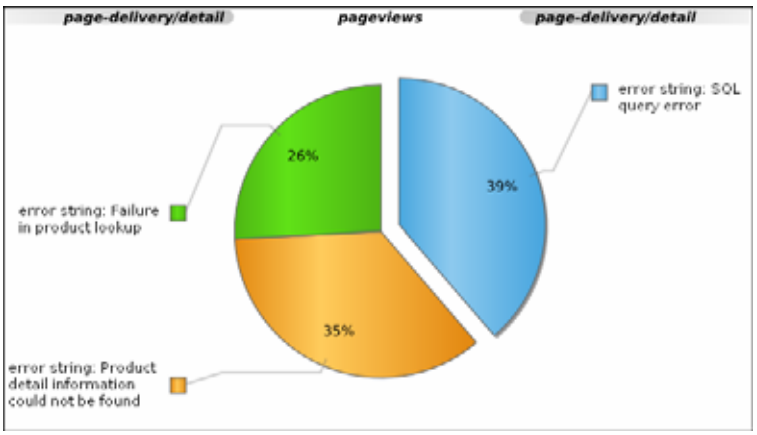
6.2.8 Trapping Application Functional Errors

Sometimes you want to detect strings that appear on pages and have them reported as errors. For example, if a user receives the message "Your credit card has expired". Note the following:

- All pages within the selected application are searched for the specified error string. It is not possible to limit the search to specific pages (as it is with page content checks).
- Functional errors can be specified in terms of a literal search string or an XPath expression, and whether the server response or client request should be searched. More information about using XPath queries is available in Appendix F, "Working with XPath Queries".
- Displayed page texts that match your specified error text strings are reported with the page content result "error string: *error search string*".

An example of a functional error report is shown in Figure 6–12.

Figure 6–12 Functional Error Analysis

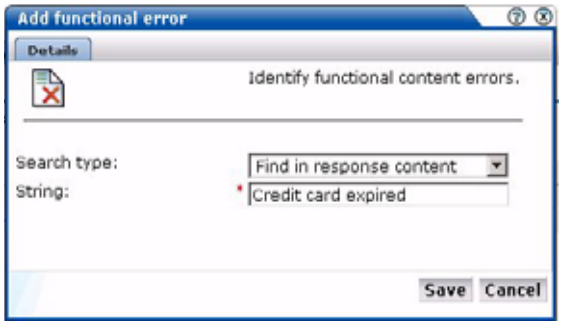


Defining Functional Errors

To define a functional error string, do the following:

1. Select **Configuration**, then **Applications**, and select the required application. The Application overview (similar to the one shown in Figure 6–5) appears. Click the **Functional Errors** tab. The currently defined functional errors are displayed. Click **« Add new functional error »** to define a new error, or click an existing one to modify it. The dialog shown in Figure 6–13 appears:

Figure 6–13 Add Functional Error

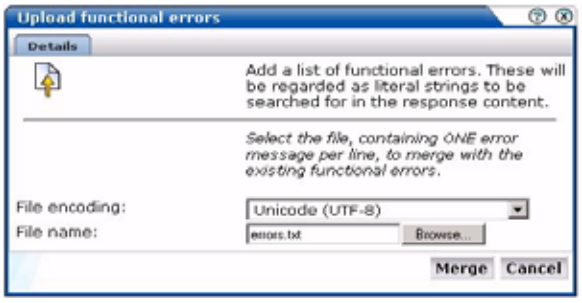


2. Specify whether the search should use a literal search string or an XPath expression, and whether the server response or client request should be searched. More information about using XPath queries is available in Appendix F, "Working with XPath Queries". When ready, click **Save**. Any changes you make will take effect within 5 minutes.

Importing Lists of Functional Errors

Instead of separately defining each site error that you want to be monitored, you can click **Upload list** to import a file containing a list of error messages. This could, for example, be a list of predefined application errors. The dialog shown in Figure 6–14 appears.

Figure 6–14 Upload Functional Errors Dialog



Use the **Browse** button to locate and select the required file. Optionally, use the **File encoding** menu to specify the file's character encoding. For more information on international character set support, see Appendix G, "Working With National Language Support". If an unsupported encoding is encountered, or the transcoding fails, an error is reported. The file must contain one error message per line, and there should be no blank lines in the file. Be aware that these messages will be regarded as literal strings to be searched for in the response content.

Defining Translations for Functional Errors

Optionally, you can also define a set of translations for each unique error string. For example, you could define the translations for Oracle database errors shown in Table 6–2.

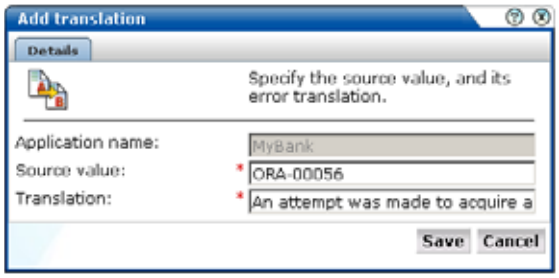
Table 6–2 Example Error String Translations

Error string	Translation
ORA-00056	An attempt was made to acquire a DDL lock that is already locked.
ORA-00057	The number of temporary tables equals or exceeds the number of temporary table locks.
ORA-00058	DB_BLOCK_SIZE initialization parameter is wrong for the database being mounted.
ORA-00059	The value of the DB_FILES initialization parameter was exceeded.
ORA-00060	Transactions deadlocked one another while waiting for resources.
ORA-00061	The shared instance being started is using DML locks, and the running instances are not, or vice-versa.
ORA-00062	The instance was started with DML_LOCKS = 0, and the statement being executed needs a full-table lock (S, X, or SSX).
ORA-00063	The number of log files specified exceeded the maximum number of log files supported in this release.

To define an error translation, do the following:

1. Select **Configuration**, then **Applications**, and select the required application. The Application overview (similar to the one shown in Figure 6–5) appears. Click the **Error translations** tab. The currently defined error translations are displayed. Click **« Add new translation »** to define a new translation, or click an existing one to modify it. The dialog shown in Figure 6–15 appears:

Figure 6–15 Add Translation

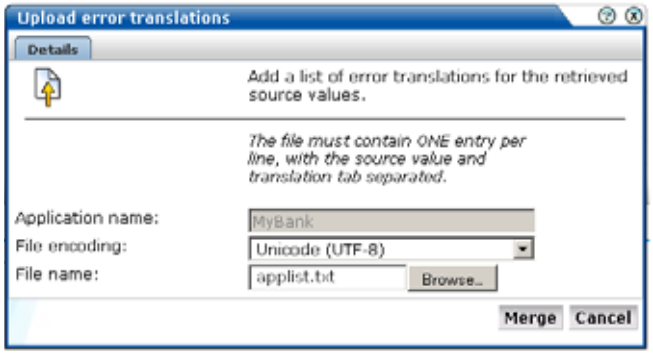


2. Specify the required source value and its translation. When ready, click **Save**.

Importing Lists of Translations

Instead of separately defining each translation, you can click the **« Upload list »** item to import a file containing a list of translations. The dialog shown in Figure 6–16 appears.

Figure 6–16 Upload Error Translations



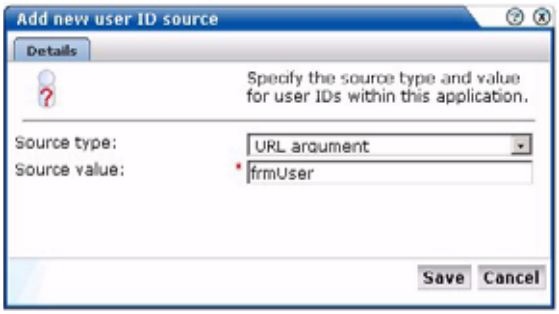
Specify the name of the translation file. Optionally, use the **File encoding** menu to specify the file's character encoding. For more information on international character set support, see Appendix G, "Working With National Language Support". If an unsupported encoding is encountered, or the transcoding fails, an error is reported. The file may only contain one translation per line, with source values and translations tab separated. When ready, click **Merge**.

6.2.9 Defining User Identification

Within RUEI, user identification is first based on the HTTP Authorization field. If this is not found, the application's user identification scheme is used. This can be specified in terms of URLs, cookies, request or response headers, or XPath expressions. When it is not configured, RUEI will use the SSL client certificate (when available). The common name (CN) portion of it is used. If this is not found, the client ID is reported as Anonymous. To configure user identification, do the following:

1. Select the required application, and click the **User ID** tab.
2. Click the **« Add new source »** item. The dialog shown in Figure 6–17 appears.

Figure 6–17 Add New User ID Source



3. Use the **Search type** menu to specify the user identification mechanism. This can be specified in terms of a literal search string, an XPath expression, or a cookie, and whether the server response or client request should be searched. More information about using XPath queries XPath queries is available in Appendix F, "Working with XPath Queries". Use the **Search value** field to specify the required parameter. When ready, click **Save**.

Note: You can check the effect your user identification definition has by viewing the XLS User Information report in the Clients category. For more information on reports, see Chapter 2, "Working With Reports".

National Language Support

See Appendix G, "Working With National Language Support" for a detailed discussion of the implications for identification when working with international character sets.

6.2.10 Viewing the Application Page Structure

The structure of the pages detected for an application are shown in the application overview on the left-hand side of the window. An example is shown in Figure 6–18.

Figure 6–18 Example Application Page Structure

Potentially, an application could have a very large number of pages associated with it. Indeed, far too many to be easily readable in the structure shown in Figure 6–18. For this reason, the structure view is restricted to those pages that have some Point of Interest (POI) associated with them. This could include the fact that the page is featured in a report or transaction, is defined as a key page, is manually named, or is part of a monitored KPI. The **View** menu shown in Figure 6–19 allows you to control which type of pages are displayed in the structure overview.

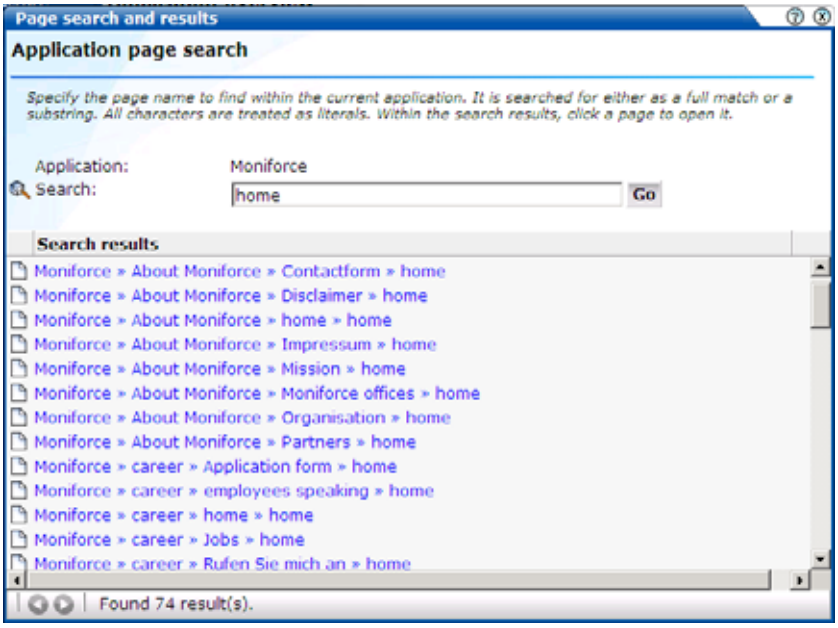
Figure 6–19 View Menu

6.2.11 Locating Page Details

By drilling down through the application page categories, you can locate specific pages. However, if you are working with an application with a large number of pages, it may be more convenient for you to use the page search facility. Do the following:

1. Select the application you want to search, and click the **Search** button above the application overview (see Figure 6–5). A screen similar to the one shown in Figure 6–20 appears.

Figure 6–20 Page Search and Results Dialog



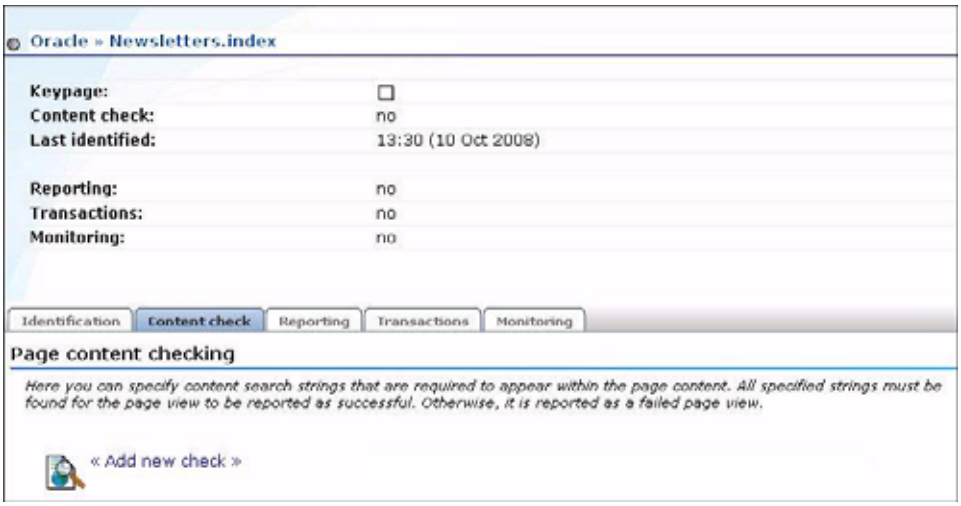
2. Specify the search profile you want to use to locate the required page(s). Note that the search is restricted to the current application, and page names have the structure *application* » *group* » *name*. The search facility will try to match any search pattern you specify either as a full match or as a substring. Hence, the search pattern "home" would match occurrences of this string or any substring in the application, group, or page names. When ready, click **Go**.
3. The search results are shown in the lower part of the dialog. Click a matched page to open it. Use the **Backward** and **Forward** buttons to scroll between multiple pages of results.

Note: The scope of the search includes both pages that have already been detected, and undetected pages that appear in reports and transactions.

6.2.12 Tracking Page Usage

Information about each page detected for an application is available through the page Analysis window. An example is shown in Figure 6–21.

Figure 6–21 Page Analysis Window



The following tabs are available within this window:

- **Identification**: specifies the page identification scheme (manual or automatic), and the conditions used to identify it.
- **Content check**: specifies if content search strings have been defined for the page. This is described in Section 6.2.13, "Specifying Page Content Checks".
- **Reporting**: lists the reports in which this page appears. Reports are described in Chapter 2, "Working With Reports."
- **Transactions**: lists the transactions in which this page is defined. See Section 6.5, "Building Transactions" for more information on defining transactions.
- **Monitoring**: list the KPIs in which this page appears. See Section 5.2, "Defining KPIs and SLAs" for more information about the procedure for defining KPIs.

Defining Keypages

Use the **Keypage** check box in Figure 6–21 to define a page as a key page.

Keypages are monitored Web pages that receive special attention. Typically, these are pages in which you have particular interest. For example, your organization's home page, or a series of pages in a transaction such as placing an order. For these pages, additional information is recorded. This includes client information (such as the ISP, the country of origin, and so on), and the client browser information (such as operating system, browser version, and so on).

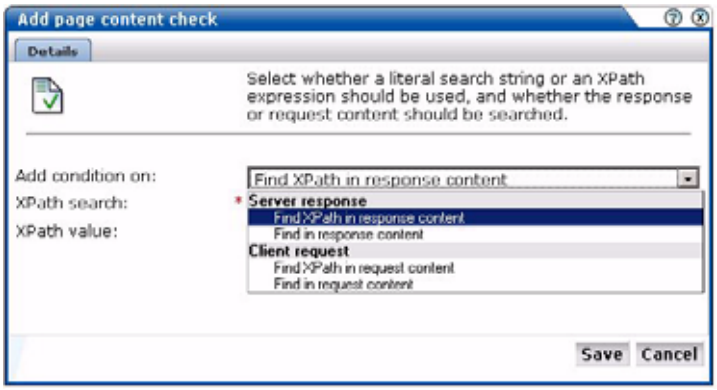
6.2.13 Specifying Page Content Checks

Sometimes you want to monitor a specific page for the occurrence of a specific text string. For example, your Web application has an Order page, and at the end of a successful sale, the text string "Thank you for shopping with us" appears on the page. You can define a page content check that looks for this string on the required page. Note that if the specified text string is not found on the page, the page content check returns "configured string not found".

To define a page content check, do the following:

1. Select **Configuration**, then **Applications**, then **Applications**, and then select the required application page. The Page analysis window (shown in Figure 6–21) appears.
2. Click the **Content check** tab, and click **Add check**. The dialog shown in Figure 6–22 appears.

Figure 6–22 Add Page Content Check



3. Specify whether the search should use a literal search string or an XPath expression, and whether the server response or client request should be searched. In the case of an XPath expression, you can also specify an exact value to search for in either the client and server response content. More information about using XPath queries is available in Appendix F, "Working with XPath Queries". When ready, click **Save**.

6.2.14 Manually Identifying Pages

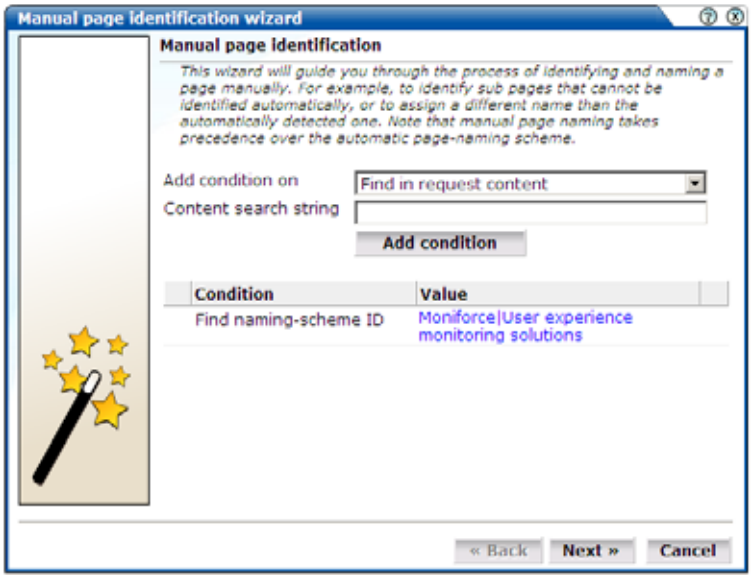
In addition to identifying pages through applications, you can also define pages manually. Note that manually identified pages take precedence over pages identified automatically through applications. This facility is very useful in the case of sub pages that cannot be identified automatically, and to which you want to assign a different name. Manually identified pages are created by selecting an existing page to be the basis for the new page.

To manually identify pages, you can either define the new page from scratch, or use an existing page (automatically detected or manually defined) as the basis for the new page.

To define a page, do the following:

1. To define the page from scratch, select the required application in the application overview, and click the **New page** button. To use an existing page as a basis for the new page, select the required application page, and click the **New page (based on current)** button. In either case, the dialog shown in Figure 6–23 appears.

Figure 6–23 Manual Page Naming Wizard



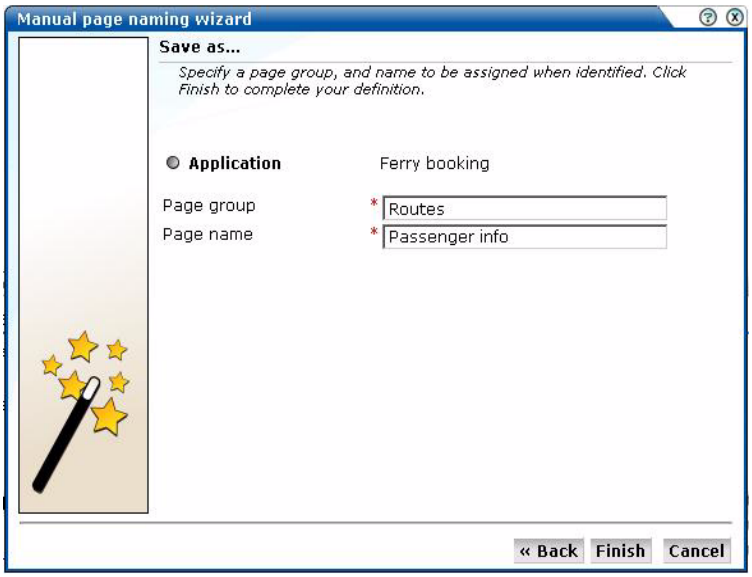
Note: If the required page is not visible in the application overview for you to select, locate it using the **Search** button (described in Part 6.2.11, "Locating Page Details").

2. Use this dialog to specify the conditions that must be met for the page to receive the assigned name. These conditions can be defined in terms of the page's partial or exact URL, content, domain, or arguments. An XPath expression can also be specified. Click **Add condition** for each required condition.

   Note that when specifying an exact URL (for example, `http://www.oracle.com/contact.html`) the domain and remaining URL structure are automatically assigned to the page conditions. For example, within the "Find in domain" option (`oracle.com`) and the "Find exact URL" option (`/contact.html`).

3. As you specify additional conditions, these are shown in the dialog. *All* specified conditions must be met for a match to be made. Note that conditions shown in blue can be removed by clicking them, while conditions shown in black cannot be removed. You must specify at least one condition for page identification. When ready, click **Next**. The dialog shown in Figure 6–24 appears.

Figure 6–24 Save as Dialog



4. Use this dialog to specify a group and name for the page. When ready, click **Finish**.

5. The new page's details are shown in a window similar to the one shown in Figure 6–18. You can use this window to track the page's detection, and modify its definition.

6.2.15 Controlling Reporting Within the URL Diagnostics Group

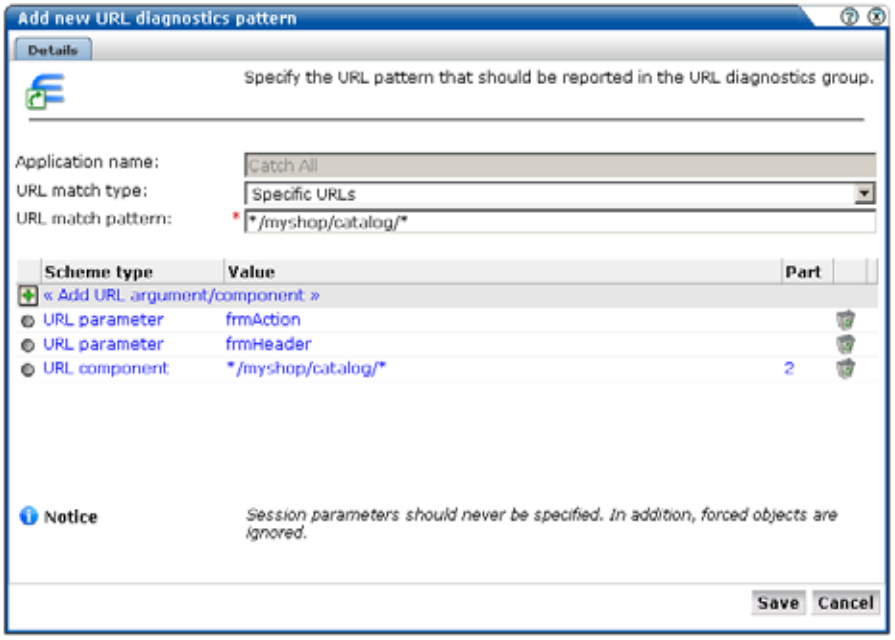
The URL diagnostics group (described in Section 3.2.4, "The URL Diagnostics Group") allows you to view the functional URLs reported for hits within applications. These can be customized on application level to meet your specific requirements.

The use of URL diagnostics can provide valuable insight into application issues. For example, if a certain application is experiencing unusually large load times, you can quickly identify the specific problem object or the server responsible. Moreover, when coupled with the Session Diagnostics facility (see Section 3.9, "Working With the Session Diagnostics Facility"), this functionality provides extremely powerful root-cause analysis of application issues.

To specify the URL diagnostics reporting scheme that should be used for a selected application, do the following:

1. Select **Configuration**, then **Applications**, and select the required application. The Application overview (similar to the one shown in Figure 6–5) appears. Click the **URL diagnostics** tab. The currently defined URL patterns used to specify the scope of the monitored URLs are displayed. Click **« Add new URL pattern »** to define a new pattern matching scheme, or click an existing one to modify it. A dialog similar to the one shown in Figure 6–25 appears.

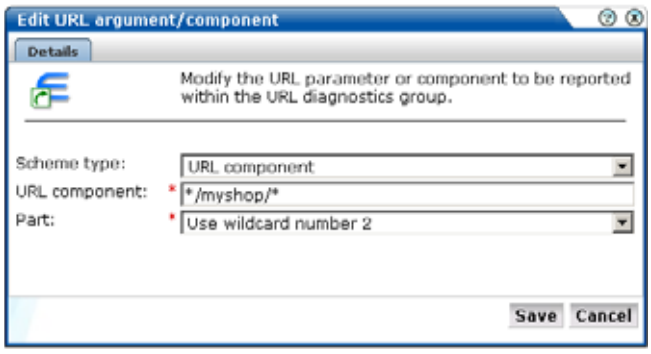
Figure 6–25 Edit URL Diagnostics Dialog



2. Use the **URL match type** menu to specify whether the schemes you are about to define should be applied to all application URLs, or only to specific URLs. In the case of the later, you need to specify the URL structures that should be reported for the application within the URL diagnostics group. These should be defined as URL patterns that, when matched to detected URLs, will be reported. While the use of a wildcard characters (*) is supported, all other specified characters are interpreted as literals. Note that if no URL structures are defined, the application's associated hits are not reported within the URL diagnostics group.

3. You can also specify the parts (or components) of the detected URL structures that should be reported. Alternatively, you can the restrict the reported URL to specific arguments. In either case, click the **« Add URL argument/component »** item. A dialog similar to the one shown in Figure 6–26 appears.

Figure 6–26 Add URL Argument/Component

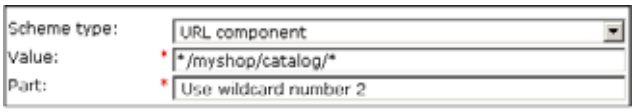


4. Use the **Scheme type** menu to specify if a matched URL should be limited to a specific parameter or component when reported. In the case of a parameter, you must specify the parameter name to be reported. In the case of a component, you must specify the component of the matched URL to be isolated, and use the **Part**

menu to specify the part of it that should be reported. The number of options available is equivalent to the number of wildcards (*) specified in the **URL component** field.

For example, consider the component definition shown in Figure 6–27.

Figure 6–27 Example URL Diagnostics Component Definition



In this case, only the part after `*/MyShop/catalog/` would be reported. Note that part parameters are matched to the wildcards specified in the **Value** definition. For example, the specified value `*/session=*/*` contains three wildcards, and so the matched URL is regarded as having three logical parts. Note that a maximum of nine wildcards can be specified within an URL diagnostics definition.

When ready, click **Save**. You are returned to the dialog shown in Figure 6–25.

5. Review the parameter and component definitions for the application. When ready, click **Save**. Any matched URL patterns are reported within the URL diagnostics group after 5 minutes.

Excluded URL Information

Note that forced objects (described in Section D.1.2, "Forced Objects") are automatically stripped from reported URLs. In addition, it is recommended that you configure your application definitions to exclude the reporting of session parameters and static-based objects (such as images). This is in order to prevent diagnostics information becoming too long and its possible truncation.

6.2.16 Controlling JavaScript Replay Execution

Application pages viewed through the Session Diagnostics replay facility can contain inline JavaScript code. Typically, this code is used to perform checks. For example, by connection to a specified server to determine if a session has expired. These checks, as well as other JavaScript functionality, can present problems when viewing their associated pages through the Replay facility.

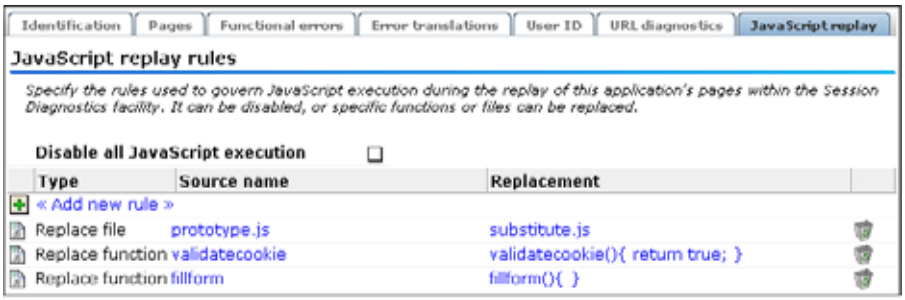
For this reason, the application configuration facility allows you to specify how execution of inline JavaScript code should be handled within the Replay viewer (described in Section 3.9, "Working With the Session Diagnostics Facility"). JavaScript execution can be completely disabled, or you can specify that specific functions or files should be replaced during page replay.

Defining Execution Rules

To define the JavaScript execution rules that should be used when replaying an application's pages, do the following:

1. Select **Configuration**, then **Applications**, then **Applications**, and then select the required application. The Application overview (similar to the one shown in Figure 6–5) appears. Click the **JavaScript replay** tab. The currently defined execution rules are displayed. A dialog similar to one shown in Figure 6–28 appears.

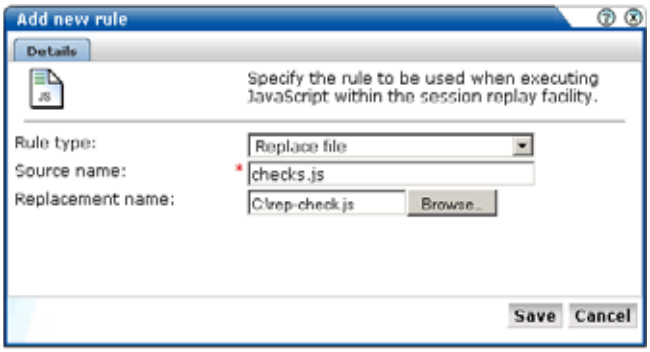
Figure 6–28 JavaScript Replay Rules



2. Use the **Disable all JavaScript execution** check box to specify whether all JavaScript code within the selected application's pages should be disabled when replayed within the Replay facility. Note that if checked, any existing execution rules are ignored, and it is not possible to define new ones. By default, it is checked.

3. Click **« Add new rule »** to define a new execution rule, or click an existing one to modify it. Note that this facility is only available if the **Disable All JavaScript execution** check box is unchecked. A dialog similar to the one shown in Figure 6–29 appears.

Figure 6–29 Add New Rule Dialog



4. Use the **Rule type** menu to specify the type of execution rule you want to define. You can select the following options:

   - **Replace function**: specifies that a named JavaScript function should be removed and, optionally, substituted for a return code at execution. For example, a function that checks whether a cookie is still valid could be replaced during replay with the returned value "OK".

     The definition for the specified function must appear in the page's inline code. It is not possible to replace external functions. Note that the JavaScript code is only replaced in the rendered browser page, and not in the replayed page's contents (as reported within the **HTTP content** facility).

     Be aware that if the function definition contains any comment between the `function` syntax and the function name, replacement will fail. For example, the following construction would fail:

     ```
     function
     /* some comment */
     ```

```
myfunction ( url ) {
.....}
```

If your application pages include references to external functions, you can replace them by uploading files containing the modified function definitions. This is described below.

- **Replace file**: specifies that a named file containing JavaScript code should be replaced with an alternative file. For example, a file containing validation routines might be replaced with a simplified version for replay purposes. If this option is selected, the **Source name** field must specify the name and extension of the file to be replaced. These must be the same as those specified within the associated `script` element. For example, consider the following file reference:

  ```
  <script type="text/javascript" src="public/scripts/checks.js"></script>
  ```

  Here, the file name `checks.js` must be specified.

  Use the **Replacement file** field to specify the substitute file. This must have the file extension `.js`, and the MIME type "text". The file is uploaded to the `/opt/ruei/gui/upload/` directory on the Reporter system.

  When ready, click **Save**. Any changes you make to the defined application replay rules are applied immediately.

Uploading Replacement Files

The replacement `.js` file is uploaded to the `/opt/ruei/gui/upload` directory on the Reporter system. Note that, if necessary, you can modify the contents of the replacement file by selecting the appropriate rule, and either uploading a modified version of the original file, or specifying a completely new file. In either case, the contents of the original file are overwritten with the newly uploaded file. When a rule is deleted, any file uploaded for it is automatically also deleted.

Be aware that, if an application contains multiple rules referring to the same file, only one version of the file is held on the Reporter file system, and this is always the latest version to be uploaded. The file is only removed from the file system when all rules that use it have also be been deleted.

Quite often the same JavaScript files are used across multiple applications. Be aware that each replacement file specified for an application represents a unique file. This is true even if the same file name is specified across multiple applications. For example, imagine that three applications, A, B, and C, all have the replacement file `mychecks.js` specified for them. In this case, three versions of the `mychecks.js` file are maintained by RUEI. Any changes made to one particular file only apply to its associated application, and not to any other applications.

6.3 Defining Single Sign-On (SSO) Profiles

Single sign-on (SSO) is a method of access control that enables a user to log in once and gain access to the resources of multiple software systems without being prompted to log in again. Because different applications and resources support different authentication mechanisms, SSO has to internally translate and store different credentials compared to what is used for initial authentication. SSO offers the following benefits:

- Reduces password fatigue from different user name and password combinations.
- Reduces time spent re-entering passwords for the same identity.

- Reduces IT costs by lowering the number of IT help desk password-related calls.

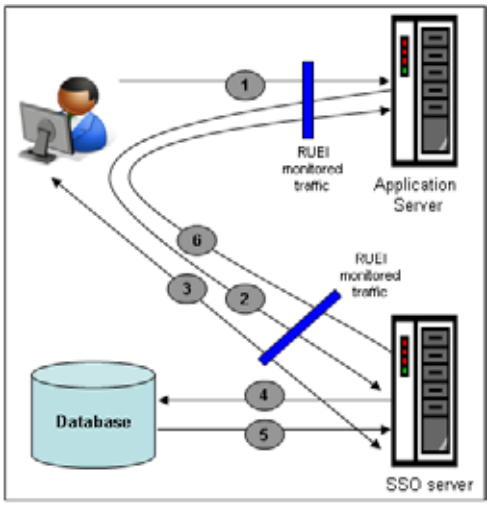
SSO uses centralized authentication servers that all other applications and systems utilize for authentication purposes, and combines this with techniques to ensure that users are not actively required to enter their credentials more than once.

In order to facilitate the correct monitoring of SSO-enabled applications, you need to configure the authentication server(s) used within your environment. This is done through the creation of an SSO profile.

6.3.1 Understanding How SSO-Enabled Traffic is Monitored

SSO servers manage user profiles and provide a login page to authenticated users. Applications then interact with SSO servers to validate temporary tokens. Figure 6–30 illustrates how application authentication works when enabled by an SSO server.

Figure 6–30 Authentication Flow Within SSO-Enabled Application Traffic



The authentication flow shown in Figure 6–30 takes the following sequence:

1. The user attempts to access a protected URL. The application server checks for the existence of an authentication cookie for the requested application. If found, it means that the user is already logged on, and no further authentication is required.
2. The user is re-directed by the application server to the SSO server. The application server also provides an application URL to the SSO server so that it knows where to go after user logon. Note the SSO server also checks whether the user is already authenticated (by another application) by validating any existing authentication cookie.
3. In the event the user is not recognized based on an existing authentication cookie, the SSO server requests credentials from the user via the login page, and these are specified by the user in a user name and password combination.
4. The user's credentials are verified against their entry in the SSO server database. Once validated, the authentication is preserved by an SSO cookie. The name of this cookie must be specified when creating a SSO profile.

5. The SSO server fetches the user's attributes. The attributes that are actually fetched are implementation-specific, and are not relevant to RUEI.
6. The SSO server passes the fetched attributes to the partner application server, using the URL provided to it in step 2. Note that a token argument is added to this URL. The name of this token argument must be specified when creating SSO profiles. The application server will probably also issue its own cookie to the user. This is configured as part of the application or suite definition.

Finally, note the network lines over which steps 1, 2, and 5 pass must be within the scope of RUEI monitored traffic.

SSO Profiles and Applications

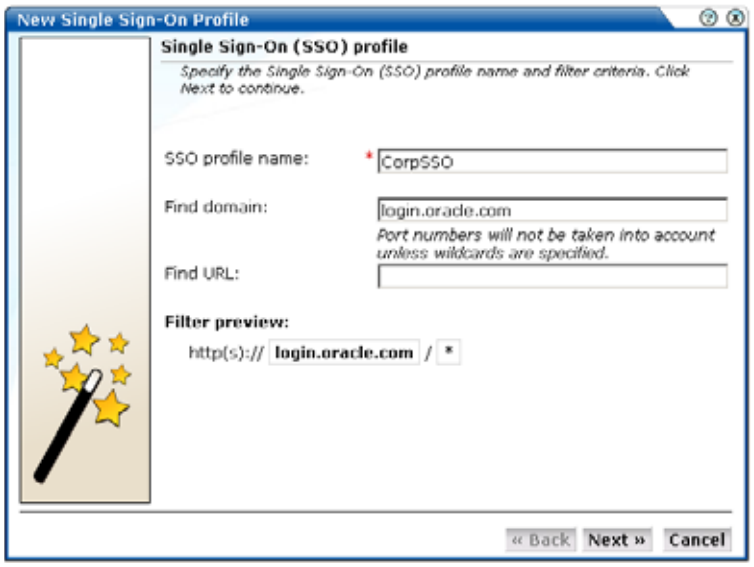
It is important to understand that SSO profiles and applications, although closely related, are reported as separate entities within RUEI. For this reason, SSO profile and application definitions should be mutually exclusive. That is, each should be based on separate domains and cookies. Otherwise, the monitored traffic is reported as application-related traffic, and the potential benefits to enhanced reporting are not realized.

6.3.2 Creating SSO Profiles

To define a SSO profile, do the following:

1. Select **Configuration**, the **Applications**, then **Single Sign-On**, and Click **New SSO profile**. The dialog shown in Figure 6–31 appears.

Figure 6–31 New Single Sign-On Dialog



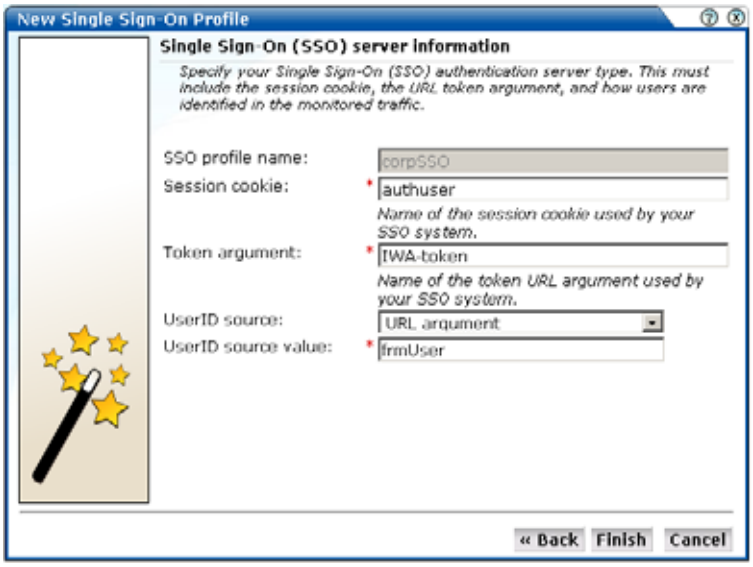
2. Specify a name for the SSO profile. This must be unique across suites, services, applications, and SSO profiles. Note that SSO profiles cannot be renamed later.
3. Use the remaining fields to specify the scope of the SSO profile. This is defined in terms of partial page URLs. Note that as you enter this information, you can see the effect of your definition through the **Filter preview** column.

Note: It is advised that filter definitions be mutually exclusive across SSO profiles, applications, suites, and services. Otherwise, this can lead to unpredictable results. See Section 7.6, "Controlling Rule Ordering Within RUEI" for information about how you can influence the order in which matching rules are applied.

