Oracle® Real User Experience Insight

Installation Guide

Release 6.0.1 for Linux x86-64

E16360-02

December 2009

ORACLE®

Oracle Real User Experience Insight Installation Guide, Release 6.0.1 for Linux x86-64

E16360-02

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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, define Key Performance Indicators (KPIs) and Service Level Agreements (SLAs), and trigger alert notifications for incidents that violate them.

Audience

This document is intended for the following people:

- System administrators responsible for the installation of RUEI. This assumes a sound understanding of the Linux operating system.

- The person within your organization designated as RUEI Super Administrator (that is, the `admin` used). They are responsible for post-installation configuration, and system maintenance.

Some familiarity with network and Web technology is assumed. In particular, you should have a sound understanding of network topology, and a good operational knowledge of your organization's network and application environment.

This guide is organized as follows:

- Chapter 1, "Getting Started" introduces RUEI. In particular, how it monitors data traffic, the role of the Reporter and Collector modules, and the supported configurations.

- Chapter 2, "Installing the Linux Operating System" describes the procedure for installing the base operating system.

- Chapter 3, "Installing the Required Components" describes the procedure for installing all the components required by RUEI.

- Chapter 4, "Installing the RUEI Software" describes the procedure for preparing the server system(s) for RUEI, and installing the RUEI software.

- Chapter 5, "Upgrading to RUEI 6.0.1" describes the procedure for upgrading an existing RUEI 5.0.*x* installation to release 5.0.

- Chapter 6, "Configuring RUEI" describes the procedure for initially configuring RUEI. This procedure is performed by the person within the organization who has been assigned the role of RUEI Super Administrator.

- Chapter 7, "Installing and Configuring the Oracle HTTP Server" describes the procedure for installing and configuring the Oracle HTTP server. This is an optional part of the RUEI installation process, and is only required if you intend to use the Oracle Single Sign-Off (SSO) service to authenticate RUEI users.

- Appendix A, "The ruei-check.sh Script" provides a detailed explanation of the `ruei-check.sh` script. It is strongly that you use this script to verify successful installation, and to troubleshoot any issues that occur during the installation process.

- Appendix B, "Setting the Maximum Data Group Size" provides a detailed explanation of how the default maximum Data Browser group sizes can be increased to provide more accurate reporting of monitored traffic.

- Appendix C, "Troubleshooting" highlights the most common issues encountered when installing RUEI, and offers solutions to quickly locate and correct them. It should be reviewed before contacting Customer Service.

- Appendix D, "Installation Checklist" provides a checklist of actions that should be completed, and the information gathered, before starting to install the RUEI software.

- Appendix E, "Third-Party Licenses" contains licensing information about certain third-party products included with RUEI.

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Related Documents

For more information, see the following documents in the Oracle Real User Experience Insight library:

- *Oracle Real User Experience Insight User's 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.*

- *Oracle Real User Experience Insight Accelerator for JD Edwards.*

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.

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Getting Started

This chapter introduces the role of Oracle Real User Experience Insight (or RUEI for short), its architecture, attachment, and deployment options.

1.1 What is RUEI?

The usage of Web applications and services continues to grow. This includes not only the use of the Internet as a marketing channel, but also Extranet-based supply chain and back-office integration, and Intranet deployment of internal applications. Increasingly, it also includes the utilization of Web services which implement clearly defined business functions. RUEI is designed for measuring, analyzing, and improving the availability and performance of all of these deployment scenarios.

1.1.1 Data Collection

Typically, RUEI is installed before the Web servers, behind a firewall in the DMZ (as shown in Figure 1–1). The data collection method is based on Network Protocol Analysis (NPA) technology. This method is 100% non-intrusive. Hence, it does not place any load on a Web server, or require installing software agents that will impact performance. In addition, it does not require any change to the current application or infrastructure. When a new application release is deployed, or when an additional Web server is added, there is no or very little change required to RUEI's monitoring environment.

Figure 1–1   How RUEI Collects Data
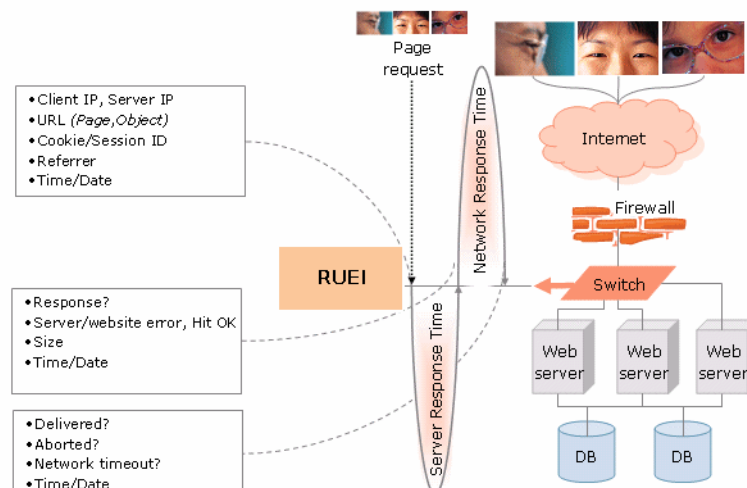
When an object is requested by a visitor, RUEI sees the request and measures the time the Web server requires to present the visitor with the requested object. At this point, RUEI knows who requested the page (the client IP), which object was requested, and from which server the object was requested (server IP).

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).

1.1.2 Product Architecture

RUEI is based on a three layer product architecture, as shown in Figure 1–2:

Figure 1–2   RUEI Product Architecture
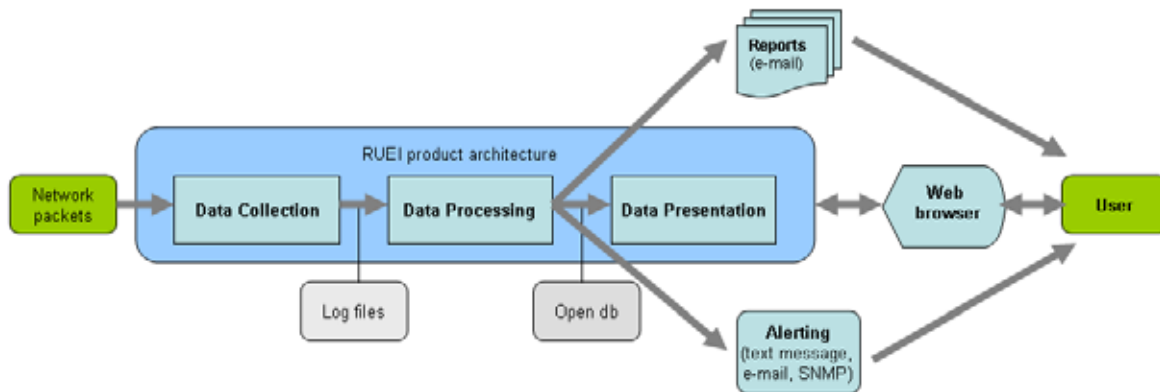
The monitored data packets are processed by the following layers:

- **Data collection**

  This layer is responsible for acquiring raw data and delivering it to the Data processor. This data can be collected from multiple sources. The available attachment options are described later in this section.

- **Data processing**

  This layer converts the raw data into OLAP data sets. These comprise the multidimensional data structure that is viewable within the data browser.

- **Data presentation (reporter)**

  This layer is RUEI's analysis and reporting environment. This is a Web-based information portal that can be accessed from any selected browser. The interface between the data processing and data presentation layer is based on open db calls.

1.2 Security

To read HTTP(S) data streams, a proprietary software module reassembles TCP/IP packet streams. Because the data collectors do not have an assigned IP number, and

the software using these data collectors does not have a functional IP stack, RUEI is not able to respond to incoming traffic received on the data collectors. This makes RUEI "invisible" to the monitored networks, and completely secure.

> **Note:** Because of the non-intrusive way in which RUEI collects data, it is not possible for it to request retransmission in the event of an error on the measurement port.

Data collection can be configured to log encrypted data. To facilitate this, a copy of the Web server's private SSL keys needs to be set up in the data collector. In addition, RUEI can be configured to omit logging of sensitive data in the arguments of POST requests of forms or content; so called *data masking* (or blinding).

1.3 Connection Options

RUEI supports the use of both copy ports[1] and TAPs[2] for monitoring network traffic (10/100 Mbps and 1 Gbps Ethernet connections are supported). Copy ports and TAPs are available for copper or fibre-based network infrastructures. While both devices allow non-intrusive monitoring of network traffic, there are differences between these two connection options. These are highlighted in the rest of this section.

1.3.1 Copy Ports

A copy port is a switch that starts to build up a Layer 2 forwarding table on the basis of the source MAC address of the different packets that the switch receives. After this forwarding table is built, the switch forward traffic that is destined for a MAC address directly to the corresponding port.

For example, after the Web server MAC in Figure 1–3 is learned, unicast traffic from the browser to the Web server is only forwarded to the Web server port. Therefore, the Collector does not see this traffic.

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[1] Copy ports are also known as Switched Port Analyzer (SPAN) ports which is a feature of Cisco switches.

[2] Test Access Port (TAP) devices are provided by specialist vendors, such as NetOptics Inc.

Figure 1–3   Network Connection Using a Copy Port
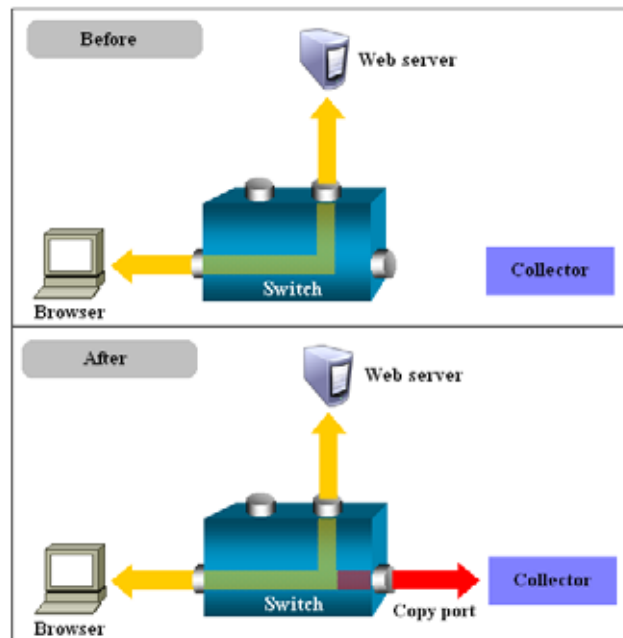
In the configuration shown in the lower part of Figure 1–3, the Collector is attached to a port that is configured to receive a copy of every packet that the browser sends and receives. This port is called a copy port. Copy ports can copy traffic from any or all data ports to a single unused port and prevents bi-directional traffic on the port to protect against backflow or traffic into the network.

Be aware that activating a copy port on a switch can have a performance impact. Typically, copy ports support a wide range of configuration options, and for further information about these options you should consult your switch documentation or contact the vendor.

1.3.2 TAPs

TAPs can be placed between any two network devices (such as routers and firewalls). Any monitoring device connected to a TAP receives the same traffic as if it were in-line, including all errors. This is achieved through the TAP duplicating all traffic on the link, and forwarding it to the monitoring port(s). The example shown in Figure 1–4 illustrates a typical TAP deployment for one Collector.

Figure 1–4   Network Monitoring Using a TAP
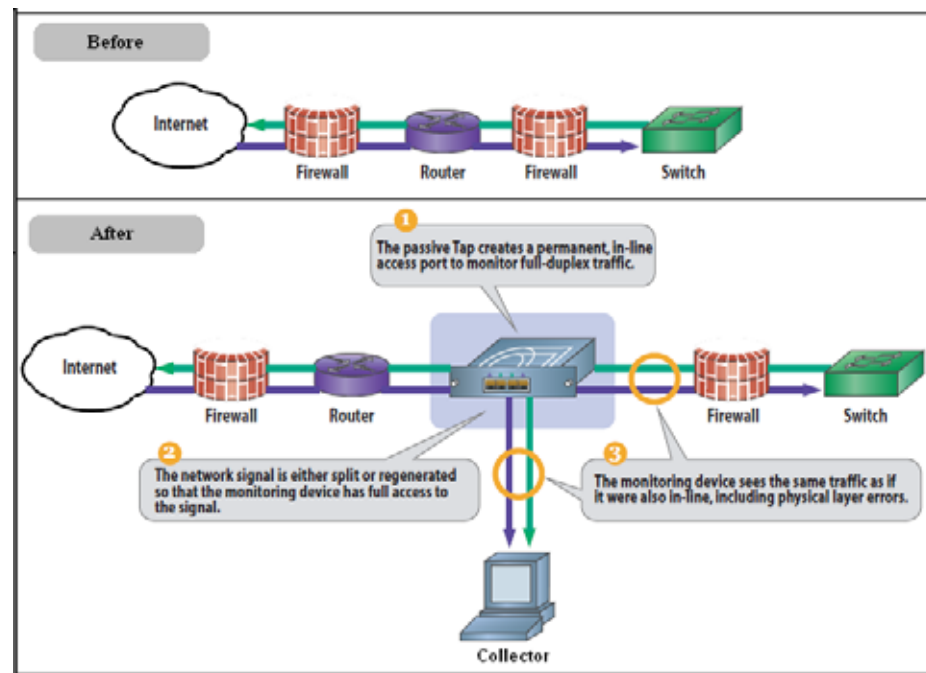
Unlike copy ports, in the event of power failure, TAPs continue to allow data to flow between network devices. TAP devices are available for copper or fibre-based infrastructures. Generally, the use of TAPs is considered preferable because they can be easily deployed when and where required, but without reconfiguration of switches or engineers needing to re-cable a network link.

> **Note:**   Broadly speaking, there are three types of TAPs: network, regeneration, and aggregation TAPs. RUEI supports the use of network and regeneration TAPs. The use of aggregation TAPs is *not* recommended because they can lose data, and do not provide an acceptable level of accuracy. However, the deployment of multiple Collectors, or the connection of multiple links directly to one Collector, is available for the aggregation of data from multiple streams. In addition, be aware that when capturing data with a network-TAP device, the use of cascaded TAP configurations is not supported.

1.4 Installation and Deployment Options

A RUEI system can be configured in two different ways: as a Reporter, or as a Collector. Each installation option is reviewed in the following sections.

Reporter

Here, the Reporter provides a browser-based interface to the collected data. After processing, this data is stored in an Oracle database. This database can reside locally (that is, on the Reporter system), or on a remote database server.

Note that each Reporter installation also contains a local Collector instance. The Reporter can either be configured to just process information gathered by this local Collector (this is a single-server configuration similar to the one shown in Figure 1–5), or can (optionally) be configured to receive information from additional Collector

installations. Note the local Collector instance on the Reporter system can also be disabled if not required.

Collector

If a RUEI system is installed as a Collector, it submits the data it gathers to a Reporter system. Multiple Collectors can be attached to the same Reporter. Split server #1 in Figure 1–5 is an example of a single Collector split-server configuration, while split server #2 is an example of a split-server configuration using two Collectors. Note that a direct network connection is required between the Collector(s) systems and the Reporter system.

Figure 1–5   Configuration Options
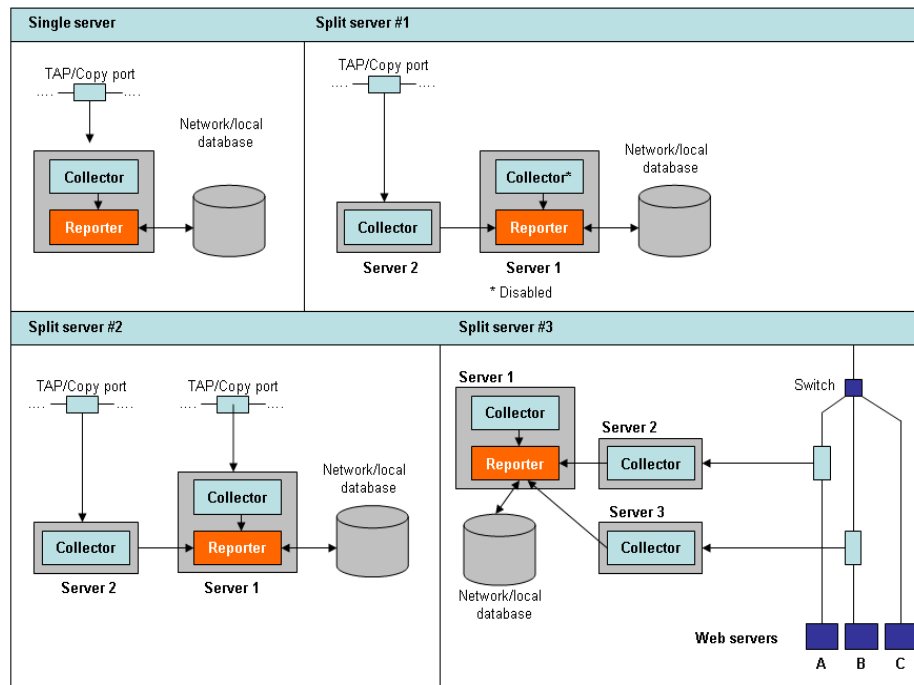
1.4.1 Local and Remote Database Installations

As mentioned earlier, the data available via the Reporter system is stored in an Oracle database. This database can reside locally on the Reporter system, or on a remote database server (such as a database cluster).

The use of a remote database server provides a number of potential advantages over a locally installed database. In particular, it offers easier integration with existing security and backup policies, as well as improved performance through the use of dedicated servers.

Currently, RUEI 6.0.1 supports the Oracle 11g database. Note the Oracle 10g database is not supported.

1.4.2 Scalability Options

The use of multiple Collectors may be considered when there is a need to monitor very high levels of data traffic. In addition, this deployment also provides the possibility of enhanced security. For example, by placing the Collector(s) outside the office network, while placing the Reporter system within the network.

Split-server configuration #1 in Figure 1–5 shows an example of a typical DMZ installation. The Collector is located in the DMZ, and the Reporter is within the server network environment. Note that the local Collector instance is disabled. Split-server configuration #2 shows an example of a deployment consisting of two Collectors. This could, for example, be used between two data centers (both monitoring the DMZ), where one data center acts as a failover for the other.

Split-server configuration #3 shows an example of a deployment in which both data lines are monitored in the same reporting environment. It also features the use of offloading to a database on a separate server. Note this deployment assumes that the traffic on each line is mutually exclusive. It also shows an example of a deployment used for security reasons. While the traffic from Web servers A and B are monitored and reported, the traffic from Web server C is not. This is also the reason why the Collectors are not placed above the switch.

For security reasons, it is recommended that access to the Reporter system is restricted to trusted IP ranges. Similarly, you may want to locate the Reporter system inside the internal network to maximize its security. The Collector's data gathering ports should be in the DMZ.

1.5 Hardware Requirements

The required minimum system specifications for the selected configuration (as explained in Section 1.4, "Installation and Deployment Options") are described in the following sections.

Network Cards

It is recommended that you carefully consider the selection of network cards for your infrastructure. Depending on the connection option you selected in Section 1.3, "Connection Options", both copper and fibre-based network cards may be required. If necessary, consult both your network and systems management teams.

> **Note:** For more information about required and recommended system specifications, please contact Customer Support.

1.5.1 Single-Server Requirements

Table 1–1   Single-Server System Minimum Requirements

Element	Requirements
CPU	64-bit Intel or AMD dual-CPU, dual-core processor (> 2 G Hz) or equivalent.
Memory	16 GB.
Disk space	Minimum 400 GB HDD free space.[1,2]
Network interfaces	When using a network-TAP device[3], a minimum of three network interfaces is required: ■ Two interfaces for network traffic capturing. ■ One interface for network services.

