Oracle® Real User Experience Insight

Installation Guide

Release 5.1 for Linux x86-64

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Oracle Real User Experience Insight Installation Guide, Release 5.1 for Linux x86-64

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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 the RUEI Administrator. This person is 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 5.1" describes the procedure for upgrading an existing RUEI 4.5.*x* or 5.0.*x* installation to release 5.1

- 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 Administrator.

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

- Appendix D, "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*.

- *Oracle Real User Experience Insight Accelerator for WebLogic.*

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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1

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
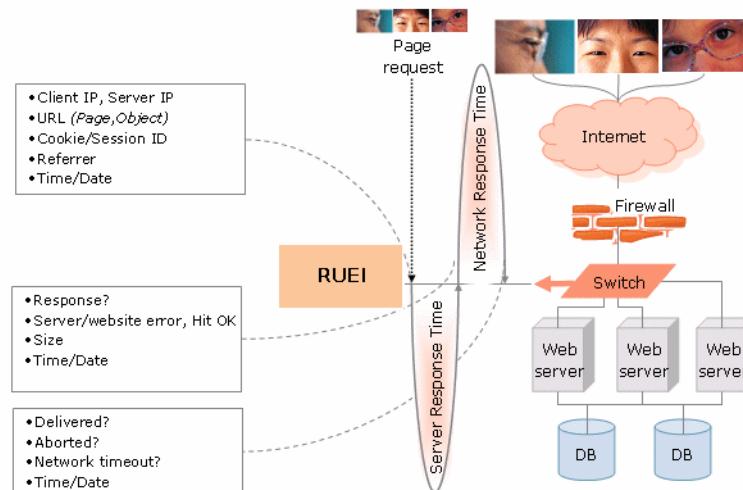
When an object is requested by a visitor, RUEI sees the request and measures the time the Web server requires to present the visitor with the requested object. At this point, RUEI knows who requested the page (the client IP), which object was requested, and from which server the object was requested (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
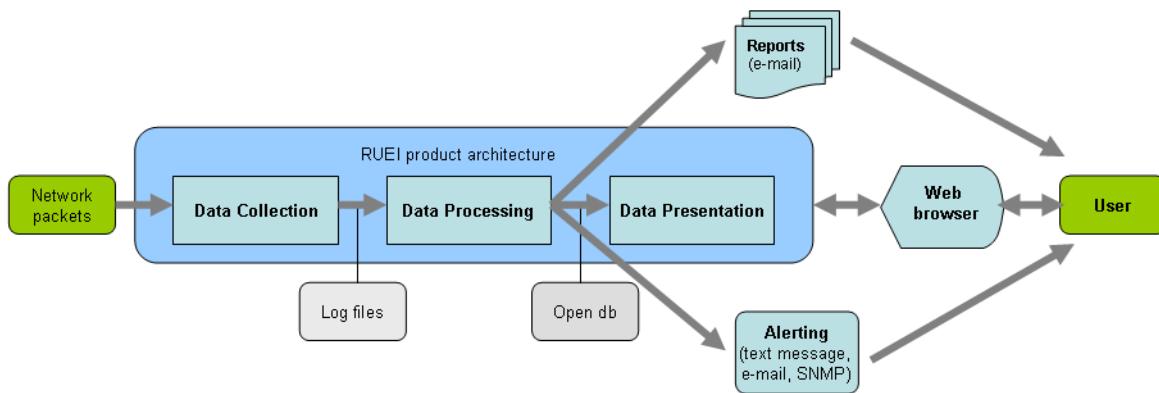
The monitored data packets are processed by the following layers:

- **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
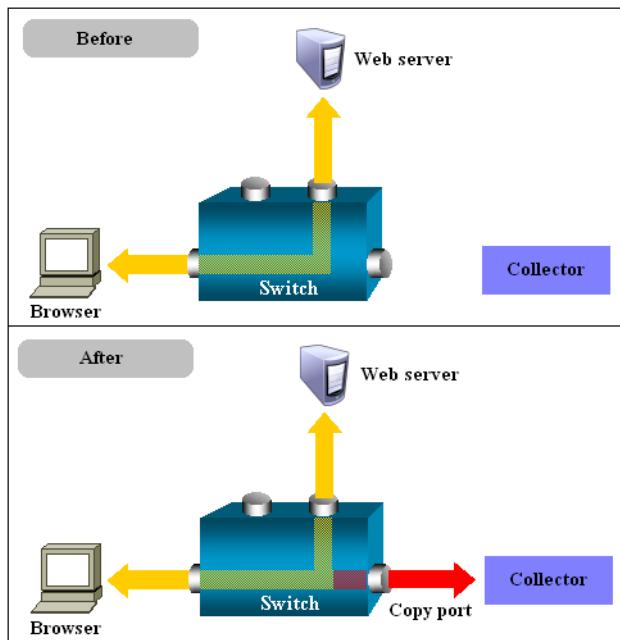
In the configuration shown in the lower part of Figure 1–3, the Collector is attached to a port that is configured to receive a copy of every packet that the browser sends and receives. This port is called a copy port. Copy ports can copy traffic from any or all data ports to a single unused port and 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
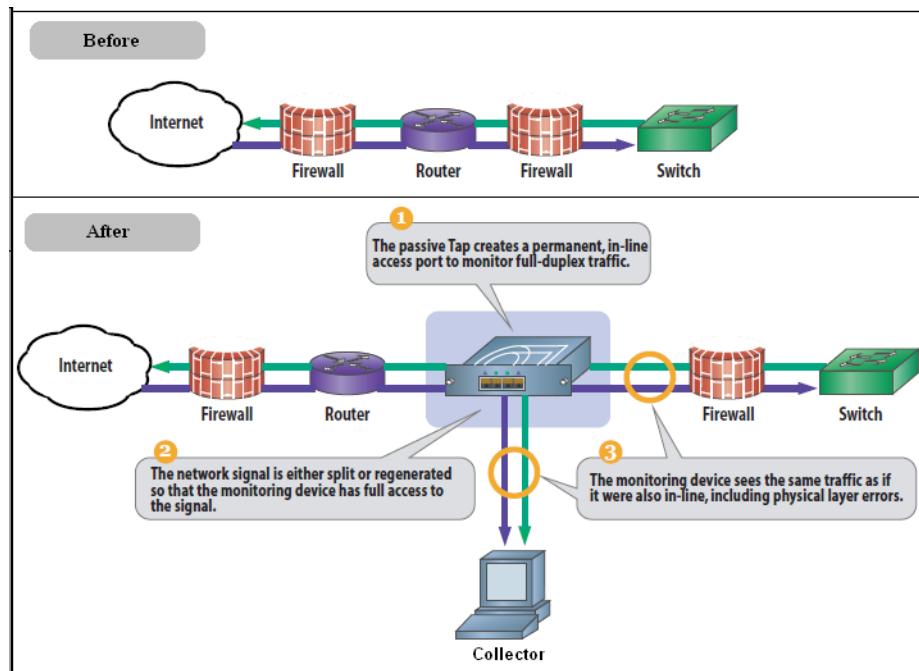
Unlike copy ports, in the event of power failure, TAPs continue to allow data to flow between network devices. TAP devices are available for copper or fibre-based infrastructures. Generally, the use of TAPs is considered preferable because they can be easily deployed when and where required, but without 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 ont 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
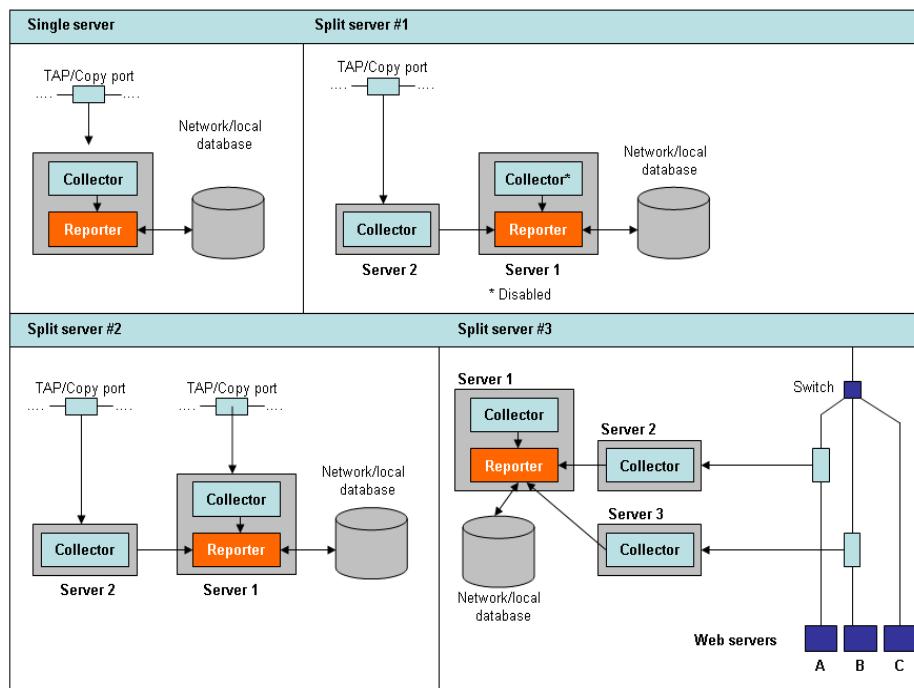
1.4.1 Local and Remote Database Installations