The highest level filter is the domain. You can specify a partial URL instead of, or to refine, a domain. It is not possible to specify a profile name and leave all other fields blank. That is, a blank filter. Note that if a wildcard character (*) is not specified within the **Domain** field, network traffic arriving on a non-standard port (that is, other than ports 80/443), is not associated with the SSO profile unless the port number is explicitly stated. In addition, While the use of a wildcard character is supported, all other specified characters are interpreted as literals. Note it is not possible to specify the wildcard character and no other information for domain name and URL combinations. See Section 7.6, "Controlling Rule Ordering Within RUEI" for information about how you can control the order in which filters are applied.

When ready, click **Next**. The dialog shown in Figure 6–32 appears.

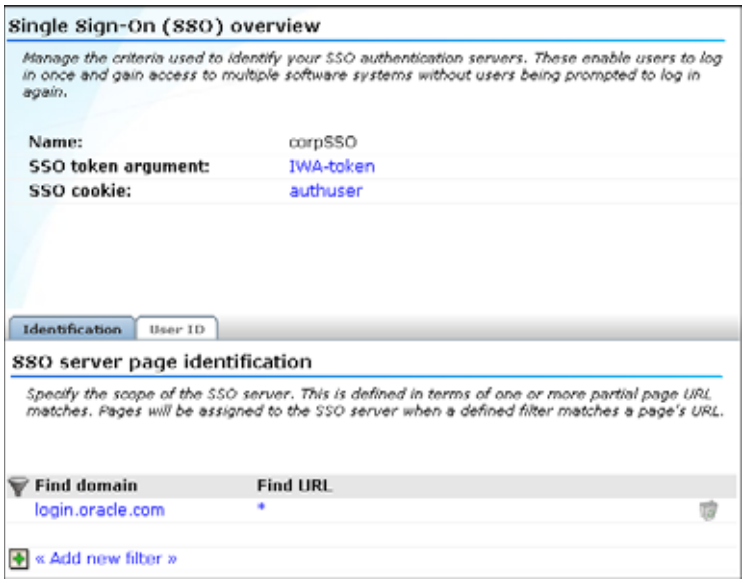
Figure 6–32 Single Sign-On Server Information Dialog



4. Use this dialog to specify information about the SSO authentication server you are using. You need to specify the session cookie name, the URL argument which contains the authentication token, and how users are identified in the monitored traffic. Normally, this is defined in terms of a URL argument and value. However, it can also be specified in terms of cookies, request or response headers, or XPath expressions.

   When ready, click **Finish**. An overview of the SSO profile definition you have specified is displayed. An example is shown in Figure 6–33.

Figure 6–33 SSO Profile Overview



This overview provides a summary of the defined SSO profile and allows you, if necessary, to modify its definition. The **Identification** section summarizes the match criteria currently defined for the SSO application. The **User ID** section summarizes how users are identified. This can be specified in terms of URLs, cookies, request or response headers, or XPath expressions.

You can check the effect your user identification definition has by viewing the XLS User Information report in the Clients category. For more information on reports, see Chapter 2, "Working With Reports".

6.3.3 Modifying SSO Profiles

After defining an SSO profile, you can modify it via its overview. The following tabs are available:

- **Identification**: Specifies the scope of the SSO server in terms of one or more partial page URL matches. Pages are assigned to the SSO server when a defined filter matches a page's URL. To add a new filter, click **Add new filter**. Click an existing filter to modify it. A dialog similar to the one shown in Figure 6–34 appears.

Figure 6–34 Edit SSO Profile Filter Dialog

The note at the bottom of the dialog indicates the current rule ordering scheme. This is explained in Section 7.6, "Controlling Rule Ordering Within RUEI".

- **User ID**: Specifies how user IDs are identified within the application. When not defined, the SSL client certificate is used (when available).

6.3.4 Verifying Your SSO Configurations

When verifying the correct operation and reporting of your SSO-enabled applications, the important aspect to inspect is the correct identification of users. It is recommended that you regularly review the reporting of within the Data Browser (All sessions > User Id > Sessions and pageviews). For example, an unexpectedly high level of unidentified (anonymous) users.

Also, you should verify that URLs within SSO-enabled applications are not reported within application-related data. This can indicate that there is a problem.

6.4 Working With Suites

As explained earlier, page identification within RUEI is based on applications. However, if these applications are based on certain Oracle Enterprise architectures (such as Oracle E-Business Suite, Siebel, and WebLogic Portal), then a fourth level, *suite*, is introduced. A suite is essentially a collection of applications, and Web pages associated with these suites have the structure *suite* » *application* » *group* » *page*.

Why Use Suites?

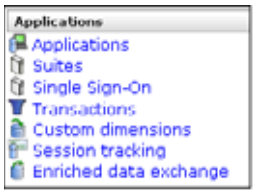
If you are using any of the any of the currently supported Oracle Enterprise architectures within your monitored environment, it is *strongly* recommended that you make use of this facility. It not only saves you time in defining your applications, and makes applications within suites more compatible, but also ensures that these architectures are monitored correctly.

Creating Suites

To define a suite instance, do the following:

1. Select **Configuration**, then **Applications**, and then **Suites** from the menu structure shown in Figure 6–35.

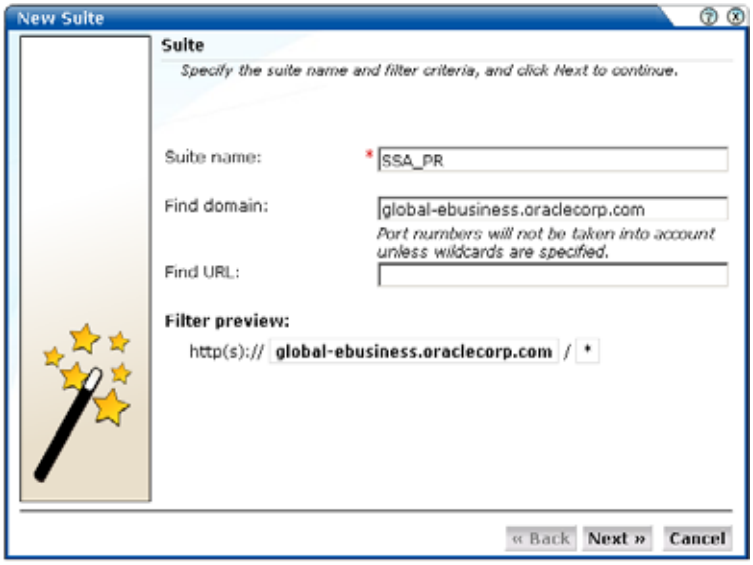
Figure 6–35 Suites



Important: For information about package availability, please contact Customer Support or visit the Web site http://www.oracle.com/enterprise_manager/user-experience-management.html.

2. Click **New suite**. The dialog shown in Figure 6–36 appears.

Figure 6–36 New Suite

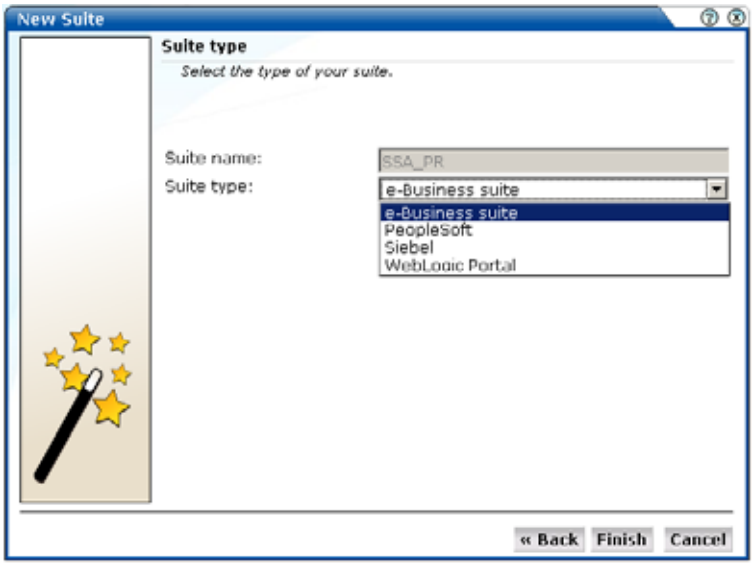


3. Specify a name for the suite. The name must be unique across suites, services, SSO profiles, and applications, and is restricted to a maximum of six characters. Note that suite instances cannot be renamed later.

4. Use the remaining fields to specify the scope of the suite. This is defined in terms of partial page URLs. The use of these filter criteria is the same as described in Section 6.2, "Defining Applications". Note that as you enter this information, you can see the effect of your definition through the **Filter preview** column. The use of blank filters is not permitted. Note that if a wildcard character (*) is not specified within the **Domain** field, network traffic arriving on a non-standard port (that is, ports 80/443), is not associated with the suite instance unless the port number is explicitly stated. In addition, while the use of a wildcard character is supported, all other specified characters are interpreted as literals. Note it is not possible to specify the wildcard character and no other information for domain name and URL argument combinations. When ready, click **Next**. The dialog shown in Figure 6–37 appears.

Note: It is advised that filter definitions should be mutually exclusive across suites, SSO profiles, applications, and services. The use of non-mutually exclusive filter definitions can lead to unpredictable results. See Section 7.6, "Controlling Rule Ordering Within RUEI" for more information about how you can control the order in which filters are applied.

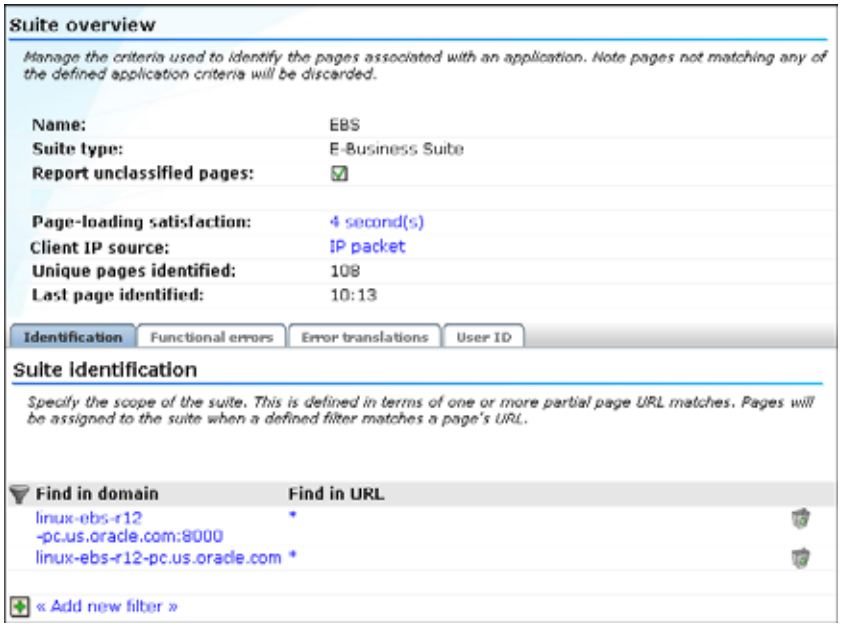
Figure 6–37 Suite Type



5. This dialog allows you to specify the Oracle Enterprise architecture upon which the suite is based[1]. When ready, click **Finish**. The suite definition you have specified is displayed. An example is shown in Figure 6–38.

[1] The options available for selection depend on the accelerator packages you have installed.

Figure 6–38 Suite Overview



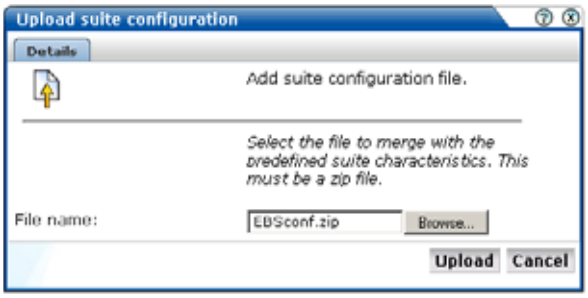
6. This overview provides a summary of the defined suite. This includes the defined page identification filter(s), the number of pages that have so far been matched to the suite, the functional errors (if any) that should be detected and recorded, and the user identification mechanism used within the suite to track visitor sessions. Each of these can be modified as required. The procedure is equivalent to that described in Section 6.2, "Defining Applications".

Uploading Configuration Files

It is strongly recommended that you run the appropriate script supplied with the package within your Oracle architecture production environment. For example, `create_EBS_info.pl` script. This is in order determine how these architectures have been implemented within your environment. In particular, the page-naming scheme. Do the following:

1. Download the script supplied with the accelerator package. See the documentation supplied with the appropriate package for further information on the use of this facility.
2. Run the script within our deployment environment. This script assigns an identification to the page IDs within your environment. It creates a number of `.txt` files.
3. Create a `.zip` file from the generated `.txt` files.
4. Select **Configuration**, then **Applications**, then **Suites**, select the appropriate suite, and click **Upload configuration**. The dialog shown in Figure 6–39 appears.

Figure 6–39 Upload Suite Configuration



5. Specify the name of the file generated by the script. A **Browse** button is available to help you locate the required file. This must be a `.zip` file. When ready, click **Upload**.

> **Note:** This configuration file must be uploaded for each required suite instance. It may only contain known (and non-empty) `.txt` files. All these files must be in the root directory. That is, subdirectories are not permitted. It is important you upload the correct configuration file for the required suite instance, and that it is based on the actual production environment. The result of importing an erroneous configuration file is incorrect reporting.

Modifying Suite Definitions

As explained earlier, a suite is essentially a collection of applications. Once you have defined your suites, you can modify its associated properties in the same way as described for applications in Section 6.2, "Defining Applications".

You should pay particular to the following points:

- A number of default suite-specific functional errors are defined. You should review these to reflect the requirements of your environment. The procedure is the same as described in Section 6.2.8, "Trapping Application Functional Errors".
- By default, unclassified pages are not reported. You can modify this through the **Report unclassified pages** check box. The procedure is the same as described in Section 6.2.3, "Reporting Unclassified Pages".
- When reporting on user visits, the client IP address is, by default, fetched from the TCP packet. However, when the RUEI system is placed in front of a NAT device, it may be more useful for the client IP address to be obtained from a specific header. This is fully explained in Appendix J, "Monitoring NATed Traffic".
- A default user identification scheme is defined for each suite. You should review this to reflect the requirements of your environment. The procedure is the same as described in Section 6.2.9, "Defining User Identification".
- In addition to identifying pages through suites, you can also define pages manually. The procedure is the same as described in Section 6.2.14, "Manually Identifying Pages". However, you cannot define a new page from scratch. You must use an existing page as the basis for a new page.

6.5 Building Transactions

A transaction is a collection of pages that define a logical task. For example, a ferry booking application might have the following pages defined for the transaction booking:

1. Route and date details.
2. Passengers and vehicle details.
3. Payment details.
4. Confirmation.

This facility provides you with far greater insight into how visitors experience your Web pages. For example, you might notice that 80% of visitors who start the above transaction fail to complete it while on the last page. This might indicate that there is something visitors find confusing or annoying about that page.

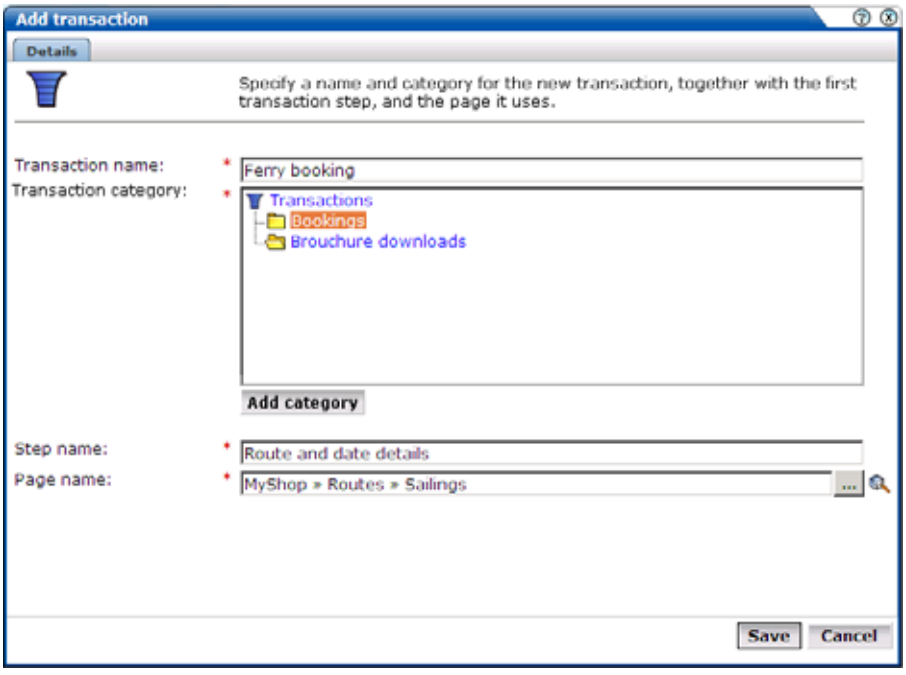
In order to facilitate administration, transactions are classified into categories. For example, you could define separate categories for bookings, requests for brochures, or job applications.

6.5.1 Defining Transactions

To define a new transaction, do the following:

1. Select **Configuration**, then **Applications**, and then **Transactions**. The currently defined transaction categories are displayed. Click **New transaction**. The dialog shown in Figure 6–40 appears:

Figure 6–40 Add Transaction Dialog

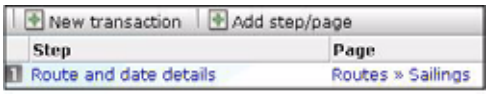


2. Specify a name for the transaction, and the category in which it will be stored. Note that you can click the **Add category** button to create a new transaction category. In addition, specify the first step in the transaction. Each step in a transaction must have a unique name. Use the **Page name** field to specify the page

used in step. Note that you can click the **Search** icon to the right of the **Page name** field to search for a required page. For information about applications, see Section 6.2, "Defining Applications". When ready, click **Save**. The new transaction, and its first step, are listed. An example is shown in Figure 6–41.

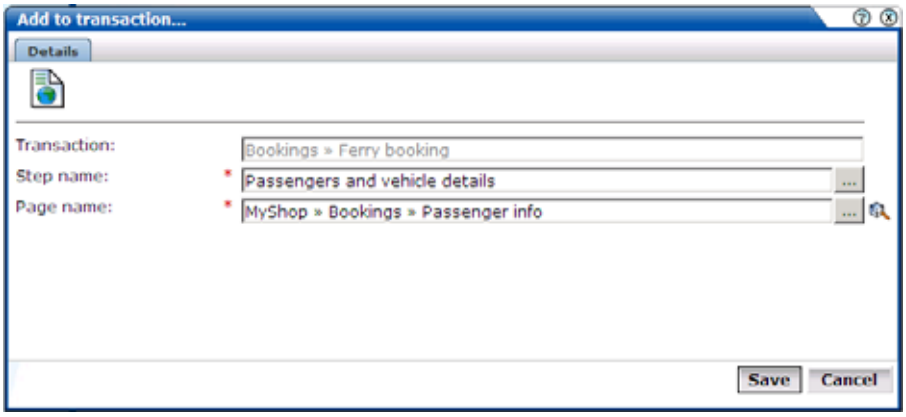
Note: Within the Page name field, although it is possible to enter the page name directly, it is *strongly* recommended that you select it from the list. This prevents the risk of entering a non-existent page name. However, for performance reasons, a maximum of 500 pages are listed. If the required page is not listed, you can enter it manually in the format *application* » *group* » *page*. The separator character (») can be produced with the key sequence Alt 0187. If you enter the page name directly into the field, it is strongly recommended that you review the application overview (shown in Figure 6–1) to ensure that it is correctly specified.

Figure 6–41 Transaction Listing



3. Use this window to define the remaining steps in the transaction. Note that an individual step can be made up of several pages. For example, in a payment method step, you may have a separate page for each available payment method (such as credit card, bank transfer, and so on). Click **Add step/page** to define additional transaction steps or pages. The dialog shown in Figure 6–42 appears.

Figure 6–42 Add to Transaction Dialog



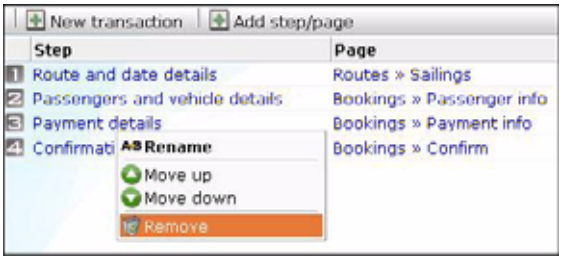
4. Use this dialog to create transaction steps or specify additional pages for existing steps. Note that you can click the **Search** icon to the right of the **Page name** field to search for a required page. When ready, click **Save**. You are returned to the transaction definition shown in Figure 6–41.
5. Repeat the above procedure for each required transaction step. Note that a maximum of 15 steps can be defined for a transaction.

6.5.2 Modifying Transactions

To modify an existing transaction, do the following:

1. Select **Configuration**, then **Applications**, then **Transactions**, and click the required category and transaction. The transaction definition appears similar to the one shown in Figure 6–43.
2. Use the context menu available under transaction steps to change their order in the transaction, or to rename or delete them. You can also use the **Add step/page** button to extend the existing definition with additional steps or pages.

Figure 6–43 Transaction Menu



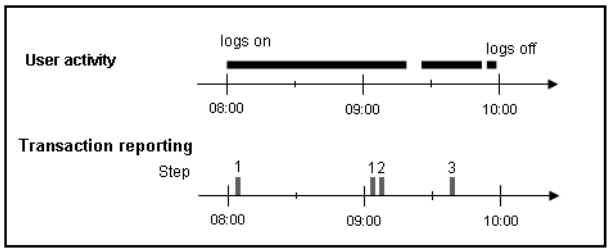
Note: Information about the transactions you have defined is available through the Transaction category of reports. For more information on reports, see Chapter 2, "Working With Reports."

6.5.3 Specifying the Transaction Flush Time

Transaction reporting is based upon the session within which a visitor started the transaction. A transaction is considered terminated if the visitor has been inactive for longer than the defined session idle time (by default, 15 minutes). The use of this setting is described in Section 7.4.3, "Controlling Session Reporting". In addition, a transaction is considered terminated if the transaction lasts longer than the defined transaction flush time. By default, this is 60 minutes. After this time, the transaction's details are written to the Data Browser.

For example, consider the transaction activity shown in Figure 6–44.

Figure 6–44 Example User Activity

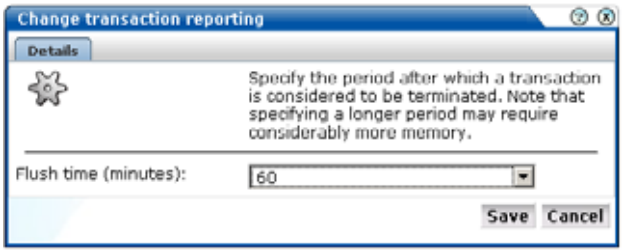


The user's transaction activity from 08:00 until logging off at a little before 10:00 would be recorded as two transactions. The first transaction would be recorded as starting at 08:00, and would report one step (step 1). The second transaction would be reported as starting at 09:00, and would show three steps (1, 2, and 3). If you need to modify the transaction reporting, you should consider modifying the transaction flush time.

In order to control the transaction flush time, do the following:

1. Select **Configuration**, then **General**, the **Advanced settings**, then **Session processing**, and then **Transaction flush time**. The dialog shown in Figure 6–45 appears.

Figure 6–45 Change Transaction Reporting Dialog



2. Specify, in minutes, the period after which transaction information is written to the Data Browser. When ready, click **Save**.

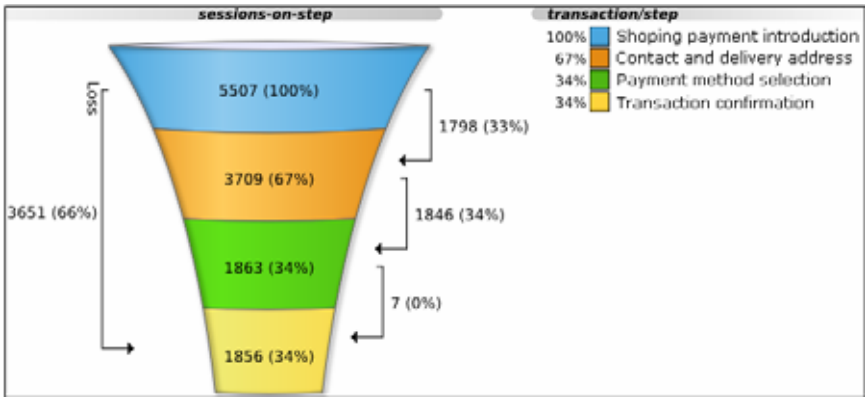
Any change you make to this setting takes effect within five minutes.

6.5.4 Interpreting Transaction Information

Transaction steps are correlated within their defined sequence. Hence, it is possible for RUEI to detect when visitors go back and forth between transaction steps, and ensure that the page visit is only recorded once. However, if visitors view pages out of the defined sequence, this can lead to inaccurate information.

Transaction completion is calculated by comparing the number of page visits within a session to the first transaction step to the number of page visits to the last transaction step. A sample transaction funnel is shown in Figure 6–46.

Figure 6–46 Example Transaction Funnel



Therefore, in order to obtain accurate transaction information, it strongly recommended that you carefully review the design of all transaction pages within your Web environment. In particular, you should ensure that:

- All transactions are designed in such a way as to ensure complete execution of all the defined steps. That is, visitors are required to visit all steps to complete the transaction. Furthermore, it should not be possible for visitors to enter or leave the transaction funnel through any means other than the designated path.

- It is not possible for visitors to skip transaction steps. For example, through the use of bookmarks or hyperlinks on marketing material. In addition, avoid the use of your Home page in transaction definitions because, typically, visitors can easily skip it.

Reporting Transaction Information

Be aware that when a user starts a transaction, if the user is inactive for longer than the session idle time (by default, 15 minutes) without completing it, the transaction is regarded as having timed out, and is reported as failed. If the user then continues with the transaction and completes it in the same session, this is not recorded as a completed transaction. For this reason, if you have a back-office system tracking transaction completions, you may notice that the number of completed transactions it reports is higher than that reported by RUEI.

It is recommended that you design your transactions to be short as possible in order to minimize the chance that users time out during transactions.

7

Defining the Web site Configuration

This chapter describes how to manage the basic Web site configuration used within the monitored environment. This includes specifying the cookie technology, the scheme for identifying users, and the Web services. In addition, a number of advanced facilities are also described. These include modifying the rule ordering used to monitor network traffic, and facilities to fine tune the reporting of data.

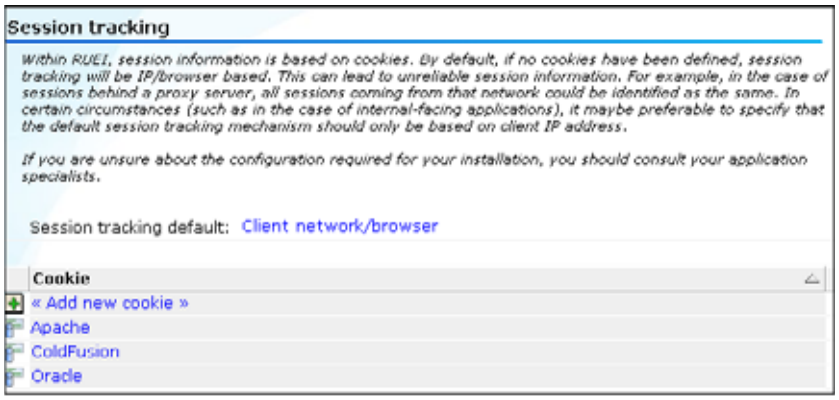
7.1 Specifying Cookie Technology

In order to accurately monitor your Web environment, RUEI needs to know and understand the cookie technology your Web site is using. This will either be a standard technology (such as ASP or ColdFusion), or a custom implementation. In the case of the latter, you will need to provide the system with information about it. Note that you can define a maximum of five cookie technologies for use when monitoring.

To specify your cookie technology, do the following:

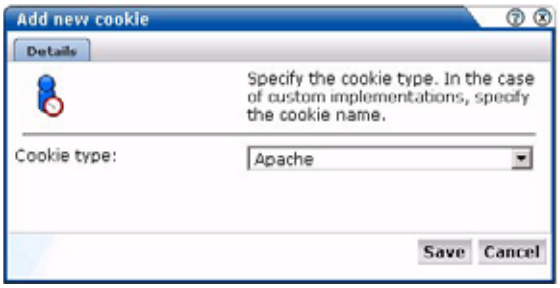
1. Select **Configuration**, then **Applications**, and then **Session tracking**. Note that this option is only available to Administrators. The currently defined cookie settings are displayed. An example is shown in Figure 7–1.

Figure 7–1 Session Tracking Window



2. The currently defined cookie settings are displayed. Click **« Add new cookie »** or an existing cookie definition. A dialog similar to the one shown in Figure 7–2 appears.

Figure 7–2 Add New Cookie Dialog



3. Select the cookie technology used in your Web environment from the **Cookie type** menu. If you are using a non-standard technology, select "(custom)".
4. If you selected "(custom)", you are required to specify the name of the cookie used by your organization.
5. If you select "(URL argument)", you are required to specify the name of the URL argument used by your organization. The use of URL arguments in session tracking is fully explained in Appendix B, "Cookie Structures". When ready, click **Save**.

Any changes made to this setting are applied after a short interval (typically, 5 - 10 minutes), and are then visible within the Reporter system shortly after this.

7.1.1 Implementing JavaScript Cookie Generation

As mentioned earlier, session tracking is based on cookies. However, in certain circumstances, a cookie may not be suitable or available. For example, consider the following situations:

- The cookie changes with every hit (for instance, this is the case with obSSOCookie).
- The path set within the cookie only covers part of the application.
- The privacy policies configured on the Web server disable the use of cookies.

If no suitable cookie is available for session tracking, it is recommended that you implement a client-side cookie mechanism using JavaScript.

Configuring a Client-Side Cookie Mechanism

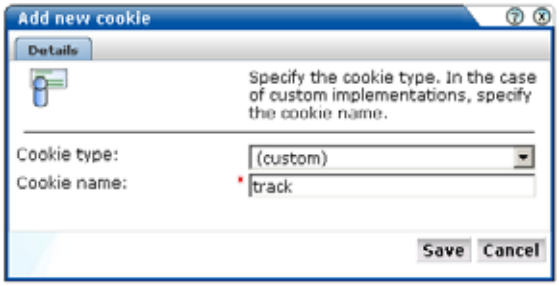
Do the following:

1. Add the following code to the appropriate login page:

```
<SCRIPT
LANGUAGE="JavaScript">if(document.cookie.indexOf('track=')==-1){document.cookie
='track='+parseInt(Math.random()*2147418112)+new
Date().getTime()+';path=/;domain='+document.location.host.substring(
document.location.host.lastIndexOf('.',
document.location.host.lastIndexOf('.') - 1)) ;}</SCRIPT>
```

2. Select **Configuration**, then **Applications**, and then **Session tracking**. Click **Add new cookie**. The dialog shown in Figure 7–3 appears.

Figure 7–3 Add New Cookie Dialog



3. Select the cookie technology (custom) from the **Cookie type** menu, and specify the appropriate cookie name. In the above JavaScript code, this is `track`. Note that the name should match that specified in the login page JavaScript code, and should only contain alphanumeric characters. In addition, it is recommended that the cookie name is restricted to no more than 10 characters in order to minimize header sizes. When ready, click **Save**.

Verifying the Cookie Configuration

To verify that your cookie configuration is being tracked correctly, do the following:

1. Clear all cookies in the browser.
2. (Re)login to the monitored application.
3. Perform a number of pageviews.
4. Logout out of the monitored application.
5. Wait for at least 10 minutes.
6. Open the RUEI Reporter environment, and select **Browse data**, open the All sessions group, select **Session diagnostics**, and locate the recorded session (by user ID or time). You can filter on applications.
7. Open the session and verify that there where more pageviews than just the login page. This verifies that the session ID is preserved after the login.

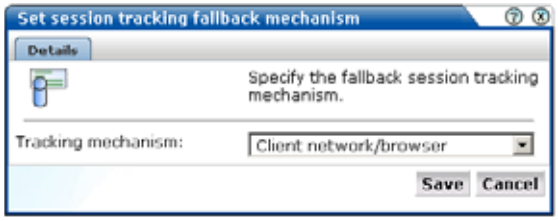
7.1.2 Specifying the Fallback Session Tracking Mechanism

If you do not specify a cookie technology, then (by default) a combination of the client network and client browser is used to track sessions. However, in the event that this is not suitable for your environment, the client IP address can be used as an alternative tracking mechanism.

To specify the fallback session tracking mechanism, do the following:

1. Select **Configuration**, then **Applications**, and then **Session tracking**. The currently defined cookie settings are displayed. Click the currently defined session tracking fallback mechanism. The dialog shown in Figure 7–4 appears.

Figure 7–4 Set Session Tracking Fallback Dialog



2. Use the **Tracking mechanism** menu to specify if a client network and browser combination should be used (the default), or the client IP address.

   When ready, click **Save**. Any change you make takes effect immediately.

Which Fallback Session Tracking Mechanism Should be Selected?

When considering which fallback mechanism to use, a general rule is that external-facing applications should use the default network / browser combination, while internal-facing applications should use client IP address. In the case of multiple users behind the same proxy server, the use of the default fallback mechanism is recommended. However, be aware this will result in all such users being recorded in one single session. The use of the client IP address mechanism is generally recommended in the following circumstances:

- All users have a unique IP address. Note that for each application, you can specify if the client IP address should be retrieved from the TCP packet or a specific HTTP request header. This is described in Appendix J, "Monitoring NATed Traffic".
- The organization enforces the use of a normalized browser. That is, a standard browser (such as Internet Explorer or Mozilla Firefox), with a standard version and plug-ins.
- Some (or all) of the monitored applications are partially implemented in Java. Oracle E-Business Suite (EBS) is an example of such an application architecture. For these applications, the use of the client IP address mechanism prevents both Java and client requests appearing in the same reported session.

Important: The accurate specification of the cookie technologies used within your Web site is *strongly* recommended to ensure the accurate reporting of your network traffic.

In addition, you should that the cookie specified to track visitor sessions is not blinded. If it is, session creation based on the cookie will fail.

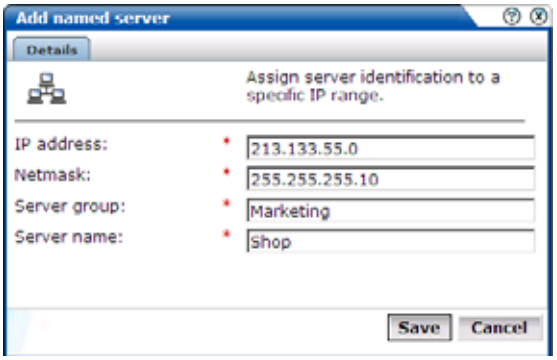
7.2 Defining Named Web Server Groups

Optionally, you can use the **Named servers** facility to obtain more detailed insight into the visitors to your monitored Web sites. This facility allows you to assign ranges of server IP addresses (specified in the netmask) to a Web server group, and to individual Web servers. For example, a server group could be a department or data center, and the server name refers to specific Web servers within that group. In this way, you can easily identify the location of specific Web servers when problems (such as failed pages) occurred.

To use this facility, do the following:

1. Select **Configuration**, then **Applications**, and then **Named servers**. This option is only available to users with IT Analytical level access. The currently defined named servers are displayed. Click **« Add new server »**. The dialog shown in Figure 7–5 appears:

Figure 7–5 Add Named Server Dialog



2. Use the fields within the dialog to specify a range of IP addresses or a specific IP address within a netmask, and the associated Web server and its group. When ready, click **Save**.

Uploading a List of Named Servers

Optionally, you can click **« Upload list »** to merge a list of named servers with those that are currently defined. The file must contain only one entry per line, and the information for each server (as shown in Figure 7–5) must be tab-separated. Note that any definition in the merged file for an already defined named server overwrites its existing definition.

Any changes made to the named server groups are applied after a short interval (typically, 5-10 minutes), and are then visible within the Reporter system shortly after this.

7.2.1 Viewing Server Information

The Web server information collected during monitoring can be viewed in the Data Browser via the All pages, Key pages, All functions, Failed functions groups, Failed URLs, Failed pages, and Slow URLs groups. The server IP identifies the specified IP addresses, and the server group refers to the group name. By zooming into a server group, you can view the individual Web server names that comprise the group. Zoom in again, and you can view the individual IP addresses assigned to that Web server.

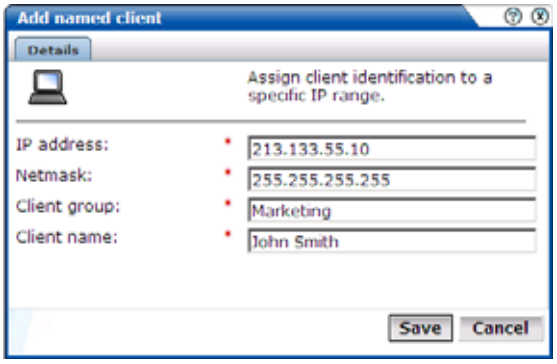
7.3 Defining Named Client Groups

In some instances, you want to be able to enhance the information associated with visitor IP addresses. This is especially useful when monitoring Intranet traffic and you want to be able to use your own client classification.

To use this facility, do the following:

1. Select **Configuration**, then **Applications**, and then **Named clients**. The currently defined named servers are listed. Click **« Add new client »**. This option is only available to IT users with Analytical level access. The dialog shown in Figure 7–6 appears.

Figure 7–6 Add Named Client Dialog



2. Use the fields within the dialog to specify a range of IP addresses or a specific IP address within a netmask, the client, and their associated group (for example, company department). When ready, click **Save**.

Uploading a List of Named Clients

Optionally, you can click **« Upload list »** to merge a list of named clients with those that are currently defined. The file must contain only one entry per line, and the information for each client (shown in Figure 7–6) must be tab-separated. Note that any definition in the merged file for an already defined named client overwrites its existing definition.

Any changes made to your defined named client groups are applied after a short interval (typically, 5-10 minutes), and are then visible within the Reporter system shortly after this.

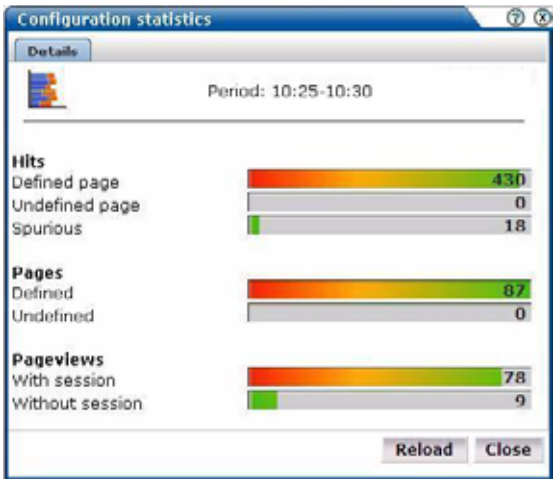
7.3.1 Viewing Named Client Group Information

The visitor information can be viewed within the Data Browser via the named client view (within the Failed URLs, Failed pages, Key pages, Slow URL, All sessions, All functions, and Failed functions groups).

7.4 Fine-tuning Your Settings

The settings you specify for monitored traffic may need to be fine-tuned in order for you to receive what you regard as the most reliable data. In order to do this, it is recommended that you periodically review the relevant report for these settings. In addition, you can view configuration details by selecting **Show statistics** from the **Configuration** menu. An example is shown in Figure 7–7:

Figure 7–7 Configuration Statistics



The following information is reported:

- The **Hits** section indicates the objects associated with a defined application (Defined page), those not part of a defined application (Undefined page), and those not part of a page (Spurious).
- The **Pages** section indicates the detected pages associated with a defined application (Defined), and those not associated with a defined application (Undefined). Note that undefined pages are not recorded, and further information is not available about them.
- The **Pageviews** section indicates the pages viewed within cookie-tracked sessions (With session), and those for which no cookie information was available (Without session).