Table 1–1   (Cont.) Single-Server System Minimum Requirements

Element	Requirements
GSM modem (optional)	Optional support for a GSM modem to send text messages messages. The modem needs to be either GSM07.05 or GSM07.07 compatible. It can be connected through a serial or USB port. If USB is used, RUEI uses the first available port (ttyUSB0). Alternative methods of sending text messages are available (http/e-mail).

[1]   To ensure acceptable performance of the RUEI installation, it is recommended to use high performance disk systems, with a minimum supported I/O rate of 70 MB/s. When monitoring high volumes of traffic, more powerful disk systems may be required. (Hardware) RAID-5, RAID-10, or equivalent storage configurations are strongly recommended.

[2]   This may need to be increased if Enriched data exchange is enabled.

[3]   When capturing data with a network-TAP device, the use of cascaded TAP configurations is not supported.

1.5.2 Reporter Requirements

Table 1–2   Reporter System Minimum Requirements

Element	Requirements
CPU	64-bit Intel or AMD dual-CPU, dual-core processor (> 2 G Hz) or equivalent.
Memory	16 GB.
Disk space	Minimum 400 GB HDD free space[1,2].
Network interfaces	A minimum of 1 network interface is required.
GSM modem (optional)	Optional support for a GSM modem to send text messages. The modem needs to be either GSM07.05 or GSM07.07 compatible. It can be connected through a serial or USB port. If USB is used, RUEI uses the first available port (ttyUSB0). Alternative methods of sending text messages are available (http/e-mail).

[1]   To ensure acceptable performance of the RUEI installation, it is recommended to use high performance disk systems, with a minimum supported I/O rate of 70 MB/s. When monitoring high volumes of traffic, more powerful disk systems may be required. (Hardware) RAID-5, RAID-10, or equivalent storage configurations are strongly recommended.

[2]   This may need to be increased if Enriched data exchange is enabled.

1.5.3 Collector Requirements

The requirements for Collector systems are shown in Table 1–3:

Table 1–3   Collector System Minimum Requirements

Element	Requirement
CPU	64-bit Intel or AMD dual-core processor or equivalent.
Memory	8 GB.
Disk space	Minimum 200 GB HDD free space.

Table 1–3   (Cont.) Collector System Minimum Requirements

Element	Requirement
Network interfaces	When using a network-TAP[1] device, a minimum of three network interfaces are required:
	■ Two interfaces for network traffic capturing[2].
	■ One interface for communication with the Reporter system.
	When using a network-copy port, a minimum of two network interfaces are required:
	■ One interface for network traffic capturing.
	■ One interface for communication with the Reporter system.

[1]   Capturing data with a network-TAP device prevents the use of a cascaded TAPs configuration.

[2]   For up and down stream traffic. Note that the use of TAPs that integrate up and down stream traffic on one line is not recommended.

> **Important:**   Please note that an Intel (or compatible) 64-bit platform is a *strict* requirement for both the hardware and the operating system in all deployment scenarios.

1.5.4 Deployment Best Practices

This section presents a best practices framework within which to optimize your RUEI deployment. It is recommended that you carefully review the following information.

Planning Your Deployment

It is important that the nature of the monitored network environment is clearly understood before deciding upon your RUEI deployment strategy. This includes not only the basic network connectivity, ports, addressing, and physical device requirements, but also a sound understanding of the monitored applications.

Moreover, before deploying RUEI, the basic traffic flows within the network must have been identified. This should include information about average and peak volumes of traffic. Any physical deployment requirements (such as space limitations, distances, power planning, rack space and layout, or cabling) should also have been identified.

You can use the checklist presented in Appendix D, "Installation Checklist" to capture much of this information.

Forms-Based Traffic

If you are planning to monitor Forms-based traffic (with the Oracle E-Business accelerator package), be aware that the memory requirements may be higher than those outlined in Section 1.5, "Hardware Requirements". This is especially the case in deployments with heavy levels of Forms traffic. In this case, you should consider a split-server deployment.

Full Session Replay

If you are planning to make use of the Full Session Replay facility, you may need to configure additional storage capacity. This is explained in Section 1.5.6, "Full Session Replay Storage Requirements".

Encrypted Traffic

If a significant level of the monitored traffic is encrypted, this can increase the CPU overhead. In this case, it is recommended that you consider configuring additional CPUs or, alternatively, a split-server deployment.

Very High Levels of Traffic

When very high levels of traffic are being monitored (that is, more than 10 million pageviews per day), you should consider a split-server deployment. Alternatively, consider the use of a remote database. The latter has the effect of significantly reducing (by up to 30%) the CPU overhead on the Reporter system. Monitored environments with more than 20 million pageviews per day should consider the use of both a split-server deployment and a remote database.

1.5.5 Data Retention Policies

As explained in the *Oracle Real User Experience Insight User's Guide*, the availability of specific data within the Data Browser, as well as reports based on that data, depends on the Reporter data retention policies defined for your RUEI installation. By default, RUEI retains information on daily, monthly, and yearly levels for 32 days, 13 months, and 5 years, respectively. In addition, information about failed pages, URLs, and services is retained for 15 days. The maximum amount of database storage required to maintain the default data retention policies is shown in Figure 1–4.

Table 1–4   Default Required Database Storage

Type of data retained	Default retention policy	DB space required per period (GB)	Total DB space required (GB)
Failed pages/URLs/services	15	1.5	22.5
Daily[1]	32	1	32
Monthly	13	1	13
Yearly	5	1	5
Suites[2]	15	0.5[3]	7.5
Additional overhead			10
Total required DB space			90

[1]   This includes the All pages, All sessions, All functions, All transactions, Key pages, and URL diagnostics groups.
[2]   Suites use the Daily retention policy setting.
[3]   0.5 GB is required per day for each configured suite type.

Be aware that, in addition to the database storage required for each retained type of data, appropriately 10 GB of database storage is also required for other purposes. This includes KPIs, SLAs, and processing requirements. In Table 1–4, it is assumed that one suite type is configured.

If you modify the default Reporter data retention policies, it is recommended that you use the **Calculate** facility to see the effect your new retention policy would have on required database storage. Note that the projected database utilization is based on previous database utilization, rather than maximum database usage.

The default amount of database storage available to the Reporter is 200 GB, and for most deployments, this will meet your operational requirements.

Example - Increasing the Number of Groups

Consider the following situation. You have decided to retain information on daily, monthly, and yearly levels for 90 days, 24 months, and 5 years, respectively, and failed pages, URLs, and services information should be retained for 90 days. For the purposes of this example, it is assumed that only one suite type is configured. The maximum amount of database storage required to maintain this data is shown in Figure 1–5.

Table 1–5   Required Database storage

Type of data retained	Default retention policy	DB space required per period (GB)	Total DB space required (GB)
Failed pages/URLs/services	90	1.5	135
Daily	90	1	90
Monthly	24	1	24
Yearly	5	1	5
Suites	90	0.5	45
Additional overhead			10
Total required DB space			264

Maximum Data Browser Group Sizes

In addition to modifying the data retention policy settings, you can also modify the maximum size to which Data Browser groups are allowed to grow before data is condensed. This is fully explained in Appendix B, "Setting the Maximum Data Group Size".

1.5.6 Full Session Replay Storage Requirements

If you are planning to make use of the Full Session Replay facility, you may need to configure additional storage capacity available to the Collector system. This should be a separate device (not a partition of the Collector server's existing hard drive), and made accessible to the RUEI file system. The procedure to do this, together with guidance on storage requirements, is described in the rest of this section. Note that this procedure must be repeated for each Collector for which full session replay information is required.

Configuring Additional Storage for Full Session Replay

To configure the additional required storage, do the following:

1. Mount the device. For example, under /mnt/external_storage.

2. Temporarily stop the Collector by issuing the following command:

```
appsensor stop wg
```

3. Move the `$APPSENSOR_HOME/wg/REPLAY` directory to the new device. In the above example, this is `/mnt/external_storage`, and the result is that the replay files are now located in the `/mnt/external_storage/REPLAY` directory.

4. Create a symbolic link from `/mnt/external_storage/REPLAY` to `$APPSENSOR_HOME/wg/REPLAY`.

5. Restart the Collector by issuing the following command:

```
appsensor start wg
```

6. Calculate the required storage capacity. To do so, multiple the average number of daily pageviews by the average page size. Then, multiple this number by the number of days you wish full session replay data to be retained. Use Table 1–6 as guidance.

Table 1–6   Full Session Replay Storage Estimates

	Low page weight (~10 Kb)		Medium page weight (~50 Kb)		High page weight (~100 Kb)	
Pageviews per day (millions)	Size per day (GB)	Disk I/O (MB/sec)	Size per day (GB)	Disk I/O (MB/sec)	Size per day (GB)	Disk I/O (MB/sec)
0.5	5	0.1	25	0.3	50	0.6
2	20	0.2	100	1.2	200	2.3
5	50	0.6	250	2.9	500	5.8
10	100	1.2	500	5.8	1000	11.6
20	200	2.3	1000	11.6	2000	23.1
50	500	5.8	2500	28.9	5000	57.9

> **Important:**   Table 1–6 is intended for guidance only. It is *strongly* recommended that you regularly review average page sizes and daily pageviews, and adjust the required storage size as necessary.

7. Select **Configuration**, then **General**, then **Advanced settings**, and then **Collector data retention policy**. Click the **Full session replay storage size (GB)** setting. Specify (in gigabytes) the required storage size. Note that the maximum that can be specified is 100 TB. When ready, click **Save**.

1.5.7 Memory Requirements

When calculating the amount of RAM required by your RUEI installation, it is recommended that you consider the following:

■ For the Reporter system, each million visitor sessions per day requires 256 MB. Hence, 3 million visitor sessions per day would require 768 MB. In addition, each million pageviews requires 100 MB - 256 MB. Note that exact amount depends the length of monitored URLs, average session duration, and the number of events (such as custom dimensions).

■ For each Collector system, each 10,000 hits requires 200 MB, and each 1000 SSL connections require 1 MB. In addition, up to 600 MB of network traffic can be buffered before individual TCP sessions start to be dropped. Up to 600 MB should also be assumed for content checks (such as XPath queries and error strings). Note that if you define a large number of content checks, or specify that they contain NLS character sets, the memory required may increase.

1.6 Software Requirements

The following GNU/Linux distributions are supported:

- Oracle Enterprise Linux 5.*x*.

- RedHat Enterprise Linux 5.*x*.

Encrypting Sensitive Data

If sensitive data needs to be encrypted, you have the opportunity to encrypt your entire disk configuration during the disk partitioning phase of the Enterprise Linux installation procedure. For more information, see Section 2.4, "Set up Disk Partitioning".

1.7 Network Requirements

- All server system clocks should be synchronized via NTP using UDP port 123.

- Support DNS information requests over TCP and UDP port 53.

- Support reports and e-mail alerts using TCP port 25.

- Support SNMP traps on request from an SNMP Manager using UDP port 161/162.

- The RUEI user interface is accessible over HTTPS port 443.

- In the case of a remote database setup, access to TCP port 1521 is required between the Reporter and remote database server.

- Each remote Collector system should be accessible by the Reporter system over TCP port 22. It is recommended all other ports be blocked.

Collector-Reporter Bandwidth

The amount data transferred between a remote Collector and the Reporter system largely depends on the type and level of network application traffic monitored by RUEI. In addition, the configuration of RUEI (such as defined functional errors, content checks, and page naming schemes) also influences the size of Collector files that need to be transferred to the Reporter system.

At peak times, the amount of data that needs to be transferred will be higher than during low traffic periods. Note that the exact amount of the data transmission from a remote Collector to the Reporter system can only be determined after the actual RUEI deployment.

For an initial deployment, the following simple rule can be used: each 5 million daily pageviews will result in a peak transfer of approximately 125 MB at peak time, and approximately 1 GB per day. Hence, typically only a few percent of the actual monitored traffic will be stored by a Collector and transferred to the Reporter. When you want or need to minimize this data transfer, it is recommended that you minimize the amount of monitored HTTP traffic which is not required by RUEI. For example, by using a subnet or VLAN-filtered network.

1.8 Client 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 browser plug-ins are required.

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

> **Important:** Ensure that any pop-up blocker within the browser has been disabled.

AJAX Support

RUEI uses AJAX to enhance its user interaction. Internet Explorer relies on the MSXML control to facilitate AJAX. The AJAX dependencies can trigger a security warning when using strict security settings.

Internet Explorer 6 does not properly support transparent images in the PNG format. RUEI uses a well know fix (AlphaImageLoader) for this problem which relies on DirectX. If you are experiencing browser crashes with IE6, you may need to update your version of DirectX. The PNG fix can trigger a security warning when using strict security settings.

1.9 Overview

The process of preparing the server system, and installing the RUEI software, has the following phases:

1. Install the Linux operating system. This is described in Chapter 2, "Installing the Linux Operating System".

2. Install all prerequisites for RUEI. This is described in Chapter 3, "Installing the Required Components".

3. Install the RUEI software. This is described in Chapter 4, "Installing the RUEI Software". The procedure for upgrading an existing 5.*x* or 6.0.0 installation to release 6.0.1 is also described.

4. Perform an initial configuration of the RUEI installation. This is described in Chapter 6, "Configuring RUEI".

5. Install and configure the Oracle HTTP server. Note that this is only required if you intend to use the Oracle Single Sign-on (SSO) service to authenticate RUEI users. This is described in Chapter 7, "Installing and Configuring the Oracle HTTP Server".

The procedure to install the required components depends on whether you are installing a Reporter or Collector system, and whether the Reporter system should use a locally installed database or a remote one. Figure 1–6 shows the recommended installation path.

Figure 1–6   Installation Procedure

2
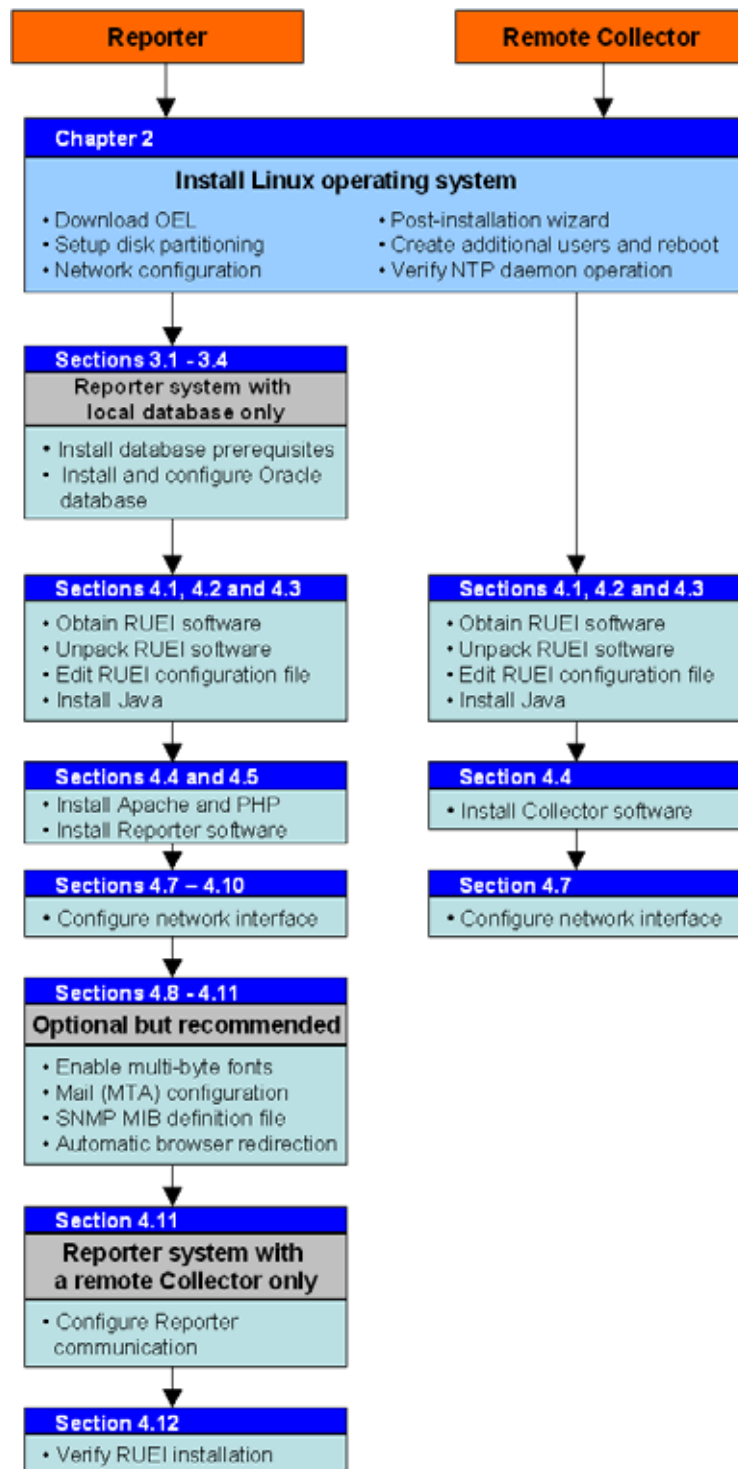
Installing the Linux Operating System

This chapter describes the procedure for installing Oracle Enterprise Linux 5.3. However, the procedure for installing Oracle or RedHat Enterprise Linux 5.*x* is very similar.

2.1 Introduction

The procedure for installing Oracle Enterprise Linux 5.*3* is fully described in the product documentation. This section presents a summary of that procedure, and assumes a sound knowledge of Linux system administration.

For information on vendor-specific variations, consult the appropriate documentation. The installation procedure described is based on the use of a DVD media package.

Obtaining the Linux Operating System

The Oracle Enterprise Linux 5.*3* software is available from the Oracle E-Delivery Web site (http://edelivery.oracle.com/linux).

Planning Network Interfaces

For remote access, one interface with a fixed IP address is required for each server. For a Collector (and an all-in-one RUEI server), one (SPAN/copy) or two (TAP) interfaces without IP address, are required.

For explanation of the RUEI global settings specified in the rest of this section, see Section 4.3.1, "The RUEI Configuration File".

Planning the Software Installation Location

Depending on installation location of the database and the RUEI software, the necessary disk space needs to be carefully planned. During operating system installation, you will need this information at hand during the disk partitioning phase.

The following are the disk space requirements when using the default installation locations indicated throughout this guide:

- Database Disk Space Requirements

    - /u01/app/oracle 300 GB (ORACLE_BASE).

- Reporter and Collector Disk Space Requirements

    - /opt/ruei 1 GB (RUEI_HOME).

    - /var/opt/ruei 100GB (RUEI_DATA).

    This means that for an all-in-one RUEI server installation, a minimum of 400 GB is required. In the case of a high-traffic implementation, involving a dedicated

remote Collector, a minimum of 200 GB of disk space is recommended for `/var/opt/ruei` (RUEI_DATA).

> **Note:** As of RUEI release 5.1, a Collector only system does not require any database.

2.2 Download ISO Image and Burn DVD

1. Download the appropriate ISO image. This guide assumes you are using the DVD version of Oracle Enterprise Linux 5.3.

2. Unzip the files.

3. Burn the ISO file to DVD. Note that this requires the use of a DVD-burning utility (such as UltraISO or Magic ISO Maker).

> **Note:** According to your corporate policy, the Linux installation procedure may use a different procedure to that described in the following sections.

2.3 Run Installer

> **Note:** After installing Linux on the first node, repeat the Linux installation procedure for each system.

1. Ensure that server system is able to boot from DVD. Insert the Oracle Enterprise Linux DVD, and power on.

2. When the Oracle Enterprise Linux boot screen appears, press **Enter** to start the installation process.

3. When asked to test the DVD media, select **Skip**. After a short interval, the installer goes into GUI mode. (The media test is not necessary because the DVD burning software would have informed you of any errors on the media).