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 5.1 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 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 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 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 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 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.

1.6 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.

1.8 Client Requirements

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

- Mozilla Firefox 2.0 and 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 4.5.x or 5.0.x installation to release 5.1 is also described.

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

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
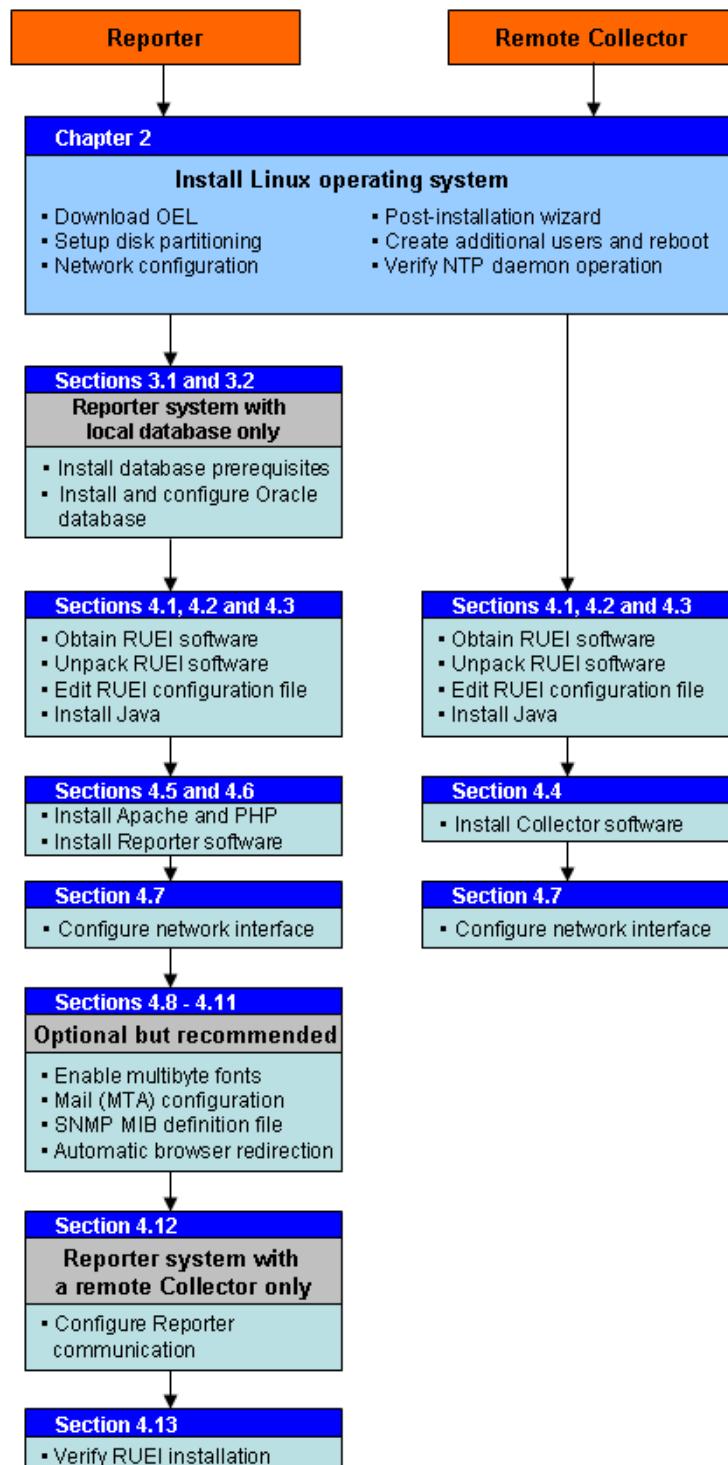
Installing the Linux Operating System

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 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.