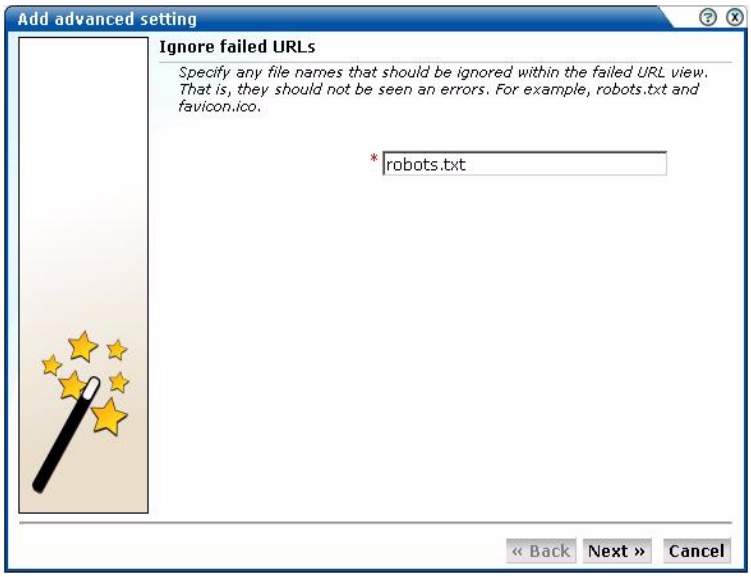
In addition, there are a number of advanced settings that are available to refine the accuracy of the report data. These are described in the following sections.

7.4.1 Ignoring Failed URL Hits

Hit failures are recorded in the failed URL group. Because hit failures can occur for a wide variety of reasons, you can control what is recorded. For example, it is unlikely that you want incidents related to remote robot searches to be recorded. Do the following:

1. Select **Configuration**, then **General**, then **Advanced settings**, then **Ignore failed URLs**. Note that this option is only available to Administrators. The dialog shown in Figure 7–8 appears.

Figure 7–8 Ignore Failed URLs Dialog



2. Specify any file names that should be ignored within the failed URL view. That is, they should not be seen as errors. For example, `robots.txt`, or `favicon.ico`. Note the specified objects are removed from the listed object URLs. When ready, Click **Next**.

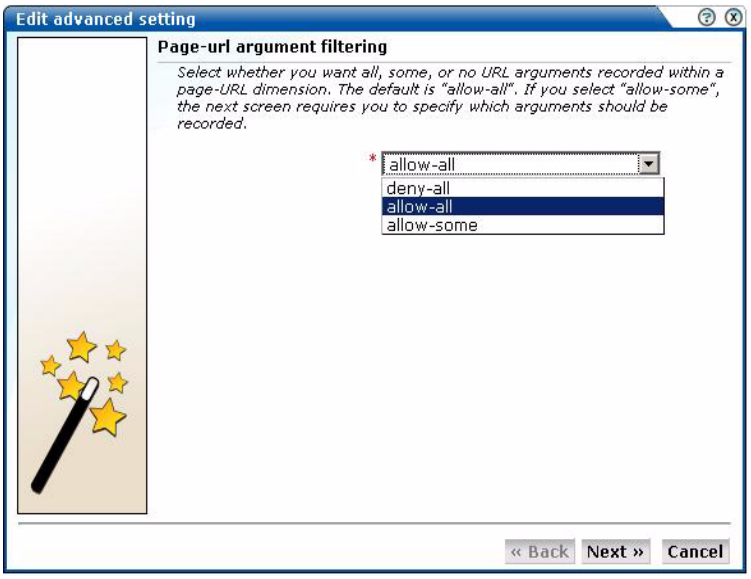
The new setting is applied after 10 minutes. A short period after this time, the changes you have specified are visible in the Reporter interface.

7.4.2 Filtering Arguments in the Page URL Dimension

You can control whether you want all, some, or no URL arguments recorded within the lowest level page URL dimension. Do the following:

1. Select **Configuration**, then **General**, then **Advanced settings**, and then **Page URL argument filtering**. Note that this option is only available to Administrators. The dialog shown in Figure 7–9 appears.

Figure 7–9 Page URL Argument Filtering Dialog



2. Use the menu to select the appropriate filter. The default is "allow-all". That is, record all arguments. When ready, click **Next**.
3. If you selected the "allow-some" filter, the next dialog requires you specify which arguments should be recorded. Separate multiple arguments with an ampersand (&) symbol. When ready, click **Next**.

The new setting is applied after 10 minutes. Shortly after this time, the changes you have specified are visible in the Reporter interface.

> **Note:** It is recommended that you make use of this facility if session or other random arguments are included in your page URLs. Otherwise, the content of page-based views (such as all pages or failed URLs) can become very large.

7.4.3 Controlling Session Reporting

Within RUEI, session information is reported within the All sessions group. Here, information about a visitor session is available appropriately five minutes after the start of a session. By default, a visitor session is considered terminated if the visitor has been inactive for longer than the defined session idle time (by default, 15 minutes).

In order to optimize the reporting of sessions, the **Session idle time** advanced setting is available to specify the period (in minutes) of inactivity after which a visitor session is regarded as terminated. The default is 15 minutes.

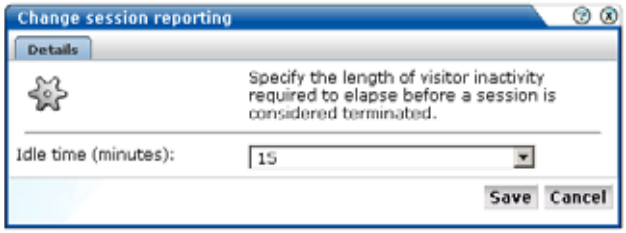
> **Important:** Because of the impact this setting can have on the performance of your installation, as well as the accuracy of the reported data, it is *strongly* recommended that you only change it under guidance from Customer Support.

Specifying Session Settings

In order to specify the idle time that should used when reporting sessions, do the following:

1. Select **Configuration**, then **General**, then **Advanced settings**, then **Session processing**, and then **Session idle time**. The dialog shown in Figure 7–10 appears.

Figure 7–10 Change Session Reporting Dialog



2. Specify, in minutes, the period of visitor inactivity after which the session should be regarded as terminated. The default is 15 minutes. When ready, click **Save**.

Any change you make to this setting takes effect within five minutes.

7.5 Defining Web Services

The emergence of Web services has become one of the most important advances in the technology industry. Organizations are increasingly integrating enterprise applications to exchange information such as purchase orders, inventory levels, shipment notices, and interbank transactions, to name but a few.

Understanding Web services

It is important to distinguish this new breed of Web services from traditional ones. Generally, a Web service was any service available over the Web (such as search engines, language translators, weather guides, maps, and so on). However, these types of Web services required some human intervention.

A Web service is defined by the W3C[1] as "a software system designed to support interoperable machine-to-machine interaction over a network". It implements a clearly defined business function that operates independently of the state of any other service. It has a well-defined contract with the consumer of the service. Services are loosely coupled - a service does not need to know the technical details of another service in order to work with it - and all interaction takes place through the interfaces. Using this technology, the service provider simply exposes a service on the Web, publishes the interface and service naming specifications, and waits for a connection.

Services are made available through *service descriptions*. They describe how to call the service, and what information is required to request the service and get a response. The data exchange takes a request-response pattern. RUEI primarily supports the monitoring of XML-SOAP and similar messages.

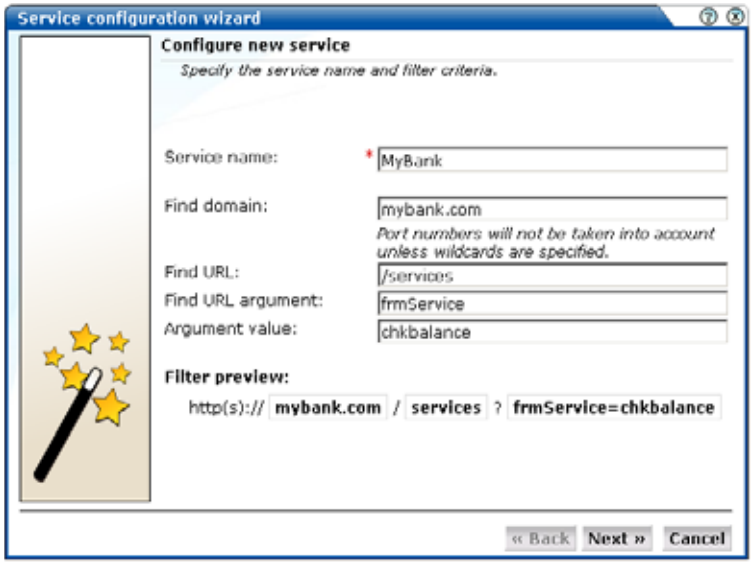
Defining Web services

To define a Web service, do the following:

1. Select **Configuration**, and then **Services**. The currently defined Web services are listed. Click **New services**. The dialog shown in Figure 7–11 appears.

[1] The World Wide Web Consortium (W3C) is the main international standards organization for the World Wide Web.

Figure 7–11 Service Configuration Wizard



2. Specify a name for the service. This is the name that will be used for the defined service within reports and the Data Browser. The name must be unique across services, SSO profiles, suites, and applications. Note that services cannot be renamed later.

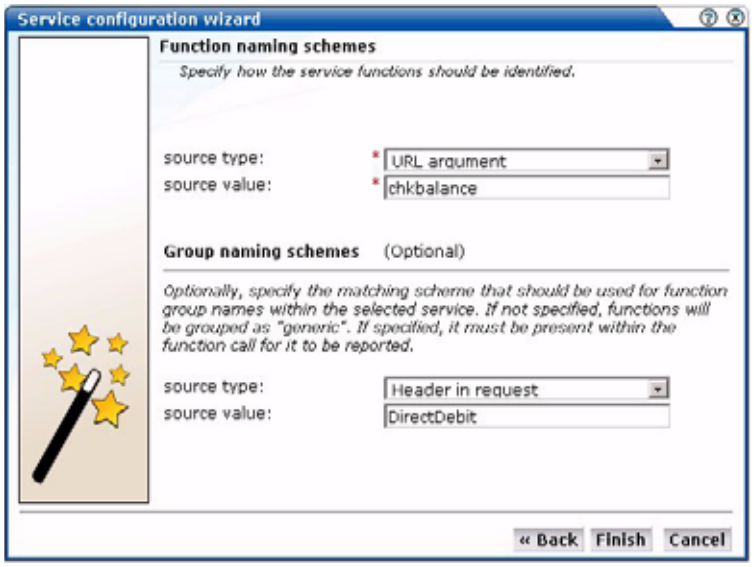
3. Use the remaining fields to specify the scope of the service. This is defined in terms of partial service URLs. Note that as you enter this information, you can see the effect of your definition through the **Filter preview** column.

   The highest level filter is the domain. You can specify a partial URL instead of, or to refine, a domain. It is not possible to specify a service name and leave all the other fields blank. Note that if a wildcard character (*) is not specified within the **Domain** field, network traffic arriving on a non-standard port (that is, 80/443), is not associated with the service unless the port number is explicitly stated. In addition, while the use of a wildcard character is supported, all other specified characters are interpreted as literals. Note it is not possible to specify the wildcard character and no other information for domain name and URL argument combinations.

   Note: It is recommended that filter definitions should be mutually exclusive across services, SSO profiles, applications, and suites. For example, do not define a service filtered on the domain "us.oracle.com" and then another service, suite, or application filtered on "us.oracle.com/application_servlet". The use of non-mutually exclusive filter definitions can lead to unpredictable results. See Section 7.6, "Controlling Rule Ordering Within RUEI" for information about how you can influence the order in which filters are applied.

   You can also specify an argument within the partial URL that must be matched. Note that if you use this facility, both the argument and argument name must be complete in order for them to be matched to page URLs. That is, partial matching is not supported. When ready, click **Next**. The dialog shown in Figure 7–12 appears.

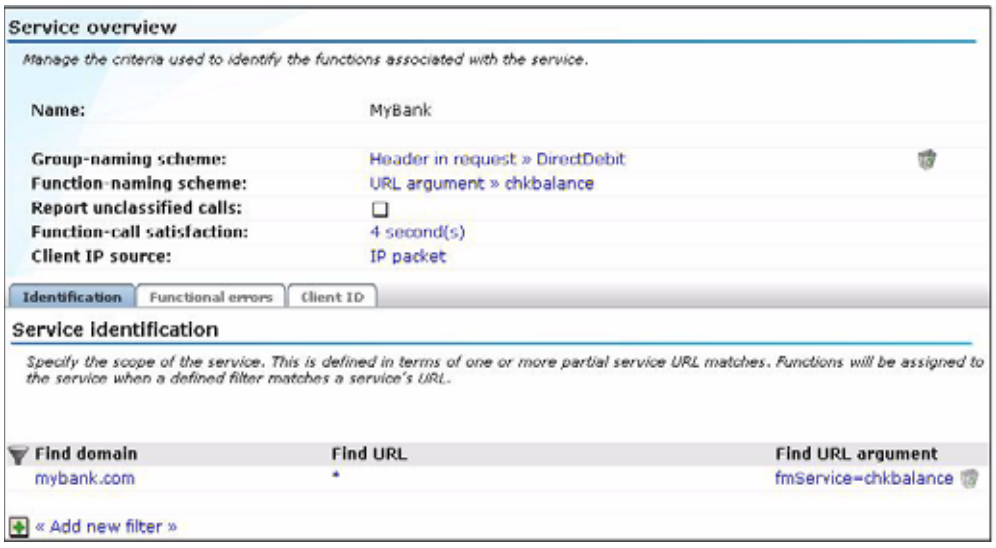
Figure 7–12 Function Naming Scheme Dialog



4. Use this dialog to specify how the service should be identified and reported. It is important to understand that while applications (see Section 6.2, "Defining Applications") have the structure *application* » *group* » *page*, services have the structure *service name* » *function group* » *function name*. Note that functions that do not belong to a defined group are regarded as belonging to the default group "generic". If you specify a group naming scheme, this must be found within the function call for it to be reported.

   When ready, click **Finish**. An overview of the service definition you have specified is displayed. An example is shown in Figure 7–13.

Figure 7–13 Service Overview



Refining Your Service Definitions

Once you have defined your service, you can modify its associated function scheme. Within the **Identification** section, you can click « **Add new filter** » to specify

additional filters for the functions that should be associated with the service. A function will be assigned to a service when one of the defined filters is matched. You can also modify an existing filter definition by clicking it. In each case, you can select from the same filters as shown in Figure 7–11. The service overview is updated to reflect your additions or modifications.

Client Identification

For reporting purposes, if the user / client ID is not found, client identification falls back to the SSL certificate (if there is one). The common name (CN) portion of it is used. If this is not found, the client ID is reported as Anonymous.

Specifying the IP Address Source

When reporting on user visits, the client IP address is, by default, fetched from the TCP packet. However, when the RUEI system is placed in front of a NAT device, it may be more useful for the client IP address to be obtained from a specific header. The **Client IP source** check box (shown in Figure 7–13) allows you to specify the required scheme. This is explained in Appendix J.

7.5.1 Reporting Unclassified Function Calls

By default, function calls that have been identified as belonging to a service through its URL definition, but for which no classified name has been found, are discarded and not reported. However, if you want these unclassified calls to be reported, use the **Report unclassified calls** check box shown in Figure 7–13.

Because hits not identified as belonging to the service are identified as unclassified calls, incorrect or insufficiently defined function calls will be identified as unclassified. Note that unclassified calls are reported in the relevant Data Browser group under the category "Other".

7.5.2 Specifying Function Loading Satisfaction

In order to assess a function's responsiveness, RUEI assigns a satisfaction level for each function. This specifies the end-to-end time (that is, the sum of all server and network times) for the selected function calls in the service. This represents the end-to-end time (in seconds) required to call the function. That is, the total server and network times. The default is four seconds, and can be specified to within three decimal places (for example, 2.567). This is equivalent to the page loading threshold described in Section 6.2.7, "Specifying Page Loading Satisfaction".

7.5.3 Trapping Function Call Errors

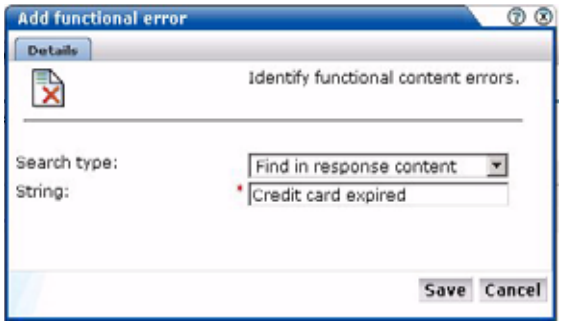
Sometimes you want to detect strings associated with functions and have them reported as errors. For example, if a function responds with the message "Requested item is out of stock". Note the following:

- All functions within the selected service are searched for the specified error string. It is not possible to limit the search to specific functions.
- Functional errors can be specified in terms of a literal search string or an XPath expression, and whether the server response or client request should be searched. More information about using XPath queries is available in Appendix F, "Working with XPath Queries".
- Displayed page texts that match your specified error text strings are reported with the page content result "error string: *error search string*".

To define a functional error in a service function that you want monitored, do the following:

1. Select **Configuration**, then **Services**, and then select the required service. The service overview (similar to the one shown in Figure 7–13) appears. Click the **Functional Errors** tab. The currently defined functional errors are displayed. Click **« Add new functional error »** to define a new error, or click an existing one to modify it. A dialog similar to the one shown in Figure 7–14 appears.

Figure 7–14 Add Functional Error



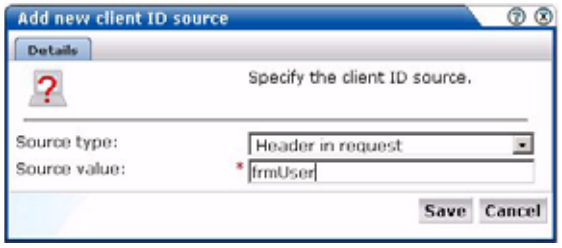
2. Specify whether the search should use a literal search string or an XPath expression, and whether the server response or client request should be searched. More information about using XPath queries is available in Appendix F, "Working with XPath Queries". When ready, click **Save**.
3. Alternatively, you can click **Upload list** to upload a file of functional errors you want detected. This is the same procedure as for uploading a list of application errors described in Section 6.2.8, "Trapping Application Functional Errors". The file must contain only one error string per line. Be aware that these messages will be regarded as literal strings to be searched for in the response content.

7.5.4 Defining Client Identification

In order to track the clients using functions, the client identification mechanism used within a service needs to be defined. It can be specified in terms of URLs, XPath expressions, cookies, and whether the server response or client request should be searched. Do the following:

1. Select **Configuration**, then **Services**, and then select the required service. The service overview (similar to the one shown in Figure 7–13) appears. Click the **Client ID** tab. The currently defined client ID sources are displayed. Click **« Add new source »** to define a new source, or click an existing one to modify it. The dialog shown in Figure 7–15 appears:

Figure 7–15 Add Client ID Source



2. Specify whether the search should use a literal search string or an XPath expression, and whether the page URL, cookie, server response, or client request should be searched. More information about using XPath queries is available in Appendix F, "Working with XPath Queries". When ready, click **Save**.

7.6 Controlling Rule Ordering Within RUEI

By default, the order in which application, SSO profile, suite, and service filters are matched within RUEI is determined by the level of detail specified in the definition. That is, the definitions with the most information specified for them are applied first. However, sometimes you may want to modify the order in which filters are applied.

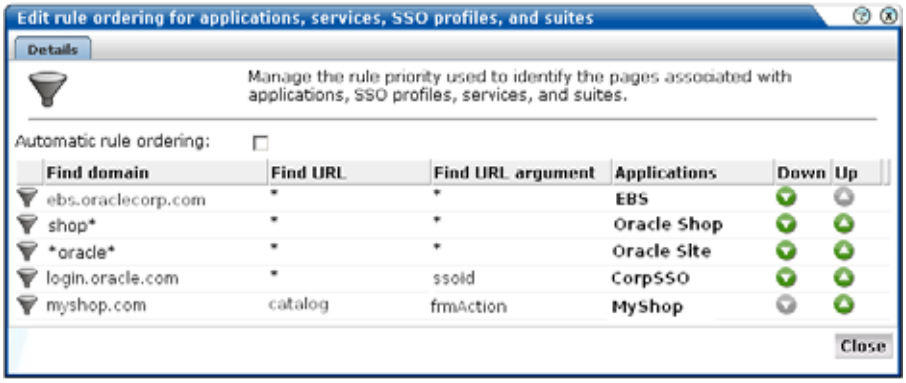
For example, you want to monitor network traffic for the domain "shop.oracle.com". You have defined two applications: one for the domain "shop*", and one for the domain "*oracle*. Because the string "*oracle*" is longer than the string "shop*", it is applied first. However, you want page identification for the "shop*" domain to take priority. You can use the rule ordering facility to override the default rule matching order, and specify the order in which pages for the required domains should be applied.

Note: It is recommended you use the default rule ordering, and that you define your applications, SSO profiles, suites, and services with sufficient information for them to be mutually exclusive.

To use the rule ordering facility, do the following:

1. Click the **Configuration** tab, select the **Configuration** menu option, and then the option **Edit ruling orders**. Note this option is only available to users with Full IT access permissions. A dialog similar to the one shown in Figure 7–16 appears.

Figure 7–16 Edit Rule Ordering



2. Use the **Automatic rule ordering** check box to specify whether the rule ordering is automatically derived from the currently defined applications, SSO profiles, suites, and services. As explained earlier, by default, the definitions with the most information specified for them are applied first. This is check box is automatically unchecked if you use the **Up** and **Down** controls to specify the order in which the rules should be applied. If you re-check it, the filter ordering is automatically reset to the default.

   Note any changes you make are immediately put into effect. When ready, click **Close**.

Important: Be aware that if you modify the default rule ordering, and then define a new application, SSO profile, suite, or service, its associated filter is immediately placed at the bottom of the current rule ordering. Therefore, you should always review the rule ordering after the creation of new filters.

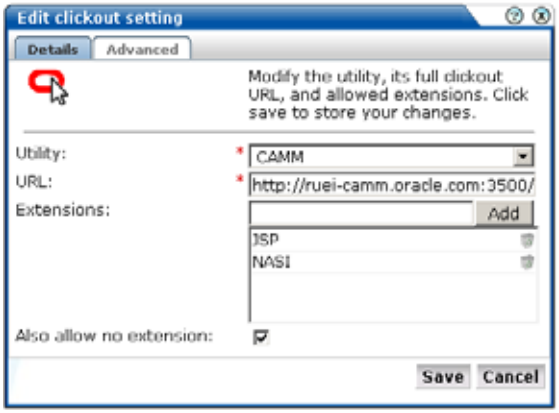
7.7 Configuring Clickouts to External Utilities

The URL diagnostics group (described in Section 3.2.4, "The URL Diagnostics Group") and Session Diagnostics facility support clickout from selected functional URLs to external diagnostics utilities (such as CAMM and AD4J).

To configure access from within RUEI to these utilities, do the following:

1. Click the Configuration tab, then click **General**, then **Advanced settings**, and then the **Clickout settings**. Note that this option is only available to Administrators. Click **« Add new item »** or an existing external utility definition. A dialog similar to the one shown in Example 7–17 appears.

Figure 7–17 Edit Clickout Setting



2. Select the external utility whose interface you want to configure. Currently, CAMM and AD4J are supported. The use of these utilities is described in Section 3.2.4, "The URL Diagnostics Group".

3. Specify the full URL to be used when a clickout to the selected external utility is requested.

4. Use the **Extensions** entry field to specify the object file extensions for which clickout should be available. Use the **Add** button to specify additional extensions. You can also use the **Also allow no extension** check box to specify that hits with no associated file extensions should have clickout availability.

5. Click the **Advanced** tab, and use the **Regular expression** and **Replace** fields to specify the parts of the URL passed to the external application that should be replaced. This is useful if the external application requires the URL in a somewhat different format. For example, that the query part of the URL should be stripped off.

   When ready, click **Save**. Any changes made to these settings are applied immediately.

8

Managing Security-Related Information

This chapter describes how to configure and manage the security-related settings used by RUEI for traffic monitoring. This includes setting network filters to prevent the capturing of specific networks, hosts, Virtual Local Area Networks (VLANs), or to reduce overall monitored traffic. The security of sensitive data can also be maintained by specifying masking actions for HTTP protocol items (such as URL arguments, HTTP headers, and cookies). Finally, the managing of your Web server's private keys to encrypt secure traffic is also described.

The management of all security-related information is the responsibility of the **Security Officer**.

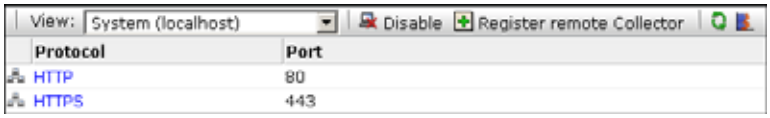
Important: The Collector must be restarted after making any changes to security-related settings (other than HTTP protocol item maskings) for them to become effective.

8.1 Managing the Scope of Monitoring

Within RUEI, you control the scope of traffic monitoring by specifying which TCP ports it should monitor. Obviously, no information is available for unmonitored ports. It is recommended that you carefully review your selections of monitored and unmonitored TCP ports (both HTTP and HTTPS).

The currently monitored ports can be viewed by selecting **Configuration**, then **Security**, and then **Protocols**. An example is shown in Figure 8–1:

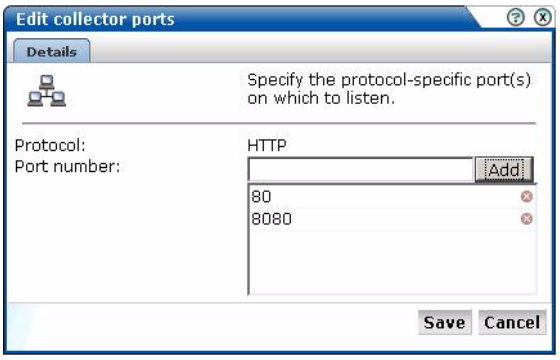
Figure 8–1 Monitored Protocol Ports



To modify these settings, do the following:

1. Use the **View** menu to select the required Collector. The System (localhost) item represents the local server system.
2. Click the protocol (**HTTP** or **HTTPS**) whose port settings you want to modify. A dialog similar to the one shown in Figure 8–2 appears.

Figure 8–2 Edit Collector Ports Dialog



3. To add a new port number, enter the required number in the **Port number** field, and click **Add**. To remove a port from the list, click the **Remove** icon to the right of the port. When ready, click **Save**.

> **Important:** The port numbers specified within each protocol must be mutually exclusive. That is, a port number should only appear in one protocol's list of assigned port numbers.

4. You are prompted to restart the Collector. This is necessary in order to make your changes effective. Note you can also restart the selected Collector by clicking the **Restart Collector** icon shown in Figure 8–1.

> **Note:** Upon installation, the HTTPS port 443 is defined as the default monitored port.

Oracle E-Business Suite-Specific Support

If the Oracle E-Business Suite (EBS) accelerator package has been installed, two additional protocol settings (**HTTP/Forms servlet mode** and **Forms socket mode**) are available within this facility. These are described in the *Oracle Real User Experience Insight Accelerator for Oracle E-Business Suite Guide.*

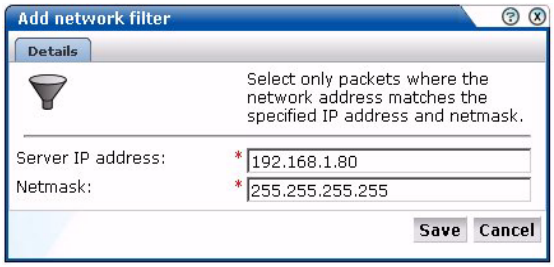
8.2 Defining Network Filters

In addition to port numbers, you can use network filters to manage the scope of monitored traffic. They allow you to restrict monitoring to specific servers and subnets, and to restrict the level of packet capture.

To define or modify network filters, do the following:

1. Select **Configuration**, then **Security**, and then **Network filters**.
2. Use the **View** menu to select the required Collector. The System (localhost) represents the Collector running on the Reporter server system. The currently defined network filters are displayed. Click **« Add new filter »** to define a new filter, or click an existing filter to modify it. The dialog shown in Figure 8–3 appears:

Figure 8–3 Add Network Filter Dialog



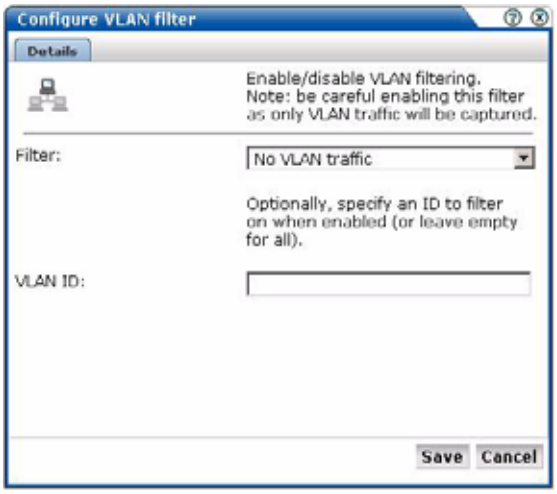
3. Use the **Server IP address** and **Netmask** fields to specify the address to which the Collector should listen. It is strongly recommended that this is done in consultation with your network specialist.
4. When ready, click **Save**.
5. You are prompted to restart the Collector. This is necessary in order to make your changes effective. Note that you can also restart the selected Collector by clicking the **Restart Collector** icon shown in Figure 8–1.

8.2.1 Defining VLAN Filters

VLAN filters offer a means by which to limit monitored traffic to specific servers and subnets. To define VLAN filters, do the following:

1. Select **Configuration**, then **Security**, and then **Network filters**.
2. Use the **View** menu to select the required Collector. The System (localhost) represents the Collector running on the Reporter system.
3. Click the **Configure VLAN filter** icon on the taskbar. The dialog shown in Figure 8–4 appears.

Figure 8–4 Configure VLAN Filter Dialog



4. Use the **Filter** menu to specify whether VLAN filtering should be enabled. Note that enabling this filter means that only VLAN traffic will be monitored.
5. Optionally, use the **VLAN ID** field to specify a specific VLAN on which to filter.
6. When ready, click **Save**.

7. You are prompted to restart the Collector. This is necessary in order to make your changes effective.

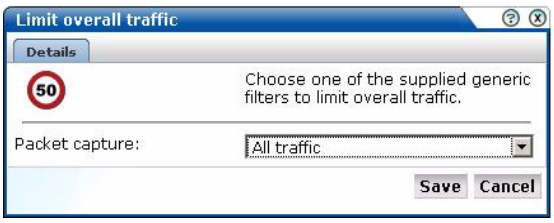
8.2.2 Limiting Overall Traffic

In addition to the use of network and VLAN filters, it is also possible to specify how much of the overall traffic that remains after the application of other filters is actually monitored. By default, all remaining traffic is monitored.

To specify the level of overall traffic monitoring, do the following:

1. Select **Configuration**, then **Security**, and then **Network filters**.
2. Use the **View** menu to select the required Collector. The System (localhost) represents the Collector running on the Reporter system.
3. Click the **Limit overall traffic** icon on the taskbar. The dialog shown in Figure 8–5 appears:

Figure 8–5 Limit Overall Traffic Dialog



4. Select the required portion (All traffic, 1/2, 1/3, 1/4, or 1/8) of the traffic that the Collector should monitor and, in cases of other than all traffic, the part of the data stream that should be monitored. For example, you could have an installation in which four Collectors are configured, and each Collector monitors a different quarter of the packet capture.
5. When ready, click **Save**.
6. You are prompted to restart the Collector. This is necessary in order to make your changes effective. Note that you can also restart the selected Collector by clicking the **Restart Collector** icon shown in Figure 8–1.

Traffic Monitoring

The setting described above specifies how much of the total network traffic is measured. Therefore, if you specify that half of all traffic should be monitored, only the monitored half is reported. When using a setting of less than 100%, you should bear in mind that the reported information does not reflect all actual traffic.

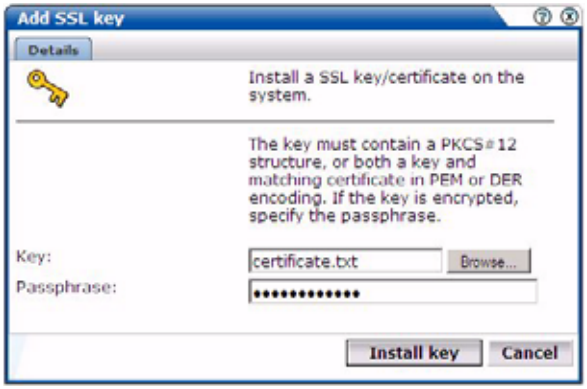
Traffic monitoring is based on IP addresses. This means that, regardless of what setting you use, complete user sessions are recorded. However, the number of those sessions depends on your selected setting.

8.3 Managing SSL Keys

RUEI can be configured to monitor encrypted data (such as HTTPS and SSL). In order to do this, a copy of the Web server's private SSL keys needs to be imported into RUEI. To import certificates to monitor encrypted content, do the following:

1. Select **Configuration**, then **Security**, and then **SSL keys**. Use the **View** menu to select the required Collector. A list of the currently installed keys and their status is displayed.
2. Use the **View** menu to select the required Collector. The System (localhost) represents the Collector instance on the Reporter server system. The currently defined SSL keys and certificates are displayed. Click **« Add new key »** to define a new key. Note that existing SSL key definitions cannot be modified. The dialog shown in Figure 8–6 appears.

Figure 8–6 Add SSL Key Dialog



3. Use the **Key** field to specify the file containing the key. If the key is encrypted, you must specify the passphase. When ready, click **Install key**.

The certificate will be encrypted on the disk.

Note: The supplied file can be in PAM, DER, or PKCS12 format, and must include the key and matching certificate. The key must be an RSA key. Note that encryption protocols that use 40-bit keys (such as DES_40, RS2_4-0, and RC4_40) are not supported.

8.3.1 Removing SSLs

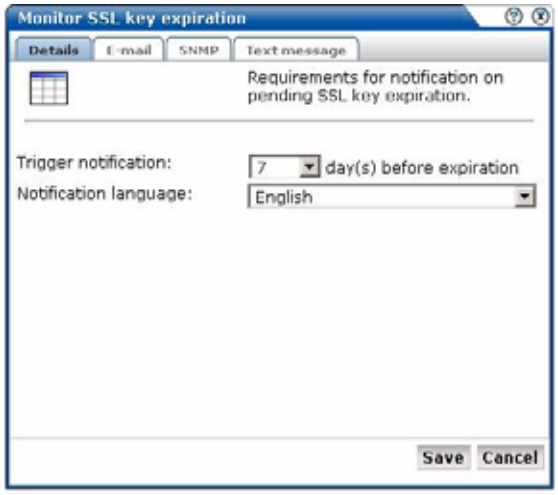
To remove an installed SSL key, right click the required key, and select **Remove**. You are prompted to confirm the key's removal.

8.3.2 Monitoring Key Expiration

Optionally, you can configure notifications about pending SSL key expirations. This allows you to plan the importation of new keys, and ensures that there are no gaps in the monitored data while new keys are obtained and activated. Do the following:

1. Click the **Monitor key expiration** icon on the taskbar. If it is not already visible, select **Configuration**, then **Security**, and then **SSL keys**. The dialog shown in Figure 8–7 appears.

Figure 8–7 Monitor SSL Key Expiration



2. Specify the number of days prior to expiration when notification should be generated. Use the controls on the other tabs to specify the e-mailing, SNMP, and text message notification details. These are similar to the dialogs explained in Section 5.5.6, "Using SNMP Notifications"

3. When ready, click **Save**.

Note: The check for expired SSL keys is scheduled to be run once a day at 6 am (Reporter system time).

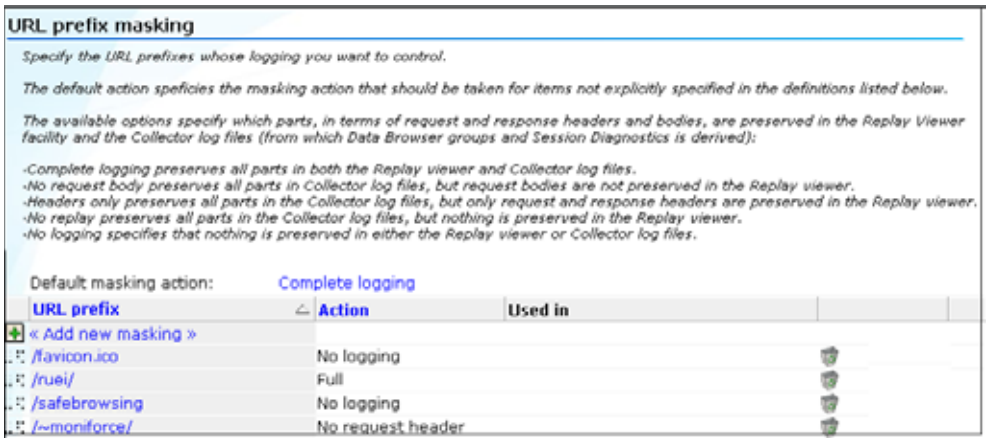
8.4 Masking User Information

The RUEI installation can be configured to omit the logging of sensitive information. This is called *masking*, and it allows you to prevent passwords, credit card details, and other sensitive information from being recorded on disk. RUEI's security facilities allow you to control the logging of POST URL arguments, HTTP headers, cookies, and the contents of URLs.

To implement a masking, do the following:

1. Select **Configuration**, then **Security**, then **Masking**, and then select the appropriate option for the HTTP protocol item you want to configure. For example, **POST URL argument masking**. A window similar to the one shown in Figure 8–8 appears.

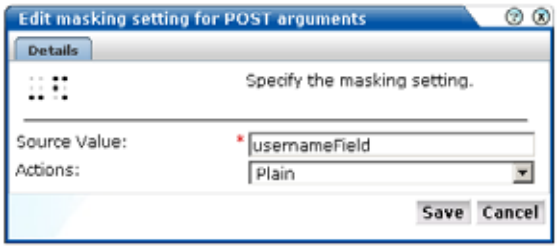
Figure 8–8 URL Prefix Masking Window



The currently defined maskings for the selected HTTP protocol item are listed.

2. Click the **« Add new masking »** item to define a new masking, or click an existing one to modify it. A dialog similar to the one shown in Figure 8–9 appears.

Figure 8–9 Edit Masking Setting Dialog



3. Specify the name of the item whose logging you want to control. Depending on the selected protocol item, this will either be the name of a POST URL argument, or an item within a HTTP header, cookie, or URL prefix. Note the procedure for defining URL prefix maskings is described later in this section.

4. Select the masking action to be assigned to the defined item. The following options are available for protocol items other than URL prefixes:

   - **Default**: specifies that the defined default action for the selected HTTP protocol item should be performed for this item. The use of this facility is described in the following section.
   - **Hashed**: specifies that the item's contents should be replaced with a calculated hash value when logged. This mechanism provides a unique value for comparison purposes, but is not in human-readable form. For example, five different user IDs would receive five different hashes when logged, while multiple sessions by the same visitor would receive the same hash. This manufactured (hashed) value provides uniqueness, but not the real value itself.
   - **Blinded**: specifies that the item's original contents should be overwritten with an Xs when logged.

- **Plain**: specifies that the item should be logged in its original state. That is, unprotected.
- **Truncated**: specifies that only the first 1 KB characters of the HTTP protocol item are logged. Values longer than this have their reminder truncated and hashed, and appended to the first 1 KB of plain (unhashed) data. In this way, their uniqueness is preserved.

When ready, click **Save**. Any changes you specify take effect within 5 minutes.

Note: All items are case insensitive.

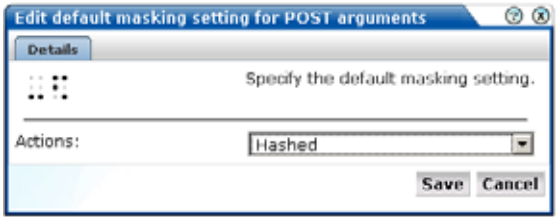
Specifying the Default Action

As mentioned earlier, the default setting specifies the action that should be taken for HTTP protocol items not explicitly specified in your security definitions. By defining items with the "Default" action, you can modify the security settings for a large number of data items (both listed and unlisted) with one user action.

To specify the default action, do the following:

1. Select the HTTP protocol item whose default action you want to specify. For example, **HTTP header masking**.
2. Click the current setting for the **Default masking action** menu. This is located at the top of the masking window. A dialog similar to the one shown in Figure 8–10 appears.