4. At the Welcome to Oracle Enterprise Linux screen, click **Next**.

5. Select the appropriate options from the Language and Keyboard settings screens.

6. If the installer detects a previous version of Enterprise Linux, you are prompted to "Install Enterprise Linux" or "Upgrade an existing installation". Select "Install Enterprise Linux", and click **Next**.

> **Important:** Oracle recommends that you install the Linux operating system with the default software packages (RPMs), and that you do not customize the RPMs during installation. This installation includes most required packages, and helps you limit manual checks of package dependencies.

2.4 Set up Disk Partitioning

1. When prompted, select the default **Remove Linux partitions on selected drives and create default layout** option, and check the option **Review and modify**

partitioning layout. When prompted to confirm your selection, select **Yes**. Click **Next** to continue.

> **Important:** For security reasons, it is *strongly* recommended you check the **Encrypt System** check box so that all sensitive data is stored in a secure manner. A passphase is required during booting the system.

2. When prompted to confirm the removal of all partitions, click **Yes**.

3. Review and modify (if necessary) the automatically selected disk partitions.

   For most automatic layouts, the installer assigns 100 MB for /boot, 2 GB for swap, and the remainder is assigned to the root (/) partition. Ensure the specified SWAP space is sufficient. See Table 2–1 and Table 2–2 for required disk space and swap space requirements.

   The installer creates a disk configuration using the Logical Volume Manager (LVM). For example, it will partition the first hard drive (/dev/sda in the described configuration) into two partitions: one for the /boot partition (/dev/sda1), and the remainder of the disk dedicated to a LVM named VolGroup00 (/dev/sda2). The LVM Volume Group (VolGroup00) is then partitioned into two LVM partitions: one for the root file system (/), and another for swap. If you have selected a non-standard layout, ensure that the system meets the required disk space specifications shown in Table 2–1. Ensure enough swap space is allocated for Oracle Enterprise Linux. Its required swap space is shown in Table 2–2.

Table 2–1   Required Disk Space Specifications

Partition	Minimum Required Disk Space (GB)
ORACLE_BASE (default /u01/app/oracle)[1]	300
RUEI_HOME (default /opt/ruei)	1
RUEI_DATA (default /var/opt/ruei/)	100

[1] This is the example location of the database used throughout this guide.

Table 2–2   Required Swap Space

Available RAM	Swap Space Required
Up to 8192 MB	Equal to the size of RAM.
More than 8192 MB	0.75 times the size of RAM.

> **Important:** The Reporter server requires high performance data storage. RAID-10 or RAID-5 (or equivalent) storage configurations with high performance disks are strongly recommended.

> **Note:** The requirements shown in Table 2–1 and Table 2–2 can vary depending upon the composition and volume of monitored data. For more information, please contact Customer Support.

4. Accept the GRUB boot loader, as well as all default values, and click **Next**.

2.5 Network Configuration

1. Ensure that a static IP address is assigned to the interface used to access the RUEI Web interface. In addition, the assigned IP address and host name should be configured in the /etc/hosts file. If necessary, ensure that all Reporter and Collector systems are correctly defined in the DNS system.

2. Ensure that the network interface(s) used for network packet monitoring are administratively *up*, but *without* an IP address.

> **Important:** Make the network interface *up* status permanent (after a reboot) by setting the ONBOOT parameter of the capturing interfaces to *yes*. The network interfaces configuration can be found in /etc/sysconfig/networking/devices/ifcfg-eth*X* (where *X* represents the necessary network interface). Alternatively, use the graphical utility **system-config-network** to perform the above actions.

2.6 Package Installation

1. Select the appropriate time zone for your environment, and click **Next**.

> **Important:** In distributed environments, all time zones specified for Reporter and Collector systems *must* be identical.

2. Specify a root password, and click **Next**.

3. At the additional tasks dialog box shown in Figure 2–1, leave the **Customize later** radio button checked, leave all the check boxes unchecked, and click **Next**.

Figure 2–1 Additional Tasks Dialog Box

4. At the **About to install** screen, click **Continue** to start the installation.

5. At the prompt screen, click **Next** to begin installation of Enterprise Linux.

6. Upon successful installation, remove the DVD, and click **Reboot**.

> **Important:** It is *strongly* recommended that you use the settings described above, and do not perform a "minimal" installation of Oracle Enterprise Linux. This can lead to a wide range of problems, further described in Section C.8, "Missing Packages and Fonts Error Messages".

2.7 Post-Installation Wizard

1. When the system boots for the first time, a post-installation wizard appears, and allows you to finalize the operating system configuration settings. Click **Forward**.

2. At the User license agreement screen, read the license terms. You will not be able to proceed until you have accepted them. Then click **Forward**.

3. Use the screen shown in Figure 2–2 to allow only secure WWW (HTTPs) and SSH traffic. Be aware that, by default, SSH traffic is enabled, but secure WWW (HTTPS) traffic is not. Note that, when prompted with a warning about not setting the firewall, click **Yes**.

Figure 2–2   Firewall Configuration
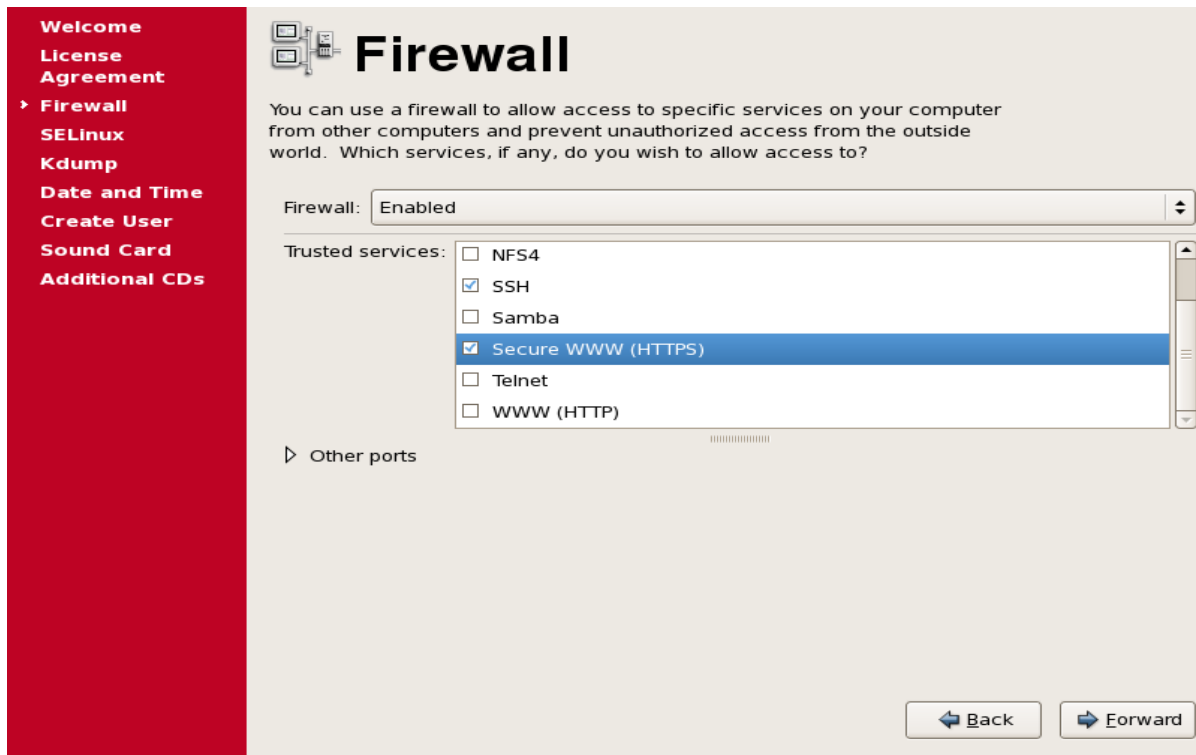
4. Use the screen shown in Figure 2–3 to disable Security Enhanced Linux (SELinux). Click **Forward**. Note that you are prompted with a warning that changing the SELinux setting requires rebooting the system so that the entire system can be relabeled. Click **Yes**.

Figure 2–3 SELinux Configuration

> **Important:** Security Enhanced Linux (SELinux) must be disabled for correct operation of RUEI.

5. Accept the default setting on the Kdump screen (disabled), and click **Forward**.

6. Adjust the date and time settings using the screen shown in Figure 2–4. The use of NTP is strongly recommended, and is required in a split-server deployment. Click **OK**.

Figure 2–4 Date and Time Settings
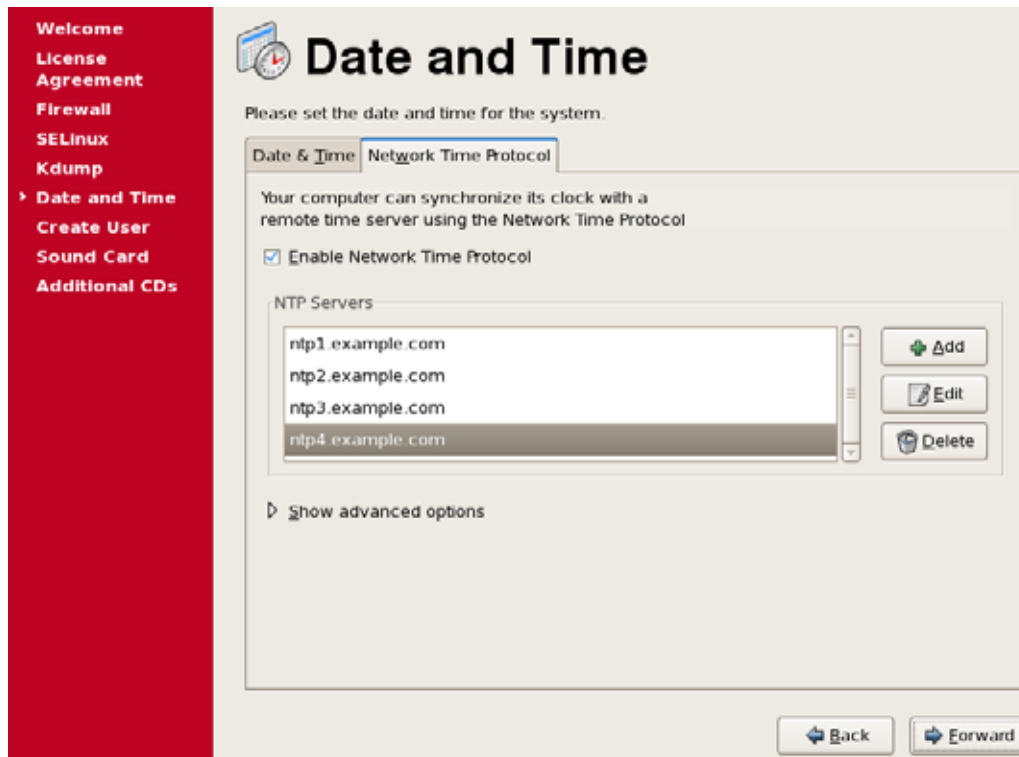
> **Important:** In distributed environments, all time zones specified for Reporter and Collector systems *must* be identical.

2.8 Create Additional Users and Reboot

1. Create any additional required (non-Oracle) operating system user accounts. Note that during the installation of the RUEI software, the `moniforce`[1] user account is created. The creation of the `oracle`[1] user is described in a later section. Do *not* create either user account at this point.

2. If prompted, confirm the detection of a sound card.

3. On the Additional CDs screen, click **Finish**.

4. Because the SELinux option has been changed (to disabled), you are prompted to reboot the system. Click **OK**.

5. After reboot, use the `root` user account, and the password you specified during installation to logon.

---

[1] This is the default user names used throughout this guide. For a complete explanation of the settings used by RUEI, see Section 4.3.1, "The RUEI Configuration File".

2.9 Verify NTP Daemon Operation

Because the NTP daemon is a critical component of RUEI, especially in a split Reporter-Collector configuration, it is recommended that you verify that it is activated in at least run level 5 during boot. Use the following commands:

```
chkconfig --list | grep ntp
ntpd     0:off   1:off   2:off   3:off   4:off   5:off   6:off
chkconfig ntpd on
chkconfig --list | grep ntp
ntpd     0:off   1:off   2:on    3:on    4:on    5:on    6:off
/etc/init.d/ntpd start
Starting ntpd:                                  [  OK  ]
```

Note that if the NTP daemon is not already running, you can start it with the command

```
/etc/init.d/ntpd restart
```

The following sample output show when the NTP daemon is synchronized (indicated by an "*").

```
ntpq -pn
     remote           refid      st t when poll reach   delay   offset  jitter
 ==============================================================================
 *194.171.167.130    .PPS.           1 u 994 1024 377    6.429   0.041   0.093
 +80.85.129.25       130.235.20.3    3 u 725 1024 377    4.435   0.673   0.129
 +82.94.235.106      135.81.191.59 2 u 678 1024 377    1.709   1.774   0.020
  127.127.1.0        .LOCL.         10 l   8   64 377    0.000   0.000   0.001
```

Important: In distributed environments, all time zones specified for Reporter and Collector systems *must* be identical.

3

Installing the Required Components

This chapter describes the procedure for installing all required components prior to installing RUEI. The installation of the RUEI software itself is described in Chapter 4, "Installing the RUEI Software".

> **Note:** It is assumed throughout this guide that the installation is performed as the `root` user, unless indicated otherwise.

3.1 Mounting the Enterprise DVD

If the Enterprise Linux DVD is mounted automatically, the content is located in the directory `/media/Enterprise Linux dvd 20090127` (the date depends on the downloaded version of the DVD). If the DVD is not automatically mounted, use the following commands to mount it:

```
mkdir -p /mnt/dvd
mount /dev/dvd /mnt/dvd
```

> **Note:** In the rest of this chapter it is assumed the Linux operating system DVD is mounted on `/mnt/dvd`.

3.2 Installing Collector-Only System Prerequisites

Besides the base operating system, you do not need to install any additional RPM packages. You should proceed directly to Chapter 4, "Installing the RUEI Software".

3.3 Installing the Database Prerequisites

Note the procedure described in this section is only required for a Reporter system with a local database.

1. Install all prerequisites for the Oracle database using the following commands:

```
cd /mnt/dvd/Server
rpm -Uhv kernel-headers-2.6.18-*.el5.x86_64.rpm \
elfutils-libelf-devel-0.137-*.el5.x86_64.rpm \
elfutils-libelf-devel-static-0.137-*.el5.x86_64.rpm \
glibc-devel-2.5-* \
glibc-headers-2.5-*.x86_64.rpm \
gcc-4.1.2-*.el5.x86_64.rpm \
gcc-c++-4.1.2-*.el5.x86_64.rpm \
```

```
libstdc++-devel-4.1.2-*.el5.x86_64.rpm \
libgomp-4.3.2-*.el5.x86_64.rpm \
libaio-devel-0.3.106-*.x86_64.rpm \
sysstat-7.0.2-*.el5.x86_64.rpm
```

3.3.1 Installing the Reporter Prerequisites

1. Issue the following command to install all prerequisites for the Reporter:

```
rpm -Uhv httpd-2.2.3-*.el5.x86_64.rpm \
apr-1.2.7-*.x86_64.rpm \
apr-util-1.2.7-*.el5.x86_64.rpm \
php-5.1.6-*.el5.x86_64.rpm \
mod_ssl-2.2.3-*.el5.x86_64.rpm \
distcache-1.4.5-*.x86_64.rpm \
php-common-5.1.6-*.el5.x86_64.rpm \
php-cli-5.1.6-*.el5.x86_64.rpm \
php-mbstring-5.1.6-*.el5.x86_64.rpm \
php-ldap-5.1.6-*.el5.x86_64.rpm \
gmp-4.1.4-*.el5.x86_64.rpm \
postgresql-libs-8.1.11-*.el5_1.1.x86_64.rpm \
lm_sensors-2.10.7-*.el5.x86_64.rpm \
net-snmp-5.3.2.2-*.el5.x86_64.rpm \
net-snmp-utils-5.3.2.2-*.el5.x86_64.rpm \
perl-XML-Twig-3.26-*.fc6.noarch.rpm \
perl-XML-Parser-2.34-*.x86_64.rpm
```

2. Issue the following the commands to install all optional fonts. Alternatively, install the multi-byte character sets necessary to meet your NLS requirements.

```
rpm -Uhv fonts-*
```

3. Continue with the rest of the installation procedure from Section 3.4.1, "Creating the Database User Accounts and Groups".

3.3.2 Installing All Requirements Using a Yum Repository (Alternative)

As an alternative to manual installation, you can use a Yum repository to install the required RPMs. This requires a working Yum repository. For information on Yum repositories, see http://linux.duke.edu/projects/yum/. Install the necessary Oracle database packages using the following commands:

```
yum -y install gcc
yum -y install gcc-c++
yum -y install compat-libstdc++-33
yum -y install libstdc++-devel
yum -y install elfutils-libelf-devel
yum -y install glibc-devel
yum -y install libaio-devel
yum -y install sysstat
```

Install the necessary Reporter packages using the following commands:

```
yum -y install perl-URI
yum -y install perl-XML-Twig
yum -y install net-snmp-utils
yum -y install sendmail-cf
yum -y install httpd
yum -y install mod_ssl
yum -y install php
yum -y install php-mbstring
```

```
yum -y install php-ldap
yum -y install bitstream-vera-fonts
yum -y install librsvg2
yum -y install xorg-x11-xinit
yum -y install fonts-*
```

3.4 Installing and Configuring the Oracle Database

This section describes the procedure for installing the Oracle database. This section can be skipped if you preparing a Reporter server with a remote database or a Collector system. Continue with the installation procedure at Chapter 4, "Installing the RUEI Software".

Download Oracle Database 11g Release 1 (11.1.0.6.0) Standard Edition, Standard Edition One, and Enterprise Edition from the Oracle database home page (http://www.oracle.com/technology/software/products/database/index.html).

The procedure for installing the Oracle database is fully described in the product documentation. This section presents a summary of that procedure.

The information in this guide is based on the *Oracle Database 11g for Linux x86-64 Quick Installation Guide*. It is recommended that you download and review it. It is available at http://download.oracle.com/docs/cd/B28359_01/install.111/b32285/toc.htm.

Note: The Oracle database's maximum memory usage is set by the MEMORY_TARGET parameter. By default, this is set to 40% of the available server RAM. For example, in a system with 16 GB RAM, it is set to approximately 6.4 GB. Note that if extra RAM is added to the server system to increase performance, it is not made available to the Oracle database until the MEMORY_TARGET parameter is manually increased.

Information about automatic memory management is available at http://download.oracle.com/docs/cd/B28359_01/server.111/b28310/memory003.htm#ADMIN11200.

3.4.1 Creating the Database User Accounts and Groups

1. Create two groups (dba and oinstall) with the following commands:

   ```
   /usr/sbin/groupadd dba
   /usr/sbin/groupadd oinstall
   ```

2. Create the oracle user, and specify oinstall as the primary group and dba as the secondary group, with the following command:

   ```
   /usr/sbin/useradd -g oinstall -G dba oracle
   ```

3. Set the oracle user password with the following command:

   ```
   passwd oracle
   ```

3.4.2 Configuring the Kernel Parameter Settings

1. Modify the /etc/sysctl.conf file to satisfy the Oracle installer's requirements by adding the following lines:

```
kernel.sem = 250 32000 100 128
net.ipv4.ip_local_port_range = 1024 65000
net.core.rmem_default = 4194304
net.core.rmem_max = 4194304
net.core.wmem_default = 262144
net.core.wmem_max = 262144
fs.file-max = 6553600
```

2. Make these changes effective immediately with the following command:

```
/sbin/sysctl -p
```

3.4.3 Setting Shell Limits for the Oracle User

1. To improve the performance of the software, you must increase the shell limits for the `oracle` user. Add the following lines to the `/etc/security/limits.conf` file:

```
oracle soft nproc 2047
oracle hard nproc 16384
oracle soft nofile 1024
oracle hard nofile 65536
```

2. If not already present, add the following lines to the `/etc/pam.d/login` file:

```
session required /lib64/security/pam_limits.so
session required pam_limits.so
```

3. Depending on the `oracle` user's default shell, you need to make changes to it. For the Bourne, Bash, or Korn shell, add the following lines to the bottom of the `/etc/profile` file:

```
if [ $USER = "oracle" ]; then
    if [ $SHELL = "/bin/ksh" ]; then
        ulimit -p 16384
        ulimit -n 65536
    else
        ulimit -u 16384 -n 65536
    fi
fi
```

For information about other shells, you should refer to the *Oracle Database 11g Release 1 for Linux x86-64 Quick Installation Guide* (at http://download.oracle.com/docs/cd/B28359_01/install.111/b32285/toc.htm).