> **Note:** A check box allows you to encrypt the entire system. If selected, for security reasons, a password 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 B.9, "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
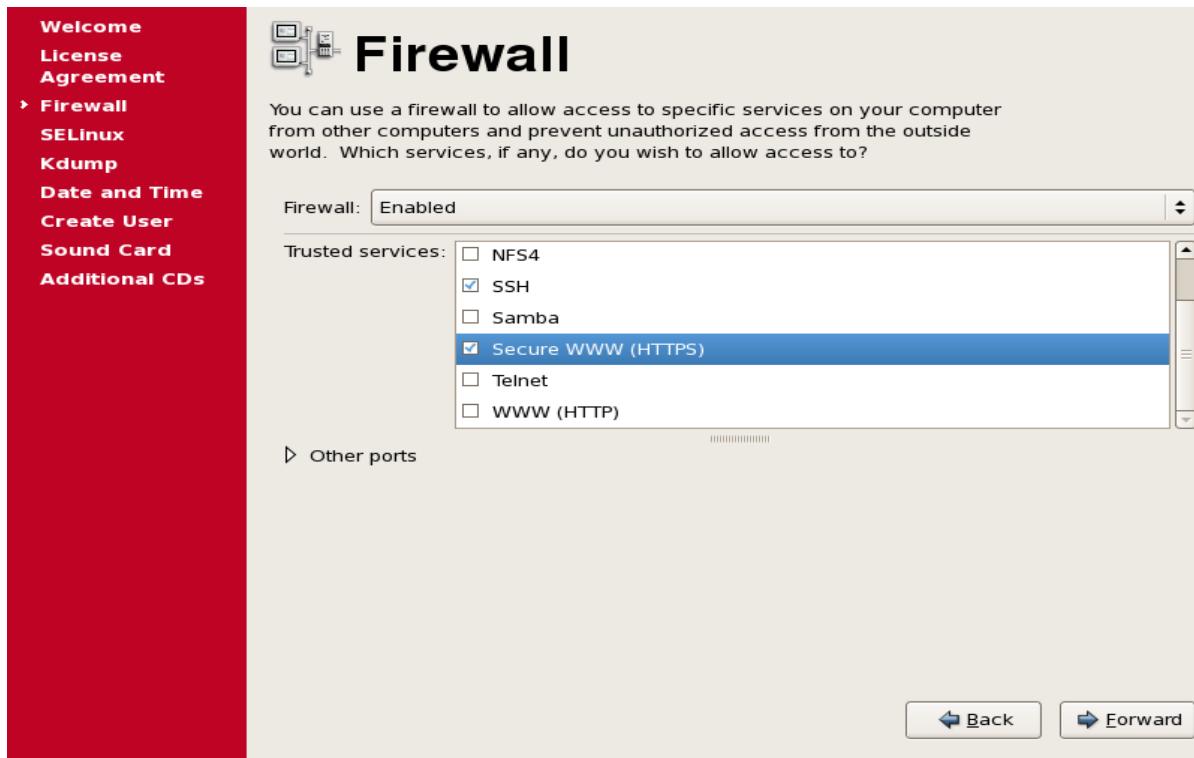
4. Use the screen shown in Figure 2–3 to disable Security Enhanced Linux (SELinux). Click **Forward**. Note that you are prompted with a warning that changing the SELinux setting requires rebooting the system so that the entire system can be relabeled. Click **Yes**.

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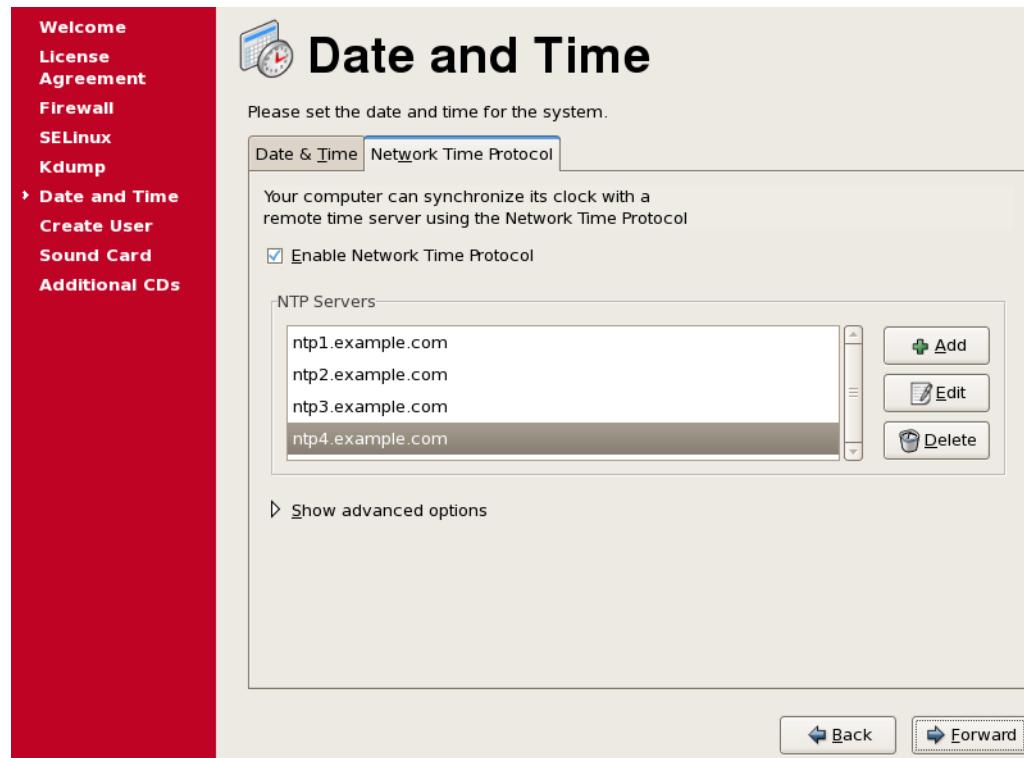
> **Important:**   In distributed environments, all time zones specified for Reporter and Collector systems *must* be identical.

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".

Text Mode Installation (Optional): When using the text mode installation, by default:

- Firewall: HTTPS (TCP 443) is blocked.

- Security: SE Linux is enabled.

Allow HTTPS traffic (TCP 443) and disable SElinux using the **system-config-securitylevel** utility.

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-gd-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
    ```

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 net-snmp
yum -y install sendmail-cf
yum -y install httpd
yum -y install mod_ssl
yum -y install php
yum -y install php-gd
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
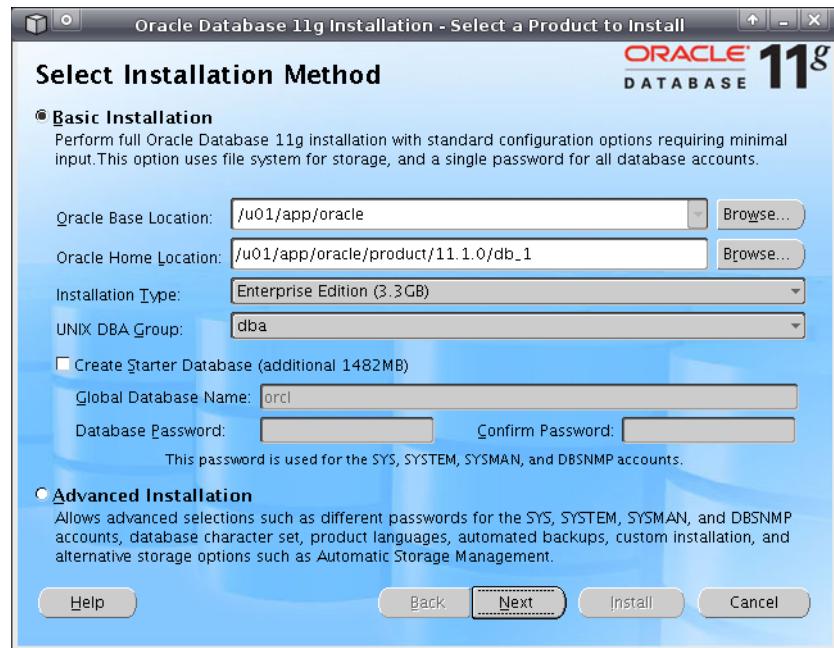
Note that the **Create Starter Database** check box should be unchecked.