Figure 8–10 Edit Default Masking Setting Dialog



3. Select the required security setting to be applied to all data item's with the action "Default". When ready, click **Save**. Any changes you make to this setting take effect within 5 minutes.

Automatically Listed Items

In addition to the HTTP protocol item maskings you explicitly define, items are also automatically detected by RUEI during configuration. These are assigned the action "Default". You can modify their assigned actions either individually or collectively through changing the defined default action, but you cannot remove them.

In addition, be aware that after deleting an item (for example, a custom dimension item described in Section 3.8, "Working With Custom Dimensions"), if you have not modified its masking action, it is automatically removed from the displayed items list. However, if you have previously modified its defined action, you will need to explicitly remove it from the items list.

Masking HTTP headers

A number of pre-configured HTTP headers maskings are defined. These items are used by RUEI for the processing of monitored traffic. They have the action "Used in system" defined for them, which means their associated items are recorded in their original state. This action cannot be modified because they are required for the correct monitoring of network traffic.

Note that if session tracking is based on some standard technology (such as Apache or Coldfusion), the cookie is not reported in the "Used in" section. Instead, these cookies have the default masking action assigned to them, unless they have been defined manually, and have been configured differently from their default values. This does not reprsent a problem if the default masking action has not been set to blinded. If it has, all visitor sessions would be booked on one session.

Masking URL Components

In addition to URL POST arguments, cookies, and HTTP headers, it is also possible to protect certain URL contents by specifying a prefix. This facility is useful when you want to prevent the storage of URL structures that might contain sensitive information.

The options specify which parts, in terms of request and response headers and bodies, are preserved in the Replay Viewer facility and the Collector log files (from which information within the Data Browser groups and Session Diagnostics facility is derived). The following masking actions can be specified:

- **Complete logging**: specifies that all parts should be preserved in both the Replay viewer and Collector log files (after all other defined maskings have been applied).

  Note: Selecting the "Complete logging" option as the default masking action is the equivalent of enabling replay functionality in previous versions of RUEI by selecting **Configuration**, then **Security**, then **Blinding**, then clicking the **Toggle Replay functionality** icon on the toolbar, and selecting the "Enabled" option.

- **No Request body**: specifies that all parts (after all other defined maskings have been applied) are preserved in Collector log files, but request bodies are not preserved in the Replay viewer.
- **Headers only**: specifies that all parts (after all other defined maskings have been applied) are preserved in the Collector log files, but only request and response headers are preserved in the Replay viewer.
- **No replay**: specifies that all parts (after any other defined maskings have been applied) are preserved in the Collector log files, but nothing is preserved in the Replay viewer.
- **No logging**: specifies that nothing is preserved in either the Replay viewer or Collector log files.

The items recorded in the Replay Viewer facility and the Collector log files (from which information within Data Browser groups and Session Diagnostics is derived) for each of these masking actions is explained in Table 8–1.

Table 8–1 Items Logged With URL Prefix Masking Action

Masking action	Request header	Request body	Response header	Response body	Recorded in Collector log file
Complete logging	X	X	X	X	X
No request body	X		X	X	X
Headers only	X		X		X
No replay					X
No logging					

Note that if an item is used within the RUEI installation (for example, as part of an application or suite definition), this is indicated in the displayed list, and the item cannot be removed. In addition, be aware that while multiple (overlapping) item definitions are possible, the longest matching specification will be used as the assigned masking action.

Be aware that, in the case of overlapping matching URL prefixes (for example, `/ru` and `/ruei`), that have been assigned different masking actions, the longest match is taken. In addition, note that the prefix must be a true prefix. For example, if the matching URL is `/app/ruei`, neither `/ru` or `/ruei` will be matched.

Note: URL prefixes are case sensitive.

Masking Data Used by External Applications

As explained in Section 9.17, "Exporting Enriched Data", data collected by RUEI can be exported to enable its combination with other data warehouse data. Because any data items masked within RUEI are also masked when exported, it is recommended that you carefully review the requirements for data items used by external applications. The settings windows available within the masking facility provide an ideal audit tool to verify your security requirements.

Masking the Authorization Field

As explained in Section 6.2.9, "Defining User Identification", user identification is first based on the HTTP Authorization field. Be aware that, if this is sent over the network in plain format, this represents a security issue because the user name and password can potentially be decoded from it. This is a limitation of the basic authentication protocol.

If Authorization fields are sent over the network in plain format, you can use the masking options described in the previous section to control whether they are preserved in the Replay viewer. Alternatively, you can ensure that Authorization fields are hashed when included in network traffic. In this case, the user IDs are unavailable in the Session diagnostics facility.

National Language Support

See Appendix G, "Working With National Language Support" for a detailed discussion of the operation of data masking when working with international character sets.

Modifying Your Masking Definitions

Be aware that when changing a data item's security, any data already stored in log files is unaffected by the change. If necessary, you should consider purging the system (this is fully described in Section 9.13, "Resetting the System").

Important: It is *strongly* recommended that you regularly verify that all sensitive data is masked correctly on a regular basis. Applications often change over time, and so do their use of POST variables, cookies, headers, and URL structures. The Collector and Reporter raw log files can be found in the directories `/var/opt/ruei/processor/data`. The Session diagnostics export facility can also be used to audit the content of these files. This is described in Section 3.9.3, "Exporting Full Session Information".

9

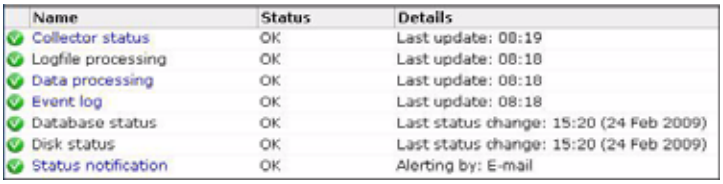
Monitoring and Maintaining the System

This chapter explains the tasks performed by an Administrator. These include monitoring the status of the system, performing backups and upgrades, working with the event log, managing system users, and configuring data retention policies.

9.1 Monitoring the Status of the System

An Administrator can check the system's condition, and receive automatic status monitoring messages on the Status page. To reach this page, select **System**, and then **Status**. An example is shown in Figure 9–1:

Figure 9–1 Status Page



Name	Status	Details
Collector status	OK	Last update: 08:19
Logfile processing	OK	Last update: 08:18
Data processing	OK	Last update: 08:18
Event log	OK	Last update: 08:18
Database status	OK	Last status change: 15:20 (24 Feb 2009)
Disk status	OK	Last status change: 15:20 (24 Feb 2009)
Status notification	OK	Alerting by: E-mail

Through the **Status** page, you can the status of the attached Collectors and the log file process, the current level of processing within the system, and the event log. You can also configure which users are notified (and how) about a system status error.

9.1.1 Temporary Delays and Alerts

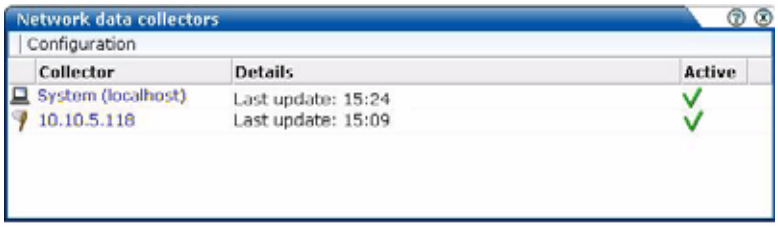
Be aware that the system status indicator shown in Figure 9–1 is only updated when the browser screen is refreshed. If one or more of the system processes are found to be failing, a system alert can be generated (as described in Section 9.4, "Configuring System Failure Alerts"). Therefore, the situation can arise that a process is shown temporarily as failing (with a red cross), but no alert is generated. This is because the system status indicator has returned to normal by the time the system processes are checked.

Due to this design, when an alert is triggered, it is recommended that you regard it as a warning that the system is starting to fail. A failure can be the result of a system delay that is larger than the default boundaries. For example, the latency between a hit on the monitored line, and the moment the information based on that hit is available in the Reporter, may not be long enough. This latency may be out of boundary within a high-traffic environment. A failure may also be the result of a temporary peak in traffic. However, if this condition persists, it is recommended that you review the monitored traffic level.

9.2 Viewing the Status of the Collectors

You can view the status of each Collector attached to the system by selecting **System**, then **Status**, and then **Collector status**. It opens the Network data Collectors window. An example is shown in Figure 9–2.

Figure 9–2 Network Data Collectors



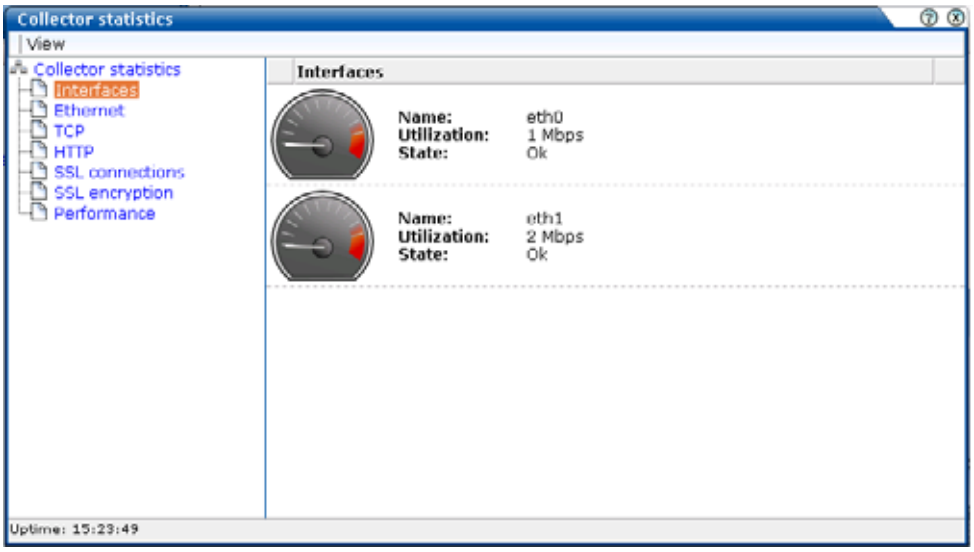
The System (localhost) refers to the Collector instance on the Reporter system. Other Collectors within the network are represented by their IP address. For each Collector, the following menu options are available:

- **View statistics**: displays a detailed report of the traffic monitored by the Collector. An example is shown in Figure 9–3. This is described in more detail in the following section.
- **Configure**: opens a sub-menu through which you can configure security-related settings for the selected Collector. These are described in Chapter 8, "Managing Security-Related Information."
- **Edit description**: allows you to modify the brief description specified when the Collector was registered (see Section 9.2.2, "Attaching New Collectors"). This can be useful for providing additional information about the Collector system. For example, where the Collector is patched in the organization's network, or the contact information for the system's administrator.
- **Restart**: restarts the selected Collector. You are prompted to confirm the restart.
- **Unregister**: removes an attached Collector from the Reporter system. You are prompted to confirm the Collector's removal.

9.2.1 Working Within the Collector Statistics Window

The information shown in this window (Figure 9–3) refers to the traffic monitored since midnight for the selected Collector, or the counters were reset. The **Uptime** field in the bottom left-hand corner of the window shows the time the Collector has been running. The uptime is reset when the Collector is restarted to update its configuration. You can reset all HTTP request counters shown in the window by selecting **Reset counters** from the **View** menu. Note that the counters will be reset the next time a network packet is detected. Hence, on an installation with no network traffic, the counters will never be reset. The display is automatically refreshed every two seconds.

Figure 9–3 Collector Statistics Window



The tabs available in the top-left part of the part of the window provide a detailed breakdown of the traffic monitored by the selected Collector. They are explained in Table 9–1:

Table 9–1 Collector Statistics Report Tabs

Tab	Description
Interfaces	Provides information on the available network interfaces for data collection. The number of interfaces and their status depends on the system configuration. Note that you will not see any "normally" configured interfaces. For each available interface, the name (in the form `ethx`), utilization (that is, current bandwidth), and state are displayed. The state can be indicated as "OK", "Down", "Not configured", "Not active", or "Not promiscous" (that is, the network adapter is only able to see traffic sent to its MAC address).
Ethernet	Provides a breakdown of the raw packet data transmitted over the monitored ports in terms of its protocols (such as IPv4 and ARP), and the number of measured frames. The "Truncated" listing indicates corrupted or dropped frames.

Table 9–1 (Cont.) Collector Statistics Report Tabs

Tab	Description
TCP	Provides an analysis of the TCP stream. The following counters are reported: ■ In progress: the number of currently active TCP sessions. These are sessions for which there is currently data transfer, or which are still in the connection establishment stage, or sessions for which the disconnect procedure has been initiated, but has not yet completed. This counter is a direct indication of the network load. ■ Max simultaneous: the maximum number ever attained by the **In progress** counter since the Collector was started. ■ Connection reset: the number of sessions that were terminated with a TCP RESET segment. Such sessions are immediately dropped by both parties: no further data (including a disconnect procedure) can be sent on such a session. ■ Connection refused: the number of sessions that could not be established because the requested service was missing. This happens if a peer tries to establish a connection on a system to a port on which no one is listening. ■ Total: the total number of sessions that have taken place since the Collector was started. The following network error meters are also shown: ■ Out of sequence: indicates the segments received out of sequence. A high level of errors could indicate a problem in the quality of the underlying network between peers, which is usually the Internet between a client PC and a server. ■ Bad checksum: indicates corrupted segments en route. A high number of issues can indicate either a hardware, wiring, or network problem. ■ Bad offset and / or length: indicates the number of packets that had an incorrect length compared to their advertised length. This indicates a corrupt packet. ■ Dropped segments: indicates the total value of segments dropped for any unexpected reason, such as bad checksum, length, and so on. Check your hardware and network architecture when this value becomes unusually high. Note that in the case of complex customer configurations, it probably indicates that the required traffic is not being correctly routed across the Collector's TAP device. For example, two network trunks could be used (for in and outbound traffic), but the Collector can only see one of them. In this case, you should ensure that the TAP device is correctly connected to both trunks. In addition, in configurations where VLAN trunk is used, (for example, to separate in and outbound traffic), the mixing of VLAN and non-VLAN traffic is not supported.
HTTP	Provides an analysis of the monitored HTTP stream. In particular, the type of requests (such as GET or POST) they contain.

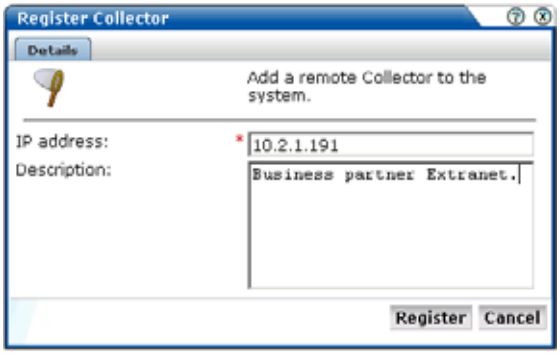
Table 9–1 (Cont.) Collector Statistics Report Tabs

Tab	Description
SSL connections	Reports the encryption method used for packets of encrypted data. In particular: ■ SSLv2: number of SSL version 2 connections (the Collector has no support for tracking these connections). ■ SSLv23: number of mixed mode SSL connections (that is, sessions that start as SSL version 2, but are scaled up to version 3 during the connection establishment phase). ■ SSLv3: number of SSL version 3 connections. ■ TLSv1: number of TLS version 1 connections. ■ Other: number of other connections (those connections that do not fit into one of above categories). Errors related to SSL key management are reported. In particular: ■ No server key: the private SSL key for the requested server connection has not been made available to the Collector. ■ No master key: number of connections dropped because the master key for a connection could not be computed. ■ No session key: number of connections dropped because the session key for a connection is missing. Information about (currently) unsupported encryption: ■ Pure SSLv2: client is using pure SSL version 2 protocol. This is not supported by the Collector. ■ Ephemeral: session relies on ephemeral keys for encryption. Such keys cannot be made known to the Collector and, as a result, such sessions cannot be tracked. ■ Anonymous DH: session relies on anonymous Diffie-Hellman key negotiation. Such keys are unknown to the Collector and, as a result, such sessions cannot be tracked. The **Decrypt errors** gauge indicates the connections which could not be decrypted. This can be caused by several reasons, including the master key could not be decrypted, session keys were incorrectly computed, or a segment could not be decrypted.
SSL encryption	Provides a breakdown of the monitored encrypted data in terms of the employed encryption algorithm. The **Used** column indicates the amount (percentage) of total monitored SSL encrypted traffic that used an encryption algorithm, and the **Errors** column indicates the percentage of measured SSL encryption which failed (that is, could not be read).
Performance	Reports on the impact to the Collector. Note that if the peak load nears 100%, immediate action should be taken to prevent data being dropped by the Collector. See Section 8.2.2, "Limiting Overall Traffic" about traffic sampling. If this does not provide a solution, it is also recommended that you contact Customer Support. The Collector's memory usage is also indicated. The maximum memory threshold is 30% for Reporter / Collector systems, and 70% for Collector only systems).

9.2.2 Attaching New Collectors

To attach a new Collector to the system, select **Register remote Collector** from the **Configuration** menu. The Register Collector dialog shown in Figure 9–4 appears.

Figure 9–4 Register Collector dialog



Specify the IP address of the new system and, optionally, a brief description. For example, the contact information for the system's administrator. When ready, click **Register**. See the *Oracle User Experience Insight Installation Guide* for more information about the configuration requirements for Collector systems.

Note: This facility is also available by selecting **System**, then **Status**, and then **Collector status**. Note that users who are not authorized as an Administrator will receive a read-only version of this interface.

9.3 Specifying the Fallback Collector Encoding

The Collectors can monitor network traffic containing data in a wide variety of character encoding standards. Table G–1 provides a complete list of the encoding standards supported by RUEI.

In order for RUEI to correctly report on monitored network traffic, it must understand the encoding used within that traffic. Generally speaking, RUEI first attempts to use the encoding detected for the HTML document. If this fails to produce a satisfactory result, the fallback encoding (if one is specified) is used to decode URL and posted form arguments.

When using this facility, it is important to understand the following points:

- At the HTTP level, there is no relationship between content encoding and URL encoding. Moreover, the HTTP protocol does not specify any standard for URL argument encoding.
- The fallback encoding is only applicable to URL and POST arguments. Content-based reporting (for example, functional errors) is not affected by this setting. In addition, the selected fallback encoding applies across all applications, pages, and domains monitored by the selected Collector.
- The fallback encoding is not a manual override to the auto-detected encoding. Rather, it specifies the encoding that RUEI should attempt to use once the auto-detected document encoding has failed to satisfactorily decode the URL and POST arguments. If the fallback encoding also fails to produce a satisfactory result, the arguments are reported in their original (non-decoded) format.

Important: If you are using international characters sets within your Web sites, it is *strongly* recommended you carefully review your Web site content, and the encodings used for it. In addition, you should regularly review the reporting of full URL and POST arguments to ensure they are correct.

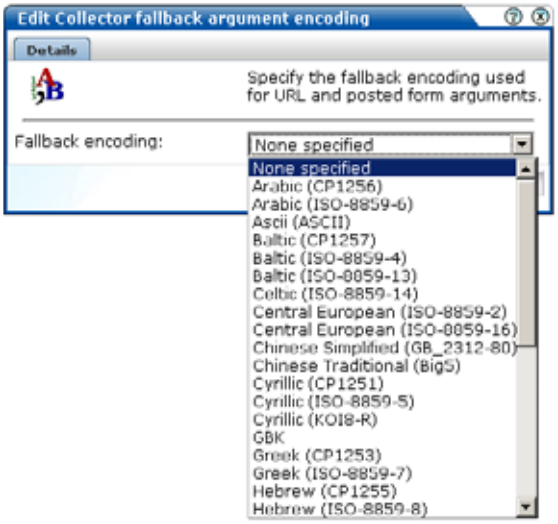
To specify the fallback encoding, do the following:

1. Select **Configuration**, then **General**, then **Advanced**, and then **Fallback Collector encoding**. A panel similar to the one shown in Figure 9–5 appears.

Figure 9–5 Fallback Collector Argument Encoding

2. Click the currently defined fallback encoding for the required Collector. By default, no fallback encoding is defined. The dialog shown in Figure 9–6 appears.

Figure 9–6 Edit Collector Fallback Argument Encoding Dialog



3. Use the **Fallback encoding** menu to specify the fallback Collector encoding. The list of available encodings is equivalent to that shown in Table G–1.

   When ready, click **Save**.

Any change you make to this setting takes effect almost immediately.

9.4 Configuring System Failure Alerts

In addition to being notified about KPI and SLA violations, you can also configure alerts for system failure. It is strongly recommended that you do so to ensure prompt action in the case of system problems. To do so, select **System**, then **Status**, and then **Status notification**. The dialog that appears is similar to that described in Section 5.5.1, "Alert Profiles".

Note: The system status alerting does not consider any alerting schedules or escalation levels. When configuring alerts, ensure all user information (such as E-mail addresses and telephone numbers) is correctly specified for the people who should be notified in case of system status failures. Note also that the system status check is run every 10 minutes. Hence, if a system failure is indicated in Figure 9–1, you may not immediately receive an alert about it, but when the scheduled system check is run.

9.5 Configuring Database and Disk Space Limits and Alerts

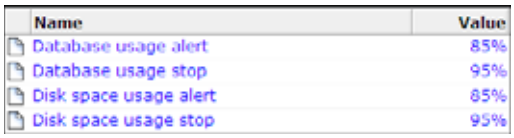
In order to ensure the uninterrupted operation of your system, limits are set to the maximum level of available database and disk space utilization. When the maximum database utilization level is reached, no further data is written to it until an administration mechanism has brought the database's size back to within its permitted boundary. Similarly, when the maximum disk space utilization is reached, no further data (in the form of log and enriched data exchange files) is written to the file system until an administrator process has deleted existing files. In addition, you can also configure alerts to be generated when either of these problems may be about to arise.

Important: It is strongly recommended you only modify the default settings if you have a sound knowledge of RUEI, and clearly understand the use and effect of these settings.

To define database or disk space thresholds, do the following:

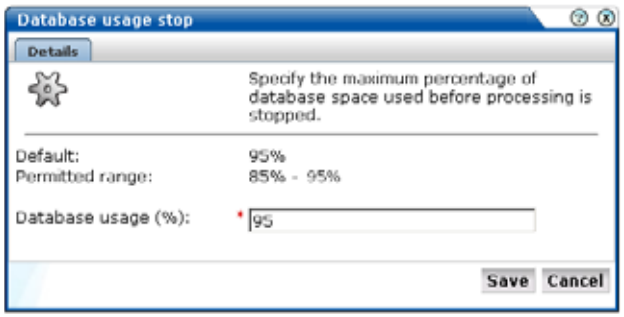
1. Select **Configuration**, then **General**, then **Advanced settings**, and then **Database/disk space usage**. The thresholds selection panel shown in Figure 9–7 appears.

Figure 9–7 Database and Disk Space Thresholds



2. Select the required threshold. A dialog similar to the one shown in Figure 9–8 appears.

Figure 9–8 Change Data Retention



3. In the case of an alert threshold, use the dialog to specify the maximum database or disk space utilization before an alert is generated. The generated alert is sent to the same recipients, and uses the same notification mechanism, as that defined for system failure alerts (described in Section 9.4, "Configuring System Failure Alerts"). In the case of a stop threshold, specify the maximum database or disk space utilization before database processing or data collection is stopped. When ready, click **Save**. Any changes you specify take effect immediately.

Defining Threshold Values

When defining threshold values, be aware of the following:

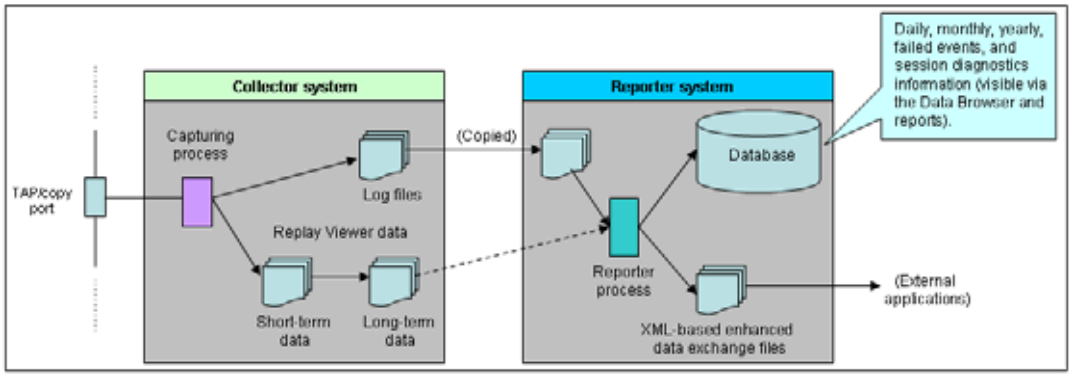
- The maximum permitted setting for stopping the database or disk space utilization is 95%. This is because if the available disk space becomes completely (100%) full, other components on the system may no longer work. In addition, remote logging onto the system may no longer be possible. Similarly, if the database is allowed to become completely full, the administrative mechanism used to reduce its size will no longer work.
- The specified thresholds refer to all partitions used for RUEI. That is, `/var/opt/ruei`, and any mounted partitions under it. The alert and stop mechanisms will be triggered if at least one partition reaches its specified threshold.
- Checking of the defined thresholds is not performed continuously, but every 10 minutes. Hence, it is possible that by the time a check is performed, and an alert is issued, the database or disk space utilization is already higher than the specified threshold. For this reason, it is recommended that you set threshold values slightly lower than their intended target. For example, instead of setting the disk space stop threshold at 95%, set it to 93% or 94%.
- An alert notification threshold cannot be higher than its associated stop threshold. For example, if the database stop threshold is 95%, the alert threshold cannot be higher than this.
- By default, alert thresholds are 85%, and stop thresholds are 95%.
- There is also a Linux operating system limit of 95% on disk space usage. If this limit is reached, only the `root` user can write to disk. Because RUEI does not have this privilege, further utilization of disk space is prevented.

9.6 Specifying Data Retention Policies

The availability of specific data within the Data Browser, as well as reports based on that data, depends on the amount of available disk space on the Collector and

Reporter systems, as well as the amount of database space available on the Reporter system. This is illustrated in Figure 9–9.

Figure 9–9 Data Retention Across Collector and Reporter Systems



Data gathered during monitoring is first written to log files, stored on the Collector system. These files are copied to, and processed by, the Reporter to populate the database that holds the multi-dimensional data structure viewable through the Data Browser and reports. These temporary log files are automatically removed from the Collector system after three days, and from the Reporter system (by default) after seven days.

If full logging has been specified for data masking, all hit-based information is held in a series of short-term data files. These files are regularly filtered into long-term data files that contain only information about failed events (that is, failed pages, objects, and function calls). While this information is viewable within the Session diagnostics replay facility on the Reporter system, the data is stored on the Collector system.

The size of the database user quota for the Report system is configurable during installation. By default, it is set to 200 GB. It is important to understand that data is consolidated when it is no longer required by the Reporter's defined retention policy. For example, by default, daily information about the last 32 days is retained. Daily information older than this is consolidated into the monthly information. Similarly, monthly information is consolidated into yearly information. Finally, if the enhanced data exchange facility has been enabled (see Section 9.17, "Exporting Enriched Data"), an export file is created every five minutes. The XML-based export files are, by default, retained for seven days.

By default, RUEI keeps information on a daily, monthly, and yearly levels for 32 days, 13 months, and five years, respectively. Hence, for example, the oldest daily information will be dropped after 32 days. In addition, temporary log files are kept on the file system for approximately seven days. Be aware that a new RUEI installation will grow quickest during the first 32 days. After that time, the growth rate will slow. Of course, the growth rate depends on monitored traffic levels.

By default, information about failed URLs, pages, and service calls is kept for 15 days. If available, it can be viewed via the Session diagnostics replay facility (described in Section 3.9, "Working With the Session Diagnostics Facility").

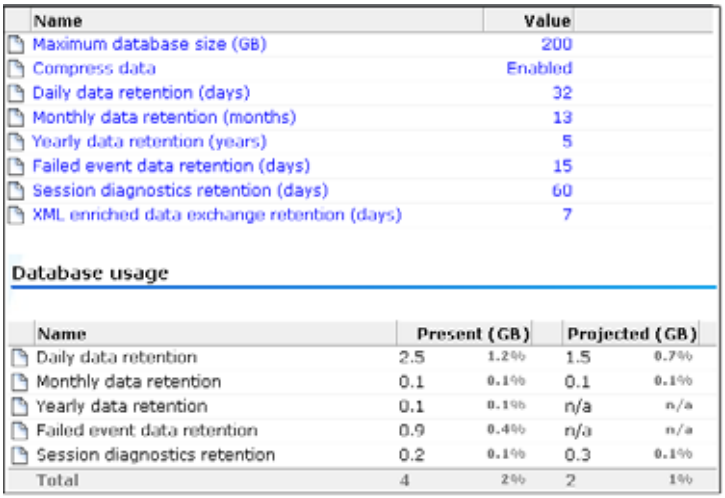
The settings described in the rest of this section allow you to optimize the disk and database utilization of your RUEI installation to meet your operational requirements.

9.6.1 Defining Reporter Retention Policies

To specify the data retention policies used by the Reporter system, do the following:

1. Select **Configuration**, then **General**, then **Advanced settings**, and then **Reporter data retention policy**. A screen similar to the one shown in Figure 9–10 appears.

Figure 9–10 Reporter Data Retention Policy Panel



Name	Value
Maximum database size (GB)	200
Compress data	Enabled
Daily data retention (days)	32
Monthly data retention (months)	13
Yearly data retention (years)	5
Failed event data retention (days)	15
Session diagnostics retention (days)	60
XML enriched data exchange retention (days)	7

Database usage

Name	Present (GB)		Projected (GB)	
Daily data retention	2.5	1.2%	1.5	0.7%
Monthly data retention	0.1	0.1%	0.1	0.1%
Yearly data retention	0.1	0.1%	n/a	n/a
Failed event data retention	0.9	0.4%	n/a	n/a
Session diagnostics retention	0.2	0.1%	0.3	0.1%
Total	4	2%	2	1%

As can be seen in Figure 9–10, every setting that has an impact on the database has a corresponding **Database usage** listing. This indicates the total database space (in gigabytes) currently used for the item, and the proportion this represents of the database's maximum permitted size. The projected database utilization (based on monitored traffic levels) is also indicated. Information about disk space utilization is available within the dialog boxes for individual settings.

2. Select the required setting. The following settings are available:

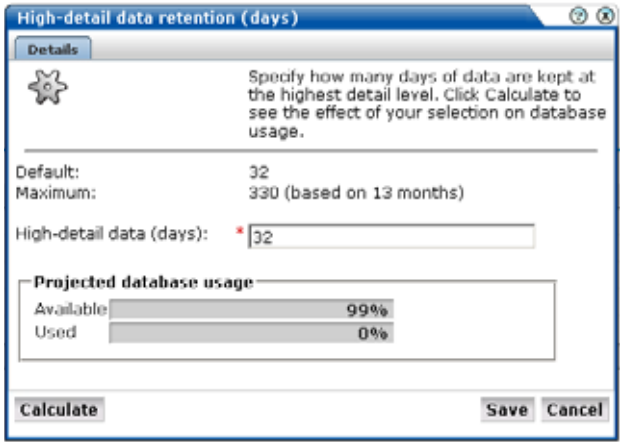
   - **Maximum database size**: specifies (in gigabytes) the maximum amount of data allowed to be stored in the database. Note that you will need to specify the database SYSTEM user password to change this setting.
   - **Compress data**: specifies whether data should be compressed for long-term storage. By default, compression is enabled. Be aware that disabling compression effectively doubles the amount of required database storage space. However, it would also significantly reduce the redo logging generated.
   - **Daily data retention**: specifies the period for which daily information is available. The default is the last 32 days. The maximum period for which daily data may be kept depends on the monthly setting.
   - **Monthly data retention**: specifies the period for which monthly information is available. The default is the last 13 months. The maximum period for which monthly data may be kept depends on the yearly setting.
   - **Yearly data retention**: specifies the period for which yearly information is available. The default is the last five years. The minimum setting depends on the daily setting, while the minimum number depends on the monthly setting.
   - **Failed event data retention**: specifies the period for which information about failed URLs, pages, and service calls is available. The default is for the last 15 days. If information is not available in the Session diagnostics replay, you may need to review this setting. Note this setting is linked to the Replay error page storage size setting (described in Section 9.6.2, "Defining Collector Data Retention Policies"). If you intend to increase the Failed event data retention setting, it is recommended you also increase the Error page replay storage size

setting in order to facilitate this. Note also this setting has a high impact on disk space usage, and any change to it should be carefully considered in terms of anticipated network traffic.

- **Session diagnostics retention**: specifies the maximum number of days for which session diagnostics information is available. This facility is fully described in Section 3.9, "Working With the Session Diagnostics Facility". The default is the last seven days, and the minimum is the last two days. This setting has an impact on database and disk space usage. The reported database usage is not included in the reported disk space usage.
- **XML enriched data exchange retention**: specifies the maximum number of days for which XML enhanced data exchange is available. This facility is fully described in Section 9.17, "Exporting Enriched Data". The default is the last seven days, and the minimum is the last 24 hours. Be aware that, if set to one day, the previous day's data is deleted at around midnight, and only a limited amount of information is available for the current day. In order for you to be able to download the previous day's data after midnight, it is recommended that a maximum of at least two days is specified. The maximum depends on the available database and disk space. The location of the files is the directory `/var/opt/ruei/processor/xml-events/wg/xml-sespage`. Within this, data for each day has its own directory with the format name *yyyymmdd*.

A dialog similar to the one shown in Figure 9–11 appears.

Figure 9–11 Change Data Retention



3. Use the dialog's control to specify the retention policy for the selected option.

   For most settings, you can click **Calculate** to see the effect of your selection on database or disk space usage, as applicable.

   When ready, click **Save**. Any changes you specify take effect immediately.

> **Note:** It is recommended that if you want to increase the amount of data kept, you start with the low-level data retention setting and work towards the high-level data retention setting. If you want to decrease the amount of data kept, start with the high-level data retention setting, and work towards the low-level data retention setting.

Calculating Required Days, Months, and Years

When specifying the high, medium, and low-level data retention settings, it is important to understand the dependency between stored days, months, and years. Use the following rules to calculate the required settings:

- A month is assumed to have 30 days. The number of months that must be stored for a specified period of days is the number of days divided by 30 (rounded up to the next hole integer), plus one. For example, 33 days would require 33/30 (1.1 rounded up to 2), plus 1. Hence, three months.
- The number of required years for a specified period of months is the number of months divided by 12 (rounded up to the next whole integer), plus one. For example, 11 months would require one year, while 13 months would require two years.

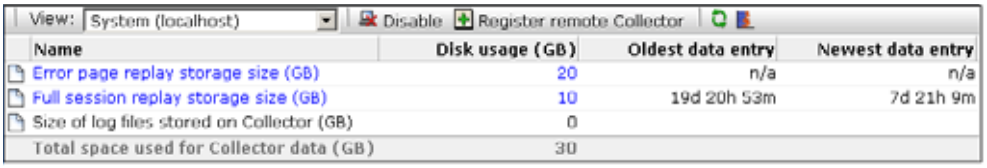
For example: 900 days, 31 months, and 3 years.

9.6.2 Defining Collector Data Retention Policies

To specify the data retention policy used by a Collector system, do the following:

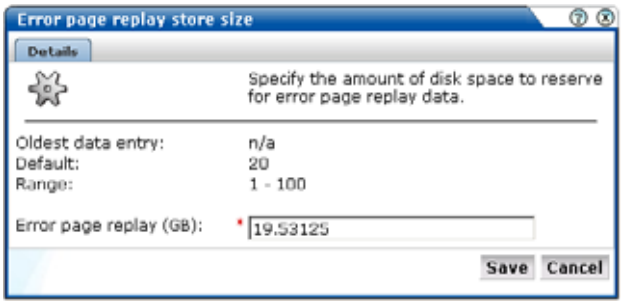
1. Select **Configuration**, then **General**, then **Advanced settings**, and then **Collector data retention policy**. The panel shown in Figure 9–12 appears.

Figure 9–12 Collector Data Retention Policy



2. Use the **View** menu to select the required Collector. The System (localhost) represents the Collector running on the Reporter system. The Oldest data entry column indicates how far back in time (in seconds, hours, minutes, or days) data for the indicated storage is available. Typically, if the oldest entry is reported as 10 minutes, this indicates a very busy system that cannot store more than 10 minutes of data.
3. Click either the **Error page replay store size** or **Full session replay storage size** option. A dialog similar to the one shown in Figure 9–13 appears.

Figure 9–13 Long-Term Replay Viewer Store Size



If content information is not available in the replay viewer, you may need to review this setting. You should also review the Failed event data retention setting.

If the Error page replay viewer store holds more days of data than the Failed event data setting, then the extra amount of data is not accessible via the GUI. Conversely, if the Error page replay viewer store size setting is lower than the number of days of failed event data, then replay viewer data will not be available for the extra period. However, the other views on the data will be available as usual, through the other Data Browser groups.

Note that if the Full session replay storage setting is set to less than 15 minutes, the error replay facility may not function correctly. In addition, if set to zero, the Error page replay store size setting can no longer be modified.

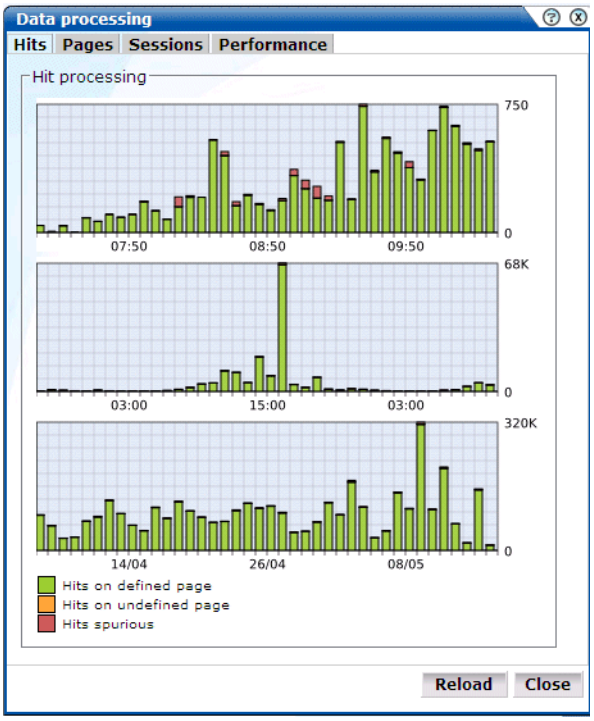
Note that in the case of a local Collector, the size of log files stored on Collector item will always be zero.

4. Specify the amount (in GB) of available disk space reserved for error page replay or session diagnostics files. When ready, click **Save**. Any change you specify takes effect immediately.

9.7 Viewing a Traffic Summary

You can open an overview of the monitored network traffic by selecting **System**, then **Status**, and then **Data processing**. This provides you with immediate information about hits, pages, and session processing, as well as the system load. An example is shown in Figure 9–14:

Figure 9–14 Data Processing Dialog



Note the Available resource usage (%) item on the **Performance** tab indicates the current processing level. If this approaches 100%, it means a lag in the processing of data is starting to occur, and it is no longer possible to process data in real time.

Be aware that because this facility is based on application logic, non-application traffic (such as suites, services, and SSOs), are not represented in the displayed reports.

Important: In order for RUEI to correctly report on monitored traffic, it is *strongly* recommended that you regularly review this traffic summary. If necessary, review the RUEI configuration accordingly. For example, add additional cookie technologies. In addition, if the system is unable to track sessions, proper tracking of transactions will also not be available because transaction reporting requires session tracking.