3.4.4 Creating the Database Directory

Throughout this guide it is assumed that the directory `/u01/app` is the root of the Oracle installation. This is specified in the ORACLE_BASE environment variable.

1. Enter the following command to display information about all mounted file systems:

```
df -k
```

This command displays information about all the file systems mounted on the system, including:

- The physical device name.

- The total amount, used amount, and available amount of disk space.

- The mount point directory for that file system.

2. Create the necessary subdirectories in the mount point directory that you identified and set the appropriate owner, group, and permissions for them using commands similar to the following:

```
mkdir -p /u01/app
chown -R oracle:oinstall /u01/app
chmod -R 775 /u01/app
```

3.4.5 Configuring the Oracle User's Environment

1. Logon to the system as the `oracle` user.

2. Add or edit the `umask` setting in the `~/.bash_profile` file to the following:

```
umask 022
```

3. Make the setting active for the current shell by issuing the following command:

```
. ./.bash_profile
```

4. Set the ORACLE_BASE environment variable to define the location of the root of the Oracle directory tree:

```
export ORACLE_BASE=/u01/app/oracle
```

5. Unzip the Oracle database installation zip file. This creates the directory `database`. Then, run the graphical installer (note this will not run under user `root`). Ensure that your X Window environment is properly set up. In addition, when logging on remotely with SSH, ensure X forwarding is enabled. Use the following commands:

```
cd <location of the zip file>
unzip linux_11gR1_database.zip
./database/runInstaller
```

6. Use the installation wizard, and specify the values shown in Figure 3–1.

Figure 3–1   Select Installation Method
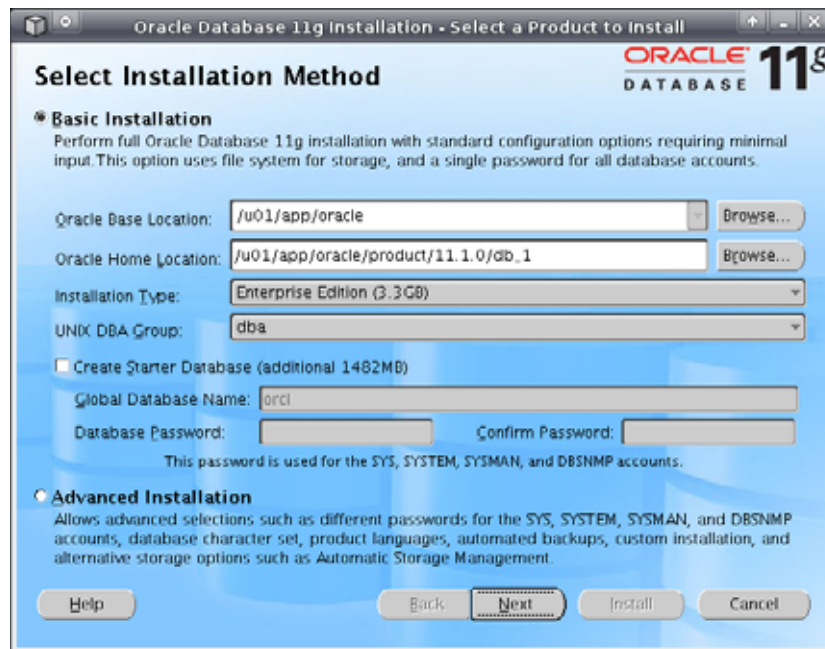
Note that the **Create Starter Database** check box should be unchecked.

7. When ready, click **Next**. Specify the values shown in Figure 3–2. When ready, click **Next**.

Figure 3–2   Specify Inventory Directory and Credentials
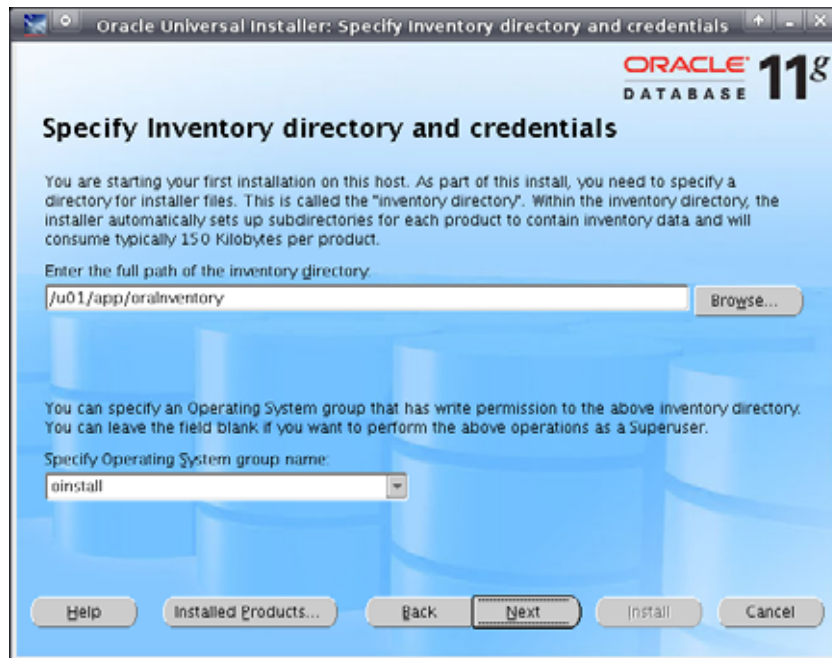
> **Important:** Any warnings or errors reported during database installation (especially any missing prerequisites) must be resolved before proceeding. See Section 3.3.2, "Installing All Requirements Using a Yum Repository (Alternative)" and Appendix C, "Troubleshooting" for information about required components.

If all dependencies are met, you can click **Next**.

8. When installation is almost complete, you are prompted to run two scripts, `orainstRoot.sh` and `root.sh`, as `root`. This is shown in Figure 3–3.

Figure 3–3 Configuration Scripts
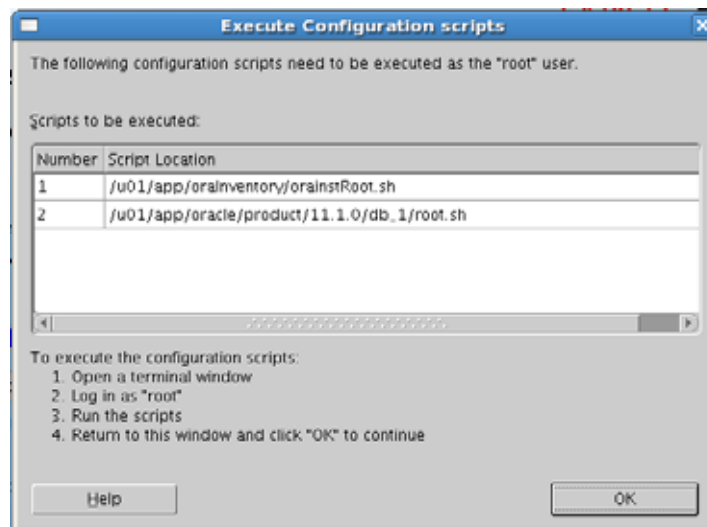
Run the two scripts indicated in Figure 3–3. They should be run in a terminal window as `root`. You will receive output similar to the following:

```
/u01/app/oraInventory/orainstRoot.sh
Changing permissions of /u01/app/oraInventory to 770.
Changing groupname of /u01/app/oraInventory to oinstall.
The execution of the script is complete

Finished product-specific root actions.
```

The second script generates the following output:

```
/u01/app/oracle/product/11.1.0/db_1/root.sh
Running Oracle 11g root.sh script...

The following environment variables are set as:
    ORACLE_OWNER= oracle
    ORACLE_HOME=  /u01/app/oracle/product/11.1.0/db_1

Enter the full pathname of the local bin directory: [/usr/local/bin]:
    Copying dbhome to /usr/local/bin ...
    Copying oraenv to /usr/local/bin ...
    Copying coraenv to /usr/local/bin ...

Creating /etc/oratab file...
```

```
Entries will be added to the /etc/oratab file as needed by
Database Configuration Assistant when a database is created
Finished running generic part of root.sh script.
Now product-specific root actions will be performed.
```

On completion of each script, return the dialog shown in Figure 3–3, and click **OK**. In the main installer screen, verify that the message "The installation of Oracle database 11g was successful" appears. Click **Exit**, and confirm by clicking **Yes**.

3.4.6 Creating an Oracle init Script File

1. Logon as the `root` user.

2. Create an `/etc/init.d/oracledb` script file to start and stop the Oracle database. An example of this initialization script is available in the RUEI installation zip file (`/root/RUEI/extra/oracledb`) explained in Chapter 4, "Installing the RUEI Software". Note that you will need to modify the settings for the ORACLE_BASE and ORACLE_HOME environment variables shown above if you selected a different installation directory for the Oracle database.

3. Make the script file executable and use it to start the Oracle database with the following commands:

```
chmod +x /etc/init.d/oracledb
/sbin/chkconfig --add oracledb
/sbin/service oracledb start
```

The Oracle database is now installed, and the database listener should be up and running.

4

Installing the RUEI Software

This chapter describes the procedure for installing the Apache Web server and RUEI software. The procedure for upgrading an existing RUEI 5.*x* installation to release 6.0 is described in Chapter 5, "Upgrading to RUEI 6.0.1". The post-installation configuration procedure is described in Chapter 6, "Configuring RUEI".

4.1 Obtaining the RUEI Software

The RUEI software is available from the Oracle E-Delivery Web site (`http://edelivery.oracle.com`). Select the following media pack criteria:

- Oracle Enterprise Manager
- Linux x86-64

4.2 Unpacking the RUEI Software

Copy the downloaded RUEI zip file to `/root` directory on the server, and unzip it. Use the following commands:

```
cd /root
unzip package_name.zip
```

The following directories are created which contain the software needed to complete the RUEI installation:

- `/root/RUEI/60`
- `/root/RUEI/ZendOptimizer`
- `/root/RUEI/IC`
- `/root/RUEI/PHP`
- `/root/RUEI/Java`
- `/root/RUEI/extra`

4.3 Generic Installation Tasks

All steps described in this section must be performed regardless of your planned installation (that is, a Reporter with local database, a Reporter with remote database, or a Collector).

4.3.1 The RUEI Configuration File

The /etc/ruei.conf file specifies the settings used within your installation. Note that all components in your RUEI environment (such as the remote database and Collectors) require the same global /etc/ruei.conf configuration file. The settings shown in Table 4–1 are defined.

Table 4–1   RUEI Settings.

Setting	Description[1]	Value
RUEI_HOME[2]	Home directory of the RUEI software.	/opt/ruei
RUEI_DATA[2]	Directory for RUEI data files.	/var/opt/ruei
RUEI_USER	The RUEI operating system user.	moniforce
RUEI_GROUP	The RUEI operating system group.	moniforce
RUEI_DB_INST[3]	The database instance name.	ux
RUEI_DB_USER[4]	The database user name.	UXINSIGHT
RUEI_DB_TNSNAME[5]	The database connect string.	uxinsight

[1]   Be aware that all variables specified in this table are the values used throughout this guide, and can be modified as required.

[2]   The directory name cannot exceed 50 characters in length.

[3]   The database instance name cannot exceed 8 characters in length.

[4]   The database user name cannot exceed 30 characters in length.

[5]   The alias name cannot exceed 255 characters in length.

There is no need to change the settings for JAVA_HOME and INSTANTCLIENT_DIR if you intend to use the software contained on the RUEI distribution pack.

1. Create the moniforce group and user. The home directory of moniforce should be set to /var/opt/ruei, with read permissions for group members.

```
/usr/sbin/groupadd moniforce
/usr/sbin/useradd moniforce -g moniforce -d /var/opt/ruei
chmod -R 750 /var/opt/ruei
chown -R moniforce:moniforce /var/opt/ruei
```

2. An example of the configuration file is included in the RUEI distribution pack. Ensure the file is readable by the RUEI_USER user by issuing the following commands:

```
cp /root/RUEI/extra/ruei.conf /etc/
chmod 644 /etc/ruei.conf
chown moniforce:moniforce /etc/ruei.conf
```

In case of a remote database installation, the ruei.conf file needs to be identical with that of the Reporter system.

4.3.2 Installing Java

For both Reporter and Collector systems you need to install the Java Runtime Environment (JRE). Java is bundled within the RUEI distribution pack.

1. Issue the following commands:

```
cd /root/RUEI/Java
chmod +x ./jre-1_5_0_21-linux-amd64-rpm.bin
./jre-1_5_0_21-linux-amd64-rpm.bin
```

Note you are prompted to accept the Java licence agreement. You cannot continue until you have done so.

2. This installs the necessary Java software in the directory `/usr/java/jre1.5.0_21`. To make the install directory version independent, create a more generic symlink using the following command:

```
ln -s /usr/java/jre1.5.0_21 /usr/java/jre
```

4.4 Remote Collector Installation

This section can be skipped for Reporter or remote database servers.

Logon to the Collector system as the `root` user, and do the following:

1. The RUEI file and directory locations are fixed. Therefore, it is necessary to use the exact directory name described below. Create the RUEI application root directory using the following command:

```
mkdir -p /opt/ruei
chmod 750 /opt/ruei
```

2. Change to the RUEI root directory and run the `ruei-install.sh` script using the following commands:

```
cd /root/RUEI/60
chmod +x ruei-install.sh ruei-check.sh
./ruei-install.sh collector
```

3. In addition to the actions described above, you need to configure the network interfaces. This is fully described in Section 4.6, "Configuring the Network Interface". Moreover, you also need to setup a password-less remote login from the Reporter system to the newly created Collector system. The necessary configuration steps are described in Section 4.11, "Configuring Reporter Communication (Split-Server Setup Only)".

4.5 Reporter Installation

This section describes the procedure for installing the required components for a Reporter system. These include the Apache Web server, the Oracle database Instant Client, and the Zend Optimizer.

4.5.1 Installing the Apache Web Server and PHP

This section describes the installation and configuration of the Apache Web server, and the components that use it.

4.5.1.1 PHP Configuration

1. Ensure that the Web server starts automatically after re-boot by issuing the following command:

```
/sbin/chkconfig httpd on
```

2. Edit the `/etc/sysconfig/httpd` file to include the following line at the bottom of the file:

```
source /etc/ruei.conf
```

3. Create the following settings in the `/etc/php.d/ruei.ini` file:

```
session.gc_maxlifetime = 14400
memory_limit = 96M
upload_max_filesize = 128M
post_max_size = 128M
```

4.5.1.2 Avoiding rsvg Warnings

RUEI uses rsvg for graph generation. In order to avoid warnings about a missing directory, create the empty `.gnome2` directory using the following command:

```
mkdir -p /var/www/.gnome2
```

4.5.2 Installing the Oracle Database Instant Client

Install the Oracle database Instant Client and SQLplus extension with the following commands as the `root` user:

```
cd /root/RUEI/IC
rpm -Uhv oracle-instantclient11.1-basic-*.rpm
rpm -Uhv oracle-instantclient11.1-sqlplus-*.rpm
```

4.5.3 Installing the php-oci8 Module

Install the `php-oci8` module (this is part of the RUEI distribution set) using the following commands:

```
cd /root/RUEI/PHP
rpm -Uhv php-oci8-11gR1-*
```

4.5.4 Installing the Zend Optimizer

Go to the directory containing the Zend Optimizer code, unpack the tar file, and run the Zend optimizer installer. Read the license agreement. You will not be able to proceed until you have accepted the license terms. Accept all default settings, and allow the installer to restart the Apache Web server. Issue the following commands:

```
cd /root/RUEI/ZendOptimizer
tar zxvf ZendOptimizer-3.3.3-linux-glibc23-x86_64.tar.gz
cd ZendOptimizer-3.3.3-linux-glibc23-x86_64
./install
```

> **Note:** If you upgrade your system packages (for example, using Yum), this can overwrite changes you previously made to the `/etc/php.ini` file. Therefore, you should be prepared to re-install the Zend Optimizer. When doing so, ensure the Zend Optimizer installer indicates the location of the `php.ini` file as `/etc/php.ini` and not `/usr/local/Zend/etc/php.ini`.

Additional Information

It is recommended you move the Zend configuration lines created in the `/etc/php.ini` file to the RUEI-specific PHP configuration file `/etc/php.d/ruei.ini` to prevent upgrade issues. If you performed a default installation of the Zend Optimizer, this involves moving the following lines:

```
[Zend]
zend_extension_manager.optimizer=/usr/local/Zend/lib/Optimizer-3.3.3
zend_extension_manager.optimizer_ts=/usr/local/Zend/lib/Optimizer_TS-3.3.3
```

```
zend_optimizer.version=3.3.3

zend_extension=/usr/local/Zend/lib/ZendExtensionManager.so
zend_extension_ts=/usr/local/Zend/lib/ZendExtensionManager_TS.so
```

4.5.5 Creating the RUEI Database Instance

The RUEI database can reside either locally (that is, on the Reporter server) or on a remote database server. In this section you will create the database instance required for RUEI, and generate the "connection data" required for the Reporter to connect to this database instance.

You will need the following scripts to be present on the system where the database instance (RUEI_DB_INST) will be created:

- `ruei-prepare-db.sh`: creates the database instance, Oracle wallet and database connect files.

- `ruei-check.sh`: a hardware and environment check utility, and is automatically invoked by `ruei-prepare-db.sh`. The script can also be used as a stand-alone troubleshooting utility. A complete description of the script, refer to Appendix A, "The ruei-check.sh Script".

The four "connection data" files created during the procedure described in this section are as follows:

- `cwallet.sso`

- `ewallet.p12`

- `sqlnet.ora`

- `tnsnames.ora`

The RUEI configuration file (/etc/ruei.conf) also needs to be present on the database server and configured as described in Section 4.3.1, "The RUEI Configuration File".

Do the following:

1. Copy the `ruei-prepare-db.sh` and `ruei-check.sh` scripts to the server on which you intend to run the database instance, and make them executable for the `oracle` user. These scripts can be found in the RUEI distribution zip (/root/RUEI/60).

2. Review the settings in the /etc/ruei.conf file to match your needs as described in Section 4.3.1, "The RUEI Configuration File".

3. Logon to the database server as the `oracle` user on the database server, and set the ORACLE_HOME environment variable. You need to run the `ruei-prepare-db.sh` script as the `oracle` user. This script creates the RUEI_DB_INST database, but only after a number of hardware and software environment checks have been performed. The actual checks performed depend on the system type you are currently installing.

   The script prompts you for the RUEI database user password, and the password used to protect the Oracle wallet. Once the wallet password is stored in a secure location, the RUEI application can login to the database automatically. The `ruei-prepare-db.sh` script also creates the "connection data" files for you now.