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
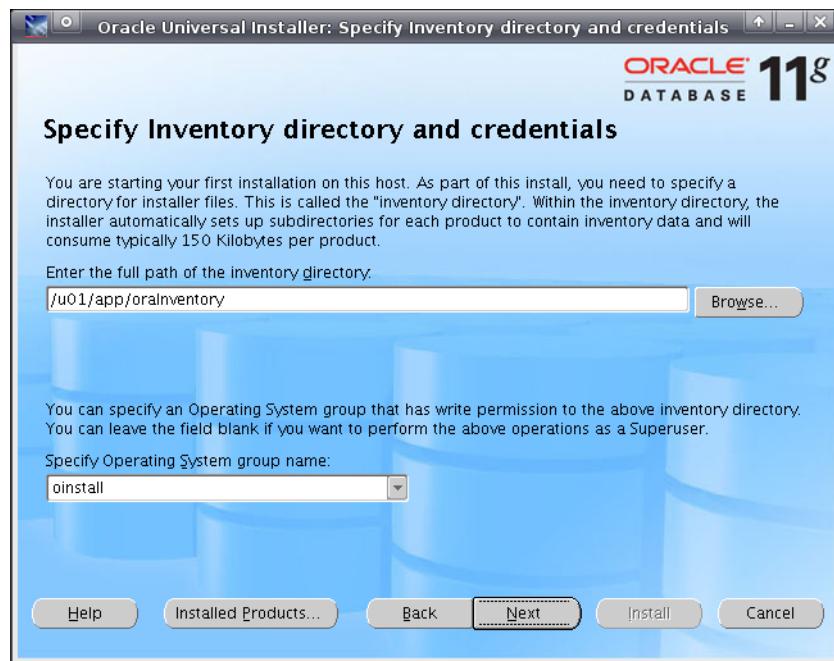
> **Important:**   Any warnings or errors reported during database installation (especially any missing prerequisites) must be resolved before proceeding. See Section 3.3.2, "Installing All Requirements Using a Yum Repository (Alternative)" and Appendix B, "Troubleshooting" for information about required 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
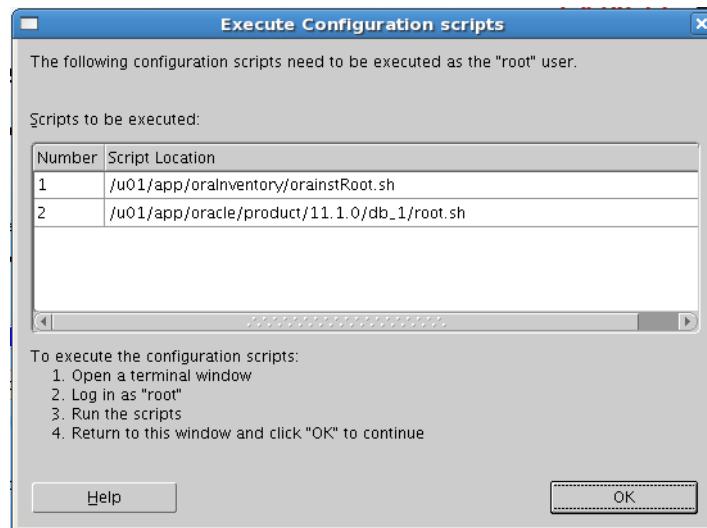
Run the two scripts indicated in Figure 3–3. They should be run in a terminal window as `root`. You will receive output similar to the following:

```
/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/50/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 should now be up and running.

3.4.7 Setting the Memory Usage

For each Collector only system, set the available memory usage for the Oracle database to 10%. For example, if the system has 8 GB memory, then set the amount available to the Oracle database to 800 MB. To do so, issue the following commands as the `oracle` user:

```
$ sqlplus / as sysdba
SQL> alter system set memory_target=800M scope=both;
```

Note if you receive an error message stating the specified value is greater than MEMORY_MAX_TARGET, then the MEMORY_TARGET parameter has already been decreased.

Note that for Report systems, the default available memory usage setting does not need to be modified.

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 4.5.*x* installation to release 5.0 is also described. 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/51`
- `/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

If you are planning an installation using the default installation location and users, you can use the default settings in the /etc/ruei.conf file. If you are not planning to use the default installation directories, operating system users and groups, it is recommended that you carefully review the settings in this configuration file and adapt them to your needs. All components in your RUEI environment (such as the remote database and Collectors) require the same global ruei.conf configuration file. The following settings are specified:

Table 4–1   RUEI Settings.

Setting	Description[1]	Default 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 defaults used throughout this guide, and can be modified as required.
[2] The directory name cannot exceed 50 characters in length.
[3] The directory name cannot exceed 8 characters in length.
[4] The directory name cannot exceed 30 characters in length.
[5] The directory 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 (default moniforce) 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_18-linux-amd64-rpm.bin
./jre-1_5_0_18-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_18`. To make the install directory version independent, create a more generic symlink using the following command:

```
ln -s /usr/java/jre1.5.0_18 /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
```

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

```
cd /root/RUEI/51
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 passwordless 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 add 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 copying 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/51`).

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 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. 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
   ```

   > **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
   /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/51
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 Administration 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 Administrator 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-8.13.8-2.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 with a remote Collector.

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 5.1

This chapter describes the procedure for upgrading an existing RUEI 4.5.*x* or 5.0.*x* installation to release 5.1. The post-installation configuration procedure is described in Chapter 6, "Configuring RUEI".

5.1 Upgrading From RUEI 5.0.*x* to 5.1

This section describes the procedure for upgrading from an existing RUEI 5.0.*x* installation to release 5.1.

> **Note:** Before proceeding with the upgrade, make a backup of your configuration. This is necessary if you need to perform a rollback (described in Section 5.1.1, "Rolling Back to 5.0.x"). To do so, select **System**, then **Maintenance**, and then **Backup and restore**. The procedure is fully described in the *Oracle Real User Experience User's Guide*.

The upgrade procedure should not take longer than a few minutes. During this time, data collection is temporarily stopped. Note the upgrade procedure described below should be performed as the `root` user unless indicated otherwise.

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.

Reporter Upgrade

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. Note as of release 5.1, a stand-alone Java package is used to install the Java Runtime Environment (JRE), rather than the version built into the database. Install the version bundled with the RUEI distribution set by issuing the following commands:

   ```
   cd /root/RUEI/Java
   ```