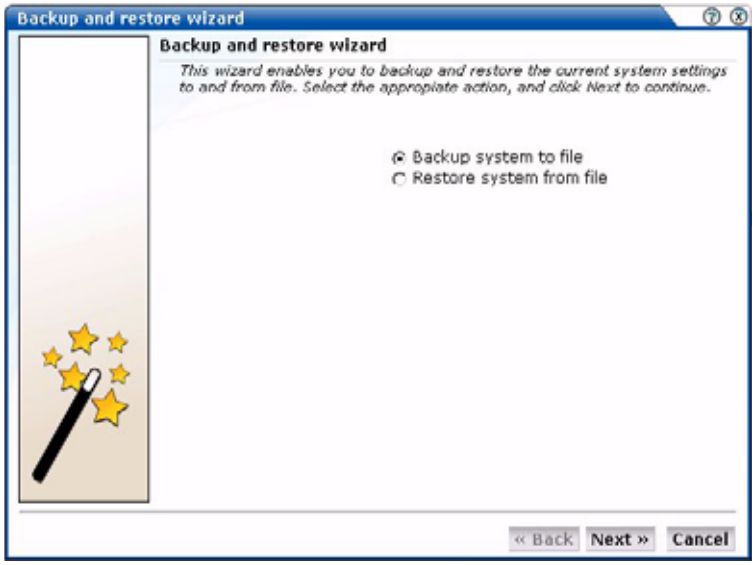
9.8 Creating and Restoring Configuration Backups

You can create backups of your system's current configuration, and restore it if necessary. It is recommended that you regularly make backups. Note that backups only contain the system settings. For security reasons, SSL keys and collected data are not included.

To create or restore a backup, do the following:

1. Select **System**, then **Maintenance**, and then **Backup and restore**. The dialog shown in Figure 9–15 appears.

Figure 9–15 Backup and Restore Dialog



2. Use the radio buttons to selected the required operation. When ready, click **Next**.
3. Depending on how your browser is configured, you are either prompted to specify the location to which the zip file should be saved, or it is immediately saved to the defined default location.

Important: The generated backup file contains large amounts of information intended for Customer Support use only. Do *not* try to modify the file's contents. When performing a restore, be aware that all current settings are overwritten by the restored ones.

9.9 Working with the Event Log

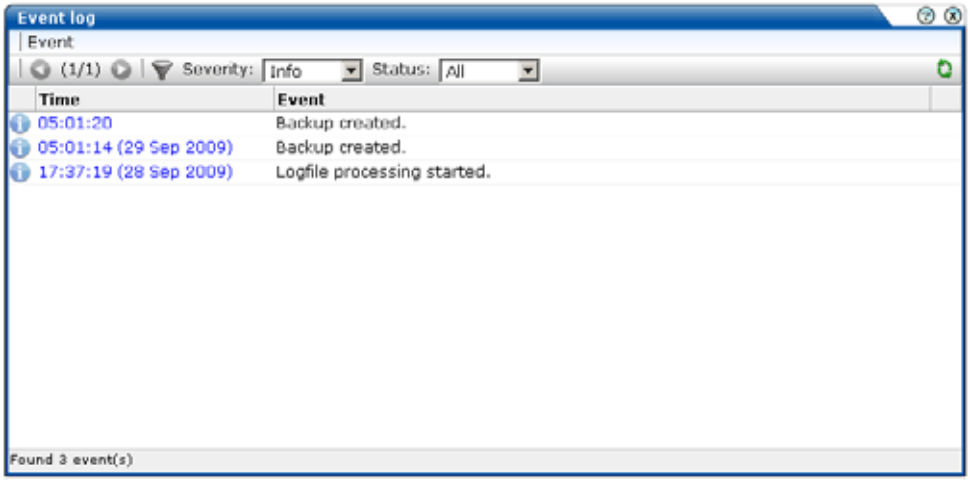
In addition to the status information described in Section 9.1, "Monitoring the Status of the System", RUEI maintains an event log. This contains a record of all system events. It enables both you and Customer Support to quickly identify and resolve any issues that might arise within your RUEI installation.

It is recommended that you regularly review the contents of the event log. If the event log contains any unread error messages, this is indicated by the **Event log** item within the **Status** panel being shown with an error icon. Be aware that while most events are reported almost immediately, Collector-related events can take up to five minutes to be reported.

To review the event log, do the following:

1. Select **System**, then **Status**, and then **Event log**. A dialog similar to the one shown in Figure 9–16 appears listing the most recent events.

Figure 9–16 Event Log



2. Use the controls within the toolbar to scroll through the list of events. Each displayed log page can contain up to 100 reported events. By default, all event types are listed. However, the **Severity** menu enables you to restrict the displayed list to a selected category. The potential impact of an event is indicated through the following severities:

   - **Info**: indicates a user-triggered action. For example, the restart of a Collector, the creation of a new user account, or a configuration backup or restoration.
   - **Warning**: indicates an event that might cause your RUEI installation to fail. For example, the Reporter system is close to running out of disk space or a backlog is developing in the processing of log files.
   - **Error**: indicates an event that results in your RUEI installation not being fully operational. For example, a remote Collector is no longer available.

   You can also use the **Status** menu to view all reported events, or restrict the displayed list to new (unread) events.

3. Optionally, you can select the following options within the **Event** menu:

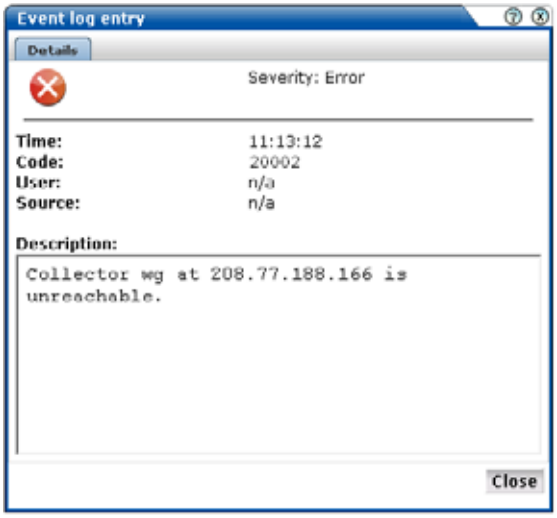
   - **Mark all events as read**: new (unread) events are highlighted in bold. After being read, the highlighting is removed. Use this option to clear all

highlighting within the event list, and reset the status of the **Event log** item within the **Status** panel to OK.

- **Reload**: refreshes the displayed event list with any event information that occurred since you opened the log. Note that you can also click the **Reload** icon within the toolbar to do this.
- **Close**: closes the event log.

4. You can click a displayed event to view more information about it. A dialog similar to the one shown in Figure 9–17 appears.

Figure 9–17 Example Event Log Entry

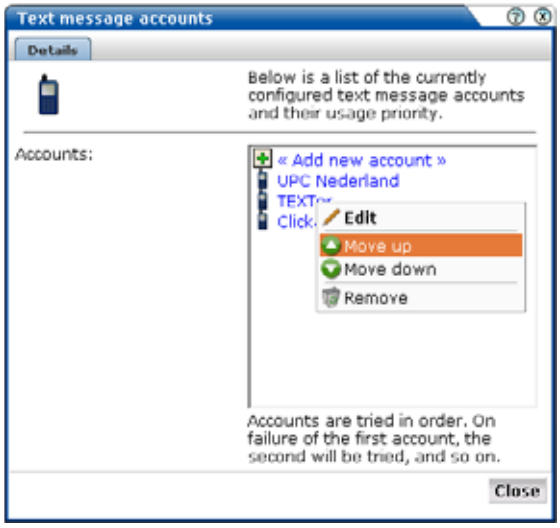


This dialog provides you with the complete event text, as well as the associated event code. Note that both of these should be specified when contacting Customer Support. In the case of remote Collectors, the reported source is the Collector's IP address.

9.10 Configuring Text Message Providers

RUEI supports the use of text message notifications. In order to make use of this facility, all text message providers that you are planning to use must be configured and known to the system. To manage your provider information, select **System**, then **Maintenance**, and then **Text message providers**. The dialog shown in Figure 9–18 appears.

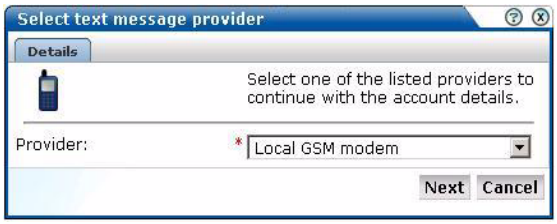
Figure 9–18 Text Message Accounts Dialog



To configure a text message provider, do the following:

1. Click **« Add new account »** to define a new text message provider. The dialog shown in Figure 9–19 appears.

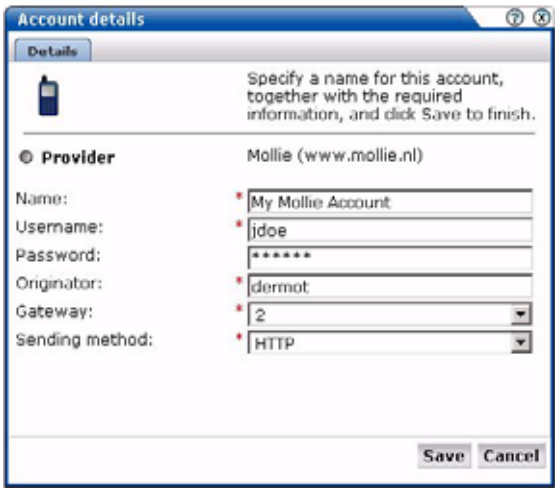
Figure 9–19 Select Text Message Provider Dialog



2. Select the required text message provider from the list. It contains a number of predefined supported services. Each of these require an account with the associated provider. When ready, click **Next**. A dialog similar to the one shown in Figure 9–20 appears.

Important: If you specify a local GSM modem, a GSM modem must be installed on the system. The installed local modem must be a USB or serial GSM ETSI 07.05-compliant modem.

Figure 9–20 Account Detail Dialog



3. The exact fields available within the dialog depend on the provider selected in Figure 9–19. For example, if you selected a local GSM modem, you are required to specify the local port and baud rate for the modem. If not known, automatic detection is available. Optionally, you can also specify a SIM PIN (if one is required).
4. If you selected the predefined Mollie or Clickatell services, you are required to specify the user name, password, originator, API ID, and protocol sending method used for the account. These should have been supplied to you by your account provider. When ready, click **Save**. You returned to the dialog box shown in Figure 9–18.
5. Right click the providers in the list and use the **Move up** and **Move down** options to control a provider's position in the list. Providers are tried in the order they appear in the list. Hence, the first account is tried and, on failure, the second one, and so on.
6. When ready, click **Close** to leave the dialog.

Unicode Support

While Unicode is supported in text messages, there are a number of restrictions of which you should be aware. In the case of locally installed modems, messages are sent to the modem using the 7-bit GSM 3.38 alphabet. Any unsupported characters in the original message are replaced by a question mark (?) character. In the case of an external service provider, it is recommended that you consult your service provider for information about multi-byte character set support. In the case of both locally installed modems and external service providers, text messages are limited to 160 characters.

9.11 Creating Helpdesk Reports

If you experience problems with the use or operation of RUEI, you can contact Customer Support. However, before doing so, it is strongly recommended that you create a Helpdesk report file of your system. To do so, select **System**, then **Configuration**, and then **Helpdesk report**. You are then prompted to specify a location to which the file should be downloaded.

This file contains extended system information that is extremely useful to Customer Support when handling any issues that you report.

Please note that this file contains software proprietary information. Do *not* try to modify its content.

9.12 Adding Network Data Collectors

To view the status of network data collectors, or to add new ones, select **System**, then **Maintenance**, and then **Network Data Collectors**. The use of this facility is the same as that described in Section 9.2, "Viewing the Status of the Collectors".

9.13 Resetting the System

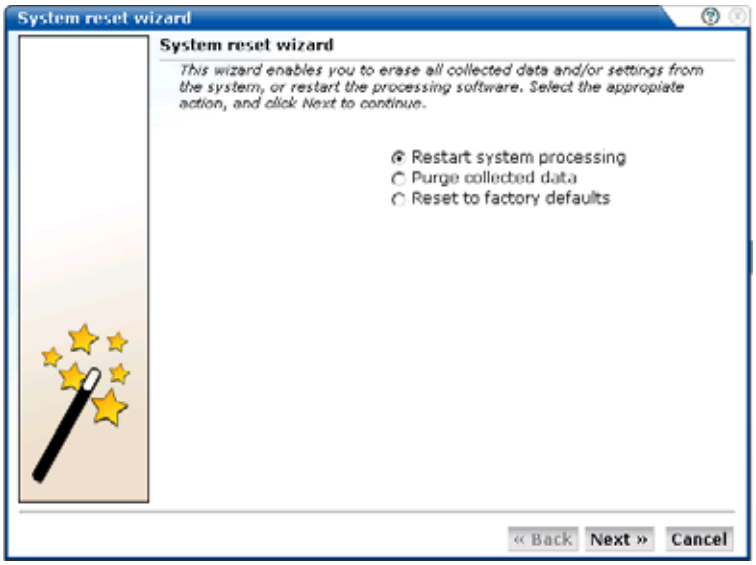
If you experience unexplained problems, you can restart processing to ensure that it is operating properly and synchronized. Note that selection of this option will result in a temporary delay in data availability and monitoring.

In the last resort, you can remove all collected data from the system. Alternatively, you can reset all parameters (such as created users and environment parameters) to their out-of-the-box default values.

To reset the system, do the following:

1. Select **System**, then **Maintenance**, and then **System reset**. The dialog shown in Figure 9–21 appears.

Figure 9–21 System Reset Wizard



2. Select the required option:
   - **Restart system processing** to reactivate system processing. This is the default.
   - **Purge collected data** to remove all collected data from the system.
   - **Reset to factory defaults** to remove all collected data and SSL keys, and reset all system parameters to their default values.

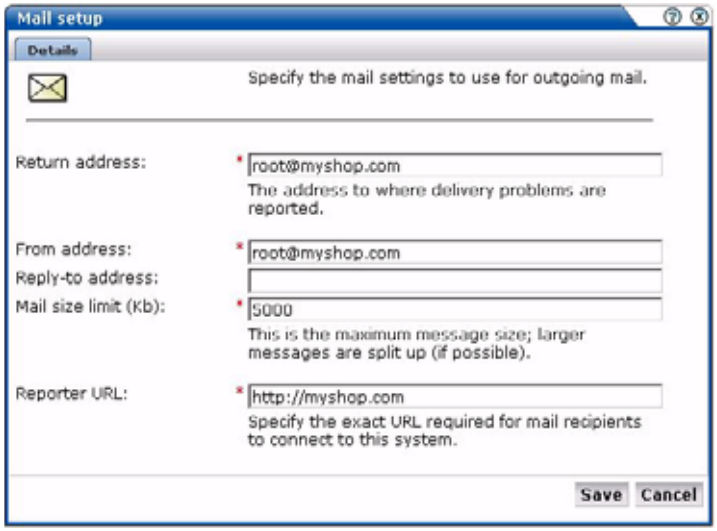
   When ready, click **Next**.

Caution: The **Purge collected data** and **Reset to factory defaults** options are irreversible. All collected data will be erased. In the case of **Reset to factory defaults**, all system settings will also be returned to their original state. Therefore, a complete initial configuration (and the definition of the `admin` user password using the `set-admin-password.sh` script) will be required before you have access to the Reporter interface. If you have previously created a backup (described in Section 9.8, "Creating and Restoring Configuration Backups"), you can restore this backup after initial configuration. This initial configuration procedure is described in the *Oracle Real User Experience Insight Installation Guide*.

9.14 Managing the E-Mail Configuration

As explained in Section 2.2, "Using the Mailing Facility", RUEI can send automatic E-mails of requested reports. This facility uses the information specified during the initial configuration phase (described in the *Oracle Real User Experience Insight Installation Guide*). However, this configuration can be changed by selecting **System**, then **Maintenance**, and then **Mail setup**. The dialog shown in Figure 9–22 appears.

Figure 9–22 Mail Setup Dialog



Use this dialog to specify the following information:

- **Return address**: specifies the E-mail address to which failed or problem E-mails are reported. It is strongly recommended that this an address that is regularly checked.
- **From address**: specifies the address the recipient sees in their mail client.
- **Reply-to address**: specifies the address that users can click within an E-mail to reply to an E-mail. If this is not specified, the **From address** setting is used.
- **Mail size limit**: specifies the maximum message size (in kilobytes) allowed for E-mails. Note that if an E-mail contains reports that exceed this limit, the system will try to split up the reports into individuals E-mails to overcome this limitation. Reports that are too large to be sent individually are not sent, and the user is informed of the problem. The default mail size limit is 5000 Kb.

- **Reporter URL**: specifies the exact URL required for E-mail recipients to connect to the Reporter system. Typically, this is the same URL used by RUEI users to access the Reporter system.

9.15 Setting System-Wide Preferences

As explained in Section 1.6, "Customizing Your Environment", users can customize the formatting settings used in their sessions. They can specify the characters used for the decimal point indicator and the thousand separator, and the date format that should be used. Administrators can also specify defaults for these settings on a system-wide basis by selecting **System**, then **Maintenance**, and then **Formatting preferences**.

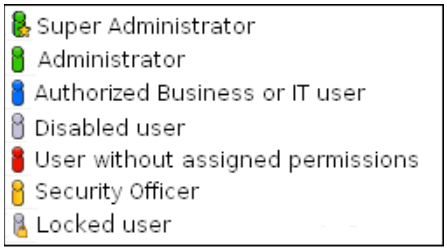
9.16 Managing Users and Permissions

To start working with user definitions, select **System**, and then **User management**. The screen shown in Figure 9–23 appears.

Figure 9–23 User Management

This screen lists the currently defined system users. For each user, their account name, full name, E-mail address, and authentication mechanism are listed. A user's role and status is indicated through the color-coded scheme explained in Figure 9–24:

Figure 9–24 User Roles and Status



User Authentication

The authentication of system users can either be performed by RUEI itself, based upon the user information stored within its database, or by an external authentication server. Currently, RUEI supports two external authentication mechanisms: via an LDAP server, or via an Oracle Single Sign-On (SSO) server. In both cases, the server must be configured to work with RUEI. The procedure to configure the LDAP server is described in Section 9.16.5, "Configuring LDAP Server User Authentication". The procedure to configure the Oracle SSO server is described in Section 9.16.6, "Configuring Oracle Single Sign-On (SSO) User Authentication".

9.16.1 Adding New Users

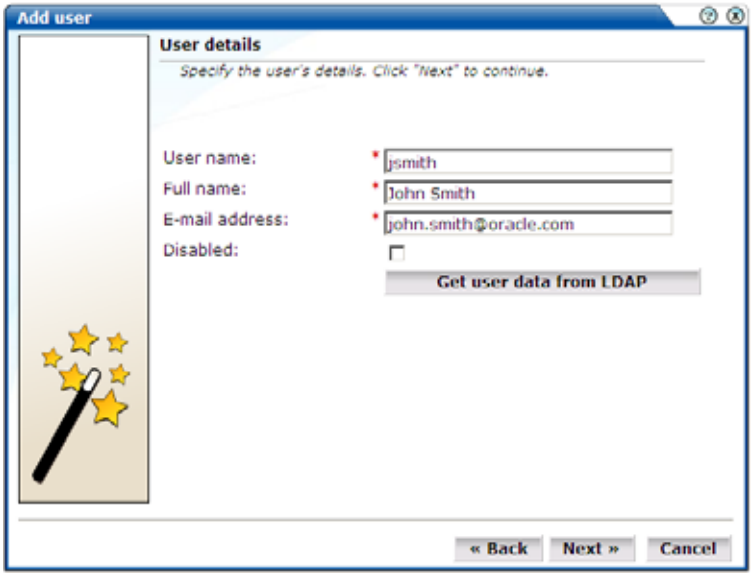
To create a new user, do the following:

1. Select **System**, then **User management**, and click the **Add new user** command button in the taskbar (see Figure 9–23). If an LDAP server connection has been configured (as described in Section 9.16.5, "Configuring LDAP Server User Authentication"), the dialog shown in Figure 9–25 appears. Otherwise, a dialog similar to the one shown in Figure 9–26 appears, and you should continue from step 3.

Figure 9–25 Add New User

2. Use the radio buttons shown in Figure 9–25 to specify whether the creation of the new user account, and its associated user settings, should be authenticated against the settings held in the RUEI installation (this is the default), or against a configured LDAP server. When ready, click **Next**. If an LDAP server is configured, the dialog shown in Figure 9–26 appears. Otherwise, a dialog similar to the one shown in Figure 9–29 appears.

Figure 9–26 User details



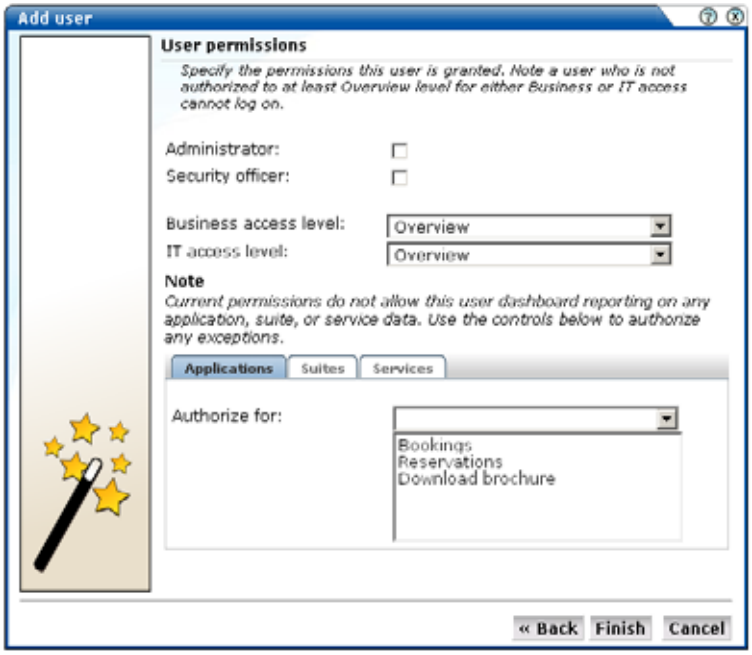
3. Use the dialog shown in Figure 9–26 to specify the following information for the new user:

   - The user name by which the user will be known within your RUEI installation. This must be a unique name. Note that if Oracle SSO server user authentication is enabled, the user is automatically created as an Oracle SSO user. In this case, specified user name must be the same as that defined within the Oracle SSO server.
   - The user's full name.
   - The user's E-mail address. This is the address to which reports and E-mail alerts will be sent. Ensure it is correct.
   - If the user will be authenticated against the settings held locally in the RUEI installation, you are required to specify and confirm a password for the new user. See Section 9.16.4, "Enforcing Password Security Policies" for information about password requirements. Note that the new password must be changed by the user within seven days or they are locked out.
   - Optionally, use the **Disabled** check box to disable the user at this time. You are free to enable them later.

   If you selected user authentication against a configured LDAP server in Figure 9–25, you can click the **Get user data from LDAP** button to retrieve the user's settings from the configured LDAP server.

   When ready, click **Next** to continue. The dialog shown in Figure 9–27 appears.

Figure 9–27 User Permissions



4. Use the check boxes and menus to specify the permissions to be assigned to the new user. The Business and IT access rights are described in Table 1–2. If the new user is assigned less than Inquiry Business and IT access levels, you can use the **Authorize for** menu to specify the specific applications, suites, and services about which the user is authorized to view information within their dashboards. The dashboards facility is described in Section 1.7, "Working with Dashboards". Click **Finish** to create the user definition. You are returned to the user list shown in Figure 9–23.

Note: In addition to the settings described above, there are a number of additional settings (such as language, mailing type, and so on) that are set to their default values when a user is created. These additional settings can also be modified using the procedure described in Section 1.6, "Customizing Your Environment".

9.16.2 Modifying Existing Users

To modify a user definition, select **System**, and then **User management**. The User management panel shown in Figure 9–23 appears. Right click the appropriate user. The context menu shown in Figure 9–28 appears:

Figure 9–28 User Menu

The following options are available:

- **Edit**: allows you to modify a user's definition. This is described in Section 9.16.3, "Modifying a User's Settings".

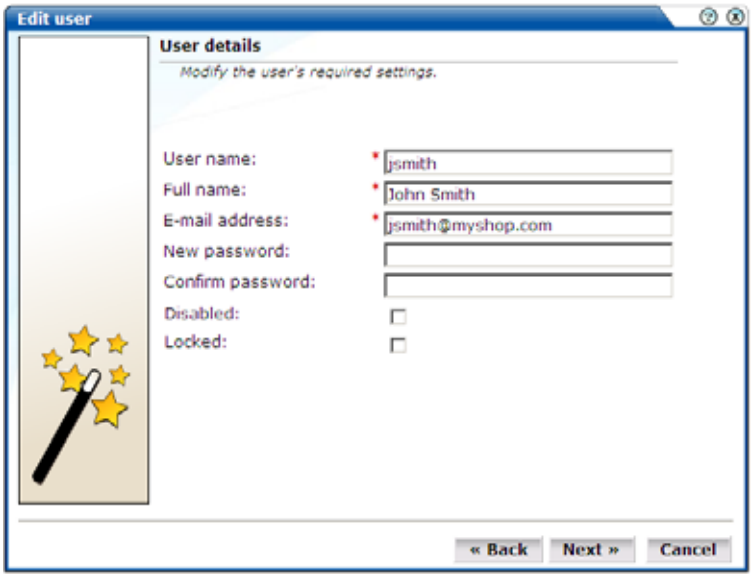
- **Enable/Disable account**: allows you to enable or disable the user account at this time. Note that all currently defined users are disabled when SSO authentication is enabled, and all SSO user accounts are disabled when SSO authentication is disabled.
- **Switch to**: allows you to temporarily change to the selected user. This is useful if you want to view the modules and reports that they are authorized to see. Select **Switch back** from the **View** menu to return to your own role. Note this option is not available when the selected user account is disabled.
- **Remove**: deletes the selected user from the system's user administration. Note that any private reports that the user created are also deleted. However, public reports created by the user remain available to other users.

9.16.3 Modifying a User's Settings

To change the settings for an existing user, do the following:

1. Select the required user within the user list shown in Figure 9–23, and select **Edit**. If an LDAP server connection has been configured (as described in Section 9.16.5, "Configuring LDAP Server User Authentication"), a dialog similar to the one shown in Figure 9–25 appears. Otherwise, the dialog shown in Figure 9–29 appears, and you should continue from step 3.
2. Use the radio buttons to specify whether the user's settings should be authenticated against the settings held in the RUEI installation (this is the default), or against a configured LDAP server. When ready, click **Next**. If an LDAP server is configured, the dialog shown in Figure 9–26 appears. Otherwise, the dialog shown in Figure 9–29 appears.

Figure 9–29 User Details



3. Optionally, modify any of the displayed information. Note that the fields shown with a red asterisk indicate they are mandatory. That is, they can not be left blank.

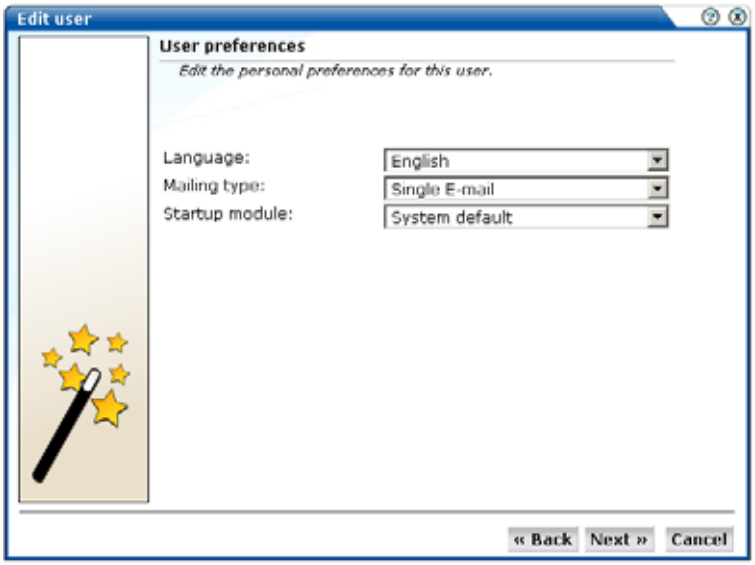
   Note that when modifying an SSO user's account, and SSO authentication is disabled, the account is automatically converted to a locally authenticated account. Therefore, it becomes mandatory to specify and confirm a password for the user.

You can use the **Disabled** check box to prevent the user from using this account. You are free to enable them later. This facility is also useful because, as mentioned earlier, all currently defined user accounts are disabled when SSO authentication is enabled, and all SSO accounts are disabled when SSO authentication is disabled.

Because user accounts are automatically locked after a user has failed to correctly enter their password on five successive attempts, you can use the **Locked** check box to reset it. Password security is described in Section 9.16.4, "Enforcing Password Security Policies". You can use this check box to unlock the user's account. When ready, click **Next**. The dialog shown in Figure 9–30 appears.

Note: If a user's password is changed via this interface, the user must change the password themselves (using the procedure described in Section 1.6, "Customizing Your Environment") within seven days or the account will be locked.

Figure 9–30 User Preferences



4. Optionally, you can modify the following:

   - **Language**: this is the language in which system messages and prompts appear. Currently, only English is available.
   - **Mailing type**: specifies whether the reports the user receives are sent in multiple E-mails (one for each report) or bundled into a single E-mail. The default is multiple E-mails.
   - **Startup module**: specifies the module in which the user starts their session. (For example, Reports, System, or User management). The default is the dashboard (described in Section 1.7, "Working with Dashboards").

   When ready, click **Next**. A dialog similar to the one shown in Figure 9–27 appears.

5. Optionally, use the check boxes and menus to specify the permissions to be assigned to the user. These are explained in Section 1.4, "Understanding User Roles". The Business and IT access rights are described in Table 1–2. If the new user is assigned only Overview Business and IT level access levels, you can use the **Authorize for** menu to specify the specific applications, suites, and services about

which the user is authorized to view information within their dashboards. The dashboards facility is described in Section 1.7, "Working with Dashboards". When ready, click **Finish** for the changes you have made to take effect.

Resetting the Super Administrator Password

In the event that you need to reset the `admin` user password, you can do so using the use of the `set-admin-password.sh` script. This is described in the *Oracle Real User Experience Insight Installation Guide*. Note the new password must be changed (via the procedure described in Section 9.16.3, "Modifying a User's Settings") within seven days.

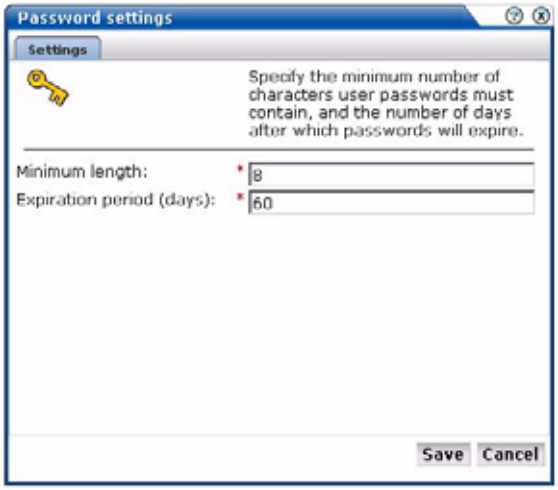
9.16.4 Enforcing Password Security Policies

Each user must be defined and authorized to work with RUEI. The procedure to do this is explained in Section 9.16, "Managing Users and Permissions". In order to optimize the security of your installation, you can use the password settings facility to enforce your organization's security policies. Specifically, you can control the maximum length of user passwords, and how often users are required to change their passwords.

To control your installation's password enforcement, do the following:

1. Select **System**, then **User management**, and click **Password settings**. The dialog shown in Figure 9–31 appears.

Figure 9–31 Password Settings



2. Use the **Password length** field to specify the minimum number of characters that user passwords must contain. The minimum length is eight characters, and the maximum length is 255 characters.
3. Use the **Expiration period** field to specify how often users are required to change their passwords. The default is 60 days. If set to 0, passwords will never expire. The maximum expiration period is 999 days. When ready, click **Save**.

Password Enforcement

When creating and authorizing users, the following rules are automatically enforced:

- Newly created users must change their passwords within seven days. Otherwise, their accounts are locked.

- Users that have their passwords reset by an Administrator must change their passwords (using the procedure described in Section 1.6, "Customizing Your Environment") within seven days.
- User accounts are locked after five failed attempts. The account must be unlocked before the user can logon again (described in Section 9.16.3, "Modifying a User's Settings"). However, locked users will continue to receive mailed reports and alerts.
- If a password's expiration period is set to 0, and later re-set to a non-zero value (or vice versa), all existing user accounts will adapt to the newly specified password expiration period.
- A user password must have a minimum of eight characters. It must contain at least one non-alphanumeric character (such as $, @, &, and !).
- A password cannot include the defined user name, or their first or last name. In addition, the user's last three passwords are also remembered, and cannot be re-used.
- Passwords are case sensitive.

9.16.5 Configuring LDAP Server User Authentication

In order to provide enhanced security, RUEI can be configured to enable user authentication via an LDAP server, rather than through the settings held locally on your RUEI installation. If an LDAP server connection has been configured, you can specify the authentication method to be used for each defined user. Note because the `admin` user is predefined, and their password is set during initial configuration (see the *Oracle Real User Experience Insight Installation Guide*), only local authentication is available for this user.

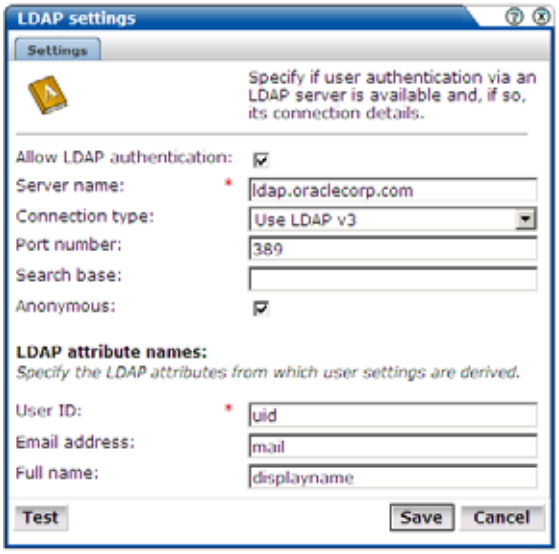
If you plan to use LDAP authentication, it is recommended that you define your LDAP connection *before* the creation of user accounts. This is in order to prevent having to modify previously specified user settings.

Configuring the LDAP Server Connection

To enable LDAP server authentication, do the following:

1. Select **System**, then **User management**, and then click **Configure LDAP connection**. Note that if an LDAP server connection has already been configured, the option is indicated as **Modify LDAP connection**. The dialog shown in Figure 9–32 appears.

Figure 9–32 LDAP settings Dialog



2. Use the **Allow LDAP authentication** check box to specify whether an LDAP server is available for user authentication. The default is unchecked (disabled).
3. Use the **Server name** field to specify the host name or IP address of the LDAP server to be used. Note that protocol information (such as `LDAP://`) should be omitted from the server name.
4. Use the **Connection type** menu to specify the LDAP version and connection method. The default is V2 (non-secure).
5. Use the **Port number** field to specify the port to which the LDAP server is listening. If necessary, discuss this with your System Administrator. The default port is 389 or 636 (for SSL encryption).
6. Use the **Search base** field to specify the location in the directory structure within which the user ID needs to be unique. This must be a valid DN. For performance reasons, this should be as specific as possible. The default is the root of the directory tree.
7. Use the **Anonymous** check box to specify if the LDAP server lookup should be performed using an anonymous user. If unchecked, then a valid Distinguished Name (DN) must be specified, and the password for that user is requested when a new user is created. The default is to use an anonymous lookup.
8. Use the **User ID**, **Email address**, and **Full name** fields to specify the attributes that should be used to extract user settings from the LDAP server. The defaults are based on standard LDAP functionality. If necessary, you should discuss these attributes with your LDAP administrator.
9. Optionally, you can click **Test** to verify whether a working connection to the LDAP server can be made. This is discussed in the following section.

   When ready, click **Save**.

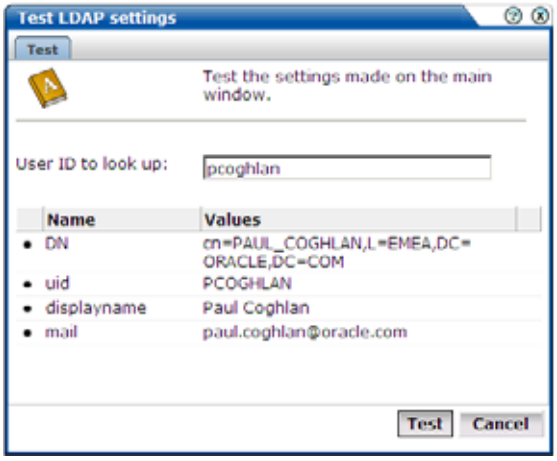
Any changes you specify to the LDAP configuration settings take effect immediately.

Testing the LDAP Server

As mentioned earlier, you can test the connection to the LDAP server. Do the following:

1. Within Figure 9–32, click **Test**. The dialog shown in Figure 9–33 appears.

Figure 9–33 Test LDAP Settings



2. Use the **User ID to look up** field to specify the user ID for which the LDAP server should search. This should be a valid user ID. When ready, click **Test**. Upon successfully finding the specified user's entry in the directory, their retrieved details are displayed. When ready, click **Cancel**. You are returned to the dialog shown in Figure 9–32.

9.16.6 Configuring Oracle Single Sign-On (SSO) User Authentication

In order to provide enhanced security, RUEI can be configured to enable user authentication via an Oracle Single Sign-On (SSO) server, rather than through the use of an LDAP server or the settings held locally on your RUEI installation.

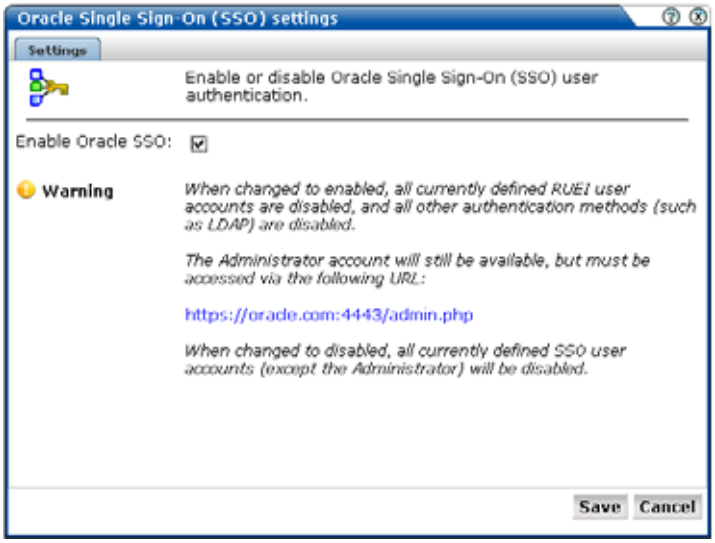
When enabled, RUEI users (other than the `admin` user) are automatically re-directed to the Oracle SSO logon page. They then logon to RUEI through this page, rather than the RUEI login dialog (shown in Figure 1–1). Note because the `admin` user is predefined, and their password is set during initial configuration (see the *Oracle Real User Experience Insight Installation Guide*), only local authentication is available for this user. Note that other users with Administrator privileges still need to logon via the Oracle SSO server.

Activating the SSO Server

To activate the SSO server, do the following:

1. Select **System**, then **User management**, and then click **Configure SSO connection**. Note that if an Oracle SSO server connection has already been activated, the option is indicated as **Modify SSO connection**. A dialog similar to the one shown in Figure 9–34 appears.

Figure 9–34 Oracle Single Sign-On (SSO) Settings Dialog



2. Use the **Enable/Disable Oracle SSO** check box to specify whether an SSO server is available for user authentication. The default is unchecked (disabled). When ready, click **Save**.
3. After enabling or disabling the Oracle SSO server, it is recommended that you logout and logon again to RUEI. This is to ensure that your RUEI installation reflects the change you have made.