   If you run the `ruei-prepare-db.sh` script for a combined Reporter/Database server, all files are placed automatically in the correct location[1]. In case of a remote

database, a separate `.tar` file is generated, and you will need to perform the extra step 4.

Issue the following commands:

```
chmod +x ruei-prepare-db.sh ruei-check.sh
export ORACLE_HOME=/u01/app/oracle/product/11.1.0/db_1
./ruei-prepare-db.sh
```

If you ran the above commands on a combined Reporter/Database server you can skip step 4 and proceed to step 5.

4. This step only applies when using a remote database.

In the case of a Reporter system using a remote database, you will need to copy the generated `/tmp/ruei-database-configuration.tar` file in step 3 from the database server to the Reporter system. The `/tmp/ruei-database-configuration.tar` file must be extracted on Reporter server in the directory `/var/opt/ruei` (RUEI_DATA). The permissions of the files need to be set so that the specified RUEI_USER (`moniforce`) can use them.

Copy the generated `.tar` file, which holds connection data files to the Reporter system. Logon to the Reporter server and extract the `.tar` file using the following commands:

```
cd /var/opt/ruei
tar xvf path-to-tar-file/ruei/database-configuration.tar
chown moniforce:moniforce cwallet.sso ewallet.p12 sqlnet.ora tnsnames.ora
```

5. Because logging of the database can consume a large amount of disk space, it is recommended you install a clean-up script to avoid the usage of unnecessary disk space. Copy the (example) script to the `oracle` user directory and activate it via `cron` using the following commands:

```
mkdir -p /home/oracle/bin
cp /root/RUEI/extra/ruei-clean.sh /home/oracle/bin
chmod +x /home/oracle/bin/ruei-clean.sh
su - oracle -c 'echo "10 0 * * * /home/oracle/bin/ruei-clean.sh" | crontab'
```

4.5.6 Installation of the Reporter Software

1. The RUEI directory locations are flexible. Therefore, it is necessary to use the exact directory name described as configured in the `/etc/ruei.conf` file. Create the RUEI application root directory using the following command:

```
mkdir -p /opt/ruei
chmod 750 /opt/ruei
```

Note: The specified RUEI_HOME and RUEI_DATA directories must have 750 permissions defined for them.

---

2. Make the `apache` and `moniforce` members of two additional groups using the following commands:

```
/usr/sbin/usermod -aG moniforce apache
/usr/sbin/usermod -aG uucp apache
```

---

[1] If you do not know the root password, you can select the "remote database" option, and manually extract the connection tar file. This is described in step 4.

```
/usr/sbin/usermod -aG uucp moniforce
```

3. Go to the directory which holds the RUEI software, and install the RUEI packages. You can specify `reporter` or `collector` to the `ruei-install.sh` script depending on the required installation:

```
cd /root/RUEI/60
chmod +x ruei-install.sh
./ruei-install.sh reporter
```

4. Re-start the Apache Web server using the following command:

```
/sbin/service httpd restart
```

5. Verify that the RUEI software was correctly installed by issuing the following command:

```
./ruei-check.sh postinstall
```

6. As the `moniforce` user, set the RUEI `admin` user password to enable logging onto the RUEI interface with the following commands:

```
su - moniforce
set-admin-password
```

You are prompted to enter and confirm the password.

Note: When defining the `admin` user password, bear the following in mind:

- The password must have at least eight characters, and contain at least one non-alphanumeric character (such as $, @, &, and !).

- The initial password must be changed within seven days.

- The user name and password are case sensitive.

4.6 Configuring the Network Interface

This section is only relevant to Reporter and Collector systems.

Make the monitoring network interface *up* status permanent (after a reboot) by setting the ONBOOT parameter of the capturing interfaces to *yes* in the interface configuration files. The network interfaces configuration can be found in `/etc/sysconfig/network-scripts/ifcfg-eth`*X* (where *X* represents the necessary network interface). Alternatively, use the graphical utility **system-config-network** to set the appropriate interfaces to "activate device when computer starts".

4.7 Enabling Multibyte Fonts (Optional, but Recommended)

This section is only relevant to the Reporter system.

For PDF generation with multibyte character content, additional fonts need to be enabled. These fonts need to be made available to Java. Use the following command to copy (or move) the RUEI-installed fonts to the appropriate Java directory:

```
cp /opt/ruei/gui/include/bi_publisher/fonts/* \
/usr/java/jre/lib/fonts/
```

4.8 Mail (MTA) Configuration (Optional, Reporter Only)

This section is only relevant to the Reporter system.

RUEI assumes a working local MTA for sending PDF reports and E-mail alerts. By default, Enterprise Linux uses the Sendmail MTA. By default, Sendmail will deliver the E-mail directly to the destination MTA. If this behavior is not according to your needs or policies, sending mail via a SmartHost (relay) might be an alternative. To configure a SmartHost in Sendmail, do the following:

1. Install the Sendmail configuration utility by issuing the following command:

   ```
   rpm -Uhv sendmail-cf-8.13.8-*.el5.x86_64.rpm
   ```

2. Find the line which contains the Smart Host setting in `/etc/mail/sendmail.mc`. Modify the SMART_HOST setting to your needs. For example:

   ```
   define('SMART_HOST', 'my.example')dnl
   ```

3. Generate the new configuration into a new `sendmail.cf` by executing the following command:

   ```
   make -C /etc/mail
   ```

4. Restart Sendmail. For example:

   ```
   /etc/init.d/sendmail restart
   ```

   > **Note:** Extensive information about the configuration of the Sendmail MTA is available at http://www.sendmail.org.

4.9 SNMP (Reporter Only)

You can download the RUEI MIB definition file through the Reporter interface. This definition file can be added to the SNMP manager. The procedure for downloading the MIB file is described in the *Oracle Real User Experience Insight User's Guide.*

4.10 Configuring Automatic Browser Redirection (Optional)

This section is only relevant to Reporter systems.

To have the browser automatically redirected to the correct RUEI path, create the file `/var/www/html/index.html` with the following content:

```
<head>
<meta http-equiv="REFRESH" content="0;URL=/ruei/">
</head>
```

4.11 Configuring Reporter Communication (Split-Server Setup Only)

This section is only relevant to a Reporter system with remote Collector(s).

A password-less SSH connection must be setup between the `Moniforce` user from the Reporter system to each Collector system. Do the following:

1. Logon to the Reporter server as root. Issue the following commands:

   ```
   su - moniforce
   ssh-keygen -P ""
   ```

Press **Enter** to accept the defaults.

2. Logon as `root` on each of the Collector systems. Issue the following commands:

```
su - moniforce
cd ~/.ssh
ssh root@Reporter cat /var/opt/ruei/.ssh/id_rsa.pub >> authorized_keys
```

(you will need to specify the Reporter system root password)

```
chmod 600 authorized_keys
```

3. Check that it is now possible to execute a remote command (as `moniforce` user) on the Reporter system without using a password. For example:

- Logon as `root` on the Reporter server.

- Logon as `moniforce` user: `su - moniforce`.

- Execute a remote pwd command: `ssh` **Collector** `pwd`.

- Enter yes to the question "Are you sure you want to continue connecting (yes/no)?".

- The command should return `/var/opt/ruei`.

4. The above steps must be performed for each Collector!

> **Note:** If the connection between the Reporter and the Collector(s) has not been correctly configured, you will receive an authorization error when you try to register the remote Collector.

4.12 Verifying Successful Installation of RUEI

On completion of the Initial Setup Wizard (described in Section 6.2, "Performing Initial RUEI Configuration"), you can verify your installation by selecting **System**, the **Status**. All system indicators should report OK. Note Status notification will indicate "Unknown" because no system alerts have yet been configured. This is fully described in the *Oracle Real User Experience Insight User's Guide.*

5

Upgrading to RUEI 6.0.1

This chapter describes the procedure for upgrading an existing RUEI 5.*x* or 6.0.0 installation to release 6.0.1. The post-installation configuration procedure is described in Chapter 6, "Configuring RUEI".

If the DVD is not automatically mounted, use the following commands to mount it:

```
mkdir -p /mnt/dvd
mount /dev/dvd /mnt/dvd
```

> **Note:** In the rest of this chapter it is assumed that the RUEI DVD is mounted on /mnt/dvd.

Note that the upgrade procedure described below should be performed as the root user unless indicated otherwise.

5.1 Upgrading From RUEI 5.*x* to 6.0.1

This section describes the procedure for upgrading from an existing RUEI 5.*x* installation to release 6.0.1.

> **Important:** Before proceeding with the upgrade, make a backup of your configuration. Select **Configuration**, then **System**, then **Maintenance**, and then **Backup and restore**. The configuration backup is required in case of a rollback. In addition, it is *strongly* recommended that you create a database backup. Information on database backup procedures is available at https://support.oracle.com/CSP/ui/flash.html.

Upgrading Accelerator packages

If your RUEI installation makes use of accelerator packages (such as for Oracle E-Business Suite or Siebel), these must be upgraded at the same time as the RUEI system. Ensure you follow the sequence of steps described in the rest of this section.

Upgrading the Reporter System

Do the following:

1. Copy the RUEI distribution pack (V*xxx*.zip) to the Reporter system /root directory, and unzip it. Repeat the unzip action for all required accelerator packages. Issue the following commands:

   ```
   cd /root
   ```

```
unzip Vxxx.zip
```

2. Install the XML::Twig module by issuing the following commands:

```
cd /mnt/dvd/Server
rpm -Uhv perl-XML-Twig-3.26-*.fc6.noarch.rpm \
perl-XML-Parser-2.34-*.x86_64.rpm
```

3. Install the Java Runtime Environment (JRE). Note that this step can be skipped if you are upgrading from RUEI 5.1. Issue the following commands:

```
cd /root/RUEI/Java
chmod +x ./jre-1_5_0_21-linux-amd64-rpm.bin
./jre-1_5_0_21-linux-amd64-rpm.bin
ln -s /usr/java/jre1.5.0_21 /usr/java/jre
```

   Note you are prompted to accept the Java license agreement. You cannot continue until you have done so.

   This installs the JRE from a standalone package bundled with the RUEI distribution set, rather than the one built into the database.

4. Temporarily stop all processing by issuing the following command:

```
cd /root/RUEI/extra
chmod +x ruei-upgrade-5.x-6.0.sh
./ruei-upgrade-5.x-6.0.sh stop_ruei
```

5. For each Collector system, issue the following commands:

```
./ruei-upgrade-5.x-6.0.sh stop_collector Collector-IP-address
```

   where **Collector-IP-address** is the IP address of the collector system. Note that this command must also be issued for the local Collector (localhost).

6. Note that this step can be skipped if you are upgrading from RUEI 5.1. Update the /etc/ruei.conf file by issuing the following commands:

```
cp /etc/ruei.conf /etc/ruei.conf.50
cp /root/RUEI/extra/ruei.conf.upgrade /etc/ruei.conf
chmod 644 /etc/ruei.conf
source /etc/ruei.conf
chown $RUEI_USER:$RUEI_GROUP /etc/ruei.conf
```

7. Update the RUEI database instance by issuing the following commands:

```
cd /root/RUEI/60
cp ruei-prepare-db.sh /home/oracle
cp ruei-check.sh /home/oracle
chmod +x /home/oracle/ruei-*.sh
su - oracle
export ORACLE_HOME=/u01/app/oracle/product/11.1.0/db_1
./ruei-prepare-db.sh
exit
```

   Upon completion, you should again be the root user.

8. Upgrade the RUEI Reporter RPMs by issuing the following commands:

```
cd /root/RUEI/extra
./ruei-upgrade-5.x-6.0.sh rpm_pre_install
cd /root/RUEI/60
chmod u+x ./ruei-install.sh
./ruei-install.sh *.rpm
```

```
cd /root/RUEI/extra
./ruei-upgrade-5.x-6.0.sh rpm_post_install
```

> **Note:** When upgrading a Reporter system that has little or no replay data on its local Collector, "*LTS?*" errors can be reported. These can be safely ignored.

9. Note that this step can be skipped if you are upgrading from RUEI 5.1. Enable additional fonts for PDF generation. Because the PDF generator uses Java libraries, these need to be made available to Java. Copy (or move) the RUEI included fonts to the appropriate Java directory. For example:

```
cp /opt/ruei/gui/include/bi_publisher/fonts/* \
/usr/java/jre/lib/fonts/
```

10. Restart the Apache Web server by issuing the following command:

```
/sbin/service httpd restart
```

> **Important:** At this point you should complete the Collector upgrade procedure described below *before* proceeding with step 11.

11. Restart processing (*after* you have upgraded all Collector systems) by issuing the following commands:

```
cd /root/RUEI/extra
./ruei-upgrade-5.x-6.0.sh start_ruei
```

The procedure for upgrading the Reporter system is complete.

> **Note:** After completion of the upgrade procedure, the default URL prefix masking action is set to "No replay". Review this setting (as described in the *Oracle Real User Experience Insight User's Guide*) to determine whether it meets your operational requirements.

> **Note:** During and after the upgrade procedure, if error or information messages appear in the event log (select **System**, then **Status**, and then **Event log**), you should mark them as read after completing the upgrade procedure, and monitor whether new messages are reported. In the event of re-occurring error messages, you should contact Customer Support.

Upgrading the Collector System(s)

Do the following:

Note steps 1 through 4 are *only* required if you are upgrading from RUEI 5.0. If you are upgrading from RUEI 5.1, you should proceed directly to step 5.

1. Remove the line containing the entry `/home/oracle/bin/ruei-clean.sh` from Oracle's `crontab` file by issuing the following commands:

```
su - oracle
crontab -e
exit
```

2. Stop the Oracle database, and remove the installation script so that it will no longer be started after a reboot, by issuing the following commands:

```
service oracledb stop
chkconfig --del oracledb
```

Note that if stopping the Oracle database service seems to take an usually long period of time, you should open a second terminal and kill any running process called `rsynclogdird`.

3. Stop the Apache Web server by issuing the following commands:

```
service httpd stop
chkconfig --del httpd
```

4. De-install all RUEI RPMs (except `ux-collector`) by issuing the following command:

```
rpm -qa | grep ^ux-.*-5.0 | grep -v ^ux-collector | xargs rpm -e
```

5. Copy the RUEI distribution pack (V*xxx*.zip) to the Collector system /root directory, and unzip it. Issue the following commands:

```
cd /root
unzip Vxxx.zip
cd /root/RUEI/60
```

6. Install the Java Runtime Environment (JRE). Note that this step can be skipped if you are upgrading from RUEI 5.1. Issue the following commands:

```
cd /root/RUEI/Java
chmod +x ./jre-1_5_0_21-linux-amd64-rpm.bin
./jre-1_5_0_21-linux-amd64-rpm.bin
ln -s /usr/java/jre1.5.0_21 /usr/java/jre
```

Note you are prompted to accept the Java license agreement. You cannot continue until you have done so.

This installs the JRE from a standalone package bundled with the RUEI distribution set, rather than the one built into the database.

7. Note that this step can be skipped if you are upgrading from RUEI 5.1. Update the /etc/ruei.conf file by issuing the following commands:

```
cp /etc/ruei.conf /etc/ruei.conf.50
cp /root/RUEI/extra/ruei.conf.upgrade /etc/ruei.conf
chmod 644 /etc/ruei.conf
source /etc/ruei.conf
chown $RUEI_USER:$RUEI_GROUP /etc/ruei.conf
```

8. Convert the Replay store and upgrade the RUEI Collector RPM by issuing the following commands:

```
cd /root/RUEI/extra
chmod +x ruei-upgrade-5.x-6.0.sh
./ruei-upgrade-5.x-6.0.sh convert_replay_store
cd /root/RUEI/60
chmod +x ruei-install.sh
./ruei-install.sh collector
```

Repeat the above steps for each Collector system in your RUEI infrastructure.

At this point, you should return to step 10 of the Reporter system upgrade procedure.

5.2 Upgrading From RUEI 6.0.0 to 6.0.1

The upgrade procedure from version 6.0.0 to 6.0.1 only takes a few minutes. There is a short interruption of the Collector service, but it is automatically restarted during the upgrade.

> **Important:** Before proceeding with the upgrade, make a backup of your configuration. Select **Configuration**, then **System**, then **Maintenance**, and then **Backup and restore**. The configuration backup is required in case of a rollback.

Reporter System

The Reporter upgrade procedure described in this section applies to both single server installations as well as dedicated Reporter systems.

Do the following:

1. Login to the Reporter as `root`. Within the `/root` directory, unzip the RUEI zip file, and go to the directory containing the application files. Repeat the unzip action for all required accelerator packages. Use the following commands:

   ```
   cd /root
   unzip Vxxxx.zip
   ```

2. Stop all processing on the Reporter system using the following commands:

   ```
   cd /root/RUEI/extra
   chmod +x ruei-upgrade-5.x-6.0.sh
   ./ruei-upgrade-5.x-6.0.sh stop_ruei
   ```

3. Install the new versions of the RPMs using the following commands:

   ```
   cd /root/RUEI/60
   chmod +x ruei-install.sh
   ./ruei-install.sh *.rpm
   ```

4. As the `moniforce` user, restart processing using the following commands:

   ```
   cd /root/RUEI/extra
   ./ruei-upgrade-5.x-6.0.sh start_ruei
   ```

Collector System(s)

For each required Collector system, login as `root`. Within the `/root` directory, unzip the RUEI zip file, go to the directory containing the application files, and install the new versions of the RPMs. Do the following:

1. Unzip the RUEI distribution package using the following commands:

   ```
   cd /root
   unzip Vxxxx.zip
   ```

2. Upgrade the Collector RPMs using the following commands:

   ```
   cd /root/RUEI/60
   chmod +x ruei-install.sh
   ./ruei-install.sh collector
   ```

5.2.1 Rolling Back to Version 6.0.0

This section describes the procedure to rollback to version 6.0.0 after upgrading to version 6.0.1. Note that the Collector included in the Reporter installation is automatically rolled back during the described procedure. However, remote Collector systems must be individually rolled back. The procedure to do this is described later in this section.

> **Important:** Be aware that it may not be possible to restore your system to its exact state prior to upgrading. It is *strongly* recommended that you contact Customer Support before rolling back an upgrade.

---

1. Login to the Reporter system as `root`. Within the `/root` directory, unzip the RUEI 6.0.0 distribution zip file, and go to the directory containing the application files. Use the following commands:

```
cd /root
unzip Vxxx.zip
```

> **Important:** Ensure that the directory where you place the 6.0.0 distribution pack does not conflict with the 6.0.1 release. In addition, if your RUEI installation makes use of accelerator packages (such as Oracle E-Business Suite or Siebel), repeat the unzipping for all previously installed accelerator packages.

---

2. Stop all processing on the Reporter system by issuing the following commands:

```
cd /root/RUEI/60
./ruei-upgrade-5.x-6.0.sh stop_ruei
```

3. Restore the previous RPMs by issuing the following commands:

```
cd /root/RUEI/60
chmod +x ruei-install.sh
./ruei-install.sh *.rpm
```

4. Restart processing by issuing the following commands:

```
cd /root/RUEI/extra
./ruei-upgrade-5.x-6.0.sh start_ruei
```

Rolling Back Remote Collector Systems

Do the following:

1. Login to the remote Collector system as `root`. Within the `/root` directory, unzip the 6.0.0 distribution zip file, and go to the directory containing the application files. Issue the following commands:

```
cd /root
unzip Vxxx.zip
```

> **Important:** Ensure that the directory where you place the 6.0.0 distribution pack does not conflict with the 6.0.1 release.

---

2. Restore the previous RPMs by issuing the following commands:

```
cd /root/RUEI/60
chmod +x ruei-install.sh
./ruei-install.sh ux-collector-*.rpm
```

5.3 Rolling Back From 6.0.*x* to 5.1.*x*

This section describes the procedure to rollback to version 5.1.*x* after upgrading to version 6.0.*x*. Note that the Collector included in the Reporter installation is automatically rolled back during the described procedure. However, remote Collector systems must be individually rolled back. The procedure to do this is described later in this section.