```
./jre-1_5_0_18-linux-amd64-rpm.bin
```

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

3. This installs the necessary Java software in the directory `/usr/java/jre1.5.0_18`. To make the install directory version independent, create a more generic symlink using the following command:

```
ln -s /usr/java/jre1.5.0_18 /usr/java/jre
```

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

```
su - moniforce
project -stop wg
```

5. Create a backup of the `/etc/ruei.conf` file (as the `root` user), replace this file with the example supplied in the distribution pack, and make this configuration file readable to the `moniforce` user by issuing the following commands:

```
mv /etc/ruei.conf /etc/ruei.conf.50.backup
cp /root/RUEI/extra/ruei.conf /etc/
chmod 644 /etc/ruei.conf
chown moniforce:moniforce /etc/ruei.conf
```

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

```
cd /root/RUEI/51/
rpm -Uhv ux-*
```

7. 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/
```

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

```
service httpd restart
```

9. Restart processing by issuing the following commands:

```
su - moniforce
project -start wg
```

The procedure for upgrading the Reporter system is complete.

Collector(s) Upgrade

Do the following:

1. Copy the RUEI distribution pack (`Vxxx.zip`) to the Collector 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. 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
```

3. 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
rm /etc/init.d/oracledb
```

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

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

5. 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
```

6. Create a backup of the `/etc/ruei.conf` configuration file, and replace it with the example contained in the distribution pack, by issuing the following commands:

```
mv /etc/ruei.conf /etc/ruei.conf.50.backup
cp /root/RUEI/51/extra/ruei.conf /etc/
```

7. Upgrade the Collector RPM by issuing the following commands:

```
cd /root/RUEI/51/
rpm -Uhv ux-collector-*
```

Repeat the above procedure for each Collector.

5.1.1 Rolling Back to 5.0.*x*

This section describes the procedure to rollback to version 5.0.*x* after upgrading to version 5.1.

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

Do the following:

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

```
su - moniforce
project -stop wg
```

2. 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.51.backup
cp /etc/ruei.conf.50.backup /etc/
```

3. Downgrade the RUEI Reporter RPMs using the following commands:

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

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

```
service httpd restart
```

5. Restart RUEI processing by issuing the following commands:

```
su - moniforce
project -start wg
```

Troubleshooting Rollback Problems

The rollback script `ruei-rollback-5.0-5.1.sh` logs its actions in the file `/tmp/ruei-rollback-5.0-5.1.log`. If you encountered any problems during the rollback, please attach this file to any request to Customer Support.

5.2 Upgrading From RUEI 4.5.*x* to 5.1

This section describes the procedure for upgrading an existing RUEI 4.5.*x* installation to release 5.1. For information on upgrading to RUEI 5.1 from a release prior to 4.5.*x*, please contact Customer Support.

The upgrade procedure needs to be performed on the Reporter system, as well as all required Collector systems. All actions must be performed by the `root` user. Be aware that when RUEI processing is stopped during the upgrade procedure, system notification alerts may be generated. These can be safely ignored.

> **Important:**   Before proceeding with the upgrade, make a backup of your configuration. This is necessary if you need to perform a rollback (described in Section 5.2.2, "Rolling Back an Upgrade"). To do so, select **System**, then **Maintenance**, and then **Backup and Restore**. The procedure is fully described in the *Oracle Real User Experience Insight User's Guide*. In addition, it is *strongly* recommended you carefully review the information in Section 5.2.1, "Differences Between 4.5.x and 5.x" before performing an upgrade.

RPM Dependencies

Be aware that the 4.5.*x* RPMs do not contain dependency information. Therefore, you should ensure that all dependency RPMs listed in Section 3.3, "Installing the Database Prerequisites" are installed *before* starting the upgrade procedure described in this rest of this section.

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 RUEI System

The information in this section should be reviewed carefully before beginning the upgrade of the RUEI system and any required accelerator packages.

> **Note:**   Currently, any defined password security policies are not applied until user logon. For this reason, it is recommended you carefully review all defined users and password security policies. In addition, you should remove all disabled user accounts prior to upgrade.

When upgrading, ensure all steps are performed in the following sequence:

1. If you need to need to upgrade your accelerator packages, login to the Reporter system as `root`. Within the `/root` directory, unzip the RUEI zip file, and go to the directory containing the application files. Use the following commands:

```
cd /root
unzip Vxxxx.zip
cd RUEI/extra
chmod +x ruei-upgrade-4.5-5.1.sh
```

2. Stop all processing by issuing the following command:

```
./ruei-upgrade-4.5-5.1.sh stop_ruei
```

3. RUEI 5.1 will be installed in the directory `/opt/ruei`, while configuration and log files are stored in the directory `/var/opt/ruei`. Before upgrading to the new RPMs, a number of environment changes need to be made. These are performed by the upgrade script using the following command:

```
./ruei-upgrade-4.5-5.1.sh rpm_pre_install
```

4. Before upgrading, obsolete versions of the Oracle Instant Client and PHP RPMs need to be uninstalled. To do so, use the following commands:

```
rpm -e php-oci8
rpm -e oracle-instantclient-sqlplus
rpm -e oracle-instantclient-basic
rm -rf /usr/lib/oracle/11.1.0.1
```

5. Install the new versions of the Oracle Instant Client RPMs using the following commands:

```
cd /root/RUEI/IC/
rpm -Uhv oracle-instantclient11.1-*
cd /root/RUEI/PHP/
rpm -Uhv php-oci8-11gR1-*
```

6. Install the additional required RPMs using the following commands:

```
cd /mnt/dvd/Server
rpm -Uhv php-ldap-* \
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
```

> **Note:** If you upgrade your PHP installation (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.

7. Copy the `/etc/ruei.conf` file included in the RUEI distribution pack.

   Ensure the file is readable by the `moniforce` user by issuing the following command:

```
chmod 644 /etc/ruei.conf
```

8. A new PDF writer is introduced in this RUEI version, and it needs to be made available to the Apache daemon. Within the `/etc/sysconfig/httpd` file,

remove the lines containing the LD_LIBRARY_PATH and TNS_ADMIN path settings, and replace with the following line:

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

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

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

10. Note as of release 5.1, a stand-alone Java package is used to install the Java Runtime Environment (JRE), rather than the version built into the database. Install the version bundled with the RUEI distribution set, and make the installation directory version independent by issuing the following commands:

```
cd /root/RUEI/Java
chmod +x ./jre-1_5_0_18-linux-amd64-rpm.bin
./jre-1_5_0_18-linux-amd64-rpm.bin
ln -s /usr/java/jre1.5.0_18 /usr/java/jre
```

11. At this point, installation of the RUEI software begins. Go to the directory containing the application files, and install the associated RPMs. Use the following command:

```
rpm -Uhv ux-*
```

12. On the Reporter system, and each required Collector system, convert all SSL keys to the new required format by using the following command:

```
./ruei-upgrade-4.5-5.1.sh convert_sslkeys
```

For each required SSL, the script will ask you to specify and confirm the 4.5.*x* activation password, and a key passphase. If the SSL key has been installed without a passphase, this should be left blank.