Enabling Oracle SSO Authentication

When using an Oracle SSO server for user authentication, it is important to be aware of the following points:

- When users are logged onto multiple SSO-registered applications, and they logout of an application, they are logged out of all other SSO-registered applications, including RUEI. Similarly, when users logout of RUEI, they are logged out of their SSO session.
- When SSO authentication is enabled:
  - LDAP authentication is automatically disabled.
  - It is not possible to change a user's password through the Reporter interface. However, the `admin` user's password can still be changed because, as explained earlier, this is authenticated locally.
  - All currently defined RUEI users are disabled. This includes users (other than the `admin` user) with Administrator privileges.
  - When modifying an existing non- Oracle SSO user account, the user account name is converted to lowercase.
  - The currently defined password policy settings (see Section 9.16.4, "Enforcing Password Security Policies") only apply to the `admin` user. The Oracle SSO server enforces its own defined password policies.
- If the SSO server is not running, or is experiencing problems, users are unable to logon.
- The user name in the Oracle SSO directory *must* be the same as the user name specified in RUEI. Note also that user names are stored in lower case in RUEI, and

any upper case characters in the Oracle SSO user names are automatically converted to lowercase in RUEI.

- As mentioned earlier, the `admin` user remains locally authenticated. In order to logon, they must use the following URL:

  `https://`*`Reporter`*`/`**`admin.php`**

Installing and Configuring the Oracle SSO Server

The facility for user authentication via an Oracle SSO server is not available until the RUEI application has been registered with the Oracle SSO server. The procedure to install and configure the Oracle SSO server for RUEI user authentication is described in the *Oracle Real User Experience Insight Installation Guide*.

9.17 Exporting Enriched Data

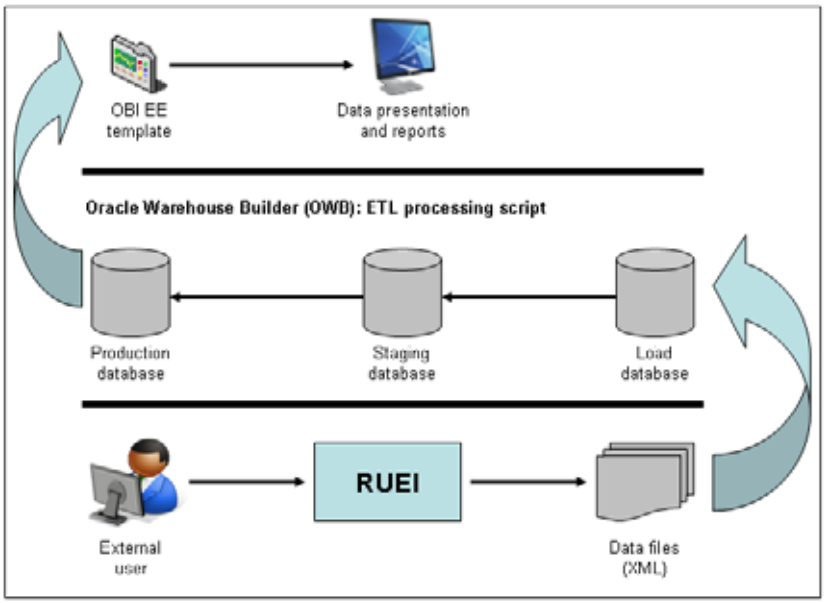
The Enriched data exchange facility enables the alternative analysis of the data collected by RUEI. In particular, it allows you to combine the data collected by RUEI with other data warehouse data. For example, a Customer Relationship Management (CRM) or Business Intelligence (BI) system. Using this facility, you can extract a rich set of collected data, such as product names, shopping basket values, and address information. The external tools should be aware the data is in Unicode (UTF-8) format.

While the facility described in Section 2.11, "Exporting Report Data" is limited to report data, the enriched data exchange facility allows the export of all page-based data. In addition, report data export is based on HTTPS transfer, and Enriched data exchange is based on SFTP file transfer. As described later, you can also customize the content of the exported data to include header information not normally collected by RUEI. Because the exported data is page-based, the available data is restricted to applications, and does not include service-related data.

Example BI Implementation Using Enriched Data Exchange

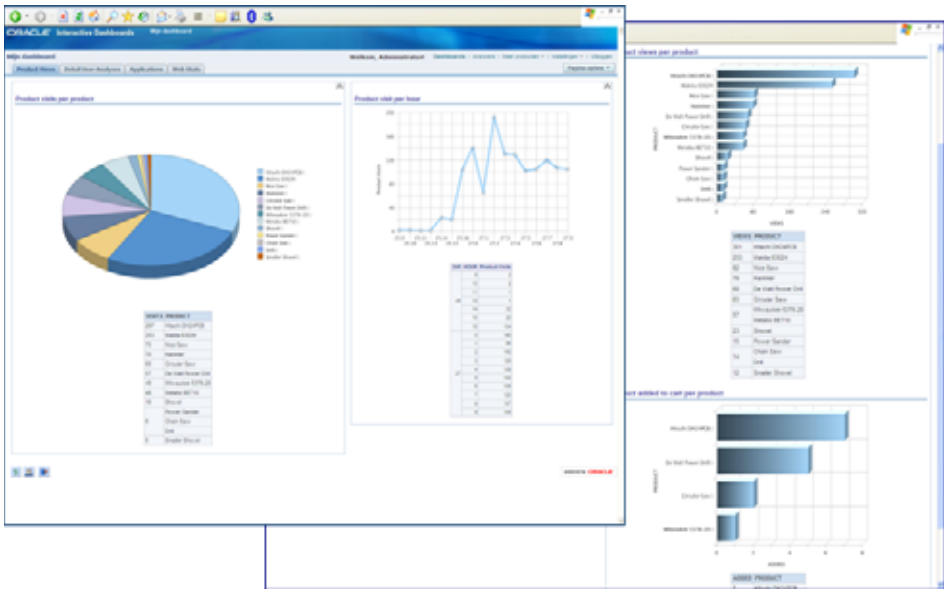
This section presents an outline of a BI solution utilizing data from the Enriched data exchange facility. It makes use of Oracle Business Intelligence foundation (part of the Oracle Fusion Middleware product family). Its schematic structure is shown in Figure 9–35.

Figure 9–35 Schematic Overview of Data Warehouse Staging Area



The framework is based on Oracle Warehouse Builder (OWB). The RUEI-captured data is uploaded to a load database. This, via a staging database, then populates the production database. Once in the production DWH, the RUEI data is available through a wide variety of reports and dashboards. An example of these reports is shown in Figure 9–36.

Figure 9–36 Example BI Dashboard

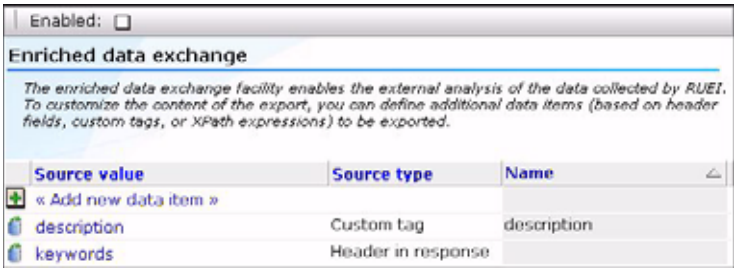


Enabling and Disabling Enriched Data Exchange

To enable Enriched data exchange, do the following:

1. Select **Configuration**, then **Applications**, and then **Enriched data exchange**. The screen shown in Figure 9–37 appears.

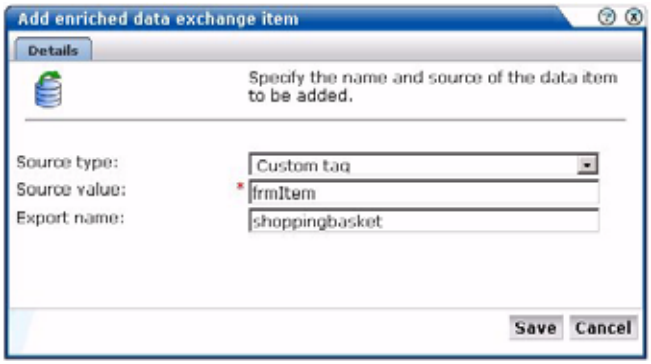
Figure 9–37 Enriched Data Exchange



2. Use the **Enabled** check box to enable or disable the Enriched data exchange facility. By default, it is enabled.

3. Optionally, you can define additional data items to be included in the exported data. Typically, these are elements in the client request or server response headers that are not normally collected by RUEI, but which you want included in the exported data. To do so, click **«Add new item»**. The dialog shown in Figure 9–38 appears.

Figure 9–38 Add Enriched Data Export Item



4. Use the **Search type** menu to define how the required item should be identified within the data collected by RUEI, and the scope of the search. You can specify to search within the client request header or server response header, using either a literal search or an XPath expression, or to search within a custom page-tagging implementation for a specific tag. Further information about support for custom page-tagging schemes is available in Appendix A, "Tagging Conventions".

   Use the **Source value** field to specify the specific argument or element from which the data item's value should be taken.

   Use the **Export name** field to specify the name to be assigned to the data item. This becomes the item's element name. For example, if specify the name "product", any matched data will appear in the export file with the label <product>. Note this field is not available if you select a header-related option in the **Source type** menu.

   When ready, click **Save**. The new data item, if found in the monitored traffic, will start to be reported in the export files within 5 to 10 minutes.

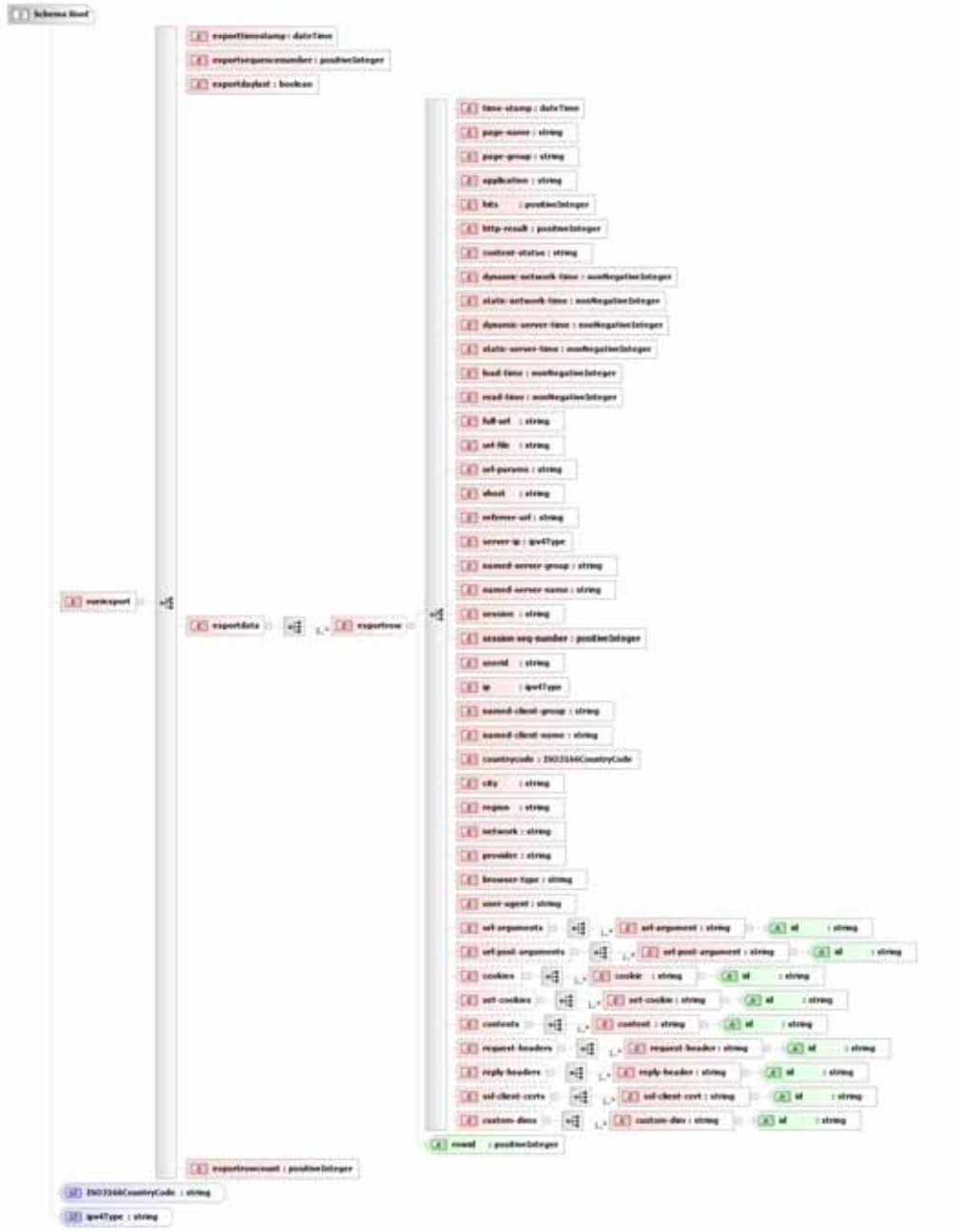
Existing data items can be modified by right-clicking them within Figure 9–37, and selecting **Edit**. You can also select **Remove** to delete it, or select **Remove all** to delete all currently defined items.

Note: The amount of disk space available for export files can also be specified. This is explained in Section 9.6.1, "Defining Reporter Retention Policies".

XML Structure

The exported data is based on pageviews, and is in XML format. This enables its immediate importation into a wide variety of systems. An XSD file defines the structure of the exported XML. The XML schema is shown in Figure 9–39:

Figure 9–39 XML Schema



For an explanation of the standard data items featured in the schema, see Appendix D, "Summary of Data Items".

File location and Naming Structure

When enabled, the Enriched data export facility creates an export file every five minutes. The files are Unicode (UTF-8) encoded. The files are located in the directory `/var/opt/ruei/processor/xml-events/wg/xml-sespage`. Each file within this directory has the following name structure:

yyyymmdd-hhmmss-nnnn`[L|M].xml.gz`

Where:

- *nnnn* represents the file sequence. Because an export file is created every five minutes, 288 files can be created per day. This can range from 0001 to 0289.
- `L` indicates that it is the last file for that day. This always has the file sequence 289, and is used to gather up any open sessions after the 24 hour period.
- `M` indicates that more files are still to follow this file.

By default, exports are retained for a period of seven days before they are automatically deleted. However, this can be configured, as explained in Section 9.5, "Configuring Database and Disk Space Limits and Alerts". In order to access these files, you will need a working FTP file transfer connection to the Reporter system. Consult your System Administrator for further information on this facility.

If required, you can use a symbolic link definition to change the location to which files are exported. Consult your System Administrator for further information on the use of this facility.

Security Considerations

While access to the data generated by the Enriched data exchange facility can be controlled in several different ways at the operating system level, it is recommended that you use SCP / SFTP and create a separate OS user with minimal access rights to the directory containing the exported data. You can then use an `scp` command to copy the data to a local system. For example:

```
scp -r <OS user>@Reporter:/var/opt/ruei/processor/xml-events/wg/xml-sespage/
20080903 .
```

A

Tagging Conventions

This appendix presents a description of the generic tagging conventions supported for use with RUEI.

Note that tags are matched in the order in which they appear in Table A–1. That is, the highest rows take priority over the lower rows. See the section below for information about matching schemes.

Table A–1 Page Tag Matching

Tag	Scheme	Structure[1]
Clicktracks	C	`'?i=%'`
	C	`"?i=%"`
Coremetrics	C	`PageID[\t ]*=[\t ]*'%'`
	C	`PageID[\t ]*=[\t ]*"%"`
	C	`cmCreateTechPropsTag('%'`
	C	`cmCreateTechviewTag('%'`
	C	`cmCreateProductviewTag ('[0-9]*',[\t ]*'%'`
custom function	C	`TAGNAME[\t ]*([\t ]*'%'`
(TAGNAME is function name)	C	`TAGNAME[\t ]*([\t ]*"%"`
custom tag	C	`<TAGNAME>%</TAGNAME>`
(TAGNAME is name)	C	`TAGNAME[\t ]*=[\t ]*'%'`
	C	`TAGNAME[\t ]*=[\t ]*"%"`
Google	C	`_uccn[\t ]*=[\t ]*'%'`
	C	`_uccn[\t ]*=[\t ]*"%"`
	C	`_setCampNameKey[\t]*'%'`
	C	`_setCampNameKey[\t]*"%"`
Hitbox	C	`hbx.pn[\t ]*=[\t ]*'%'`
	C	`hbx.pn[\t ]*=[\t ]*"%"`
Intellitracker	C	`pqry[\t ]*=[\t ]*'%'`
	C	`pqry[\t ]*=[\t ]*"%"`
Omniture	C	`pageName[\t ]*=[\t ]*'%'`
	C	`pageName[\t ]*=[\t ]*"%"`

Table A–1 (Cont.) Page Tag Matching

Tag	Scheme	Structure[1]
Oracle[2]	C	`orainfo.page[\t ]*=[\t ]*'%'`
	C	`orainfo.page[\t ]*=[\t ]*"%"`
	C	`mfinfo.page[\t ]*=[\t ]*'%'`
	C	`mfinfo.page[\t ]*=[\t ]*"%"`
	A	`mfinfo.page=%`
	A	`page=%`
Sitestat	C	`'http://[a-z0-9.-]+/[a-z0-9%.+_ -]+/[a-z0-9%.+_-]+/s?%'`
	C	`"http://[a-z0-9.-]+/[a-z0-9%.+_ -]+/[a-z0-9%.+_-]+/s?%"`
Title	C	`<title[^>]*>%</title>`
	C	`<h1[^>]*>%</h1>`
	C	`<h2[^>]*>%</h2>`
	C	`<h3[^>]*>%</h3>`
URL-structure		
Webtrekk	C	`wt_be[\t ]*=[\t ]*'%'`
	C	`wt_be[\t ]*=[\t ]*"%"`
Webtrends	C	`<meta[\t ]+name="WT.cg_n"[\t ]+content="%"`
	C*	`<meta[\t ]+name="WT.cg_s"[\t ]+content="%"`
XiTi[3]	C	`xtpage[\t ]*=[\t ]*'%'`
	C	`xtpage[\t ]*=[\t ]*"%"`

[1] * is zero (or more) characters of any kind. % is the matching part of the string.

[2] Contains the deprecated Moniforce tagging. Note this does not automatically work for all Oracle products.

[3] In addition to the pipe (|) character, "::" can also be specified as a page group separator.

Page-Group Separator

For all page-tagging schemes listed in Table A–1, the pipe character (|) can be specified within a tag as a page-group separator.

A.1 Matching Schemes

C is matching in content (* is optional).

A is matching an argument in a URL.

% is the matching part of the string.

[...]* indicates zero or more occurrences.

[...]+ indicates one or more occurrences.

[^...]* indicates zero or more exclusive (not) occurrences.

\t indicates a tab character.

Note: Tag matching is case insensitive.

B

Cookie Structures

This appendix provides an overview of the cookie technologies that RUEI supports.

In order to accurately monitor your Web environment, RUEI needs to know and understand the cookie technology you Web site is using. The procedure for specifying the cookie technology is fully described in Section 7.1, "Specifying Cookie Technology".

The structures for supported cookie technologies are shown in Table B–1:

Table B–1 Cookie Structures

Technology	Structure[1]
ADF[2]	`JSESSIONID=%`
Apache	`Apache=%`
ASP	`ASPSESSIONID*=%`
	`ASP.NET_SessionId*=%`
ColdFusion	`CFTOKEN=%`
Google	`__utma=%`
JD Edwards[2,3]	`JSESSIONID=%`
Oracle[4]	`OraTrack=%`
	`MfTrack=%`
	`mf_sess=%`
PeopleSoft[2,3]	`ps_token=%`
PHP	`PHPSESSID=%`
Siebel[2,3]	`_sn=%`
WebLogic Portal (WLP)[2]	`JSESSIONID=%`
WebSphere	`JSESSIONID=%`
(custom)	`CUSTOMNAME`[5]`=%`
(URL argument)	`URLARGUMENT`[6]`=%`

1 * is zero (or more) characters of any kind. % is the matching part of the string.

2 These are implemented as preconfigured custom cookies.

3 These cookies are only available if the relevant accelerator package has been installed.

4 Contains the deprecated Moniforce cookie. Note this does not automatically work for all Oracle products.

5 CUSTOMNAME is the cookie name.

6 URLARGUMENT is the name of the argument in the URL. This is explained in more detail in the following section.

Session Tracking Using URL Arguments

When you specify that a URL argument should be used to track user sessions, the object's URL is first checked for the specified argument. If it is not found, the parent page's URL is searched for the specified argument.

For both the object's and the parent page's URL, the following example URL structure is assumed:

```
www.domainname.com/sitename/shop;;URLARGUMENT=blabla?......
```

If the specified URL argument is not successfully located, the following URL structure is assumed:

```
www.domainname.com/sitename/shop?URLARGUMENT=blabla&......
```

C

Troubleshooting

This appendix highlights the most common problems encountered when using RUEI, and offers solutions to locate and correct them. The information in this appendix should be reviewed before contacting Customer Support.

C.1 Oracle Web Sites

Information on a wide variety of topics is available via the RUEI Web site (http://www.oracle.com/enterprise_manager/user-experience-management.html). It is recommended that you visit it regularly for support announcements.

In addition, detailed technical information is available via the Customer Support Web site (https://metalink.oracle.com). This includes information about service pack availability, FAQs, training material, tips and tricks, and the latest version of the product documentation.

C.2 Contacting Customer Support

If you experience problems with the use or operation of RUEI, you can contact Customer Support. However, before doing so, it is strongly recommended that you create a Helpdesk report file of your configuration. To do so, select **System**, **Configuration**, and then **Helpdesk report**. This file contains extended system information that is extremely useful to Customer Support when handling any issues that you report.

C.3 General (Non-specific) Problems

If you are experiencing problems with the Reporter module, or find its interface unstable, it is recommended that you do the following:

- Clear all caching within your browser, and re-start your browser.
- Examine the error log. This is described in Section 9.9, "Working with the Event Log".
- Reboot the system on which the Reporter is installed.

C.4 Starting Problems

If RUEI does not seem to start, or does not listen to the correct ports, do the following:

- Review your network filter definitions. This is described in Section 8.2, "Defining Network Filters". In particular, ensure that no usual network filters have been applied. This is particularly important in the case of VLANs.
- Ensure that RUEI is listening to the correct protocols and ports. This is described in Section 8.1, "Managing the Scope of Monitoring".

C.5 Delays in Reported Data

It is important to understand that there is a delay associated with the reporting of all monitored traffic. For information shown in the dashboard (so-called real-time data), this delay is 5 minutes. For most other data views (that is, session-based data), this delay is 15 minutes. However, there are two exceptions to this: the all page and the failed URL views. Both of these have delays of 5 minutes. It is important to understand the difference between real-time and session-based data when faced with small differences in what they are reporting. These are fully explained in Section 3.2.1, "Real-Time and Session-Based Data".

C.6 SNMP Alert Issues

If you are experiencing problems with your SNMP alerts (for example, they are not reaching the required users), it is recommended that you do the following:

- Review thoroughly your SNMP notification settings. In particular, ensure that the manager address is correct, you have downloaded and implemented the required MIB definition, and that SNMP notification has been enabled. This is described in Section 9.4, "Configuring System Failure Alerts."
- Check that you have downloaded and installed the latest version of the MIB file.
- Check network connections as a receiver.
- Check the configuration of your SNMP manager.

In addition, be aware that KPI names in SNMP alerts are specified in UTF-8, and not all SNMP managers fully support UTF-8. For further information, please review to your SNMP manager product documentation.

C.7 Text Message Alert Issues

If you are experiencing problems with your text message alerts, it is recommended that you do the following:

- Review thoroughly your text message notification settings. This is described in Section 5.5.7, "Using Text Message Notifications" and Section 9.4, "Configuring System Failure Alerts".
- Contact your text message provider for information about any reported issues.
- Check that your modem is functioning correctly.

C.8 Time Zone Issues

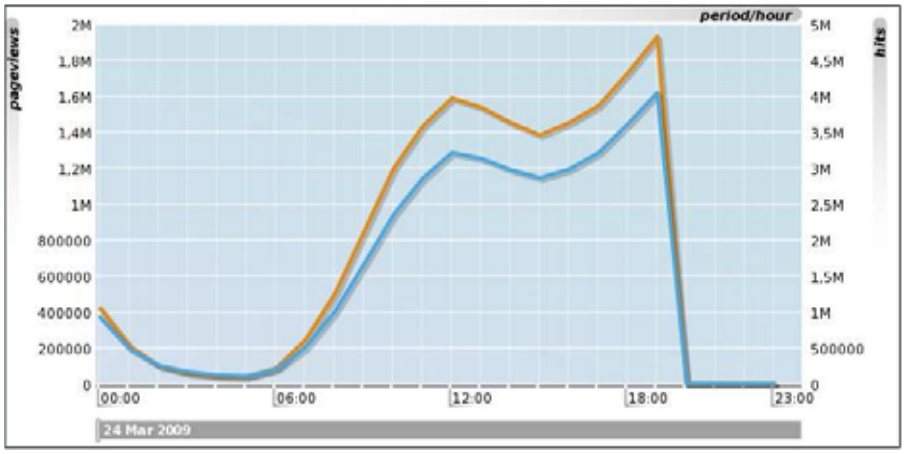
If you are experiencing problems with reported times within the Reporter, you should ensure the required time zone is explicitly set in the [Date] section of the `/etc/php.ini` file. This is fully explained in the *Oracle Real User Experience Insight Installation Guide*. In addition, you should re-start the Apache Web server (logged on as `root`) with the following command:

```
httpd -k restart
```

C.9 Data Monitoring Appears To Have Stopped

When monitoring very high levels of traffic, it can appear from the reported data that RUEI is no longer monitoring network traffic or it is delayed. An example of this is shown in Figure C–1.

Figure C–1 Drop in Reported Network Traffic



This report appears to show that network traffic stopped being monitored at 19:00. In fact, this situation is the result of an overloaded RUEI system. While traffic continues to be monitored, the generated Collector log files cannot be processed due to extremely high traffic levels and insufficient resources.

This can be confirmed by selecting **System**, then **Maintenance**, then **Data processing**, and then click the **Performance** tab. If the reported system load is approaching 100%, then the system is becoming overloaded. The use of this facility is fully described in Section 9.7, "Viewing a Traffic Summary".

As a safeguard against permanently overloaded systems, RUEI automatically stops processing all Collector log files for the previous day approximately 30 minutes after midnight. This enables any backlog to be discarded, and for RUEI to return normal processing levels.

If the situation shown in Figure C–1 persists, it is strongly recommended that you use network filters to limit the level of monitored traffic. This is fully explained in Section 8.2.2, "Limiting Overall Traffic". You might also consider assigning more resources to the RUEI system.

D

Summary of Data Items

This appendix presents a brief explanation of the data items used in RUEI. In addition, it describes some of the more technical aspects to information gathering and reporting within RUEI.

Table D–1 Data Terms

Item	Description
all-service-traffic	The total size (in Mbps) of all service function calls.
all-traffic	The total size (in Mbps) of all pages and their objects.
application / name	The name of the application.
application / page-group	The application page group.
application / page-name	The application page name.
browser-time-per-hit	The total delay time (in milliseconds) per hit due to browser activity at the client end.
calls	The total number of service function calls.
calls-per-min	The total number of service function calls per minute.
calls-per-sec	The total number of service function calls per second.
client-abort-calls	The number of service function calls where the client aborted the transfer because the client closed the connection while the function was still loading.
client-abort-calls(%)	Percentage of service function calls where the client aborted the transfer because the client closed the connection while the function was still loading.
client-abort-pageviews	The number of page views where the client aborted the transfer, possibly because the client closed the browser, or clicked reload, or clicked away, while the page was still loading.
client-abort-pageviews(%)	Percentage of page views where the client aborted the transfer, possibly because the client closed the browser, or clicked reload, or clicked away, while the page was still loading.
client-aborts-per-session	Total number of page views per session where the client aborted the transfer, possibly because the client closed the browser, or clicked reload, or clicked away, while the page was still loading.
client-browser / detail	The name and version of the client browser.
client-browser / type	The name of the client browser.

Table D–1 (Cont.) Data Terms

Item	Description
client-id.group	The group name of the client ID.
client-id.id	The client ID of the client.
client-language / language	The language of the client PC.
client-location / country	The client country (based on the country specified in the provider's DNS record).
client-location / ip	The client IP address.
client-location / network	The client network name (based on the registered IP address range).
client-location / provider	The client provider's name (based on the country specified in the provider's DNS record).
client-origin.city	The client city (based on the city specified in the provider's DNS record).
client-origin.ip	The client IP address.
client-origin.region	The client region (based on the city specified in the provider's DNS record).
client-os / class	The client operating system class name used to visit the site.
client-os / version	The complete operating system name used to visit the site.
client-time-per-call	The total delay time per service function call due to activity at the client end.
concurrent-sessions	The total number of currently active sessions.
content-error	The predefined content string was not found on the page. For example, the page should contain the string "Welcome to our Web site", but this was not found.
content-error-calls	The number of times a content error was determined during a service function call.
content-error-calls(%)	The percentage of service function calls for which a content error was determined.
content-error-pageviews	The number of times a content error was determined upon page display.
content-error-pageviews(%)	The percentage of page views for which a content error was determined upon page display.
content-errors-per-session	The total number of times during a session that a content error was determined upon page display.
content-error-views(%)	The percentage of views for which a content error was determined.
content-ok-calls	The number of times a predefined content string was found during a service function call.
content-ok-calls(%)	The percentage of service function calls for which a predefined content string was found.
content-ok-pageviews	The number of times a predefined content string was found upon page display, or no content string was specified for a page.
content-ok-pageviews(%)	The percentage of page views for which a predefined content string was found upon page display.

Table D–1 (Cont.) Data Terms

Item	Description
content-size-per-call	The size (in bytes) of the content of an object in a service function call.
content-size-per-hit	The size (in bytes) of the content of an object.
content-size-per-page	The total size (in bytes) of all objects (excluding the header) on a page.
cookie-seen(%)	The percentage of page views that could be identified from a session-specific cookie. Sessions that could not be identified via cookies are identified by IP address, in combination with browser-specific information.
domain / name	The domain part of the requested URL.
dynamic-content-size-per-hit	The average content size (in bytes) of dynamic objects.
dynamic-content-size-per-page	The average content size (in bytes) of all dynamic objects on a page.
dynamic-header-size-per-hit	The average size (in bytes) of all dynamic objects in the header part of an HTTP request.
dynamic-header-size-per-page	The average total size (in bytes) of all headers for dynamic objects on a page.
dynamic-hits-per-page	The average number of dynamic objects on a displayed page.
dynamic-network-time-per-hit	The average time (in milliseconds) taken for a dynamic object to travel over the network. Note that this includes both request and response transmission.
dynamic-network-time-per-page	The time (in milliseconds) taken for all dynamic objects within a page to travel over the network. Note that this includes both request and response transmission.
dynamic-server-time-per-hit	The average server response time (in milliseconds) for a dynamic object within a displayed page.
dynamic-server-time-per-page	The average total server response time (in milliseconds) for all dynamic objects within a displayed page.
dynamic-size-per-hit	The average size (in bytes) of a requested dynamic object.
dynamic-size-per-page	The average total size (in bytes) of all dynamic objects within a displayed page.
dynamic-time-per-hit	The average end-to-end time (in milliseconds) for all dynamic objects.
dynamic-time-per-page	The total time (in milliseconds) for all dynamic objects on the page.
end-to-end-time-per-call	The average combined network time and server response time (in milliseconds) for an object within a service function call.
end-to-end-time-per-call-p95	The average combined network time and server response time (in milliseconds) for an object within a service function call, with a percentile limit of 95% applied. This removes extreme values at the highest end and, therefore, provides a more reliable indication.
end-to-end-time-per-hit	The average combined network time and server response time (in milliseconds) for an object within a displayed page.
end-to-end-time-per-page	The average combined network time and server response time (in milliseconds) for all objects within a displayed page.

Table D–1 (Cont.) Data Terms

Item	Description
end-to-end-time-per-page-p95	The average combined network and server response time (in milliseconds) for all objects within a displayed page, with a percentile limit of 95% applied. This removes extreme values at the highest end and, therefore, provides a more reliable indication.
error-calls	The total number of service function calls that for any reason were not successfully invoked.
error-calls(%)	The percentage of service function calls that for any reason were not successfully invoked.
error-pageviews	The total number of page views that for any reason were not successfully displayed.
error-pageviews(%)	The percentage of page views that for any reason were not successfully displayed.
errors-per-session	The total number of service function call errors that occurred during a visitor session.
failed hits	The total number of hits that for any reason resulted in an error.
failed views	Percentage of page views that were not correctly generated by the server. This was because the server did not respond at all, responded with an HTTP result code 400-599, the network timed-out, required content was not found, or a site error has been found.
frustrated-calls	The number of service calls that had an end-to-end time of greater than four times the specified service function call satisfaction threshold.
frustrated-pageviews	The number of page views that took longer than four times the specified page satisfaction threshold to load in the client browser.
header-size-per-call	The average size (in bytes) of the header of a requested object in a service function call.
header-size-per-hit	The average size (in bytes) of the header of a requested object.
header-size-per-page	The average size (in bytes) of the header of a displayed page.
hits	The total number of hits.
hits-per-day	The average number of object requests in a day.
hits-per-min	The total number of hits per minute.
hits-per-sec	The total number of hits per second.
hits-per-session	The average total number of requested objects during a client session.
http-error-calls	The number of service function calls where the website did not respond, or responded with the HTTP result 400-599.
http-error-calls(%)	The percentage of service function calls that for any reason were not successfully invoked.
http-error-pageviews	The number of page views where the Web site did not respond, or responded with the HTTP result 400-599.
http-error-pageviews(%)	The percentage of page views where the Web site did not respond, or responded with the HTTP result 400-599.

Table D–1 (Cont.) Data Terms

Item	Description
http-ok-calls	The number of service function calls where the website did not respond, or responded with the HTTP result 400-599.
http-ok-calls(%)	The percentage of service function calls where the website did not respond, or responded with the HTTP result 400-599.
http-ok-pageviews	The number of page views where no HTTP errors occurred. That is, the server responded with the HTTP result 100-399.
http-ok-pageviews(%)	The percentage of page views where no HTTP errors occurred. That is, the server responded with the HTTP result 100-399.
kpi-avg-value	The average value of a KPI.
kpi-downtime	The total downtime (in minutes) for a KPI.
kpi-failures(%)	The percentage of time the KPI spent in a failing state.
kpi-max-target	The maximum target for the KPI.
kpi-min-target	The minimum target for the KPI.
kpi-success	Indicator of the KPI's current status.
kpi-success(%)	The percentage of time the KPI spent in a successful state.
kpi-uptime	The total uptime (in minutes) for a KPI.
named-client-location / group	The group name assigned to the client IP address or range.
named-client-location / ip	The IP address or range of the client.
named-client-location / name	The name assigned to the client IP address or range.
named-server-location / group	The group name of the Web server.
named-server-location / ip	The IP address or range of the Web server.
named-server-location / name	The name of the Web server.
network-error	Network errors are hits which were not delivered completely from the TCP level view. Possible reasons are a server-related problem with the connection, or a server time-out occurs when a server fails to respond to a client request.
network-error-calls	The number of times a network error was determined during a service function call.
network-error-calls(%)	The percentage of times a network error was determined during a service function call.
network-error-pageviews	The number of times a network error was determined upon page display.
network-error-pageviews(%)	The percentage of times a network error was determined upon page display.
network-errors-per-session	The number of times a network error was determined.
network-error-views(%)	The percentage of times a network error was determined during a service function call.
network-ok-calls	The number of service function calls were no network error was determined.
network-ok-calls(%)	The percentage of service function calls during which no network error was determined.
network-ok-pageviews	The number of pages were no network error was determined during page display.

Table D–1 (Cont.) Data Terms

Item	Description
network-ok-pageviews(%)	The percentage of page views during which no network error was determined.
network-timeout-calls	The number of service function calls during which a network time-out occurred.
network-timeout-calls(%)	The percentage of service function calls during which a network time-out occurred.
network-timeout-pageviews	The number of page views during which a network time-out occurred.
network-timeout-pageviews(%)	The percentage of page views during which a network time-out occurred.
network-time-per-call	The average time (in milliseconds) taken for an object to reach the client browser after response from the server during a service function call.
network-time-per-call-p95	The average time (in milliseconds) taken for an object to reach the client browser after response from the server during a service function call, with a percentile limit of 95% applied. This removes extreme values at the highest end and, therefore, provides a more reliable indication.
network-time-per-hit	The average time (in milliseconds) taken for an object to reach the client browser after response from the server.
network-time-per-page	The average time (in milliseconds) taken for a page to reach the client browser after reply from the server.
network-time-per-page-p95	The average time (in milliseconds) taken for a page to reach the client browser after response from the server, with a percentile limit of 95% applied. This removes extreme values at the highest end and, therefore, provides a more reliable indication.
object-delivery / detail	Either successful delivery or the return code or reason why the page failed.
object-delivery / type	If not successfully delivered, the category of error (Web site, network, or server) or other reason.
objects-per-day	The average number of requested objects for displayed pages in a day.
objects-per-page	The average number of requested objects for a displayed page.
object-type / class	The classification of the object.
object-type / extension	The file extension of the object.
object-type / type	The object type (static or dynamic).
object-url / full-url	The full URL of the object. That is, the domain, directories, and parameters.
object-url / group	The page group.
object-url / url	The URL without domain or arguments.
page-delivery / detail	If not successfully delivered, the return code or reason why the page failed.
page-delivery / type	If not successfully delivered, the category of error (Web site, network, server, or content) or other reason.

Table D–1 (Cont.) Data Terms

Item	Description
page-load-time	The average loading time (in seconds) per page. This is the elapsed time from the first object until the last object for the page has been delivered.
page-load-time-p95	The average loading time (in seconds) per page, with a percentile limit of 95% applied. This removes extreme values at the highest end and, therefore, provides a more reliable indication.
page-read-time	The average time (in seconds) from which the last requested object for a page has been loaded into the client browser, and the client requests another page.
page-read-time-p95	The average time (in seconds) from which the last requested object for a page has been loaded into the client browser, and the client requests another page, with a percentile limit of 95% applied. This removes extreme values at the highest end and, therefore, provides a more reliable indication.
page-url / full-url	The full page URL. That is, the domain, directories, and parameters. Note that this is case-sensitive.
page-url / group	The page group.
page-url / url	The page URL with domain or arguments.
pageviews	The total number of page views.
pageviews-per-day	The average number of page views per day.
pageviews-per-hour	The average number of page views per hour.
pageviews-per-min	The total number of pageviews per minute.
pageviews-per-session	The average total number of different page views per session. This is determined by only counting the first time that a page is viewed, and excluding any repeat views of the same page.
pageviws-per-sec	The total number of pageviews per second.
period / 5min	5-minute (and hour).
period / day	Day (and month).
period / hour	Hour (and day).
period / month	Month (and year).
period / year	Year.
referrer / domain	The domain of the referrer URL.
referrer / url	The full referrer URL. That is, the domain, directories, and parameters.
reply-content-size-per-call	The average size (in bytes) of the response body for an object in a service function call.
reply-content-size-per-hit	The average size (in bytes) of the response body for an object.
reply-header-size-per-call	The average size (in bytes) of the response header for an object in a service function call.
reply-header-size-per-hit	The average size (in bytes) of the response header for an object.
reply-size-per-call	The average size (in bytes) of the response header and body for an object in a service function call.

Table D–1 (Cont.) Data Terms

Item	Description
reply-size-per-hit	The average size (in bytes) of the response header and body for an object.
request-content-size-per-call	The average size (in bytes) of the request body for an object in a service function call.
request-content-size-per-hit	The average size (in bytes) of the request body for an object.
request-header-size-per-call	The average size (in bytes) of request header for an object in a service function call.
request-header-size-per-hit	The average size (in bytes) of request header for an object.
request-size-per-call	The average size (in bytes) for the request header and body for an object in a service function call.
request-size-per-hit	The average size (in bytes) for the request header and body for an object.
request-time-per-call	The average response time (in milliseconds) for a service function call.
request-time-per-hit	The average time taken (in milliseconds) for an object.
satisfied-calls	The number of service function calls that had an end-to-end time (that is, all server and network times) below the specified threshold.
satisfied-pageviews	The number of page views that were loaded into the client browser within the defined page loading satisfaction threshold.
server-abort-calls	The number of times a server abort was determined during a service function call. This can arise for a number of reasons, including the server reset the connection, the server sent incorrect data, or the client disappeared unexpectedly.
server-abort-calls(%)	The percentage of service function calls for which a server abort was determined.
server-abort-pageviews	The number of times a server abort was determined upon page display. This can arise for a number of reasons, including the server reset the connection, the server sent incorrect data, or the client disappeared unexpectedly.
server-abort-pageviews(%)	The percentage of page views for which a server abort was determined upon display.
server-error	Server errors are hits that result in an HTTP error code 500-599.
server-error-calls	The number of times a server error was determined during a service function call.
server-error-calls(%)	The percentage of service function calls for which a server abort was determined.
server-error-pageviews	The number of times a server error was determined upon page display.
server-error-pageviews(%)	The percentage of page views for which a server error was determined upon display.
server-errors-per-session	The average number of server errors that were determined upon page display during a session.
server-error-views(%)	The percentage of service errors in a view.
server-load	The total time spent on server (to process traffic) per second.