> **Important:** Be aware that it may not be possible to restore your system to its exact state prior to upgrading. It is *strongly* recommended that you contact Customer Support before rolling back an upgrade.
>
> In addition, you will require a configuration backup of your 5.1.*x* installation, as well as the 5.1.*x* and 6.0.*x* distribution packages to perform the described rollback procedure.

Do the following:

1. Login to the Reporter system as `root`. Within the `/root` directory, unzip the previous 5.1.*x* distribution package, and go to the directory containing the application files. Issue the following commands:

```
mkdir /root/rollback51
cd /root/rollback51
unzip Vxxx.zip
```

> **Important:** If your RUEI installation makes use of accelerator packages (such as Oracle E-Business Suite or Siebel), repeat the unzipping for all previously installed accelerator packages.

2. Stop all RUEI processing by issuing the following commands:

```
cd /root/RUEI/extra
chmod +x ./ruei-rollback-6.0-5.x.sh
./ruei-rollback-6.0-5.x.sh stop_ruei
```

3. Execute the RPM pre-install phase by issuing the following command:

```
./ruei-rollback-6.0-5.x.sh rpm_pre_install
```

4. Remove the ADF RPM and downgrade existing Reporter RPMs by issuing the following commands:

```
rpm -e ux-adf
cd /root/RUEI/60
./ruei-install.sh /root/roolback51/RUEI/51/*.rpm
```

5. Execute the RPM post-install phase by issuing the following commands:

```
cd/ root/RUEI/extra
```

```
./ruei-rollback-6.0-5.x.sh rpm_post_install
```

6. Re-start the Apache Web server by issuing the following command:

```
service httpd restart
```

At this point, you should rollback all remote Collector systems (using the procedure described below). Proceed to step 7 *after* you have rolled back all remote Collector systems. If your installation does not make use of remote Collector systems, you should proceed directly to step 7.

7. Restart RUEI processing by issuing the following commands:

```
cd /root/RUEI/extra
chmod +x ./ruei-rollback-6.0-5.x.sh
./ruei-rollback-6.0-5.x.sh start_ruei
```

Be aware that this phase can take a considerable amount of time.

8. Restore the RUEI configuration backup you created prior to upgrading by selecting **Configuration**, then **System**, then **Maintenance**, then **Backup and restore**, and then select **Restore system from file**.

Troubleshooting Rollback Problems

The rollback script `ruei-rollback-6.0-5.x.sh` logs its actions in the file `/tmp/ruei-rollback-6.0-5.x.log`. If you encountered any problems during the rollback, please attach this file to any request to Customer Support.

5.3.1 Rolling Back Remote Collector Systems

This section describes the procedure to rollback remote Collector systems to version 5.1.*x* after upgrading to version 6.0.*x*.

Do the following:

1. Login to the remote Collector system as `root`. Within the `/root` directory, unzip the previous 5.1.*x* distribution package, and go to the directory containing the application files. Issue the following commands:

```
mkdir /root/rollback51
cd /root/rollback51
unzip Vxxx.zip
```

2. Restore the Collector replay store by issuing the following commands:

```
cd /root/RUEI/extra
./ruei-rollback-6.0-5.x.sh convert_replay_store
```

3. Restore the previous Collector RPMs by issuing the following commands:

```
cd /root/RUEI/60
./ruei-install.sh /root/rollback51/RUEI/51/ux-collector-*.rpm
```

Repeat the above procedure for each required remote Collector system. When ready, return to the Reporter rollback procedure.

5.4 Rolling Back From 6.0.*x* to 5.0.*x*

This section describes the procedure to rollback to version 5.0.*x* after upgrading to version 6.0.*x*. Note that the Collector included in the Reporter installation is automatically rolled back during the described procedure. However, remote Collector

systems must be individually rolled back. The procedure to do this is described later in this section.

> **Important:** Be aware that it may not be possible to restore your system to its exact state prior to upgrading. It is *strongly* recommended that you contact Customer Support before rolling back an upgrade.
>
> In addition, you will require a configuration backup of your 5.0.*x* installation, as well as the 5.0.*x* and 6.0.*x* distribution packages to perform the described rollback procedure.

Do the following:

1. Login to the Reporter system as `root`. Within the `/root` directory, unzip the previous 5.0.*x* distribution package, and go to the directory containing the application files. Issue the following commands:

```
mkdir /root/rollback50
cd /root/rollback50
unzip Vxxx.zip
```

> **Important:** If your RUEI installation makes use of accelerator packages (such as Oracle E-Business Suite or Siebel), repeat the unzipping for all previously installed accelerator packages.

2. Stop all RUEI processing by issuing the following commands:

```
cd /root/RUEI/extra/
chmod +x ./ruei-rollback-6.0-5.x.sh
./ruei-rollback-6.0-5.x.sh stop_ruei
```

3. Execute the RPM pre-install phase by issuing the following command:

```
/ruei-rollback-6.0-5.x.sh rpm_pre_install
```

4. Restore the previous RPMs by issuing the following commands:

```
rpm -e ux-wlp
rpm -e ux-adf
cd /root/rollback50/RUEI/50
rpm -Uhv --oldpackage ux-*
```

5. Execute the RPM post-install phase by issuing the following command:

```
cd /root/RUEI/extra/
./ruei-rollback-6.0-5.x.sh rpm_post_install
```

At this point, you should rollback all remote Collector systems (using the procedure described in Section 5.4.1, "Rolling Back Remote Collector Systems"). Proceed to step 7 *after* you have rolled back all remote Collector systems. If your installation does not make use of remote Collector systems, you should proceed directly to step 7.

6. Re-start the Apache Web server by issuing the following command:

```
service httpd restart
```

7. Restart RUEI processing by issuing the following command:

```
./ruei-rollback-6.0-5.x.sh start_ruei
```

8. Restore the backup of the `/etc/ruei.conf` file (as the `root` user) you created at the start of the upgrade procedure by issuing the following commands:

```
mv /etc/ruei.conf /etc/ruei.conf.60.backup
cp /etc/ruei.conf.50 /etc/ruei.conf
```

9. Restore the RUEI configuration backup you created prior to upgrading by selecting **Configuration**, then **System**, then **Maintenance**, then **Backup and restore**, and then select **Restore system from file**.

5.4.1 Rolling Back Remote Collector Systems

This section describes the procedure to rollback remote Collector systems to version 5.0.*x* after upgrading to version 6.0.*x*.

Do the following:

1. Login to the remote Collector system as `root`. Within the `/root` directory, unzip the previous 5.0.*x* distribution package, and go to the directory containing the application files. Issue the following commands:

```
mkdir /root/rollback50
cd /root/rollback50
unzip Vxxx.zip
```

2. Restore the Collector replay store by issuing the following commands:

```
cd /root/RUEI/extra
./ruei-rollback-6.0-5.x.sh stop_collector
./ruei-rollback-6.0-5.x.sh convert_replay_store
```

3. Restore the previous Collector RPMs by issuing the following commands:

```
cd /root/RUEI/60
./ruei-install.sh /root/rollback50/RUEI/50/ux-collector-*.rpm
```

Repeat the above procedure for each required remote Collector system. When ready, return to the Reporter rollback procedure.

6

Configuring RUEI

This chapter describes the procedure for initially configuring RUEI. This task is performed by the individual within your organization who has been assigned the role of RUEI Super Administrator (this is, the `admin` user). For more information about roles, see the *Oracle Real User Experience User's Guide.*

6.1 Introduction

In order to get RUEI up and running, you will need to have prepared the server systems for RUEI, and installed the RUEI software. This is described in Chapter 2, "Installing RUEI". After that, you are required to specify the installation type and mail setup (described in Section 6.2, "Performing Initial RUEI Configuration"), and then perform some post-installation configuration (described in Section 6.4, "Performing Post-Installation Configuration"). This is necessary in order to start reporting. It includes deciding how pages and users will be identified, and specifying the scope of monitoring in your network environment. Finally, you will need to define the system's initial users, as described in Section 6.4.6, "Authorizing Initial Users". Note that if you are installing a split-server configuration, you will need to configure each Collector system. This is described in Section 6.3, "Configuring a Collector System".

> **Caution:**   The configuration of RUEI should be discussed with someone with a detailed knowledge of your organization's network topology.

6.2 Performing Initial RUEI Configuration

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. Note that this initial configuration can be changed later, as necessary. It is only intended to provide RUEI with sufficient information to start real-user monitoring and reporting.

To perform the initial RUEI configuration, do the following:

1. Start the Initial setup wizard by pointing your browser at `https://`***Reporter***`/ruei`. The dialog shown in Figure 6–1 appears:

Figure 6–1   Logon Dialog Box
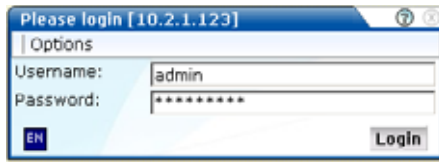
Specify the `admin` user, and the password defined with the
`set-admin-password` script (defined in Section 2.6.4, "Installation of the RUEI
Software"). When ready, click **Login**. The dialog shown in Figure 6–2 appears.

> **Note:** The first time a user logs on, they receive a warning that the
> Web server was unable to verify the identify of the site's certificate.
> Depending on your security policies, you can either choose to accept
> this certificate permanently, temporarily for this session, or reject the
> certificate. Alternatively, you can purchase a certificate from a
> Certificate Authority (CA). You can also create an SSL certificate. For
> more information, visit
> `http://httpd.apache.org/docs/2.2/ssl/ssl_`
> `faq.html#realcert`.

Figure 6–2   Initial Setup Wizard Dialog
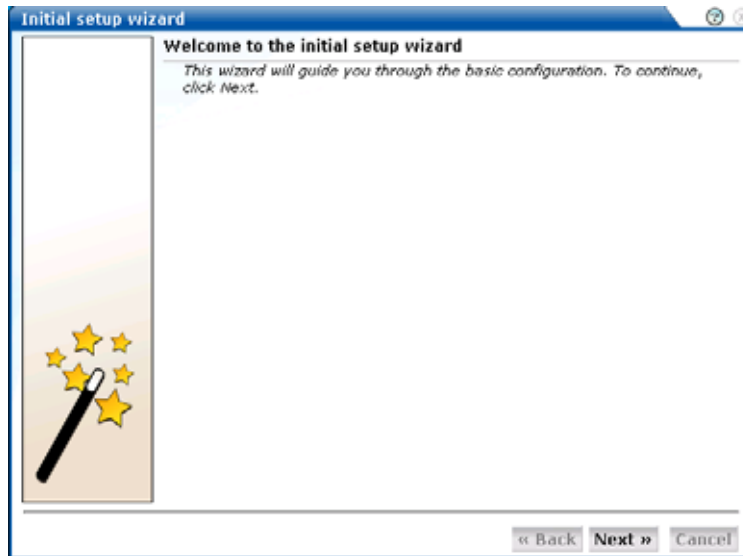
2.   Click **Next** to proceed with configuration. The dialog shown in Figure 6–3 appears:

Figure 6–3   Mail Setup Dialog

3. Specify the requested information. The e-mail information is used to configure RUEI's interface to your internal network, and will be used for reporting problems. When you have entered the required information, click **Next**. The dialog shown in Figure 6–4 appears.

Figure 6–4   Settings Overview Dialog

4. Check that the information specified in the settings overview is correct. You can use **Back** and **Next** to move between dialogs as necessary. When ready, click **Next**. The dialog shown in Figure 6–5 appears.

Figure 6–5   Applying Settings Dialog
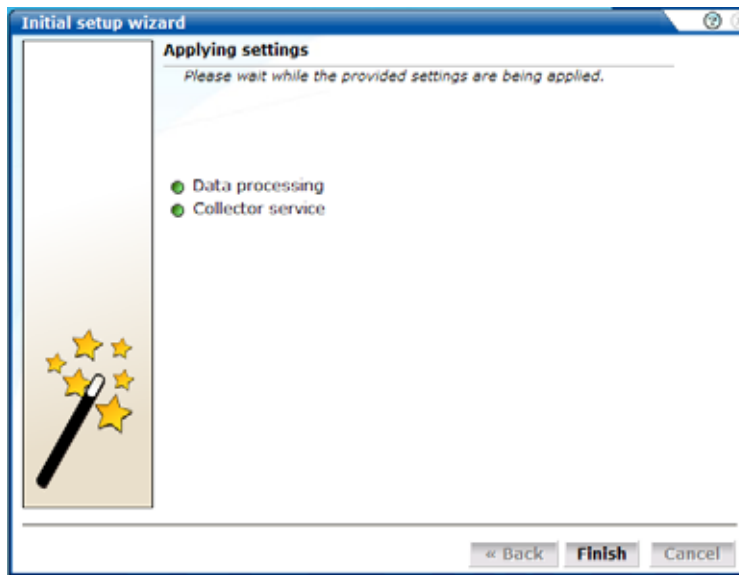
5.   This dialog indicates how far the system has got in applying your specified settings. Typically, this process takes a maximum of 15 minutes. When finished, click **Finish** to close the dialog.

6.3 Configuring a Collector System

To register a Collector to a Reporter system, do the following:

1.   Within the Reporter system, select **System**, then **Maintenance**, and then **Network data collectors**. The Network data collectors window appears.

2.   Select **Configuration**, and then **Register remote Collector**. The Register Collector dialog shown in Figure 6–6 appears.

Figure 6–6   Register Collector Dialog
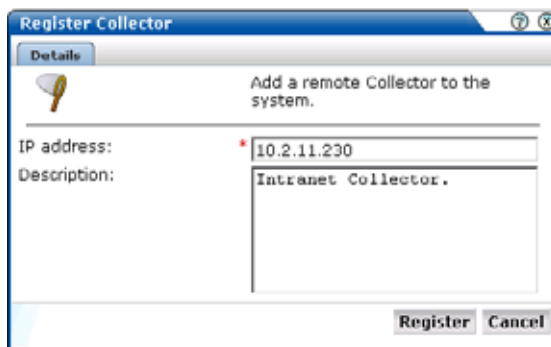
3.   Enter the IP address of the Collector. Optionally, you can also specify a brief description of the attached Collector. When ready, click **Register**. On return to the Network data collectors window, the new Collector should be listed.

6.3.1 Resetting a Collector System

If for any reason you need to register a Collector system with a different Reporter system than earlier configured, do the following:

1. Logon to the Collector system as the `moniforce` user, and remove the Collector's currently defined Reporter assignment by issuing the following commands:

```
su - moniforce
appsensor delete wg
```

2. Follow the procedure described in Section 6.3, "Configuring a Collector System" to register the Collector with the required Reporter.

6.4 Performing Post-Installation Configuration

In order to start reporting, the RUEI needs certain information about the monitored network environment. It is important to understand that RUEI is designed to work within a wide range of network environments. Therefore, the configuration choices you make will affect the accuracy and usability of the reported data. It is strongly recommended that you carefully review the settings described in this section.

6.4.1 Specifying the Cookie Technology

Within RUEI, session information is based on cookies. Therefore, RUEI needs to know and understand the cookie technology (or technologies) your organization is using. The procedure to configure this is described in the *Oracle Real User Experience Insight User's Guide.* The structure of supported cookie technologies is also explained in the *Oracle Real User Experience Insight User's Guide.*

If cookie information is not available, user tracking is based on visitor IP address. This can lead to unreliable session information. For example, in the case of users behind a proxy server, all users coming from that network would be identified as the same user.

6.4.2 Adding/Uploading HTTPS SSL Keys

Uploading SSL keys to the system is extremely important if most of your HTTP traffic is based on SSL sessions. Without the SSL keys being available to the system, the Collector will not be able to decrypt the SSL session traffic. In these circumstances, further configuration of cookies, user identification, and application pages would make little sense. Ensure that you upload and activate your HTTPS SSL keys as early on as possible in the configuration process. The management of SSL keys is fully described in the *Oracle Real User Experience Insight User's Guide.*

6.4.3 Specifying How Users are Identified

Within RUEI, user identification is first based on the HTTP Authorization field. After that, it is derived from the supplied GET/POST argument within URLs. 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 fully described in the *Oracle Real User Experience Insight User's Guide.*

6.4.4 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. For each page that the system 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. This is fully described in the *Oracle Real User Experience User's Guide.*

6.4.5 Specifying the Scope of Monitoring

Within RUEI, you control the scope of traffic monitoring by specifying which TCP ports the SYSTEM should monitor. Obviously, no information is available for non-monitored ports. In addition, you can restrict monitoring to specific servers and subnets. This is fully described in the *Oracle Real User Experience Insight User's Guide*.

6.4.6 Authorizing Initial Users

In order for users to start working with RUEI, you will need to authorize the required users. Only one user, admin, is available after installation. The procedure to set the initial admin user password is described in Section 2.6.4, "Installation of the RUEI Software". All other required users must be created and assigned the necessary roles and access permissions through the Reporter GUI. In particular, it is recommended that you create a dedicated Security Officer account to finalize the security-related configuration. User roles, creation and management are fully described in the *Oracle Real User Experience Insight User's Guide*.

Note that user names and passwords are case sensitive. For ease of entry, it is recommended that you do not include any diacritic characters, such as umlauts, within passwords.

6.5 Verifying and Evaluating Your Configuration

To ensure the quality and quantity of data being collected and analyzed by your RUEI system, it is strongly advised that you verify the system's configuration using some core metrics. These are described in the following sections.

6.5.1 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 6–7:

Figure 6–7   Data Processing Dialog
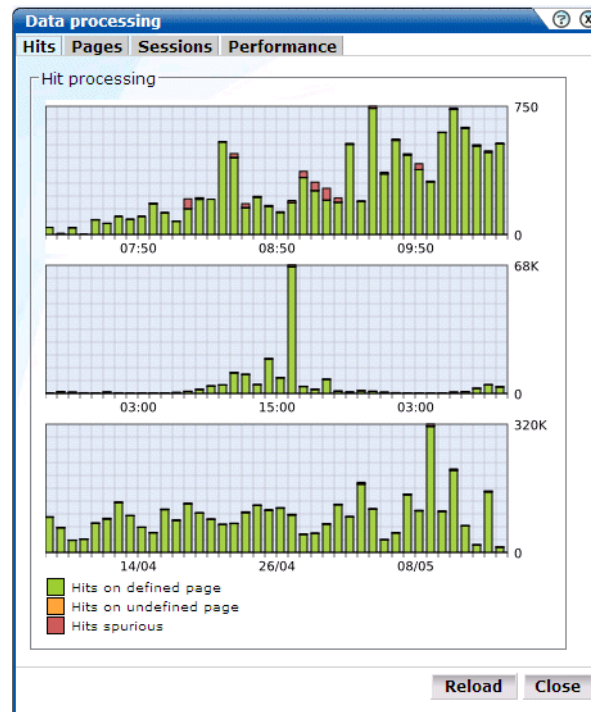
The precise number of percentage of identified sessions, pageviews, and hits relies heavily on your exact configuration. If you intend to measure all traffic, it is recommended that at least 80% of sessions, pageviews, and hits are reported as "identified". It is also recommended that you regularly review the reported numbers and percentages to ensure the quality and quantity of reported data.

> **Important:**   After initial configuration of cookies, user identification, and application page structure, the system will take at least 5 - 10 minutes before the **Sessions/Hits/Pageviews** tabs are updated with green bars. If, after 20 - 30 minutes after initial configuration, there are no green bars showing on any of the tabs, please review your initial RUEI configuration. If the bars do not indicate any activity at all, please review your system's network card configuration as outlined in Section 1.7, "Network Requirements".