13. Repeat steps 1 - 10 for each Collector system.

14. 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/jave/jre/lib/fonts/
```

15. Upgrade certain administrative information using the following command:

```
./ruei-upgrade-4.5-5.1.sh rpm_post_install
```

16. Re-initialize the database using the following command:

```
./ruei-upgrade-4.5-5.1.sh reinitialize
```

17. Because the storage of failed hits, pages, and services has changed in 5.0, they need to be converted using the following command:

```
./ruei-upgrade-4.5-5.1.sh convert_rolling_cubes
```

This may take several minutes. Any warnings generated by the script can be safely ignored.

18. Re-start RUEI using the following command:

```
./ruei-upgrade-4.5-5.1.sh start_ruei
```

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

```
/etc/init.d/httpd restart
```

20. If you require multiple-byte character set support, issue the following command to install all optional fonts. Alternatively, install the multi-byte character sets necessary to meet your NLS requirements.

```
cd /mnt/dvd/Server
rpm -Uhv fonts-*
```

21. If you customized the logo shown in the top-hand corner of the dashboard, you will need to upload the required graphics file. The procedure to do this is fully explained in the *Oracle Real User Experience Insight User's Guide*.

Troubleshooting Upgrade Problems

The upgrade script `ruei-upgrade-4.5-5.1.sh` logs its actions in the file `/tmp/ruei-upgrade-4.5-5.1.log`. If you encountered any problems during the upgrade, please attach this file to any request to Customer Support.

> **Note:** Be aware that any 4.5.*x* backup you previously created cannot be used after your system has been upgraded to version 5.1. Therefore, it is recommended you create a 5.1 backup after completion of the upgrade procedure.

5.2.1 Differences Between 4.5.*x* and 5.*x*

This section highlights a number of reporting differences you may notice between versions 4.5.*x* and 5.*x*. Note an overview of all functional changes introduced in version 5.0 is available in the *Release Notes*, and the *Oracle Real User Experience Insight User's Guide* contains a complete description of all available functionality.

Session Diagnostics

In version 4.5.*x*, URL strings were reported in their raw format. For example, `/doc/My%20Document.html`. In 5.0, URL-encoded bytes are removed, and URL strings are formatted. For example, the previous URL would now be reported as `/docs/My Document.html`. Note how the `%20` part is replaced by a space character. In addition, any NLS character encoding (such as Chinese) is now used to report the URL, rather than its URL- encoded form. There is one exception to this: the special characters /, ?, ;, %, =, and #, when present in the encoded form, are not decoded, but left "as is".

In order to minimize disruption, the upgrade procedure creates a new filter, based on the existing 4.5.*x* filter, for each defined filter. Hence, after upgrading, you will notice there are two filters: the 4.5.*x* filter will be applicable to the legacy 4.5.*x* data, and 5.0 filters will be used for monitoring 5.0 data. It is recommended you review all KPIs, SLAs, and reports that include URL-based definitions (such as filters or requirements). You are free to delete the 4.5.*x* filters whenever you decide 4.5.*x* data no longer needs to be reviewed.

URL Arguments

The handling of URL arguments within applications and custom dimensions definitions, as well as user ID matching, has also changed in 5.0.

Each URL argument has a *name=value* combination. In 4.5.*x*, the *name* part was decoded by RUEI. Therefore, all URL argument names had to be specified in their formatted version. For example, `foo$bar$baz`. In 5.0, URL argument names are no longer decoded, but reported in their raw (original) form. Therefore, they must also now be specified in their raw form. For example, `foo%24bar%24baz`.

Note the upgrade procedure automatically converts all URL argument name definitions to the new format. Therefore, it is not necessary to manually update them. However, be aware the reporting of these URL argument names will appear different in 5.0.

Conversion of Monitored Strings

The functionality that allows you to monitor strings that appear on pages (such as functional errors and page content checks) has changed in 5.0. All defined strings are automatically converted to their Unicode (UTF-8) equivalent.

Enriched Data Exchange Facility

The Enriched data exchange facility enables the alternative analysis of the data collected by RUEI. In particular, it allows you to combine the data collected by RUEI with other warehouse data. For example, a Customer Relationship Management (CRM) or Business Intelligence (BI) system. The exported data is based on pageviews, and is in XML format.

The XSD file that defines the structure of the exported XML files has changed in 5.0. Therefore, If you have systems that use data derived from the 4.5.*x* Enriched data facility, you will need review the new XML structure, and modify the operation of these systems as necessary. The Enriched data exchange facility is fully described in the *Oracle Real User Experience Insight User's Guide*.

5.2.2 Rolling Back an Upgrade

This section describes the procedure to rollback to version 4.5.*x* after upgrading to version 5.1.

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

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

   ```
   cd /root
   unzip Vxxxx.zip
   cd RUEI/51
   chmod +x ./ruei-rollback-5.1-4.5.sh
   ```

2. Run the `ruei-rollback-5.1-4.5.sh` script as `root`. This script performs all necessary rollback actions not covered by the RPM replacement.

3. Stop all RUEI processing by issuing the following command:

   ```
   ./ruei-rollback-5.1-to-4.5.sh stop_ruei
   ```

4. In RUEI 5.0, the product is installed in the directory `/opt/ruei`, while configuration and log files are stored in the directory `/var/opt/ruei`. Before downgrading to the old RPMs, a number of environment changes need to be made. These are performed by the downgrade script using the following command:

    ```
    ./ruei-rollback-5.1-4.5.sh rpm_pre_install
    ```

5. Edit the `/etc/sysconfig/httpd` file, and deleting the line referring to `/etc/ruei.conf`, and adding the following lines:

    ```
    export LD_LIBRARY_PATH=/usr/local/instantclient/lib
    export TNS_ADMIN=/home/moniforce
    ```

6. Downgrade the RUEI software using the following commands:

    ```
    rpm -e ux-wlp
    cd /root/RUEI/45
    rpm -Uhv --oldpackage ux-*
    ```

7. Remove the new versions of the Oracle Instant Client and PHP RPMs using the following commands:

    ```
    rpm -e oracle-instantclient11.1-sqlplus
    rpm -e oracle-instantclinet11.1-basic
    rpm -e php-oci8-11gR1
    ```

8. Restore the previous versions of the Oracle Instant Client and PHP RPMs using the following commands:

    ```
    cd /root/RUEI/IC
    rpm -Uhv oracle-instantclient-basic-11.1.0.*.rpm
    rpm -Uhv oracle-instantclient-sqlplus-11.1.0.*.rpm
    cd /root/RUEI/PHP/
    rpm -Uhv php-oci8-5.1.6-*
    ```

9. Restore symlinks to the Oracle Instant Client using the following commands:

    ```
    mkdir -p /usr/local/instantclient
    ln -fsv /usr/lib/oracle/11.1.0.1/client64/lib /usr/local/instantclient
    ln -fsv /usr/lib/oracle/11.1.0.1/client64/bin /usr/local/instantclient
    ```

10. Repeat steps 1 - 8 for each Collector system.

11. Restore the backup of your 4.5.*x* configuration. You will need to copy the backup file to the Reporter system, and store it in a location the `moniforce` user can access, such as `/tmp`. Then run the following commands:

    ```
    cd /root/RUEI/51
    ./ruei-rollback-5.1-4.5.sh restore_backup /tmp/backup.tar.gz
    ```

    replacing `/tmp/backup.tar.gz` with the name and location of the required backup file.

12. Undo a number of conversion actions by issuing the following command:

    ```
    ./ruei-rollback-5.1-4.5.sh rpm_post_install
    ```

13. Re-start RUEI using the following command:

    ```
    ./ruei-rollback-5.1-4.5.sh start_ruei
    ```

14. Because SSL keys are migrated to a different storage method during the upgrade, but no downgrade procedure is available, you will need to re-implement your SSL keys. This is fully described in the *Oracle Real User Experience Insight User's Guide*.

15. Optionally, convert the storage of failed hits, pages, and services back to 4.5.*x* format using the following command:

```
./ruei-rollback-5.1-4.5.sh convert_rolling_cubes
```

Troubleshooting Rollback Problems

The rollback script `ruei-rollback-5.1-4.5.sh` logs its actions in the file `/tmp/ruei-rollback-5.1-4.5.log`. If you encountered any problems during the rollback, please attach this file to any request to Customer Support.

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 **Administrator**. For more information about roles, see the *Oracle Real User Experience User 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 RUEI Administration 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
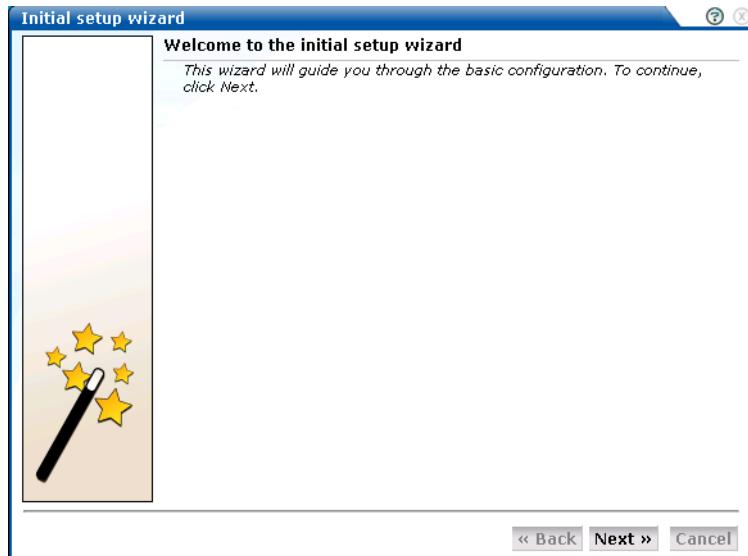
2. Click **Next** to proceed with configuration. The dialog shown in Figure 6–3 appears:

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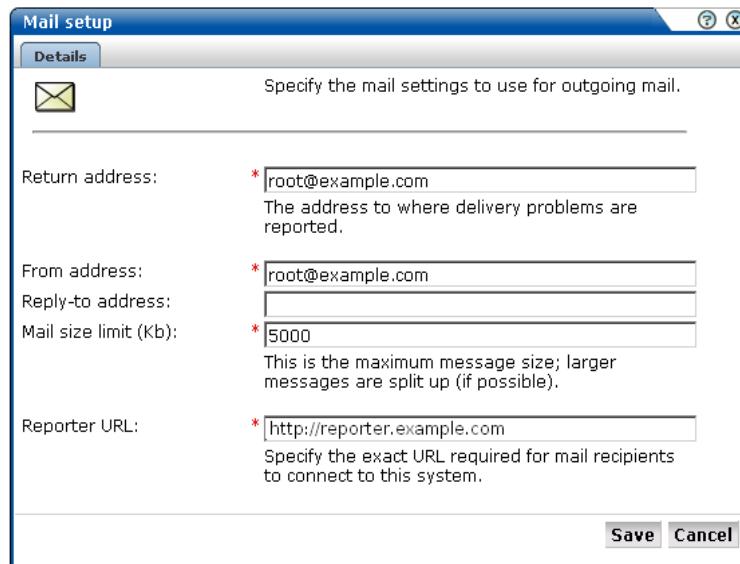
3. Specify the requested information. The e-mail information is used to configure RUEI's interface to your internal network, and will be used for reporting problems. When you have entered the required information, click **Next**. The dialog shown in Figure 6–4 appears.

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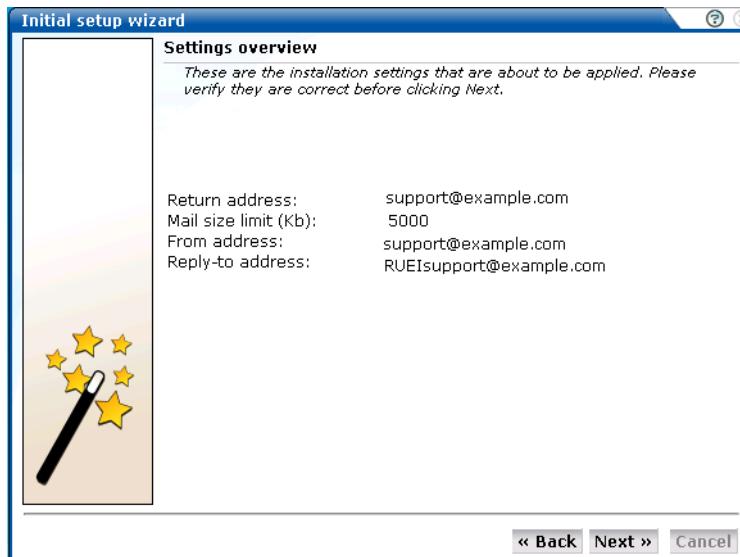
4. Check that the information specified in the settings overview is correct. You can use **Back** and **Next** to move between dialogs as necessary. When ready, click **Next**. The dialog shown in Figure 6–5 appears.

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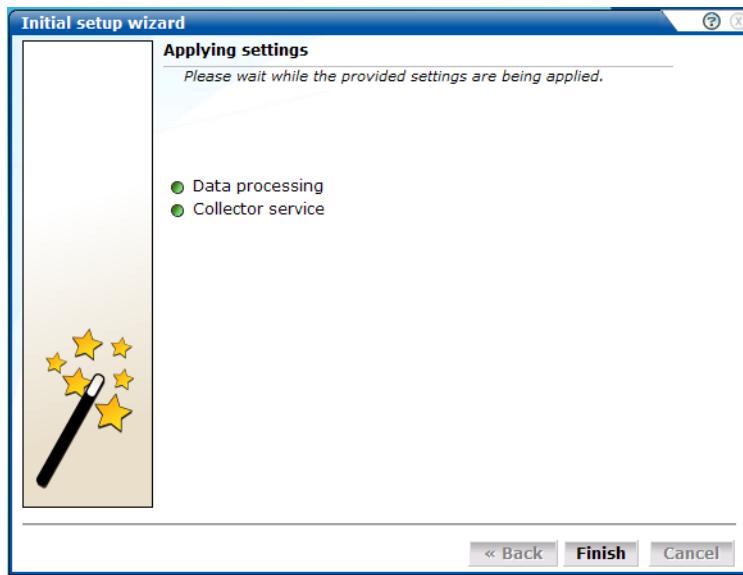
5. This dialog indicates how far the system has got in applying your specified settings. Typically, this process takes a maximum of 15 minutes. When finished, click **Finish** to close the dialog.

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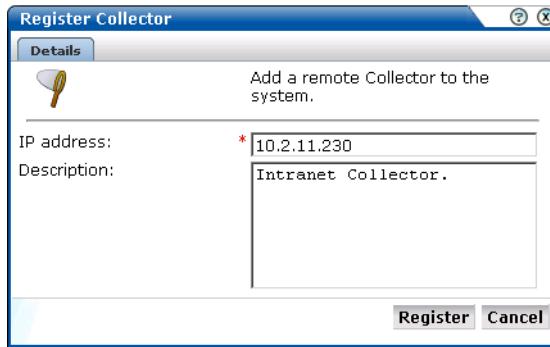
3. Enter the IP address of the Collector. Optionally, you can also specify a brief description of the attached Collector. When ready, click **Register**. On return to the Network data collectors window, the new Collector should be listed.

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, the Administrator, 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
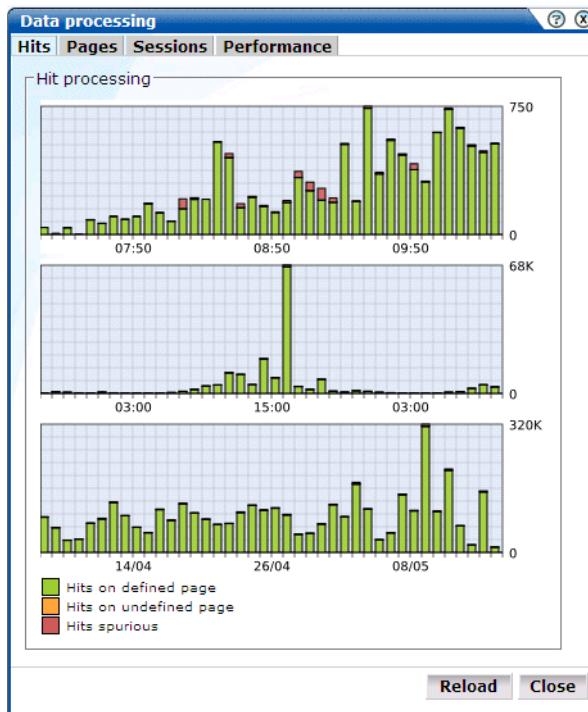
The precise number of percentage of identified sessions, pageviews, and hits relies heavily on your exact configuration. If you intend to measure all traffic, it is recommended that at least 80% of sessions, pageviews, and hits are reported as "identified". It is also recommended that you regularly review 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.

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	Role 1	2	3	4	5	6	Description
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 (by default this is `/opt/ruei`) must be at least 512 MB.
Disk space for $RUEI_DATA	•	•	•	•	•		The disk space for the specified $RUEI_DATA location (by default this is `/var/opt/ruei`) must be at least 100 GB.

Check	1	2	3	4	5	6	Description
Disk containing $RUEI_DATA	•	•	•	•	•		The specified $RUEI_DATA location (by default this is `/var/opt/ruei`) must be local. Remote file systems (such as NFS) are not supported.
Disk speed on $RUEI_DATA	•	•	•	•	•		The disk speed of the specified $RUEI_DATA location (by default this is `/var/opt/ruei`) 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 (by default this is `moniforce`) must exist.

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

Check	1	2	3	4	5	6	Description
`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 (by default this is `moniforce`).