Table D–1 (Cont.) Data Terms

Item	Description
server-timeout-calls	The number of server time-outs that were determined during a service function call. A server time-out occurs when a server fails to reply to a client request. That is, no response, or part there of, is ever sent.
server-timeout-calls(%)	The number of server time-outs that were determined during a service function call, with a percentile limit of 95% applied. This removes extreme values at the highest end and, therefore, provides a more reliable indication. A server time-out occurs when a server fails to reply to a client request. That is, no response, or part there of, is ever sent out.
server-timeout-pageviews	The number of server time-outs that were determined upon page display. A server time-out occurs when a server fails to reply to a client request. That is, no response, or part there of, is ever sent.
server-timeout-pageviews(%)	The number of server time-outs that were determined upon page display, with a percentile limit of 95% applied. This removes extreme values at the highest end and, therefore, provides a more reliable indication. A server time-out occurs when a server fails to reply to a client request. That is, no response, or part there of, is ever sent out.
server-time-per-call-p95	The average server response time (in milliseconds) per service function call, with a percentile limit of 95% applied. This removes extreme values at the highest end and, therefore, provides a more reliable indication.
server-time-per-cell	The average server response time (in milliseconds) per service function call.
server-time-per-hit	The average server response time (in milliseconds) per hit.
server-time-per-page	The average server response time (in milliseconds) per page.
server-time-per-page-p95	The average server response time (in milliseconds) per page, with a percentile limit of 95% applied. This removes extreme values at the highest end and, therefore, provides a more reliable indication.
service.function-group	The service function group.
service.function-name	The service function name.
service.name	The name of the service.
service-delivery.detail	If not successfully delivered, the return code or reason why the function failed.
service-delivery.type	If not successfully delivered, the category of error (Web site, network, server, or content) or other reason.
service-server-load	The total time spent on server (to process service function calls) per second.
service-throughput	The total service function call throughput on the server (in KB/sec).
session-duration	The average session duration (in seconds).
session-load-time	The average time (in seconds) spent loading pages per session.
session-read-time	The average time (in seconds) spent viewing pages per session.

Table D–1 (Cont.) Data Terms

Item	Description
sessions	The number of sessions. Each time that a visitor comes to your Web site (after a gap of at least 15 minutes) a session is counted.
sessions-on-first-step	The number of sessions on the first transaction step.
sessions-on-last-step	The number of sessions on the last transaction step.
sessions-on-step	The number of sessions on the selected transaction step.
sessions-per-day	The average number of sessions per day.
session-time-per-page	The average session duration (in milliseconds) for a page view.
session-time-per-page-p95	The average time (in seconds) between page requests within sessions, with a percentile of 95% applied. This removes extreme values at the highest end and, therefore, provides a more reliable indication.
size-per-call	The average size (in bytes) of the request and response for an object in a service function call.
size-per-hit	The average size (in bytes) of the request and response for an object.
sla-daily-result	The average daily value of an SLA.
sla-daily-target(%)	The defined daily level of the SLA's service agreement.
sla-downtime	The total downtime of an SLA (in minutes).
sla-failures(%)	The percentage of SLA failure.
sla-fri	Indicates whether an SLA was successfully achieved for all Fridays.
sla-hourly-result	Indicates whether the SLA was successfully achieved on a hourly basis.
sla-hourly-target(%)	The defined hourly level of the SLA's service agreement.
sla-max-value	The maximum target for the SLA.
sla-min-value	The minimum target for the SLA.
sla-mon	Indicates whether an SLA was successfully achieved for all Mondays.
sla-monthly-result	Indicates whether the SLA was successfully achieved on a monthly basis.
sla-monthly-target(%)	The defined monthly level of the SLA's service agreement.
sla-result	Indicates whether the SLA has been achieved for the selected period.
sla-sat	Indicates whether an SLA was successfully achieved for all Saturdays.
sla-success(%)	The percentage of SLA success for the selected period.
sla-sun	Indicates whether an SLA was successfully achieved for all Sundays.
sla-target(%)	The defined level of the SLA's service agreement.
sla-thu	Indicates whether an SLA was successfully achieved for all Thursdays.

Table D–1 (Cont.) Data Terms

Item	Description
sla-tue	Indicates whether an SLA was successfully achieved for all Tuesdays.
sla-uptime	The total time (in minutes) that the SLA has been up.
sla-wed	Indicates whether an SLA was successfully achieved for all Wednesdays.
sla-weekly-result	Indicates whether the SLA was successfully achieved on a weekly basis.
sla-weekly-target(%)	The defined weekly level of the SLA's service agreement.
sla-yearly-result	Indicates whether the SLA was successfully achieved on a yearly basis.
sla-yearly-target(%)	The defined yearly level of the SLA's service agreement.
static-content-size-per-hit	The average size (in bytes) of a requested static object within the body.
static-content-size-per-page	The average total size (in bytes) of all static objects within the header of a page.
static-header-size-per-hit	The size (in bytes) of all static objects within the header of an object.
static-header-size-per-page	The average total size (in bytes) of all static objects within the header of a page.
static-hits-per-page	The average number of static objects on a displayed page.
static-network-time-per-hit	The average time (in milliseconds) taken for a static object to reach the client browser after reply from the server.
static-network-time-per-page	The average time (in milliseconds) taken for all static objects within a page to reach the client browser after reply from the server.
static-server-time-per-hit	The average server response time (in milliseconds) for a static object within a displayed page.
static-server-time-per-page	The average total server response time (in milliseconds) for all static objects within a displayed page.
static-size-per-hit	The average size (in bytes) of a requested static object.
static-size-per-page	The average total size (in bytes) of all static objects within a displayed page.
static-time-per-hit	The average end-to-end time (in milliseconds) for all dynamic objects. That is, the sum of their network and server response times.
static-time-per-page	The average end-to-end time (in milliseconds) for all static objects on the page. That is, the sum of their network and server response times.
step-nr	The sequence of a step within a transaction.
throughput	Total throughput on the server (in KB/sec).
tolerating-calls	The number of service function calls that had an end-to-end time (that is, all server and network times) of less than four times the specified service function call satisfaction threshold, but higher than the threshold. That is, the function calling, while not optimal, was tolerable.

Table D–1 (Cont.) Data Terms

Item	Description
tolerating-pageviews	The number of page views that were loaded into the client browser within a time greater than the defined page loading satisfaction threshold, but less four times this threshold. That is, the page loading, while not optimal, was tolerable.
total-browser-time	The time taken (in milliseconds), after receipt, for a page to be loaded by the client browser.
total-client-time	The total delay time (in milliseconds) due to activity at the client end.
total-content-size	The body size (in bytes) of the page.
total-cookie-ok-pageviews	The number of page views for which an associated cookie was successfully used.
total-dynamic-content-size	The total body size (in bytes) for all dynamic objects.
total-dynamic-header-size	The total header size (in bytes) for all dynamic objects.
total-dynamic-hits	The total number of dynamic objects.
total-dynamic-network-time	The total network time (in milliseconds) taken for all dynamic objects.
total-dynamic-server-time	The total server response time (in milliseconds) taken for all dynamic objects.
total-dynamic-size	The total size (in bytes) for all dynamic objects.
total-dynamic-time	The total time (in milliseconds) for all dynamic objects.
total-end-to-end-time	The total end-to-end time (in milliseconds). This includes both the network transfer time and the server response time.
total-header-size	The header size (in bytes) of the page.
total-network-time	The total network transfer time (in milliseconds).
total-object-size-per-page	The average total size (in bytes) for all objects within a page view.
total-page-load-time	The total time (in milliseconds) for all page views to be processed by the client browser.
total-page-read-time	The total time (in seconds) from which the last requested object for a page has been loaded into the client browser and the client requests another page.
total-reply-content-size	The total size (in bytes) of all response body parts.
total-reply-header-size	The total size (in bytes) of all response header parts.
total-reply-size	The total size (in bytes) of all replies, including both header and body.
total-request-content-size	The total size (in bytes) of all request body parts.
total-request-header-size	The total size (in bytes) of all request header parts.
total-request-size	The total size (in bytes) of all requests, including both header and body.
total-request-time	The total time (in milliseconds) for all requests.
total-server-time	The total server response time (in milliseconds).
total-session-time	The total time (in seconds) of all sessions.
total-static-content-size	The total size (in bytes) of all static object body sections.

Table D–1 (Cont.) Data Terms

Item	Description
total-static-header-size	The total size (in bytes) of all static header sections.
total-static-hits	The total number of all static objects.
total-static-network-time	The total network transfer time (in milliseconds) of all static objects.
total-static-server-time	The total server response time (in milliseconds) of all static objects.
total-static-size	The total size (in bytes) of all static objects, including header and body.
total-static-time	The total network and server time (in milliseconds) for all static objects.
total-traffic	The total size (in bytes) of all pages and their objects.
total-transfer-time	The total time (in milliseconds) taken to reach the client after reply from the server.
traffic-per-day	The average size (in bytes) of all pages and their objects.
traffic-per-session	The average total size (in bytes) of all pages and their objects during the session.
transaction.group	The group of the transaction.
transaction.name	The name of the transaction.
transaction.step	The step name of the transaction.
transaction-completion(%)	The percentage of transactions started during sessions that were successfully completed.
transaction-end-to-end-time	The total combined network and server response time (in milliseconds) for all pages in the transaction.
transaction-load-time	The total loading time (in milliseconds) for all pages in the transaction.
transaction-network-time	The total network transfer time (in milliseconds) for all pages in the transaction.
transaction-overviews / transaction-steps	The steps in the transaction.
transaction-pageviews	The number of page views within the transaction.
transaction-read-time	The total (in seconds) for all pages in a transaction between the last requested object for a page being loaded into the client browser and the client requesting the another page.
transactions-completed-per-min	The number of completed transactions per minute.
transaction-server-time	The total server response time (in milliseconds) for all pages in the transaction.
transaction-session-time	The total time (in seconds) of all sessions in the transaction.
transactions-started-per-min	The number of started transactions per minute.
transaction-visit-time	The total time (in seconds) a client spent on a transaction. That is, until they either successfully completed it, or abandoned it.
transfer-time-per-call	The average time (in milliseconds) taken for a service function call to reach the client after reply from the server.

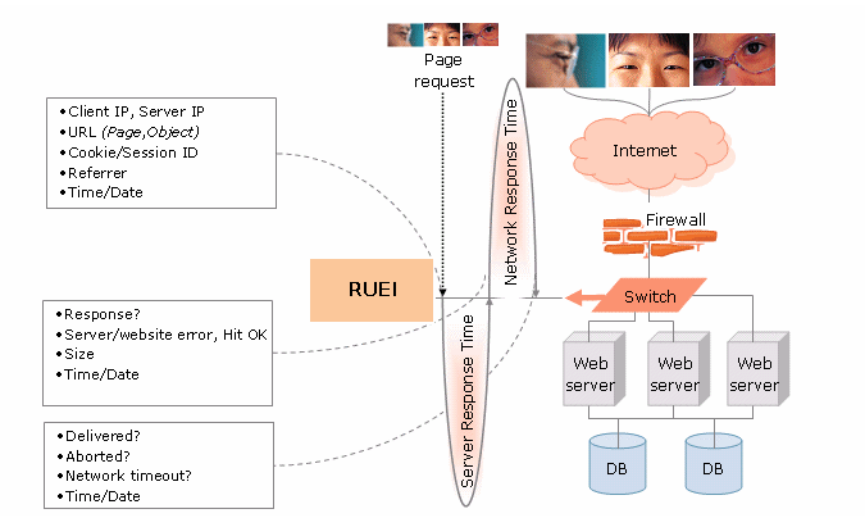
Table D–1 (Cont.) Data Terms

Item	Description
transfer-time-per-hit	The average time (in milliseconds) taken for an object to reach the client browser after reply from the server.
user-id / id	The user ID of the user (if logged on to your Web site).
views-on-first-step	The number of page views on the first transaction step.
views-on-last-step	The number of page views on the last transaction step.
views-on-step	The number of page views on the transaction step.
website-error	Web site errors are hits that result in an HTTP error code 400-499.
website-error-calls	The number of times a website error was determined during a service function call.
website-error-calls(%)	The percentage of service function calls during which a network website error occurred.
website-error-pageviews	The number of times a Web site error was determined upon page display.
website-error-pageviews(%)	The percentage of page views during which a network Web site error occurred.
website-errors-per-session	The average number of times a Web site error was determined upon page display during a session.
website-error-views(%)	The percentage of views during which a network website error occurred.

D.1 Data Collection

When an object is requested by a visitor, RUEI sees the request and measures the time the Web server requires to present the visitor with the requested object. At this point, RUEI knows who requested the page (the client IP), which object was requested, and from which server the object was requested (server IP). This is shown in Figure D–1.

Figure D–1 RUEI Data Monitoring



When the Web server responds and sends the requested object to the visitor, RUEI sees that response. At this point, RUEI can see whether there is a response from the server,

whether this response is correct, how much time the Web server required to generate the requested object, and the size of the object.

In addition, RUEI can also see whether the object was completely received by the visitor, or if the visitor aborted the download (that is, proof of delivery). Hence, RUEI can determine the time taken for the object to traverse the Internet to the visitor, and calculate the Internet throughput between the visitor and the server (that is, the connection speed of the visitor).

D.1.1 Dynamic and Static Content

Objects requested from a server are either dynamic or static. Dynamic objects are generated live by the server, and are identified by file extensions such as php, php3, php4, asp, aspx, and so on. Static objects are already available for download with no further server action required. These are generally graphic, video, or document files. Note that dynamically-generated objects are typically much more server intensive than static objects. Table D–2 shows a complete list of the object file extensions that are recorded as static.

Table D–2 Static Object File Extensions

Extension	Extension	Extension
.7z	.aac	.aaf
.ace	.ani	.arc
.arj	.atom	.au
.avi	.bmp	.bz2
.cab	.class	.css
.cur	.dat	.deb
.divx	.docx	.dot
.dotx	.dtd	.flv
.gif	.gz	.htm
.html	.ico	.iso
.jar	.java	.jpeg
.jpg	.js	.lzh
.m4a	.m4p	.mid
.mpe	.mpeg	.mpg
.mov	.mp4	.ogg
.par	.par2	.pdf
.ppt	.properties	.ra
.rar	.rm	.rss
.rtf	.svg	.swa
.swf	.tar	.tar
.tiff	.tgz	.ttf
.txt	.wav	.wma
.wma	.xhtm	.xhtml
.xls	.xml	.xsl

Table D–2 (Cont.) Static Object File Extensions

Extension	Extension	Extension
.xslt	.z	.zip

Table D–3 shows a complete list of the object file extensions that are explicitly recorded as dynamic. Note that all object file extensions not listed in Table D–2 are also recorded as dynamic.

Table D–3 Dynamic Object File Extensions

Extension	Extension	Extension
.asp	.aspx	.cfm
.cgi	.jsp	.php
.php3	.php4	.php5
.phtml	.pl	

D.1.2 Forced Objects

The file extensions shown in Table D–4 are used for forced objects. This means that objects with these file extensions will always be recorded as objects, and not pages. This is regardless of the response time, or any errors that are reported for it.

Table D–4 Object File Extensions

Extension	Extension	Extension
.bmp	.class	.css
.dat	.doc	.gif
.ico	.jar	.jpeg
.jpg	.js	.mid
.mpeg	.mpg	.png
.ppt	.properties	.swf
.tif	.tiff	.xls

D.1.3 Page and Hit Correlation

Note the correlation of pages and hits is performed on a time basis, and a page and its hits can never have a time difference longer than 15 seconds. A hit gap of longer than 15 seconds means that the hit is no longer considered part of its associated page. In addition, the system recognizes redirects, and correlates this data to the next page view.

Be aware that any download (such as a PDF or large graphics file) that takes longer than 5 minutes to be completed is discarded by RUEI, and not reported. This is regardless of whether or not the download was successful.

D.1.4 End-to-end, Server, and Network Times

The time taken for a requested object to arrive at the client side is called the end-to-end (or e2e) time. It comprises two parts:

- Server time: the time taken by the server to generate the response.
- Network time: the time taken required for the response to travel from the server to the client.

D.1.5 Browser Loading and Page Reading Times

As each object within a requested page is received at the client browser, there is sometimes a delay before the browser can start to process and load it. This is known as the browser load time. Once all objects have been loaded, the page is displayed in the client browser. The time from this moment until the next page request is known as the page read (or idle) time. It is the time the client users to review the requested page, and is set to a maximum of two minutes.

D.1.6 Reported Page Views

Be aware that the reported number of page views for a specific or hour can differ depending on the Data browser group you are using. The structure of the information available within the Data browser is explained in Section 3.2, "Understanding the Data Structure". In particular, it is calculated slightly differently between the All sessions group and the All pages group. This is illustrated in Table D–5:

Table D–5 Page View Reporting in the All Pages and All Sessions Groups

Time	Visited pages		Reported no. of page views	
	Visitor 1	**Visitor 2**	**All pages**	**All sessions**
00:00	A, B	A, B, C	5 (Visitor 1: A,B,A) Visitor 2: B,C)	0
00:15	C, D	A	3 (Visitor 1: C,D) (Visitor 2: A)	0
00:30	E	B	2 (Visitor: 1E) (Visitor 2: B)	0
00:45	F	C	2 (Visitor: F) (Visitor: C)	0
01:00	-	D	1 (Visitor 2: D)	6 (Visitor 1: A,B,C,D,E,F)
01:15	D	-	1 (Visitor 1: D)	7 (Visitor 2: A,B,C,A,B,C,D)
01:30	F	A	2 (Visitor 1: F) (Visitor 2: A)	0
01:45	-	-	- 	3 (Visitor 1: D,F) (Visitor 2: A)
	8	8	16	16

Table D–5 shows the visited page history of two users. As both visitors browse the monitored Web site, the number of pages they have visited are immediately recorded in the All pages group. For example, between 00:00 and 00:15 they had visited five pages. However, because these sessions are still active, they are not yet recorded within the All sessions group. That happens between 01:00 and 01:15, together with the other pages visited in that session.

As the two visitors' sessions progress, the number of visited pages is preserved. Because the All sessions group waits until each is regarded as finished, the related page history is recorded against a later time interval than in the All pages group. However, as can be seen in the totals at the bottom of Table D–5, after both sessions have finished, the total number of page visits reported in each group is the same.

Typically, the All pages group is used for functional analysis, (such as performance monitoring), while the All sessions group is used to identify issues are impacting users.

Finally, be aware that the page views for a session are recorded for the current day when they arrive at least 30 minutes before 12 PM. Thereafter, they are treated as belonging to a new session. Therefore, small differences can arise between reported page views in real-time data (such as the dashboard) and session-based groups.

D.1.7 Dimension Level Values

All dimension level values are limited to 255 characters. If a value is longer than this, it is automatically truncated. Note that truncated data is indicated by ending with an ellipse (…). This restrictions does not apply within the Session diagnostics facility on object level, or to posted form content.

D.1.8 Network Traffic Compression

RUEI can monitor compressed network traffic. Currently, it supports the DEFLATE (zlib) and gzip compression algorithms. Be aware that information about error messages encountered by users is written to the Session diagnostics replay facility (see Section 3.9, "Working With the Session Diagnostics Facility") "as is", and are not decompressed until requested to be viewed. The ability to correctly display such information depends on your browser’s capabilities. While Internet Explorer and Mozilla Firefox are fully supported for this purpose, the use of other (unsupported) browsers may present difficulties.

E

Explanation of Failure Codes

This appendix explains the HTTP result codes, provided by the Web server, that can be send to visitors as replies to requests.

E.1 Failure website-error

The 4xx class of status code is intended for cases in which the client seems to have erred. Except when responding to a HEAD request, the server should include an entity containing an explanation of the error situation, and whether it is a temporary or permanent condition. These status codes are applicable to any request method. User agents should display any included entity to the user.

If the client is sending data, a server implementation using TCP should be careful to ensure that the client acknowledges receipt of the packet(s) containing the response, before the server closes the input connection. If the client continues sending data to the server after the close, the server's TCP stack will send a reset packet to the client, which may erase the client's unacknowledged input buffers before they can be read and interpreted by the HTTP application.

E.1.1 Failure website-error http-bad-request (400)

The request could not be understood by the server due to malformed syntax. The client should not repeat the request without modifications.

E.1.2 Failure website-error http-unauthorized (401)

The request requires user authentication. The response must include a WWW-Authenticate header field (RFC 2616 document, section 14.47) containing a challenge applicable to the requested resource. The client may repeat the request with a suitable Authorization header field. If the request already included Authorization credentials, then the 401 response indicates that authorization has been refused for those credentials. If the 401 response contains the same challenge as the prior response, and the user agent has already attempted authentication at least once, then the user should be presented with the entity that was specified in the response, because that entity might include relevant diagnostic information.

E.1.3 Failure website-error http-payment-req (402)

Currently, this code is not implemented by most Web servers. It is reserved for future use.

E.1.4 Failure website-error http-forbidden (403)

The server understood the request, but is refusing to fulfil it. Authorization will not help, and the request should not be repeated. If the request method was not HEAD and the server wishes to make public why the request has not been fulfilled, it should describe the reason for the refusal in the entity. If the server does not wish to make this information available to the client, the status code 404 (Not Found) can be used instead.

E.1.5 Failure website-error http-not-found (404)

The server has not found anything matching the Request-URI. No indication is given of whether the condition is temporary or permanent. The 410 (Gone) status code should be used if the server knows, through some internally configurable mechanism, that an old resource is permanently unavailable and has no forwarding address. This status code is commonly used when the server does not wish to reveal exactly why the request has been refused, or when no other response is applicable.

E.1.6 Failure website-error http-method-not-allowed (405)

The method specified in the Request-Line is not allowed for the resource identified by the Request-URI. The response must include an Allow header containing a list of valid methods for the requested resource.

E.1.7 Failure website-error http-not-acceptable (406)

The resource identified by the request is only capable of generating response entities which have content characteristics not acceptable according to the accept headers sent in the request.

Unless it was a HEAD request, the response should include an entity containing a list of available entity characteristics and location(s) from which the user or user agent can choose the one most appropriate. The entity format is specified by the media type given in the Content-Type header field. Depending upon the format and the capabilities of the user agent, selection of the most appropriate choice may be performed automatically. However, this specification does not define any standard for such automatic selection.

HTTP / 1.1 servers are allowed to return responses which are not acceptable according to the accept headers sent in the request. In some cases, this may even be preferable to sending a 406 response. User agents are encouraged to inspect the headers of an incoming response to determine if it is acceptable.

E.1.8 Failure website-error http-proxy-authentication (407)

This code is similar to 401 (Unauthorized), but indicates that the client must first authenticate itself with the proxy. The proxy must return a Proxy-Authenticate header field containing a challenge applicable to the proxy for the requested resource. The client may repeat the request with a suitable Proxy-Authorization header field.

E.1.9 Failure website-error http-request-timeout (408)

The client did not produce a request within the time that the server was prepared to wait. The client may repeat the request without modifications at any later time.

E.1.10 Failure website-error http-conflict (409)

The request could not be completed due to a conflict with the current state of the resource. This code is only allowed in situations where it is expected that the user might be able to resolve the conflict and resubmit the request. The response body should include enough information for the user to recognize the source of the conflict. Ideally, the response entity would include enough information for the user or user agent to fix the problem. However, that might not be possible, and is not required.

Conflicts are most likely to occur in response to a PUT request. For example, if versioning was being used and the entity being PUT included changes to a resource which conflict with those made by an earlier (third-party) request, the server might use the 409 response to indicate that it cannot complete the request. In this case, the response entity would likely contain a list of the differences between the two versions in a format defined by the response Content-Type.

E.1.11 Failure website-error http-gone (410)

The requested resource is no longer available at the server, and no forwarding address is known. This condition is expected to be considered permanent. Clients with link-editing capabilities should delete references to the Request-URI after user approval. If the server does not know, or has no facility to determine, whether or not the condition is permanent, the status code 404 (Not Found) should be used instead. This response is cacheable unless indicated otherwise.

The 410 response is primarily intended to assist the task of Web maintenance by notifying the recipient that the resource is intentionally unavailable, and that the server owners desire that remote links to that resource be removed. Such an event is common for limited-time, promotional services and for resources belonging to individuals no longer working at the server's site. It is not necessary to mark all permanently unavailable resources as "gone", or to keep the mark for any length of time. That is left to the discretion of the server owner.

E.1.12 Failure website-error http-length-required (411)

The server refuses to accept the request without a defined Content- Length. The client may repeat the request if it adds a valid Content-Length header field containing the length of the message-body in the request message.

E.1.13 Failure website-error http-precondition-failed (412)

The precondition specified in one or more of the request-header fields evaluated to false when it was tested on the server. This response code allows the client to place preconditions on the current resource meta-information (header field data) and, therefore, prevent the requested method from being applied to a resource other than the one intended.

E.1.14 Failure website-error http-entity-too-large (413)

The server is refusing to process a request because the request entity is larger than the server is willing or able to process. The server may close the connection to prevent the client from continuing the request.

If the condition is temporary, the server should include a Retry- After header field to indicate that it is temporary and after what time the client may try again.

E.1.15 Failure website-error http-URI-too-long (414)

The server is refusing to service the request because the Request-URI is longer than the server is willing to interpret. This rare condition is only likely to occur when a client has improperly converted a POST request to a GET request with long query information, when the client has descended into a URI "black hole" of redirection (that is, a redirected URI prefix that points to a suffix of itself), or when the server is under attack by a client attempting to exploit security holes present in some servers using fixed-length buffers for reading or manipulating the Request-URI.

E.1.16 Failure website-error http-media-not-supp (415)

The server is refusing to service the request because the entity of the request is in a format not supported by the requested resource for the requested method.

E.1.17 Failure website-error http-invalid-range (416)

A server should return a response with this status code if a request included a Range request-header field (RFC 2616 document, section 14.35), and none of the range-specifier values in this field overlap the current extent of the selected resource, and the request did not include an If-Range request-header field. (For byte-ranges, this means that the first- byte-pos of all of the byte-range-spec values were greater than the current length of the selected resource).

When this status code is returned for a byte-range request, the response should include a Content-Range entity-header field specifying the current length of the selected resource (see RFC 2616 document, section 14.16). This response must not use the multipart/byteranges content- type.

E.1.18 Failure website-error http-expect-failed (417)

The expectation specified in an Expect request-header field (see RFC 2616 document, section 14.20) could not be met by this server, or, if the server is a proxy, the server has unambiguous evidence that the request could not be met by the next-hop server.

E.2 Failure server-error

Response status codes beginning with the digit "5" indicate cases in which the server is aware that it has erred or is incapable of performing the request. Except when responding to a HEAD request, the server should include an entity containing an explanation of the error situation, and whether it is a temporary or permanent condition. User agents should display any included entity to the user. These response codes are applicable to any request method.

E.2.1 Failure server-error internal-error (500)

The server encountered an unexpected condition which prevented it from fulfilling the request.

E.2.2 Failure server-error not-implemented (501)

The server does not support the functionality required to fulfil the request. This is the appropriate response when the server does not recognize the request method, and is not capable of supporting it for any resource.

E.2.3 Failure server-error dispatch-error (502)

Section 10 of the RFC 2616 document describes this as "502 Bad Gateway". The server, while acting as a gateway or proxy, received an invalid response from the upstream server it accessed in attempting to fulfil the request.

E.2.4 Failure server-error service-unavailable (503)

The server is currently unable to handle the request due to a temporary overloading or maintenance of the server. The implication is that this is a temporary condition which will be alleviated after some delay. If known, the length of the delay may be indicated in a Retry-After header.

Note: The existence of the 503 status code does not imply that a server must use it when becoming overloaded. Some servers may wish to simply refuse the connection.

E.2.5 Failure server-error dispatch-timeout (504)

Section 10 of the RFC 2616 document describes this as "504 Gateway Timeout". The server, while acting as a gateway or proxy, did not receive a timely response from the upstream server specified by the URI (such as HTTP, FTP, or LDAP) or some other auxiliary server (such as DNS) it needed to access in attempting to complete the request.

Note: Some deployed proxies are known to return 400 or 500 when DNS lookups time out.

E.2.6 Failure server-error version-not-supported (505)

The server does not support, or refuses to support, the HTTP protocol version that was used in the request message. The server is indicating that it is unable or unwilling to complete the request using the same major version as the client other than with this error message. The response should contain an entity describing why that version is not supported, and what other protocols are supported by that server.

E.3 Failure no-server-response

Number of hits requested by the client to which the server did not respond to at all. This could be caused by a server-error and/or network-error.

E.4 Failure network-error

Network errors are hits which were not delivered completely from the TCP level view. There are several possible causes:

- **server-abort**

  This status indicates a server-related problem with the connection. Any of the following situations will be reported:

  - Server resets the connection.

    This is an indication of a server application problem. It is not possible to verify that all data was transmitted or received correctly.

- Server sends incorrect data.

  The data sent from the server is malformed in such a way that it is not possible to extract the high-level HTTP information. This can be caused by a number of factors, such as packet loss, too many out-of sequence packets, and so on.

- Client went away.

  Sometimes the client might disappear unexpectedly (computer crash, modem crash, ISP down, or some other hardware problem that results in immediate loss of connectivity). This situation manifests itself as a server error, because the server eventually times out, and resets the connection. It is not possible to determine how much of the transmitted data was received by the client.

Impact on visitors

The visitor receives a server-error message, or at least not the requested information. In some cases, the partially received information is shown to the visitor. This is often an indication that there are problems with the server.

Usage

Server errors should not occur regularly. If a high number of server-errors is reported, the network and server components should be investigated using Network Protocol Analysis (NPA) tools.

Some indications for analysis on the cause of server errors:

- Load: too many connections to the server and/or load balancer can lead to resource problems.
- Balancer: is the load distributed correctly over all the servers, or is one server consistently becoming overloaded and generating errors?
- URLs: are only specific application URLs generating this type of problems?

- **server-timeout**

  A server timeout occurs when a server fails to reply to a client request. In a timeout situation, the server never transmits any data over the line; that is, no response, or part thereof, is ever sent out. (Server aborts are reported under completion status 4).

  The exact interpretation of this completion status is:

  - The client sent a complete HTTP request.
  - No data at all was sent back by the server.

  Note: A timeout means no data was sent. That is, the server's TCP stack might acknowledge that the client's request was received by sending an acknowledgment segment, but the server application itself is unable to send back any data.

  Impact on visitor

  The client never received any content. The server simply failed to respond. This can only indicate a network or server application problem.

  Usage

  The cause of server-timeouts can be investigated by analyzing the networks where this problem occurs. Server timeouts occur sporadically, and should not be

considered problematic unless a high percentage of requests is involved. In cases where all clients experience a high percentage of timeouts, network and server components should be investigated using network analysis tools and application performance testing tools.

- **network-timeout**

  The received client or server header packets was truncated. This was caused by a network problem timeout.

  One exception which should normally be seen as a network-error. But since the cause of this issue cannot be solved by the customer and is normally seen as standard behavior, we do not add this one in the failed cubes and see the hit as "success".

- **client-abort**

  Client aborted the transfer, possibly because the client closed the browser, or clicked reload, or clicked away, or was redirected, while the page was still loading.

F

Working with XPath Queries

This appendix provides detailed information about the support available within RUEI for the use of XPath queries.

XPath (XML Path Language) is a query language that can be used to query data from XML documents. In RUEI, XPath queries can be used for content scanning of XML documents. A complete specification of XPath is available at http://www.w3.org/TR/xpath. It is based on a tree representation of the XML document, and selects nodes by a variety of criteria. In popular use, an XPath expression is often referred to simply as an XPath.

RUEI supports the use of a limited set of XPath expressions to identify page names and Web services, and in performing page content and functional error checks. Optionally, you can extend the search to include the search for a literal string within the found element(s).

Note that XPath expressions are case sensitive.

Basic XPath Queries

Consider the following simple XML document that has a root element <a>, which has one child element <b>, which in turn has two child elements, <c> and <d>.

```
<?xml version="1.0" encoding="UTF-8"?>
<a>
  <b>
    <c>Hello world!</c>
    <d price="$56" />
  </b>
</a>
```

In XPath queries, the child-of relation is indicated with a / (slash) and element names are written without angle brackets (< and >). Hence, a/b means select <b> elements that are children of <a> elements. A / at the start of a query indicates that the first node in the path is the root element of the document. For example, the following query selects <c> elements that are children of a <b> element that is a child of the root element <a>:

```
/a/b/c
```

When used for content scanning, this would extract the text "Hello world!" from the above example document. As another example, the query /html/body/div/p would extract the contents of all paragraphs inside a in the body of an XHTML document.

Besides extracting the contents of elements, there is one other type of data that can be extracted; XML attribute values. To query attributes, you can refer to them as a "child"

of the element of which they are an attribute. To distinguish attribute names from element names, they must be prefixed with a @ character. An @attribute node may only appear as the very last node in an XPath. For example, the following query extracts the text "$56" from the above example document:

```
/a/b/d/@price
```

Restrictions

The XPath syntax supported by RUEI is a subset of the abbreviated XPath syntax. As a result, you may find that some syntax elements that work correctly in other XPath applications do not work in RUEI. For example, the following queries are not accepted:

```
//c          # error, // not supported
/a/*/b       # error, * not supported
/a/b/c/../b  # error, . and .. not supported
```

In addition, the following queries, although perfectly fine, will not extract anything from the above example document:

```
/a/c         # no <c> elements are children of the <a> element
/b/c         # <b> is not the root element
/a/b/e       # the document does not have <e> elements
```

Element and attribute names are case-sensitive. Hence, `/a/b/c` is not the same as `/A/B/C`.

In RUEI, all XPath queries must be absolute paths. That is, they must start at the root node, and each child element along the path must be named explicitly.

Indices and Attribute Predicates

Consider the slightly more complex XML document:

```
<?xml version="1.0" encoding="UTF-8"?>
<inventory>
  <item class="food">
    <name>Bread</name>
    <amount>12</amount>
  </item>
  <other>
    <msg>not available</msg>
  </other>
  <item class="cleaning">
    <name>Soap</name>
    <amount>33</amount>
  </item>
  <item class="food" type="perishable">
    <name>Milk</name>
    <amount>56</amount>
  </item>
</inventory>
```

The root element `<inventory>` has three `<item>` children, and an `<other>` child. By using an index `[N]` on a node in an XPath query, we can explicitly select the N-th `<item>` child element (counting starts at 1, not 0):

```
/inventory/item[2]/name  # extracts "Soap"
```

Note that when working the above example document, there is no point in specifying an index on the <name> node. There are three <name> elements in the document, but they are all children of a different <item> element. Hence, they each are the first child.

```
/inventory/item/name[2]  # extracts nothing
```

Attribute predicates are another way to specify more precisely which elements you want to select. They come in two forms: [@attr="value"] selects only elements that have the attr attribute set to value, and [@attr] selects only elements that have an attr attribute (set to any value).

```
/inventory/item[@class="cleaning"]/name  # extracts "Soap"
/inventory/item[@type]/name              # extracts "Milk"
```

The and keyword can be used to combine multiple attribute predicates within a single node. However, the XPath keyword or is not supported. In addition, instead of double quotes (") you can use single quotes (') to enclose the attribute value.

```
/inventory/item[@class='food' and @type]/name # extracts "Milk"
```

Indices and attribute predicates can be combined. The difference between the following two queries is that query A first selects all <item> elements with class="food", and then takes the second one, while query B selects the second <item> element under the condition that it has class="food" (but in the example it has class="cleaning").

```
A: /inventory/item[@class="food"][2]/name  # extracts "Milk"
B: /inventory/item[2][@class="food"]/name  # extracts nothing
```

Example

Consider the following XML-SOAP messages:

```
<?xml version="1.0" ?>
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"
        xmlns:xml="http://www.w3.org/XML/1998/namespace">
  <env:Header>
    <env:Upgrade>
      <env:SupportedEnvelope qname="ns1:Envelope"
          xmlns:ns1="http://www.w3.org/2003/05/soap-envelope"/>
      <env:SupportedEnvelope qname="ns2:Envelope"
          xmlns:ns2="http://schemas.xmlsoap.org/soap/envelope/"/>
    </env:Upgrade>
  </env:Header>
  <env:Body>
    <env:Fault>
      <env:Code>
        <env:Value>env:VersionMismatch</env:Value>
      </env:Code>
      <env:Reason>
        <env:Text xml:lang="en">Version Mismatch</env:Text>
      </env:Reason>
    </env:Fault>
  </env:Body>
</env:Envelope>
```

The error value env:VersionMismatch can be extracted with the following XPath query:

```
/env:Envelope/env:Body/env:Fault/env:Code/env:Value
```

Important

In order to apply XPath queries to a real-time HTTP data stream, RUEI only supports a limited set of XPath 1.0 functionality. In particular:

- References to internal and external files (such as DTDs) within input traffic are ignored.
- The self-or-descendant (/ /) operator is not supported.
- The maximum depth in XPath expressions is 8 levels.
- No string within an expression should be a complete substring of any other specified string. Strings have a maximum length of 256 bytes.

In addition, you should be aware of the following:

- RUEI applies XPath matching to all traffic content, regardless of whether or not it is actually in XML format. Hence, while XHTML is supported, it is interpreted as well-formed XML. Hence, using XPath queries on non-well-formed XML or non-XML traffic can lead to unreliable results.
- The use of namespaces and CDATA is not supported. If they appear in the input stream, they are treated literally. This can lead to false matches.
- All expressions are resolved as "AND". The use of the "OR" and relational expressions (such as <=, >=, <, and >) is not supported.

Using Third-Party XPath Tools

For convenience, you can use third-party XPath tools, such as the XPather extension for Mozilla Firefox, to create XPath expressions for use within RUEI. The XPather extension is available at `http://xpath.alephzarro.com/index`.

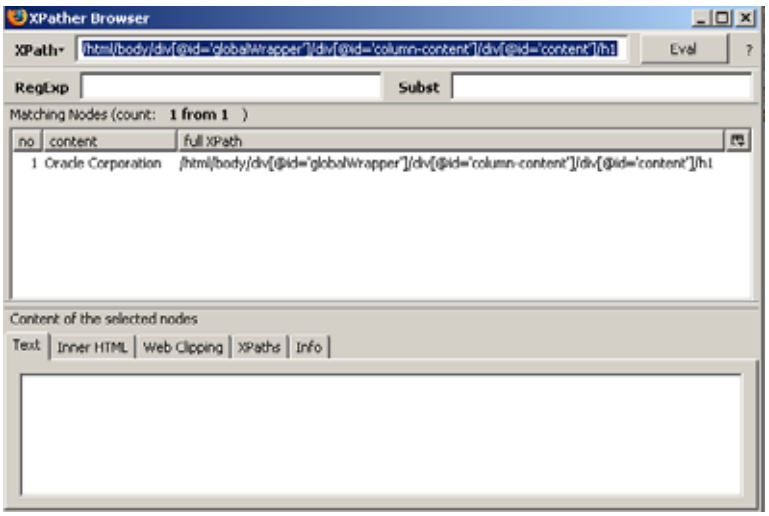
When installed, you can right-click within a page, and select the **Show in XPather** option. An example is shown in Appendix F–1.

Figure F–1 XPather Tool

You can then copy the XPath expression within the XPather browser (shown in Figure F–2) and use it the basis for your XPath query with RUEI. Be aware that you

should review the generated XPath expression to ensure that it confirms to the restrictions described above.