6.5.2 Confirming Data Collection

At this point, RUEI should be collecting data from each of its associated Collectors. You can easily check the status of these Collectors by selecting **System**, then **Status**, and then **Collector status**. This opens the Network data collectors window. This is fully described in the *Oracle Real User Experience Insight User's Guide*.

It is important to understand that the data being collected by Collector system(s) is offered to the RUEI data processing module for further analysis. If no data is collected, there is no means by which it can be processed.

7

Installing and Configuring the Oracle HTTP Server

This chapter describes the procedure for installing and configuring the Oracle HTTP server. This is an optional part of the RUEI installation process, and is only required if you intend to use the Oracle Single Sign-On (SSO) service to authenticate RUEI users. Note that the Oracle SSO service must be fully installed and configured before it can be used for RUEI user authentication.

The procedure to configure the Reporter system for Oracle SSO user authentication is described in the *Oracle Real User Experience Insight User's Guide*. Note that RUEI must be fully installed before it can be configured for Oracle SSO user authentication.

7.1 Turning off the Default Web Server

The Oracle SSO server uses its own Web server in order to prevent conflicts with the currently installed Web server. Therefore, the currently installed Web server needs to be turned off by issuing the following commands:

```
/sbin/service httpd stop
/sbin/chkconfig --del httpd
```

> **Note:** It is recommended that you do *not* un-install the default Enterprise Linux Apache Web server because this would also un-install the PHP module.

7.2 Reporter System Without Local Database

The procedure described in this section should only be followed if you are installing and configuring the oracle HTTP server for a Reporter that does not a local database. Otherwise, the procedure described in Section 7.3, "Reporter System With Local Database" should be followed.

7.2.1 Creating the Oracle User

This section is only relevant for RUEI installations configured to use a remote database. In this case, the `oracle` user does not yet exist, and so must be created by issuing the following commands:

```
/usr/sbin/groupadd oinstall oinstall
/usr/sbin/useradd -g oinstall oracle
```

7.2.2 Setting up the Oracle HTTP Server Environment

This section is only relevant for RUEI installations configured to a remote database. In this case, the following lines need to be added to the `/etc/security/limits.conf` file:

```
oracle soft nofile 16384
oracle hard nofile 65536
```

7.2.3 Creating the Installation Directory

Issue the following commands:

```
mkdir -p /u01/app/oracle
chown -R oracle:oinstall /u01/app/oracle
```

7.3 Reporter System With Local Database

The procedure described in this section should only be followed if you are installing and configuring the oracle HTTP server for a Reporter that with a local database. Otherwise, the procedure described in Section 7.2, "Reporter System Without Local Database" should be followed.

Increase the number of open files limit. Edit the following line in the `/etc/security/limits.conf` file:

```
oracle soft nofile 16384
```

7.4 Installing Oracle HTTP Server

Do the following:

1. Login to the Reporter server as the `oracle` user, and unzip the Oracle HTTP Server zip file. Ensure that you have you display environment setup correctly (reference or copy a piece about setting up the X server in other part of the install manual). The installation of Oracle HTTP server needs to be performed as the `oracle` user (only some parts in this chapter require `root` privileges).

```
unzip ofm_webtier_11.1.1.1.0_64_disk1_10f1.zip
cd webtier/Disk1
export ORACLE_BASE=/u01/app/oracle
./runInstaller
```

2. As the installation script runs, you should accept all default values, except for step 5. Here, you must uncheck the two check boxes **Oracle Web Cache** and **Associate selected components with weblogic domain** shown in Figure 7–1.

Figure 7–1   Configure Components Dialog
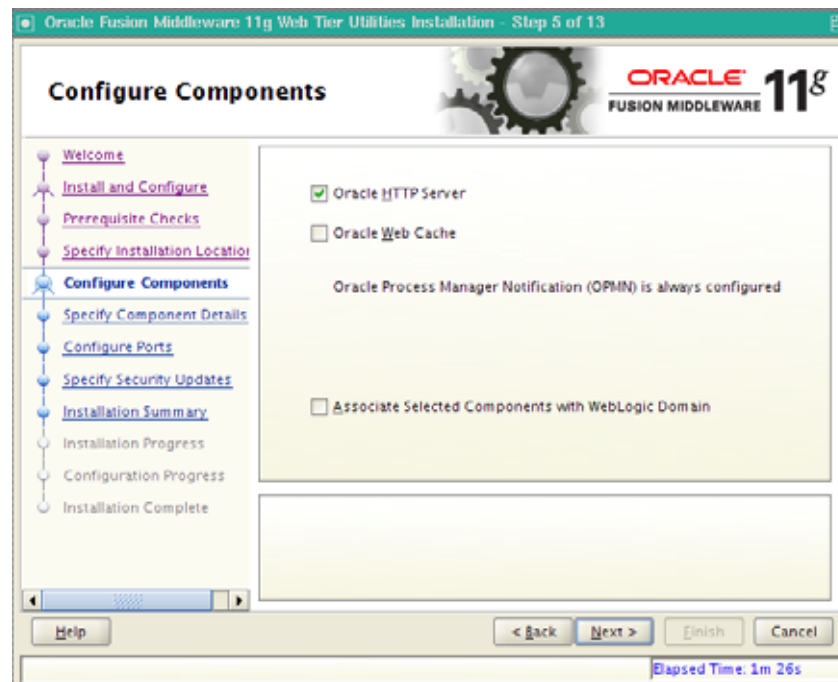
3. After exiting the installation script, set the following environment variables:

```
export ORACLE_HOME=$ORACLE_BASE/product/11.1.1/as_1
export ORACLE_INSTANCE=$ORACLE_HOME/instances/instance1
```

4. Stop the Oracle HTTP server and Oracle Process Manager Notification (OPMN) using the following command:

```
$ORACLE_INSTANCE/bin/opmnctl stopall
```

5. Edit the `$ORACLE_HOME/ohs/bin/apachectl` file to fix the bug 8327898. Change the `prefork` as follows:

```
case ${MPM} in

async   ) _httpd="httpd.async" ;;
prefork ) _httpd="httpd.prefork" ;;
*       ) _httpd="httpd.worker" ;;
esac
```

Note more information about this bug is available at `https://bug.oraclecorp.com/pls/bug/webbug_print.show?c_rptno=8327898`.

6. Edit the `$ORACLE_INSTANCE/config/OPMN/opmn/opmn.xml` file to use the `httpd.prefork` in order so that the PHP module can be loaded. In addition, set the following variables from the `/etc/ruei.conf` configuration file:

```
<environment>
      <variable id="TEMP" value="/tmp"/>
      <variable id="TMP" value="/tmp"/>
      <variable id="OHSMPM" value="prefork"/>
      <variable id="TNS_ADMIN" value="/var/opt/ruei"/>
      <variable id="RUEI_DB_TNSNAME" value="uxinsight"/>
      <variable id="RUEI_DB_USER" value="uxinsight"/>
```

```
        <variable id="RUEI_HOME" value="/opt/ruei"/>
        <variable id="RUEI_DATA" value="/var/opt/ruei"/>
        <variable id="JAVA_HOME" value="/usr/java/jre">
</environment>
```

7. Logon as the `root` user, and change the permissions for the `.apachectl` file so that the Oracle HTTP server can run as the Apache user. Issue the following commands:

```
chown root $ORACLE_HOME/ohs/bin/.apachectl
chmod 6750 $ORACLE_HOME/ohs/bin/.apachectl
```

8. Add `apache` to the `oinstall` group using the following command:

```
usermod -aG oinstall apache
```

9. Logon as the `oracle` user and edit the `$ORACLE_INSTANCE/config/OHS/ohs1/httpd.conf` file for the Oracle HTTP server to run as the Apache user. Edit the following lines:

```
User apache
Group apache
```

10. Create the `$ORACLE_INSTANCE/config/OHS/ohs1/moduleconf/php5.conf` file, and edit it to contain the following:

```
LoadModule php5_module "/usr/lib64/httpd/modules/libphp5.so"
AddHandler php5-script php
AddType    text/html    php
```

11. Copy the `/etc/httpd/conf.d/uxinsight.conf` file and make it available to the Oracle HTTP server using the following command:

```
cp /etc/httpd/conf.d/uxinsight.conf $ORACLE_INSTANCE/config/OHS/ohs1/moduleconf
```

12. Start Oracle Process Manager Notification (OPMN) and the Oracle HTTP server using the following command:

```
oracle$ $ORACLE_INSTANCE/bin/opmnctl startall
```

13. Stop the HTTP server using the following command:

```
$ORACLE_INSTANCE/bin/opmnctl stopproc ias-component=ohs1
```

14. In order to have RUEI running on the default HTTPS port, edit the `$ORACLE_INSTANCE/config/OHS/ohs1/ssl.conf` file, and change the line with the `Listen` directive to the following:

```
Listen 443
```

In addition, edit the `VirtualHost` definition as follows:

```
<VirtualHost *:443>
```

15. Start the Oracle HTTP server using the following command:

```
$ORACLE_INSTANCE/bin/opmnctl startproc ias-component=ohs1
```

16. Stop the Oracle HTTP server using the following command:

```
oracle$ $ORACLE_INSTANCE/bin/opmnctl stopproc ias-component=ohs1
```

17. Create the `$ORACLE_INSTANCE/config/OHS/ohs1/moduleconf/mod_osso.conf` file:

```
LoadModule osso_module "${ORACLE_HOME}/ohs/modules/mod_osso.so"

<IfModule osso_module>
    OssoConfigFile /u01/app/oracle/product/11.1.1/as_
1/instances/instance1/config/OHS/ohs1/osso.conf
    OssoIpCheck off
    OssoIdleTimeout off
</IfModule>
```

18. Copy the `osso.conf` file that you received after registering RUEI with the Oracle SSO server to the `$ORACLE_INSTANCE/config/OHS/ohs1` directory.

19. Start the Oracle HTTP server using the following command:

```
$ORACLE_INSTANCE/bin/opmnctl startproc ias-component=ohs1
```

7.5 Verifying the Oracle HTTP Server Configuration

You can test the Oracle HTTP server for integration with RUEI by directing your browser to `https://`***Reporter***`/ruei`. When you select **System**, then **User management**, the **Configure SSO connection** option should be enabled.

For information about enabling Oracle SSO user authentication within RUEI, see the *Oracle Real User Experience User's Guide*.

A

The ruei-check.sh Script

This appendix provides a detailed explanation of the checks performed by the `ruei-check.sh` script. It is *strongly* recommended that you use this script to verify successful installation, and to troubleshoot any installation issues.

When started, the script prompts you to specify which role or roles the system is required to perform. For example:

```
1 - Reporter + Collector + Database
2 - Reporter + Collector
3 - Reporter + Database
4 - Collector only
5 - Reporter only
6 - Database only

Please specify which role(s) this system should perform: 1
```

In the above example, the script will check the system to verify that it meets the requirements for both a Reporter and Collector installation with a local database.

The checks performed in the order shown in Table A–1, and are divided into three types: pre-installation, system, and post-installation checks. Whether a specific check is performed depends on the selected role(s).

Table A–1   ruei-check.sh Checks.

Check	1	2	3	4	5	6	Description
			Role				
System checks							
Architecture	•	•	•	•	•	•	Must be x86_64.
Operating system	•	•	•	•	•	•	Must be Oracle/RedHat Enterprise Linux 5.*x*.
Memory	•	•	•	•	•	•	Must be at least 4 GB.
							Recommended 16 GB for Reporter installation.
							Recommended 8 GB for a Collector only or remote database installation.
Swap space	•	•	•	•	•	•	Must be at least 3/4 of the installed system memory[1].
Disk space for $RUEI_HOME	•	•	•	•	•		The disk space for the specified $RUEI_HOME location must be at least 512 MB.
Disk space for $RUEI_DATA	•	•	•	•	•		The disk space for the specified $RUEI_DATA location must be at least 100 GB.
Disk containing $RUEI_DATA	•	•	•	•	•		The specified $RUEI_DATA location must be local. Remote file systems (such as NFS) are not supported.

Check	1	2	3	4	5	6	Description
Disk speed on $RUEI_DATA	•	•	•	•	•		The disk speed of the specified $RUEI_DATA location must be at least 40 MB/s (120 MB/s or more is recommended).
SELinux	•	•	•	•	•	•	SELinux must be disabled.
Network interfaces	•	•		•			Must have at least one interface must be Up without an IP address (as described in Section 2.5, "Network Configuration").
Hostname	•	•	•	•	•	•	The system's configured IP address and hostname must be specified in the `/etc/hosts` file.
DNS	•	•	•	•	•	•	The configured DNS server must resolve the system's configured hostname to its IP address.
HTTPD autostart	•	•	•		•		Must be configured to start automatically.
HTTPD up	•	•	•		•		Must be up.
Database autostart	•		•			•	Must be configured to start automatically.
SSHD autostart	•	•	•	•	•	•	Must be configured to start automatically.
SSHD up	•	•	•	•	•	•	Must be up.
SSHD	•	•	•	•	•	•	Attempts to check if the SSH is not firewalled.
NTPD autostart	•	•	•	•	•	•	Must be configured to start automatically.
NTPD up	•	•	•	•	•	•	Must be up.
NTPD	•	•	•	•	•	•	Must be synchronized with a time server.
PHP CLI	•	•	•		•		PHP must be available on the command line.
PHP settings	•	•	•		•		`session.gc_maxlifetime` must be set to 14400. `memory_limit` must be set to 96M. `post_max_size` must be set to 128M. `upload_max_filesize` must be set to 128M. Zend Optimizer must be available. (These appear as individual checks, and are only performed if the above check is passed).
RSVG	•	•	•		•		The `~apache/.gnome2` directory must exist.
Pre-install checks							
Disk space for database data directory	•		•			•	Must be 300 GB. (If on the same partition as $RUEI_DATA, must be 400 GB).
Disk containing database data directory	•		•			•	Must be local. (Remote file systems, such as NFS, are not supported).
Disk containing database data directory	•		•			•	Must not be on a logical volume.
Disk speed of database data directory	•		•			•	Must be at least 40 MB/s (120 MB/s is recommended).
$RUEI_USER user exists	•	•	•	•	•		The specified $RUEI_USER user must exist.
`apache` user exists	•	•	•		•		User `apache` must exist.
User `apache` in group $RUEI_GROUP	•	•	•		•		User `apache` must be a member of the specified group $RUEI_GROUP.

Table A–1   (Cont.) ruei-check.sh Checks.

Check	1	2	3	4	5	6	Description
User `apache` in group `uucp`	•	•	•		•		User `apache` must be a member of the group `uucp`.
User $RUEI_USER in group `uucp`	•	•		•			The specified $RUEI_USER user must be in group `uucp`.
User `root` must have `umask` of 0022	•	•	•	•	•	•	User `root` must have the `umask` 0022.
User `root` can write to /etc/http/conf.d	•	•	•		•		User `root` must be able to write to the /etc/http/conf.d directory.
User `root` can write to /etc/init.d	•	•	•		•		User `root` must be able to write to the /etc/init.d directory.
User `root` can write to /etc/ld.so.conf.d	•	•		•			User `root` must be able to write to the /etc/ld.so.conf.d directory.
User `root` can write to $RUEI_HOME	•	•	•	•	•		User `root` must be able to write to the specified $RUEI_HOME directory.
User `root` can write to $RUEI_DATA	•	•	•	•	•		User `root` must be able to write to the specified $RUEI_DATA directory.
User `root` can write to /tmp	•	•	•	•	•	•	User `root` must be able to write to the /tmp directory.
/etc/sysconfig/httpd must call /etc/ruei.conf	•	•	•		•		The /etc/sysconfig/httpd script must call the /etc/ruei.conf configuration file.
$RUEI_USER user able to contact database	•	•	•		•		The specified $RUEI_USER user must be able to connect to the database.
`oci8` PHP extension available	•	•	•		•		The `oci8` PHP extension must be available.
$RUEI_USER user able to contact database via PHP	•	•	•		•		The specified $RUEI_USER user must be able to connect to the database via PHP.
$RUEI_USER user must have `umask` 0027	•	•	•	•	•		The specified $RUEI_USER user must have a `umask` of 0027.
$RUEI_USER user able to read $RUEI_HOME	•	•	•	•	•		The specified $RUEI_USER user must be able to read the specified $RUEI_HOME directory.
$RUEI_USER user able to write to $RUEI_DATA	•	•	•	•	•		The specified $RUEI_USER user must be able to read the specified $RUEI_DATA directory.
/etc/ruei.conf syntactically correct	•	•	•		•		The /etc/ruei.conf configuration file must be a syntactically correct shell script.
User `root` able to contact database after loading `ruei.conf`	•	•	•	•	•		The `root` user must be able to connect to the database after the environment specified in the `ruei.conf` configuration file has been loaded.
`wm_concat` available	•	•	•		•		The `wm_concat` database function (used by suites) must be available.
$JAVA_HOME value valid	•	•	•		•		The value specified for $JAVA_HOME in the /etc/ruei.conf configuration file must be valid.
Post-install checks							
Reporter RPM check	•	•	•		•		The `ux-collector`, `ux-core`, `ux-generic`, `ux-ipdb`, `ux-gui`, `ux-lang-en` `ux-adf` and `ux-wlp` RPMs must be installed and have the same version (for example, 5.1.0).
Collector RPM check				•			The `ux-collector` RPM must have been installed.

Table A–1   (Cont.) ruei-check.sh Checks.

Check	Role						Description
	1	**2**	**3**	**4**	**5**	**6**	
Java shared objects	•	•		•			The Java path must have been correctly added to the LD_LIBRARY_PATH (see Section 4.3, "Generic Installation Tasks").
GUI reachable	•	•	•		•		The Reporter GUI must be reachable via the local hostname on the secure interface (note if a self-signed certificate is found, a warning is generated).
Reporter GUI can reach database	•	•	•		•		The Reporter GUI must be able to contact to the database.
Core binaries in path	•	•	•		•		The specified $RUEI_USER user must be able to call the core binaries without specifying a full name.

[1] If memory is added to meet the memory requirement, this check may start failing.

B

Setting the Maximum Data Group Size

This appendix provides a detailed explanation of how the default maximum Data Browser group sizes can be increased to provide more accurate reporting of monitored traffic. It is *strongly* recommended that you carefully review the information presented before modifying the default settings.

B.1 Maximum Group Size and Condensation

In order to optimize performance, individual groups are not permitted to grow to unlimited sizes. Each main group table has a maximum permitted size. By default, this is 300 MB. For session diagnostics information, this limit is 500 MB.

The maximum size of a group is managed by *condensing*. This is the process by which the number of rows within the group table are reduced by moving the least used data to a "other" group. For example, rows within the client-browser/version dimension might contain a small number of rows for rarely seen Mozilla Firefox versions. In this case, the number of rows within the table is reduced by replacing these with a single "other-firefox" row.

You might consider increasing the maximum size of the groups if the information you require is regularly being condensed. For example, required individual page names or user IDs are only reported as "other". Broadly speaking, this approach is recommended in the case of high levels of network traffic.

B.2 Setting the Maximum Group Size

If the maximum group size is set to more than 150% (that is, 450 MB), it is strongly recommended that the database is configured as a remote database. The maximum supported group size is 300% (that is, 900 MB). Be aware that response times to Data Browser queries may take longer to process if the maximum group size is increased.

It is important to note that custom dimensions have a significant impact on the condensing process. Incorrect configuration of custom dimensions can result in excessive condensing. For example, product names (or similar highly selective attributes) should not be configured as custom dimensions because that will skew the condensing process. Specifically, each page/product combination becomes a separate candidate for condensing, and only high frequency combinations will remain visible after condensing.