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 (by default this is `moniforce`) 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 (by default this is /opt/ruei).
User `root` can write to $RUEI_DATA	•	•	•	•	•		User `root` must be able to write to the specified $RUEI_DATA directory (by default this is /var/opt/ruei).
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 (by default this is `moniforce`) 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 (by default this is `moniforce`) must be able to connect to the database via PHP.
$RUEI_USER user must have `umask` 0027	•	•	•	•	•		The specified $RUEI_USER user (by default this is `moniforce`) must have a `umask` of 0027.
$RUEI_USER user able to read $RUEI_HOME	•	•	•	•	•		The specified $RUEI_USER user (by default this is `moniforce`) must be able to read the specified $RUEI_HOME directory (by default this is /var/opt/ruei).
$RUEI_USER user able to write to $RUEI_DATA	•	•	•	•	•		The specified $RUEI_USER user (by default this is `moniforce`) must be able to read the specified $RUEI_DATA directory (by default this is /var/opt/ruei).
/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.

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

Check	Role 1	2	3	4	5	6	Description
Post-install checks							
Reporter RPM check	•	•	•		•		The `ux-collector`, `ux-core`, `ux-generic`, `ux-ipdb`, `ux-gui`, `ux-lang-en` 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.
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 (by default this is `moniforce`) 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

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.

B.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 B–1:

Table B–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/50
./ruei-check.sh all
```

B.2 The prepare_uxinsight_db.sh Script Fails

If the prepare_uxinsight_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).

B.3 The Applying Settings Dialog Hangs

If the Applying settings dialog (Figure 6–5) hangs after performing the initial configuration (described in Section 6.2, "Performing Initial RUEI Configuration"), it is recommended that you do the following:

- Review the specified network settings and ensure that they are correct.

- Ensure that the time zone is explicitly set in your PHP installation. For more information, see Section 2.5.1, "PHP Configuration".

B.4 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.

B.5 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:

```
eth n      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.

B.6 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.

B.7 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.

B.8 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
```

B.9 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-gd php-pear php-mbstring phpldap bitstream-vera-fonts \
librsvg2 xorg-x11-xinit net-snmp-utils
```

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".

B.10 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.

B.11 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.

B.12 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.

B.13 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

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.

D

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This appendix contains licensing information about certain third-party products included with RUEI 4.5. Unless otherwise specifically noted, all licenses herein are provided for notice purposes only.

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