Figure F–2 XPather Browser



G

Working With National Language Support

This appendix provides a detailed discussion of the character encoding standards supported by RUEI when monitoring network traffic. Restrictions to the identification of such things as domain names, custom headers, and functional errors are highlighted. The operation of data masking and user ID matching when working with international character sets is also discussed.

G.1 Introduction

The Collector can monitor network traffic containing data in a wide variety of encoding standards. A complete list of the encoding standards currently supported by RUEI is shown in Table G–1.

Table G–1 Supported Encodings

Canonical Name	MIME Name[1]	Description
Big5	Big5	Traditional Chinese.
EUC-JP	EUC-JP	EUC-encoding Japanese.
GB_2312-80	GB_2312-80, gb2312, chinese	Chinese.
GBK	GBK, CP936, MS936, windows-936	Simplified Chinese.
ISO-8859-1	ISO-8859-1, ISO_8859-1, latin1	Latin alphabet no. 1.
ISO-8859-10	ISO-8859-10, latin6	Latin alphabet no. 6 (Nordic).
ISO-8859-13	ISO-8859-13	Latin alphabet no. 7 (Baltic Rim).
ISO-8859-14	ISO-8859-14, latin8	Latin alphabet no. 8 (Celtic).
ISO-8859-15	ISO-8859-15, latin9	Latin alphabet no. 9.
ISO-8859-16	ISO-8859-16, latin10	Latin alphabet no. 10 (south-eastern Europe).
ISO-8859-2	ISO-8859-2, ISO_8859-2, latin2	Latin alphabet no. 2 (central and eastern Europe).
ISO-8859-3	ISO-8859-3, latin3	Latin alphabet no. 3 (southern Europe).
ISO-8859-4	ISO-8859-4, latin4	Latin alphabet no. 4 (northern Europe).
ISO-8859-5	ISO-8859-5, cyrillic	Cyrillic.
ISO-8859-6	ISO-8859-6, arabic	Arabic.
ISO-8859-7	ISO-8859-7, greek	Greek.
ISO-8859-8	ISO-8859-8, hebrew	Hebrew.
ISO-8859-9	ISO-8859-9, latin5	Latin alphabet no. 5 (Turkish).

Table G–1 (Cont.) Supported Encodings

Canonical Name	MIME Name[1]	Description
KOI8-R	KOI8-R	Russian.
Shift_JIS	Shift_JIS, shift-JIS	Japanese.
US-ASCII	US-ASCII, ascii	American Standard Code for Information Interchange (ASCII).
UTF- 32	UTF-32	32-bit UCS transformation format. Also known as UCS-4.
UTF-16	UTF-16	16-bit UCS transformation format, byte order identified by an optional byte-order mark.
UTF-16BE	UTF16BE	16-bit unicode transformation format, big-endian byte order.
UTF-16LE	UTF16LE	16-bit unicode transformation format, little-endian byte order.
UTF-32BE	UTF32BE	32-bit unicode transformation format, big-endian byte order.
UTF-32LE	UTF32LE	32-bit unicode transformation format, little-endian byte order.
UTF-8	UTF-8	8-bit UCS transformation format.
windows-1250	windows-1250	Microsoft Windows Eastern European.
windows-1251	windows-1251	Microsoft Windows Cyrillic (Russian)
windows-1252	windows-1252	Microsoft Windows Latin.
windows-1253	windows-1253	Microsoft Windows Greek.
windows-1254	windows-1254	Microsoft Windows Turkish.
windows-1255	windows-1255	Microsoft Windows Hebrew.
windows-1256	windows-1256	Microsoft Windows Arabic.
windows-1257	windows-1257	Microsoft Windows Baltic.
windows-1258	windows-1258	Microsoft Windows Vietnamese.

[1] The name (and supported aliases) as recognized in the HTTP encoding declarations.

Note that vendor-specific Web site encoding may not be supported. Network traffic containing non-supported encoding is still recorded, but matching may not be possible. For example, the content of a page can still be viewed in the replay viewer, but the page's defined name may not be correctly associated with it.

Web Site Configuration

In order to correctly monitor a multi-byte Web site, it is essential the Web site is properly configured. For example, if its Web server advertises UTF-8, but the actual pages are not UTF-8 encoded, RUEI cannot correctly monitor them, even when some Web browsers can autodetect and correct the unsupported contents. Therefore, such things as functional error and content checks will not operate correctly for these pages.

G.2 Implementation Considerations

Data Masking

The Collector can be configured to omit the logging of sensitive information. This is described in Section 8.4, "Masking User Information". Only ASCII argument names are supported. The encoding used in the argument's content does not matter because it is replaced anyway.

Particular attention should be paid to variable names that contain a dollar ($) character. For example, `foo$bar` can be transmitted in monitored traffic as `foo%24bar` (this is browser dependent). In this case, to mask this variable correctly, the percent-encoded variable name should be specified.

Be aware that the variables to be masked must be specified in ASCII format, and be specified *exactly* as they are reported within the Session diagnostics facility. For example, the variable name `user name` would be reported with the Session diagnostics facility as `user%20name`, but can also appear as `user+name`. Hence, both variable names should be specified for masking.

If the argument name contains non-ASCII characters, you should use the Session Diagnostics facility (described in Section 3.9, "Working With the Session Diagnostics Facility") to see how it is reported, and specify this reported name as the variable to be masked. In addition, you should regularly check the log files to ensure the data is being correctly masked.

Note the restrictions and requirements described above for masking URL arguments also apply to any situation in which you want direct access to a URL argument. For example, custom dimensions or application definitions.

Custom Headers and Cookies

All header names must be encoded in ASCII because this is required by the HTTP protocol. Within header contents, all non-ASCII characters are replaced by a placeholder.

User ID Matching

Within RUEI, user identification is first based on the HTTP Authorization field. If this is not found, the application's user identification scheme is used. This can be specified in terms of URLs, cookies, request or response headers, or XPath expressions. This is explained in Section 6.2.9, "Defining User Identification".

Because a URL argument is a *name=value* combination, the *name* part is specified as the source argument from which the user ID will be read. The *value* part is extracted and reported as the user ID. The specified source argument is subject to the same requirements as explained earlier for data masking. However, the *value* part of the combination can be specified in any supported encoding. RUEI attempts to translate the *value* from its native encoding (for example, Shift-JIS) to UTF-8 so that it can be rendered within the user interface in the native language (for example, Japanese).

However, when the native encoding of the *value* is not known, the user ID cannot be properly rendered within the user interface, and the reported value is garbled. Due to the limitations of the HTTP protocol, user IDs on some Web sites may not be rendered as expected. In that case, it is recommended you specify the fallback encoding that should be used. This is explained in Section 9.3, "Specifying the Fallback Collector Encoding". Note the encoding specified for this setting is only applicable to URL and POST arguments. Content-based reporting (for example, functional errors) is not affected by this setting. Because this does not guarantee the correct rendering of all values, you should also review the Web site definitions, and verify all user IDs are ASCII only.

G.3 Specifying Content Checks

Be aware that, when specifying page content checks, the content rendered within the client browser (and seen by the end user) may differ from the underlying HTML page source. This is because of underlying font, format, and link tags, as well entity

definitions, and so on. Hence, simply copying and pasting a portion of text from the rendered page within a client browser may not always work as expected.

Normally, this problem can be overcome by copying and pasting from the **View source** facility within the client browser. However, for pages that use an encoding other than UTF-8, this approach does not work if you are using Internet Explorer 6 or 7. The reason for this is that IE uses Notepad as its source viewer, and this only supports UTF-8. As a result, the source may appear garbled, and cannot meaningfully be copied and pasted into RUEI.

Because Mozilla Firefox employs an internal HTML source rendering tool, it is always able to render the HML source accurately, even for non-UTF-8 encodings. Therefore, it is recommended you use this browser as the basis for content-based checks, and whenever an accurate rendition of the HTML source is required.

H

WebLogic Portal (WLP) Support

This appendix provides a detailed discussion of the support available for the accurate monitoring of WebLogic Portal (WLP)-based applications. Note that WLP support is provided as part of the default RUEI installation. No separate installation procedure needs to be applied.

H.1 Introduction

RUEI supports out-of-the-box monitoring of WLP applications. It automatically discovers WLP Web applications, and translates network objects to business functions. Using this support, individual user actions are automatically matched to the correct Web application, desktop, portal, book, and page to provide contextual analysis.

RUEI supports the monitoring of file-based portals as well as streaming portals. For the latter, the Disc framework must be enabled. For the monitoring of file-based portals with the Disc framework not enabled, additional information must be uploaded about the configuration of the monitored portal. This is described in Section H.3, "Synchronizing RUEI with your WLP Environment". Note that the monitoring of streaming portals that do not use the Disc framework is not supported.

The monitoring support described in the rest of this appendix has been verified against applications based on WLP version 10.3.

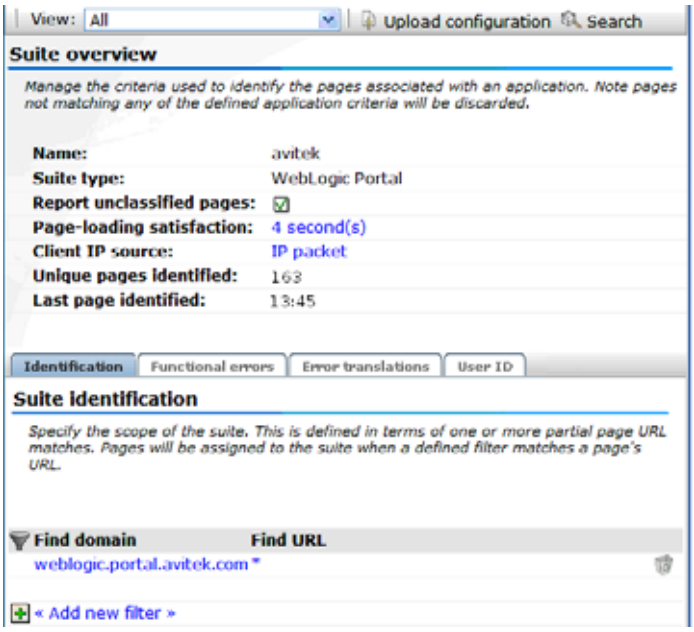
H.2 Creating WLP Suite Definitions

You can create suite definitions for WLP-based applications in the same way as for any other supported Oracle Enterprise architecture. The procedure to create suites is described in Section 6.4, "Working With Suites".

The procedure to define a WLP suite instance is briefly summarized as following:

1. Select **Configuration**, then **Applications**, then **Suites**, and click **New suite**.
2. Specify a name for the suite instance. The name must be unique across suites, services, SSO profiles, and applications, and is restricted to a maximum of six characters. Note that it cannot be renamed later. Use the remaining fields in the dialog to specify the scope of the suite. See Section 6.4, "Working With Suites" for information on this. When ready, click **Next**.
3. Select the "WebLogic Portal" option from the **Suite type** menu. When ready, click **Next**. Upon completion, the suite definition you have specified is displayed. An example is shown in Figure H–1.

Figure H–1 Example WLP Suite Overview



H.3 Synchronizing RUEI with your WLP Environment

If the monitored suite instance is a file-based portal with the Disc framework not enabled, RUEI needs to understand how the portal is implemented within your environment. Do the following:

1. Copy the `create_WLP_info.pl` script from the `/var/opt/ruei/processor/local/download/wlp` directory to the location where you intend to run the script. Copy to the same location the `.portal` file used by the monitored application.

2. Run the `create_WLP_info.pl` script on the Report system. This script creates translations for the monitored environment. The script must be run with the following required parameter:

   ```
   pearl create_WLP_info.pl -portal file.portal
   ```

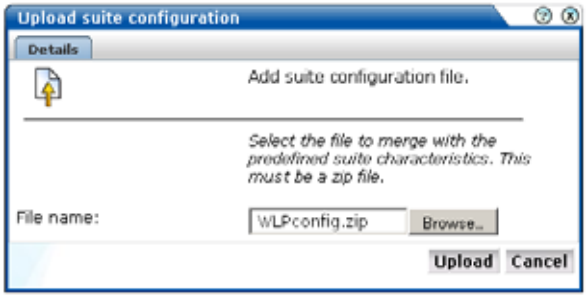
   where *`file`* is the name of the `.portal` file used by the monitored application.

   In multiple instance environments, run the script for each required instance, and separately preserve their created `.txt` files. Create a separate suite definition for each instance, as described in Section H.2, "Creating WLP Suite Definitions". In addition, be aware that if you make any changes to the monitored application, you need to re-run the script, and re-import the generated `.zip` file.

3. The script creates a number of `.txt` files in the directory where the script is executed. All relevant `.txt` files are collected and stored in a `.zip` file. Copy this `.zip` file to a location that can be used for uploading the files to the RUEI Reporter system.

4. Select **Configuration**, then **Applications**, then **Suites**, and select the suite you defined earlier in Section H.2, "Creating WLP Suite Definitions,". Click **Upload Configuration**. The dialog shown in Figure H–2 appears.

Figure H–2 Upload Suite Configuration



5. Specify the name of the `.zip` file containing the generated `.txt` files. To protect against receiving empty definitions, the upload will fail when it contains empty `.txt` files. When ready, click **Upload**.

H.4 Specifying the Cookie Technology

As explained previously, session information is based on cookies. The procedure to specify the cookie technology used by your applications is fully explained in Section 7.1, "Specifying Cookie Technology".

When creating a WLP suite instance, a preconfigured cookie for the WLP environment is automatically created. This is implemented as a custom cookie, with the name `JSESSIONID`. Because WLP is based on the WebLogic technology, it is likely that the preconfigured cookie is suitable for your WLP applications. However, depending on the configuration of your environment, you may need to modify this. In addition, to enable RUEI to monitor and track users over the complete session, you should ensure the cookie path is set to "/".

H.5 Configuring User Authentication

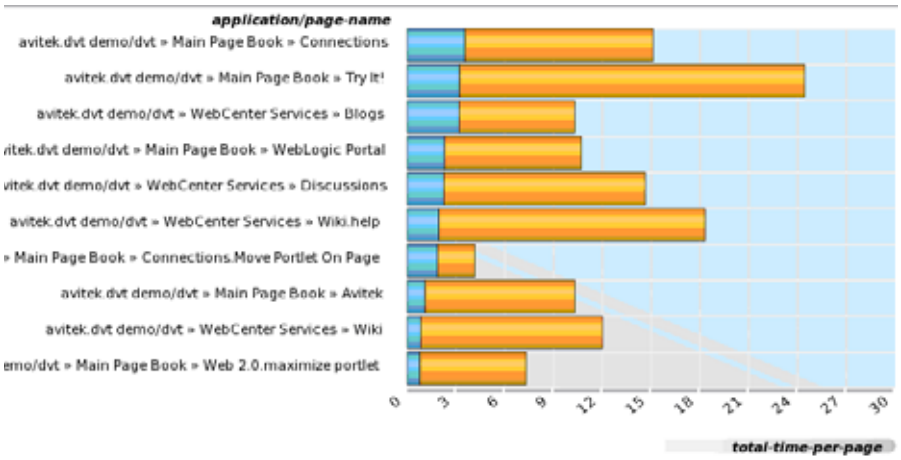
RUEI supports out-of-the-box monitoring of WLP applications that employ user authentication based on the REST framework. However, if the monitored portal uses some other user authentication mechanism, then this needs to be configured. The procedure to do so is described in Section 6.2.9, "Defining User Identification".

H.6 Verifying and Evaluating Your WLP Definitions

To ensure the quality of the data being collected and reported by RUEI for your WLP-based applications, it is *strongly* recommended you verify their reported details. You should pay particular attention to the number of associated pages detected for the defined suite(s).

Select **Browse** data, then select the All pages group, and then the Applications sub-group. Within the individual dimensions, such as Pageviews and hits, you can see pageviews are reported for several applications. The suite name in the definition is shown between brackets. An example shown in Figure H–3 is for a streaming portal.

Figure H–3 Suite Pageviews



H.7 Suite Definition Mappings

A WLP application can be identified with a hostname. Generally, a WLP suite can be accessed in two ways: using only the hostname, or using the fully-qualified hostname (including the domain). Generally, you only need to specify the domain.

Table H–1 shows how the dimensions of a WLP application are reported in RUEI.

Table H–1 WLP Definition Mappings.

Dimension level	Content
Application.name	For streaming portals: *web-app portal/desktop* (*suite_name*) For file-based portals: *portal* (*suite_name*)
Application. page-group	For streaming portals: *suite_name.web-app portal/desktop* » *book* For file-based portals: *suite_name.portal* » *book*
Application.page-name	For streaming portals: *suite_name.web-app portal/desktop* » *book* » *page.action* For file-based portals: *suite_name.portal* » *book* » *page.action*

Where:

- *action* is the name of the (REST) action executed by the user. In the All pages group, only actions are reported. In the WLP group, there is also an report option for actions. At the lowest level of actions, information about the involved portlet (if available) is reported. See Section H.8, "Known Limitations" for important information.
- *book* is the title of the book for which a page is requested.
- *desktop* is the name for the desktop used for the portal.

- *page* is the title for the page that is requested.
- *portal* is the name for the portal used within the Web application.
- *web-app* is the name for the Web application used.

Figure H–4 shows an example of how a streaming portal is reported in RUEI.

Figure H–4 Example of WLP Application Page Reporting

application/page-name	pageviews	hits
avitek.dvt demo/dvt » Main Page Book » Avitek	8	22
avitek.dvt demo/dvt » Main Page Book » WebLogic Portal	8	58
avitek.dvt demo/dvt » Main Page Book » Connections	6	76
avitek.dvt demo/dvt » WebCenter Services » Blogs	6	82
avitek.dvt demo/dvt » WebCenter Services » Wiki	6	6
avitek.dvt demo/dvt » Main Page Book » WebLogic Portal.Login	4	6
avitek.dvt demo/dvt » WebCenter Services » Discussions	2	10
avitek.dvt demo/dvt » Main Page Book » Web 2.0.restore portlet	2	2
avitek.dvt demo/dvt » Main Page Book » Connections.restore portlet	2	2
avitek.dvt demo/dvt » Main Page Book » Try It!	2	2
avitek.dvt demo/dvt » Main Page Book » Connections.Move Portlet On Page	2	4
avitek.dvt demo/dvt » WebCenter Services » Wiki.help	2	4
avitek.dvt demo/dvt » Main Page Book » Web 2.0.maximize portlet	2	4
avitek.dvt demo/dvt » Main Page Book » Connections.Login	2	2
avitek.dvt demo/dvt » Main Page Book » Connections.maximize portlet	2	2
avitek.dvt demo/dvt » WebCenter Services » Blogs.Login	2	2

H.8 Known Limitations

Currently, RUEI does not support all WLP functionality. In particular, the following known limitations exist.

- Reporting is based on the last activated area. Hence, when a end user is browsing simultaneously in multiple browser windows, the reported page name may contain incorrect information.
- Reporting on portlet level is very limited. For streaming portals, when actions involve a portlet (such as "move portlet on page"), and the portlet definition label is found in the response content or the URL of the action, is the portlet definition label reported in the WLP group. In the All pages group, portlets are not reported.

  For file-based portals, when the action involves a portlet, the instance label is reported because file-based portals do not have portlet definition labels. File-based portlet instance labels are only reported when a portal configuration file is upload (see Section H.3, "Synchronizing RUEI with your WLP Environment").
- The monitoring of streaming portals with the Disc framework not enabled is not supported.

Oracle ADF Support

This appendix provides a detailed discussion of the support available for the accurate monitoring of Oracle Application Development Framework (ADF)-based applications. Note Oracle ADF support is provided as part of the default RUEI installation. No separate installation procedure needs to be applied.

I.1 Introduction

RUEI supports out-of-box monitoring of Oracle ADF applications. It automatically discovers Oracle ADF applications, and translates network objects to business functions. Using this support, individual user actions are automatically matched to the correct Web application, task flow, and view.

The monitoring support described in the rest of this appendix has been verified against applications based Oracle ADF version 11g.

I.2 Creating Oracle ADF Suite Definitions

You can create suite definitions for Oracle ADF-based applications in the same way as for any other supported Oracle Enterprise architectures. The procedure to create suites is fully described in Section 6.4, "Working With Suites".

I.3 Enabling Monitoring of ADF Applications

The `adf-faces-databinding-rt.jar` file provides a DMS-based implementation for the `ExecutionContextProvider(oracle.adfinternal.view.faces.context.AdfExecutionContextProvider)` class. The implementation class has been pre-registered in the `.jar` file, but the feature itself can only be enabled by specifying the following application context parameter in the `web.xml` file:

```
<context-param>
  <description>This parameter notifies ADF Faces that the ExecutionContextProvider
               service provider is enabled. When enabled, this will start
               monitoring and aggregating user activity information for the client
               initiated requests. By default, this param is not set or is false.
  </description>
  <param-name>oracle.adf.view.faces.context.ENABLE_ADF_EXECUTION_CONTEXT_PROVIDER</param-name>
  <param-value>true</param-value>
</context-param>
```

I.4 Specifying the Cookie Technology

As explained previously, session information is based on cookies. The procedure to specify the cookie technology used by your applications is fully explained in Section 7.1, "Specifying Cookie Technology".

Because Oracle ADF is based on the Java technology, it is most likely that your Oracle ADF applications will use the `JSESSIONID` state cookie. To enable RUEI to monitor and track users over the complete session, you should ensure the cookie path is set to "/". If your Oracle ADF application uses another cookie name for state tracking, you need to update the application definition to reflect this. In addition, be aware that user name recognition is based on the `j_username` construction.

I.5 Suite Definition Mappings

An Oracle ADF application can be identified with a hostname. Generally, an ADF suite can be accessed in two ways: using only the hostname, or using the fully-qualified hostname (including the domain). Generally, you only need to specify the domain.

Table I–1 shows how the dimensions of an ADF application are reported in RUEI.

Table I–1 Oracle ADF Suite Definition Mappings

Dimension level	Content
Application.name	*application*
Application.page-group	*application* » *view*
Application.page-name	*application* » *view* » *action*

Where:

- *action* is the component display name (if available). Otherwise, it is the event type plus the component.
- *application* is the module name within the ADF environment.
- *view* is the view ID.

For example:

```
ADF.StoreFrontModule » myorders-task-flow/myOrders » valueChange
```

I.6 Known Limitations

Currently, RUEI does not support all Oracle ADF functionality. In particular, the following known limitation exists:

- Reporting on regions, taskflows, and client-rendered-times is not supported.

J

Monitoring NATed Traffic

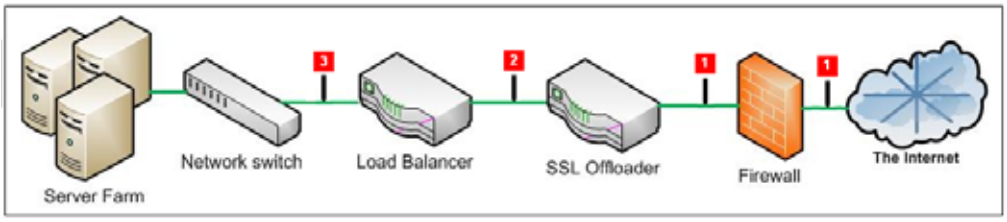
This appendix provides information about how accurate network traffic reporting can be obtained if the RUEI system is placed after a Network Address Translation (NAT) device.

J.1 Placement Before NAT Devices

As explained in the *Oracle Real User Experience Insight Installation Guide*, it is critically important that RUEI can see a copy of the network traffic. This can be obtained by using a copy / SPAN port or a TAP device.

Figure J–1 outlines a typical configuration of cascaded devices. While the number of devices can vary from that shown, the sequence is typically that indicated. Sometimes, the firewall, SSL offloader (in the case of SSL encrypted traffic), and load balancer functions are combined into one or two components.

Figure J–1 Placement of Monitoring Device



In most networks, there are three potential monitoring positions: directly behind (or in front of) the firewall, directly behind the SSL offloader, and directly behind the load balancer. These are indicated in Figure J–1. The implications of the three candidate monitoring positions is outlined in Table J–1.

Table J–1 Monitoring Position Characteristics

Position	Server info available	Client info available	SSL certificates required
1	Only if in header reply	Yes	Yes[1]
2	Only if in header reply	Yes	No
3	Yes	Only if delivered from NAT device in request header	No

[1] Note any deployment in front of an SSL offloading point will require the uploading of the SSL keys to the RUEI Collector system(s). This is necessary for RUEI to be able to decrypt the SSL traffic.

For Internet services, the load balancer is listening on the port where external clients connect to access services. It forwards requests to one of the back-end servers, which usually replies to the load balancer. This allows the load balancer to reply to the client without the client ever knowing about the internal separation of functions. It also prevents clients from contacting back-end servers directly, which may have security benefits by hiding the structure of the internal network.

It is recommended a RUEI system is placed in front of any Network Address Translation (NAT) devices. This ensures RUEI is immediately apply to see the originating IP address of the end user on TCP level. While the configuration shown in Figure J–1 can differ between different networks, it is typically the load balancer device that performs NAT.

If RUEI is deployed in a network segment where end-user IP address translation has already taken place, and the configuration procedure described in the following section is not implemented, then the only reported end-user IP address will be the single IP address of the NAT device. While this does not negatively effect the accurancy of the reported data, it does mean that geographic and ISP client information is not available.

Note: Be aware the RUEI monitoring position should always be *after* any VPN / decompression devices. This is because RUEI cannot read non-HTTP traffic between the encryption and decryption devices.

J.2 Obtaining the End-User IP Address

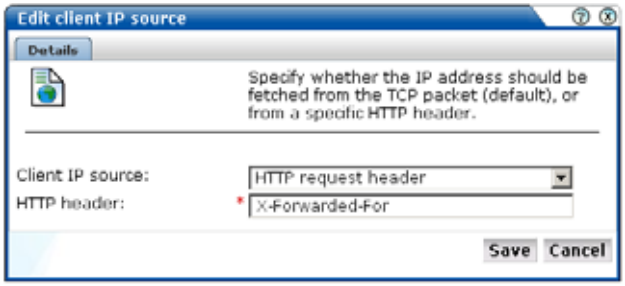
As explained earlier, obtaining the original end-user IP address is necessary for accurate geographical and ISP client reporting. Within RUEI, the IP address is normally obtained from the IP header packet sent from the client. The header of each IP packet contains, among other things, the numerical source and destination address of the packet. However, if RUEI has been placed after a NAT device, this IP packet will contain the IP address of the NAT device, and not the end-user IP address.

Fortunately, the original (end-user) IP address is normally preserved in the HTTP header sent from the NAT device to the Web server. In this case, you can specify that RUEI should look in this header for the IP address, rather than the IP packet.

To specify the use of an HTTP header, instead of the TCP packet, do the following:

1. For each required application, select **Configuration**, then **Applications**, then **Applications**, and then the application to which you want to apply the custom setting. The application overview (similar to the one shown in Figure 6–1 appears).
2. Click the current Client IP address setting. The equivalent menu structure should be followed for suites and Web services. The dialog shown in Figure J–2 appears.

Figure J–2 Edit Client IP Source



3. Use this dialog to specify how the client IP address should be retrieved. If the IP address should be retrieved from the HTTP header you must specify from which element in the header it should be fetched. When ready, click **Save**.

Any change you make to this setting will become visible in RUEI after five to 10 minutes. In addition, this change only applies to currently collected data, and not to historical data.

If RUEI is deployed behind a NAT device, you are strongly recommended to check and verify with both application and infrastructure management teams the appropriate manner to collect the End-User IP address from an HTTP header.

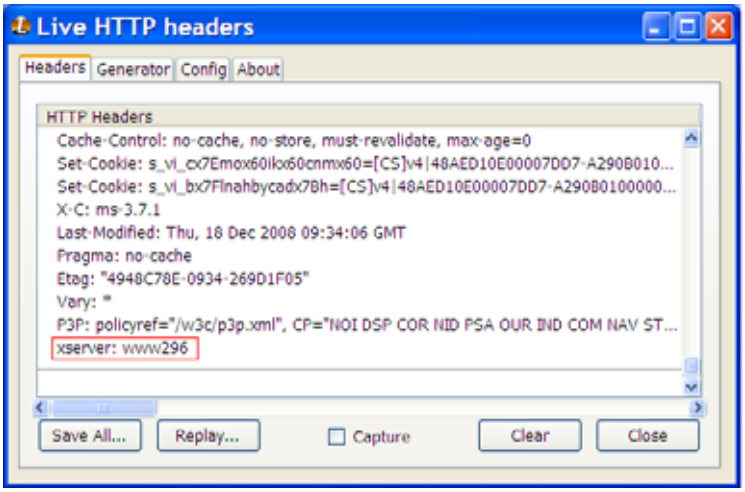
J.3 Obtaining the IP Address of the Replying Web Server

Sometimes, it is also useful to see the replying server's IP address. For example, if an issue with slow or failing pages develops on a server farm, it is much quicker to resolve the issue if the relevant server's IP address is immediately visible.

This can be achieved inserting the replying server's IP address (or other identification information) into the header sent back to the load balancer.

Figure J–3 shows an example of an HTTP header. It is taken from Mozilla Firefox's Live HTTP Headers plug-in, and shows how the original Web server identification (www236) has been moved into the HTTP header.

Figure J–3 Example HTTP Header



In this example, the header element is called xserver. It can be captured through the use of a custom dimension. This is fully described in Section 3.8, "Working With Custom Dimensions".

K

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Glossary

This glossary provides an explanation of the terms used in RUEI.

abandonment

When a visitor exits or leaves a transaction process on a Web site and does not return later in the session.

administrator

Assigned user responsible for maintaining the RUEI installation. This includes monitoring the system's health status, performing configuration backups, and defining the scope of network operations that will be monitored. They are also responsible for maintaining users and permissions.

alert

An automatically generated notification issued when a KPI moves outside its defined target range. When configuring alerts, you need to specify the duration the KPI must be up (or down) before an alert is issued, the severity of the incident, and whether additional notification should be created when the KPI has returned to its set target range.

alert profile

Defines the users who will be notified (and how they will be notified) if a business or technical KPI has been down (or up) for the specified duration required to generate an alert. Depending on how the KPI has been defined, users will also receive an up notification when the KPI returns to within its set target range.

alert schedule

Two types of alert schedule are available: business and technical. If your organization uses alerts to notify staff members about incidents that impact service levels, these schedules specify who should be notified and when.

application

Page identification mechanism. An application is a collection of Web pages. This is because pages on a Web site are typically bound to a particular application. Each application has a page naming scheme defined for it, which specifies its scope. This can be specified in terms of a domain name or a URL structure, or a partial match of both of these.

business users

Users who are concerned with evaluating visitor behavior according to business goals. As such, they use the business intelligence that RUEI offers them to monitor a wide

variety of issues, such as identifying the most popular paths taken to your Web site, or how engaged visitors are on particular pages or sections. See also IT users.

calendar

A report or information within the data browser provides information about a particular date or period. The From and To sections within the Calendar provide a mechanism to specify the required period. This can be specified in terms of days, weeks, or months.

categories

A means of grouping KPIs and SLAs. These can be customized to contain related performance indicators. Typically, each category contains KPIs and SLAs relevant to a particular aspect of an organization's operations. For example, performance, page availability, visitor traffic, and so on.

client

Facility that enables you to enhance the information associated with visitor IP addresses. This is especially useful when monitoring Intranet traffic and you want to be able to use your own visitor classification. See also server.

cookie

A small file that is stored on the user's computer while browsing a Web site. It is used to track visitors. RUEI needs to know and understand the cookie technology you Web site is using. This will either be a standard technology (such as ASP or ColdFusion), or a custom implementation.

dashboard

A visual display of the most important information required to achieve one or more objectives, consolidated, and arranged on a single screen so the information can be monitored at a glance. You are free to configure your dashboards to reflect your organization's specific requirements, with each dashboard containing relevant performance indicators. For example, you could have separate dashboards for such things as availability issues, performance, and visitor traffic.

data browser

The information captured during monitoring is stored as a multidimensional data structure. The Data browser allows you to explore Web data by simply clicking down through increasing levels of detail, and view by different dimensions (such as period, referrer, visitor type, and so on). You can use it to understand the context of the data shown in a report.

domain

An area in the Internet specified by a URL address. The top-level domain is at the end after the dot and the second-level domain comes before it, and shows where in the top-level domain the address can be found. For example in www.webtrends.com, ".com" is the top-level domain, and "webtrends" is the second level domain.

error log

RUEI maintains an error log that contains a record of all system events. Normally, it should be empty. If any error is reported in the file, you should contact Customer Support.

escalation

An optional facility that can be defined with the alert schedule so that another group of users are automatically notification if a KPI remains failing for beyond a specified period. See also reminder.

exclusive filters

Specifies that only data items that do not match the data value in the filter should be shown. See also inclusive filters.

export

You can export the data currently shown in the data browser to a wide variety of applications, such as spreadsheets. In addition, you can customize how the data should be exported. You can modify the order of data columns, specify additional columns that will appear in a Microsoft Excel export, and specify the format in which the data will be exported.

favorites

Facility that helps you to quickly locate the reports you work with most often by creating shortcuts to them.

filter

A means of narrowing the scope of a report, KPI, or data displayed in the data browser. See also inclusive filters, exclusive filters, and toggle filters.

header

Contains general information about the report you are viewing. This includes the report's title, an indication of the reported metrics, and the date or period to which the report refers.

inclusive filters

Specify that only data items that match the data value in the filter should be shown. See also exclusive filters.

information screen

Each report contains an information screen providing a glossary of the terms used in the report. This is useful when you (or other report users) need an explanation of the metrics used in a report.

inline mode

When a report is opened, it is shown in inline mode. This offers a high-level overview of the report's contents, and provides ready access to more detailed information available through the report. See also print layout mode.

IT users

Users who are concerned with supporting the IT information that RUEI needs to monitor the Web environment, such as configuring the cookies used to identify users. Typically, they are responsible for deeper analysis of failed SLAs or KPIs. For example, they might identify that failed user visits are only occurring for users from a particular network domain.

key pages

Monitored Web pages that receive special attention. Typically, these are pages in which you have particular interest. For example, your organization’s home page, or a series

of pages in a transaction such as placing an order. For these pages, additional information is recorded. This includes client information (such as ISP, the country of origin, and so on), and the visitor browser information (such as operating system, browser version, and so on).

KPI

Key performance Indicator. A means of measuring and benchmarking specific aspects of an organization's performance. These are based upon metrics. KPIs can be set independently of SLAs. What distinguishes an SLA from a KPI is that an SLA must have a target associated with it, while for a KPI a target is optional.

mailing facility

Allows you to obtain a ready overview of the reports you receive through automatic e-mails, and the frequency (daily, weekly, or monthly) with which they are sent to you. See also favorites.

masking

The Collector can be configured to omit logging of sensitive information. This is called masking, and it allows you to prevent passwords, credit card details, and other sensitive information from being recorded on disk.

messages

Can be issued to system's users to keep them informed about important system events or operational issues. For example, scheduled maintenance periods, or reported problems. They are displayed in the Message area of the Home tab.

metric

The underlying benchmark for a KPI. It is the parameter or quantitative assessment of the aspect of the monitored Web environment to be measured. It defines *what* is to be measured. For example, the number of current sessions or page views per minute.

network filters

You can use network filters to manage the scope of monitored traffic. They allow you to restrict monitoring to specific servers and subnets, and to restrict the level of packet capture. See also scope.

page

Every page monitored by RUEI must be identified to it. Information about any pages not defined to the system is discarded. Page identification is based on applications.

page tag

A piece of JavaScript code embedded on a Web page and executed by the browser when the page is viewed. RUEI supports the use of a standard scheme (such as Coremetrics) or a custom scheme.

page view

A single viewing of a web page.

parameters

These are located in the URL immediately after a question mark and followed by an equal sign and a return value, in the format *name=value*.

permissions

For all users, other than the administrator, their Business and IT access permissions define the system functionality they are authorized to use.

These are described in Table 1–1, " Roles".

print layout mode

This report layout can be thought of as the report's template: it defines the report's structure and appearance. This is the mode you will use when modifying reports, or creating new reports. See also inline mode.

reminder

A facility whereby the users defined within an alert profile receive periodic additional notifications if a KPI remains failing. See also escalation.

report

Provides you with the insight you need to assess the performance of your network infrastructure. RUEI comes with an extensive library of predefined (standard) reports. Reports are grouped into categories, dedicated to specific aspects of the monitored traffic. Each report is made of aheader, information screen, and a number of sections.

requirements

Specifies any additional conditions for a KPI. Using this facility, you can build compound KPI conditions.

return code

The request return status specifies whether the transfer was successful and why. See Appendix E, "Explanation of Failure Codes" for more information about the HTTP result codes that can be sent to visitors as replies to requests.

role

Within RUEI, four predefined roles are available: administrator, security officer, IT users, and business users.

sample interval

Specifies the interval over which a KPI will be monitored in order to determine its value. Note that the selected value does not affect the level of monitoring. However, selecting a longer period of time (such as 15 minutes) is useful for Web sites with low traffic levels, and where a sample time of 5 minutes would mean that often nothing was measured.

scope

Within RUEI, you control the scope of traffic monitoring by specifying which TCP ports RUEI should monitor. Obviously, no information is available for unmonitored ports.

sections

Typically, a report contains several sections. For example, a daily traffic report could contain two sections: one reporting traffic in terms of page views for the requested period, and the other reporting traffic in terms of bytes.

security officer

Assigned user responsible for managing security-related issues. These include defining which sensitive information (such as credit card details) are omitted from

logging, and the installation and management of SSL keys to monitor encrypted data. Se also masking and KPI.

server

A facility that enables you to obtain more detailed insight into the visitors to your monitored Web sites. It allows you to assign ranges of visitor IP addresses to a Web server group, and individual Web servers. See also client.

service level schedules

Specifies when the service levels defined for your organization should apply. Typically, an organization has a core time (for example, 9 am - 5 pm, Monday - Friday) when the committed service level should be achieved. However, you may need to define exceptions to this, such as for public holidays and planned maintenance periods.

session

A period of activity for one visitor to a Web site. A unique user is determined by the cookie IP address. Typically, a user session is terminated when a user is inactive for more than 15 minutes.

severity

Specifies the seriousness to the organization when a KPI moves outside its defined boundary. Possible values are Harmless, Warning, Minor, Critical, or Fatal.

SLA

Service Level Agreement. An agreement between a provider and a customer that explains the terms of the provider's responsibility to the customer, and the level of service that the customer can expect. For example, an SLA for a given service might promise that it will be up and running 99.99 percent of the time. Because this is monitored, it must be based on a KPI.

SSO

Single sign-on (SSO) is a method of access control that enables a user to log in once and gain access to the resources of multiple software systems without being prompted to log in again. Because different applications and resources support different authentication mechanisms, single sign-on has to internally translate and store different credentials compared to what is used for initial authentication.

suite

A collection of predefined applications. Currently, three suites are delivered: E-Business Suite (EBS), Siebel, and PeopleSoft. They save time in the configuration of applications, and ensure the applications within them are more compatible, and are correctly monitored.

target

For KPIs with SLAs associated with them, a target must be specified. You can define it in terms of a fixed range (for example, between 80 and 100), or specify a number of days over which the KPI is sampled for small, medium, or large deviation from its upper or lower limits.

toggle filters

Allows users opening a created report to select the information they view.

For example, if you are viewing client location information (within the all sessions group), you could create a report that allowed its users to select on client location. See also inclusive filters and exclusive filters.

transaction

A sequence of pages that define a logical task. For example, a ferry booking application might have the following pages defined for the transaction booking: route and date details, passengers and vehicle details, payment details, and confirmation.

up notification

An automatically generated notification received by the users specified in an alert profile when a KPI returns to its defined target range. See also alert.

users

RUEI uses predefined roles and permissions to determine the actions that users can perform. These are the administrator, security officer, IT users, and business users.

value lists

By default, data in report sections is shown in graphic form. However, you can choose to view the data in a tabular form. You can also specify the number of values that are shown in the displayed table.

web service

A clearly defined business function that operates independently of the state of any other service. It has a well-defined contract with the consumer of the service. Services are made available through service descriptions, which describe how to call the service, and what information is required to request the service and get a response.

XPath

XML Path Language (XPath) is a language for selecting nodes from an XML.

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