To determine the current data group sizes, issue the following command as the defined RUEI_USER user:

```
cop stats %date_filter
```

where *date_filter* specifies the date for which you want to view group sizes. Note that if you specify today's date, because the groups are still growing, the reported sizes may not represent their final sizes. Therefore, it is recommended that you issue the query as late in the day as possible in order to most accurately determine their final sizes. If you specify a previous day's date (for example, yesterday), the reported group sizes reflect their compressed sizes. A group's compressed size needs to be approximately doubled to determine its uncompressed size.

An example command and sample output would appear as follows:

```
cop stats %20091110

   DATA ROWS         DATA SIZE
data    desc      data     desc  cube name
----    ------   -------  ------- ----------
705532  565699   300.0 MB  30.0 MB  wg_visit_dy_20091110 (uncompressed)
918028   48727   303.0 MB   4.0 MB  wg_trans_dy_20091110 (uncompressed)
319163 1043110   169.0 MB  96.0 MB  wg_slowurl_dy_20091110 (uncompressed)
937011  222760   439.0 MB  11.0 MB  wg_sesdiag_dy_20091110 (uncompressed)
005411  005320     2.1 MB   0.3 MB  wg_service_dy_20091110 (uncompressed)
834063  126196   315.0 MB  20.0 MB  wg_page_dy_20091110 (uncompressed)
019008  001026     4.0 MB   5.0 MB  wg_kpi_dy_20091110 (uncompressed)
000345  004598     0.8 MB   0.6 MB  wg_keypage_dy_20091110 (uncompressed)
286384  967535   168.0 MB  88.0 MB  wg_failurl_dy_20091110 (uncompressed)
000378  005544     0.4 MB   0.2 MB  wg_failsrv_dy_20091110 (uncompressed)
632973 2175464   363.0 MB 151.0 MB  wg_failpg_dy_20091110 (uncompressed)
```

In the above example, it appears that the daily All pages (wg_page_dy) group has reached its maximum limit, and data is being condensed.

To set the maximum group size, issue the following commands:

```
$ su – moniforce
$ sqlplus /@$RUEI_DB_TNSNAME
SQL> update UXS_CONFIG set VALUE='375000000'
        where NAME='cube_max_size';
```

where the value specifies (in bytes) the maximum group size. In the above example, this is 375 MB.

Note that the Failed URLs, Failed services, and Failed pages groups do not use the maximum group size setting. Instead, their size is controlled through the event_max_fail setting. This specifies the maximum number of rows that can added to the group's main database table during a 5-minute period. By default, this is 5000 rows. For the Slow URLs group, the event_max_slow setting is used, and specifies the number of the slowest URLs that are recorded within each 5-minute period. By default, this is 5000 rows.

Note that if you change the event_max_fail or the event_max_slow setting, you should also review the daily_max_fail setting. This specifies the maximum number of rows that the groups' tables can contain. This is derived from the formula 288 * event_max_fail. The default, is 1.4 million rows.

Example - Increasing Maximum Group Size

Consider the case in which the maximum main group table size is increased to 900 MB (that is, 300% of the default maximum size). The maximum required database storage is indicated in Table B.

Table B–1   Default Required Database storage

Type of data retained	Default retention policy	Maximum group size (%)	DB space required per period (GB)	Total DB space required (GB)
Failed pages/URLs/services	15	300%	4.5	67.5
Daily	32	300%	3	96
Monthly	13	300%	3	39
Yearly	5	300%	3	15
Suites	15	300%	1.5	22.5
Additional overhead				10
Total required DB space				250

B.3 Reviewing the Effects of Changing the Maximum Group Size

After increasing the maximum group size setting, it is *strongly* recommended that you carefully review the effect of the change on the performance of the Reporter system. You should wait at least a full day, and select **System**, then **Status**, and the **Data processing**. Review the system load and determine whether the Reporter system can handle the additional processing overhead that increasing the maximum group size setting represents.

> **Important:**   Increasing the data group sizes can have a significant impact on overall system performance. Therefore, any changes to data group sizes should be carefully planned, and performed in manageable steps.

B.4 Managing the Maximum Size of the Database

By default, the RUEI database is limited to a maximum size of 960 GB. This should be enough to meet your operational requirements. However, if the maximum database size is ever reached, processing automatically stops. You will then need to modify the Reporter data retention policies to reflect the size of available database storage, or increase the maximum database size, before processing can continue.

C

Troubleshooting

This appendix highlights the most common problems encountered when installing RUEI, and offers solutions to locate and correct them. The information in this appendix should be reviewed before contacting Customer Support.

Support Web sites

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 information about service pack availability, 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.

Contacting Customer Support

If you experience problems with the installation or configuration of the RUEI, you can contact Customer Support. However, before doing so, it is strongly recommended that you create a Helpdesk report file of your installation. To do so, select **System**, then **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.1 Running the ruei-check.sh Script

It is recommended you use the ruei_check.sh script to troubleshoot installation issues. When first run, the script requires you to specify an installation type (reporter, collector, or database). Be aware this selection is saved to file. Therefore, if you want to run the script and be able to specify a different installation type, you need to delete the file /tmp/ruei-system-type using the following command:

```
rm /tmp/ruei-system-type
```

You can specify the parameters shown in Table C–1:

Table C–1   ruei-check.sh Parameters

Parameter	Description
`system`	Performs basic system checks, as well as a a number of prerequisites checks. These include interfaces that can be monitorable interfaces, that the Oracle database starts correctly, and that the Apache Web server, PHP, and Zend optimizer are correctly configured.
`preinstall`	Checks whether the Oracle database is correctly configured.
`postinstall`	Checks if the RUEI RPMs have been been installed correctly.
`all`	Performs all the above checks in the indicated sequences.

For example:

```
cd /root/RUEI/60
./ruei-check.sh all
```

C.2 The ruei-prepare-db.sh Script Fails

If the `ruei-prepare-db.sh` script fails, this can be because the database listener has not been started correctly due to a failing DNS look up. To resolve this problem, do the following:

- Ensure the `/etc/hosts` file includes your host.

- Ensure entries in the `/etc/nsswitch.conf` file are specified in the required (sequence hosts: files DNS).

> **Note:**   The `ruei-prepare-db.sh` script can be run with the `--clean` option to remove the current database and install a new one.

C.3 Starting Problems

If the system does not seem to start, or does not listen to the correct ports, do the following:

- Restart each Collector service. To do so, select **System**, then **Maintenance**, then **Network data collectors**, select each attached Collector, and select the **Restart** option from the menu. This is described in more detail in the *Oracle Real User Experience Insight User's Guide.*

- Review your network filter definitions. This is described in the *Oracle Real User Experience Insight User's Guide.* 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 the *Oracle Real User Experience Insight User's Guide.*

- Verify that the Collector interfaces are *up*. This is described in the Section 2.2, "Installing the Linux Operating System".

Resources and Log Files

If during, or directly after running the Initial setup wizard (described in Section 6.2, "Performing Initial RUEI Configuration"), the system returns an error, there are the following resources and log files available to help you in debugging:

- `/var/opt/ruei/processor/log/gui_debug.log`: a proprietary debug and log file that shows low-level system information. Although it contents may be difficult to read, you can find standard system error messages listed here.

- `/var/log/httpd/access_log` and `/error_log`: the Apache daemon access and error log files. If any part of the HTTP or PHP execution of the RUEI user interface is in error, it will shop up in these log files. (Note that these are *not* the log files used by RUEI for HTTP data analysis).

Root-Cause Analysis

Before starting to address specific issues, it is important to understand the basic operation of data collection, data processing, and data reporting. Any root-cause analysis of RUEI problems should take the following:

- Verify data collection. Select **System**, then **Status**, and then **Collector status**. Select a Collector from the displayed list, and verify that the system interfaces are showing traffic activity on TCP, Ethernet, and HTTP level.

- In addition, verify that there are no problems with the SSL data decryption. It is normal that some errors occur (especially shortly after startup). But if SSL traffic is to be decrypted, the error rate can never be 100%.

- Verify data processing. Select **System**, then **Status**, then **Data processing**. A screen similar to the one shown in Figure 6–7 appears. It should indicate some activity.

C.4 Data Collection Problems

If the data collection service is not running, or will not start, do the following:

- Ensure the network cards used for data collection are running in promiscuous mode. This can be verified by issuing the command `ifconfig eth`*N* (where *N* is the number of the network interface being used for data collection). It should return an output similar to the following:

```
ethn        Link encap:Ethernet  HWaddr 00:15:17:3E:26:AF
            UP BROADCAST RUNNING PROMISC MULTICAST  MTU:1500  Metric:1
            RX packets:0 errors:0 dropped:0 overruns:0 frame:0
            TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:0 (0.0 GiB)  TX bytes:0 (0.0 GiB)
            Memory:b9120000-b9140000
```

- If the network interface is not available, make sure the ONBOOT parameter is set to YES, as described in Section 2.2.4, "Network Configuration".

- If the network interface is not yet in promiscuous mode, set it by issuing the following command: `ifconfig eth`*N* `promisc` (where *N* is the number of the network interface being used for data collection).

- Verify there is *no* IP address assigned to the network interface being used for data collection. If there is a configured IP address, remove it.

> **Note:**   Do not set to 0.0.0.0 or 127.0.0.1. Remove the configured IP address completely.

C.5 Data Processing Problems

If, for any reason, data processing does not start, try to restart it by selecting **System**, then **Maintenance**, and then **System Reset**. The System reset wizard appears. Select the **Restart system processing** option. Note that restarting system processing can take between 5 and 30 minutes.

In general, if no data is being processed, verify your system's configuration as described in Section 6.5, "Verifying and Evaluating Your Configuration". If you do not apply any configuration to the system, no data processing will take place.

If you are using an environment with multiple Collectors, ensure all Collectors are up and running normally. To do so, select **System**, then **Status**, and then **Collector status**. A failing Collector can become a block to further data processing of the system's data.

C.6 E-Mail Problems

Sending E-mails is RUEI functionality that is handled on a system level, together with your Mail Transfer Agent (MTA), such as Sendmail or Postfix. If problems occur when sending E-mails, do the following:

- If mail is sent correctly by RUEI to your MTA, the user interface will report "Message sent successfully" when you attempt to send a daily, weekly, or monthly report manually.

- If mail could not be sent correctly by RUEI to your MTA, verify that the MTA is up and running. Alternatively, analyze the mail settings by selecting **System**, then **Maintenance**, and **E-mail configuration**.

- If the mail was sent successfully, but not delivered to the recipient, analyze the operation of your MTA to further identify the root cause of the mails that are not delivered.

- Refer to the /var/log/maillog file for reported mailing issues.

Common issues with E-mail delivery often involve an incorrectly configured MTA, or an MTA that is not allowed to send E-mail within the Data Center or corporate network.

C.7 SSL Decryption Problems

In order to decrypt SSL traffic, the Collector needs to have the SSL key and certificate available. To enable SSL decryption, you should do the following:

- Upload the SSL key through the appropriate Collector.

- Enable the SSL key by entering the required decryption passphase (when applicable).

The certificate needs to be uploaded to the Collector(s) by selecting **Configuration**, then **Security**, and then **SSL keys**. To check the status of the SSL decryption, select **System**, then **Status**, and then **Collector status**, and select the Collector for which you want SSL decryption analysis. Within the **SSL encryption** page, note the following:

- Decryption errors will occur if there is no SSL key uploaded.

- The percentage of successful decryption will be a low number shortly after uploading and activating the appropriate SSL keys.

- This percentage should rise in the first minutes and hours after uploading the SSL keys.

RUEI accepts PKCS#12 and PEM/DER encoding of SSL keys and certificates. Basically, this means both the certificate and key should be concatenated into one file. If you have separate key and certificate files, you can create a PKCS#12-compliant file by issuing the following command:

```
openssl pkcs12 -export -in certificate.cer -inkey key.key -out pkcs12file.p12
-passout pass:yourpassphrase
```

Where:

- *certicate.cer* is your CA root certificate file.

- *key.key* is the server's SSL key file.

- *pkcs12file.p12* is the output file name for the PKCS#12-encoded file.

- *yourpassphrase* is the passphrase you want to use to protect the file from unwanted decryption.

For example, consider the situation where the CA root certificate filename is `ca_mydomainroot.cer`, the server's SSL key is `appsrv12.key`, you want the output file to be called `uxssl.p12`, and want to protect this file with the passphrase `thisismysecretpassphrase`. The following command is required:

```
Openssl pkcs12 -export -in ca_mydomainroot.cer -inkey appsrv12.key -out uxssl.p12
-passout pass:thisismysecretpassphrase
```

C.8 Missing Packages and Fonts Error Messages

It is *strongly* recommended that you follow the installation procedure and settings described in Section 2.2.5, "Package Installation". In particular, you should not perform a "minimal" installation of Oracle Enterprise Linux. If you do so, it can lead to a wide range of reported problems, depending on the components not included in the installation, but required by RUEI.

The most common of these are reported `fontconfig` error messages in the `/var/log/http/error_log` file. These can be fixed by installing the following fonts:

- urw-fonts-noarch v2.3

- ghostscript-fonts-noarch v5

- dejavu-lgc-fonts-noarch v2

- liberation-fonts v0.2

- bitmap-fonts v0.3

- bistream-vera-fonts-noarch v1.10

Depending on your language settings, install all other required fonts.

However, other possible error messages include reported missing packages (such as `librsvg2`).

When a Yum repository is available, all dependencies available on the Enterprise Linux 5.*x* DVD can be installed by issuing following command:

```
yum -y install gcc gcc-c++ compat-libstdc++-33 glibc-devel libstdc++-devel \
elfutils-libelf-devel glibc-devel libaio-devel sysstat perl-URI net-snmp \
sendmail-cf httpd php php-pear php-mbstring phpldap bitstream-vera-fonts \
librsvg2 xorg-x11-xinit net-snmp-utils perl-XML-Twig
```

However, be aware that additional RPMs shipped with the RUEI installation zip file still need to be installed according to the procedure described in Section 2.6, "Installing the RUEI Software".

C.9 ORA-xxxxx Errors

If you receive any Oracle database errors, do the following:

- Ensure that the `/etc/sysconfig/httpd` file contains the following lines:

  ```
  source /etc/ruei.conf
  ```

  If you have to add these lines, restart the Apache Web server using the following command:

  ```
  service httpd restart
  ```

- Ensure the same host name is specified in the `/var/opt/ruei/tnsnames.ora`, `/etc/sysconfig/network`, and `/etc/hosts` files.

  Note if you make changes to any of these files, you may need to reboot the server.

C.10 Oracle DataBase Not Running

Verify the Oracle database is up and running by changing to the `moniforce` user and obtaining an SQL*Plus prompt with the following commands:

```
su - moniforce
sqlplus /@uxinsight
```

You should receive the SQL*Plus command line without being prompted for a password. This indicates that the Oracle wallet authentication was successful.

If necessary, re-start the Oracle database using the following command:

```
/etc/init.d/oracledb
```

C.11 General (Non-Specific) Problems

If you are experiencing problems with the reporting module, or find its interface unstable, it is recommended that you do the following:

- Clear all content caching within your browser, and re-start your browser.

- Examine the error log. This is described in the *Oracle Real User Experience Insight User's Guide.*

- Select **System**, then **Status**, and verify correct operation of the core components by then selecting **Data Collection**, **Logfile processing**, and **Data processing**. If any of these components are in error, try to resolve them using the advice provided in this appendix.

C.12 Network Interface Not Up

If the network interface you intend to use for data collection is not *Up* (that is, the `ONBOOT=YES` parameter was not set), you can bring it immediately using the following command:

```
ifconfig ethN up
```

where *N* represents the necessary network interface.

C.13 Memory Allocation Error During Upgrade Procedure

The following memory allocation error is received while updating the Reporter RPMs as part of the procedure for upgrading from version 5.1 to 6.0:

```
[linux.c, 326,cap_dev_set_filter()]: setsockopt(): Cannot allocate memory
```

Make more memory available to the Collector in order for it to start. Issue the following command as the root user:

```
/sbin/sysctl -w net.core.optmem_max=65535
```

D

Installation Checklist

This appendix provides a checklist of actions that should be complete, and information gathered, before starting to install the RUEI software. These include server and infrastructure readiness and configuration, as well as HTTPS encrypted traffic and alerting issues.

Server readiness	
Base hardware and operating system requirements.	
Intel/AMD 64-bit platform (minimum 2 dual-core CPUs).	
Network connectivity: ■ 10/100 MB NIC for office network connectivity. ■ 10/100/1000 MB NIC for data collection connectivity.	
Disk space: at least 400 GB (on high-performance RAID-5, RAID-10, or similar).	
Memory: at least 16 GB RAM for single server.	
OS: Oracle Enterprise Linux 64-bit or RedHat Enterprise Linux 64-bit 5.*x*.	
The `ruei-check.sh` script reports no errors.	
The EBS, JD Edwards, and PeopleSoft configuration zip files are available (only applicable if the EBS, JD Edwards, and/or PeopleSoft accelerators are to be installed).	

Infrastructure readiness	
Ensure easy placement and accessibility of the system.	
Prepare rackspace in the Data Center cabinet with power sockets.	
The server is accessible through remote ports: ■ Port 80/443 for HTTP(S) traffic to the RUEI Web server. ■ Port 22 for remote management over SSH/SCP. ■ Port 25 (E-mail). ■ Port 123 (NTP). ■ Port 161/162 (SNMP). ■ Port 1521 (for remote database setup).	
Access to the Data Center on the appropriate day and time is arranged.	
Network preparation for TAP/copy port is done and cables available in cabinet.	
Server configuration completed (see below).	

Infrastructure readiness	
Main topology with proxies, load balancers, routers, switches, and so on, is known.	
Main traffic flows throughout the infrastructure are known.	
VLAN topology, VLAD IDs, and IP addresses are known.	
The monitoring position for the RUEI server is located as close as possible to the firewall.	
The domains, applications, server farm(s), and/or VLANs to be monitored are identified.	

Server configuration

Complete the details below to for reference during server configuration.

Host name and domain name (optional).	
Data Center name.	
Placement date and time.	
Server IP, netmask, and default gateway.	
Server type (Collector/Reporter).	
NTP server IP and backup.	
DNS server IP and backup.	
Mail server and sender mail.	
Socket 0: collection port to TAP/switch name.	
Socket 1: collection port to TAP/switch name.	
Socket 2: rescue/maintenance interface.	\<reserved\>
Socket 3: Office network to switch name.	
Socket 4: collection port to TAP/switch name.	
Socket 5: collection port to TAP/switch name.	

Data collection configuration

Once in place, the server will start collecting data. Specify how much data is expected, and the technologies used.

HTTP traffic (in MB, pageviews, or hits per hour).	
Base technology for Web applications.	
Limits on amount of traffic to be captured:	
■ HTTP and HTTPS ports (if other than 80/443 HTTP/HTTPS).	
■ VLAN traffic and VLAN IDs (optional).	
Cookie technology.	
Page-labelling technology.	
Blind POST field names (such as `passwd`).	
User identification in URL (if other than login).	
Web service domains or networks.	

Data collection configuration

XML/SOAP envelopes (max 10).

Chronos/EUM URL (for EBS and Forms).

HTTPS enablement

Specify the contact(s) for the required SSL keys to monitor encrypted traffic.

Name:	Name:
Function:	Function:
E-mail:	E-mail:
Phone/Mobile:	Phone/Mobile:
Keys (if not all):	Keys (if not all):

System health notifications

The system can trigger and send alerts for various components. Specify the users, notification methods, and details for each component.

Name:	Name:
Function:	Function:
E-mail:	E-mail:
Mobile:	Mobile:
Text message:	Text message:

Alerting via SNMP (optional)[1]

SNMP management server.

SNMP community name.

SNMP version.

---

[1] RUEI provides a standard MIB to be imported into the SNMP manager.

E

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