HP Application Lifecycle Management

Software Version: 11.50

Installation Guide

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Software Release Date: July 2012

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Acknowledgements

This product includes software developed by the Apache Software Foundation (**http://www.apache.org**).

This product includes software developed by the JDOM Project (**http://www.jdom.org**).

Documentation Updates

The title page of this document contains the following identifying information:

- Software Version number, which indicates the software version.
- Document Release Date, which changes each time the document is updated.
- Software Release Date, which indicates the release date of this version of the software.

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Support

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To find more information about access levels, go to:

http://h20230.www2.hp.com/new_access_levels.jsp

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Welcome to This Guide

Welcome to HP Application Lifecycle Management (ALM). ALM empowers IT to manage the core application lifecycle, from requirements through deployment, granting application teams the crucial visibility and collaboration needed for predictable, repeatable, and adaptable delivery of modern applications.

Note: HP Quality Center Enterprise Edition is in Technology Preview. It will be released formally after completion of the Technology Preview period.

How This Guide is Organized

The *HP Application Lifecycle Management Installation Guide* describes the system prerequisites and ALM installation process.

It contains the following parts:

Part I Installation Overview

Presents the whole installation process as a numbered task, enabling you to follow the workflow in a simple step-by-step manner. Also provides an overview of the available ALM editions and ALM technology.

Part II Upgrade

Describes all aspects of the various stages involved in the upgrade process. Provides details about how to upgrade the Site Administration database schema and projects.

Part III Pre-Installation Prerequisites

Provides an overview of ALM and the installation process. Also contains general, and detailed, prerequisite information for the various supported operating systems (Windows, Linux, and Oracle Solaris), and database servers (Oracle and Microsoft SQL). Also contains important information relating to upgrading projects and database Site Administration schemas.

Part IV Installation

Describes in detail the steps required to install ALM on Windows, Linux, and Oracle Solaris platforms.

Part V Post-Installation

Describes the various post-installation tasks and available customization and management options. Also describes how to uninstall ALM.

Part VI Appendix

Contains information on troubleshooting the ALM Installation.

Documentation Library

The Documentation Library is an online help system that describes how to use ALM. You can access the Documentation Library in the following ways:

- Click **Documentation Library** in the ALM Help menu to open the Documentation Library home page. The home page provides quick links to the main help topics.
- Click **Help on this page** in the ALM Help menu to open the Documentation Library to the topic that describes the current page.

Documentation Library Guides

The Documentation Library consists of the following guides and references, available online, in PDF format, or both. PDFs can be read and printed using Adobe Reader, which can be downloaded from the Adobe Web site (http://www.adobe.com).

Reference	Description
Using this Documentation Library	Explains how to use the Documentation Library and how it is organized.
What's New?	Describes the newest features in the latest version of ALM. To access, select **Help** > **What's New**.
Product Feature Movies	Short movies that demonstrate the main product features. To access, select **Help** > **Product Feature Movies**.
Readme	Provides last-minute news and information about ALM.

HP Application Lifecycle Management (ALM) Guides

Guide	Description
HP ALM User Guide	Explains how to use ALM to organize and execute all phases of the application lifecycle management process. It describes how to specify releases, define requirements, plan tests, run tests, and track defects.
HP ALM Administrator Guide	Explains how to create and maintain projects using Site Administration, and how to customize projects using Project Customization.
HP ALM Lab Management Guide	Explains how to use Lab Management to manage lab resources used for functional and performance testing on remote hosts.
HP ALM Tutorial	A self-paced guide teaching you how to use ALM to manage the application lifecycle management process.

Guide	Description
HP ALM Installation Guide	Describes the installation and configuration processes for setting up ALM Server.
HP Business Process Testing User Guide	Explains how to use Business Process Testing to create business process tests.

HP ALM Performance Center Guides

Guide	Description
HP ALM Performance Center Quick Start	A self-paced guide giving the Performance Center user a high level overview of creating and running performance tests.
HP ALM Performance Center Guide	Explains to the Performance Center user how to create, schedule, run, and monitor performance tests. Explains to the Performance Center administrator how to configure and manage Performance Center projects.
HP ALM Performance Center Installation Guide	Describes the installation processes for setting up Performance Center Servers, Performance Center Hosts and other Performance Center components.
HP ALM Performance Center Troubleshooting Guide	Provides information for troubleshooting problems while working with HP ALM Performance Center.

HP ALM Best Practices Guides

Guide	Description
HP ALM Agile Testing Best Practices Guide	Provides best practices for implementing agile testing principles.
HP ALM Business Models Module Best Practices Guide	Provides best practices for working with the Business Models module.
HP ALM Database Best Practices Guide	Provides best practices for deploying ALM on database servers.

Guide	Description
HP ALM Entities Sharing Best Practices Guide	Provides best practices for sharing entities.
HP ALM Project Planning and Tracking Best Practices Guide	Provides best practices for managing and tracking releases.
HP ALM Project Topology Best Practices Guide	Provides best practices for structuring projects.
HP ALM Upgrade Best Practices Guide	Provides methodologies for preparing and planning your ALM upgrade.
HP ALM Versioning and Baselining Best Practices Guide	Provides best practices for implementing version control and for creating baselines.
HP ALM Workflow Best Practices Guide	Provides best practices for implementing workflows.

HP ALM Performance Center Best Practices Guides

Guide	Description
HP Performance Center of Excellence Best Practices	Provides best practices for successfully building and operating Performance Centers of Excellence.
HP Performance Monitoring Best Practices	Provides best practices for monitoring the performance of applications under test.

HP ALM API References

Guide	Description
HP ALM Project Database Reference	Provides a complete online reference for the project database tables and fields.
HP ALM Open Test Architecture API Reference	Provides a complete online reference for the ALM COM-based API. You can use the ALM open test architecture to integrate your own configuration management, defect tracking, and home-grown testing tools with an ALM project.
HP ALM Site Administration API Reference	Provides a complete online reference for the Site Administration COM-based API. You can use the Site Administration API to enable your application to organize, manage, and maintain ALM users, projects, domains, connections, and site configuration parameters.
HP ALM REST API Reference	Provides an online reference for the ALM REST-based API. You can use the REST API to access and work with ALM data.
HP ALM COM Custom Test Type Developer Guide	Provides a complete online guide for creating your own testing tool and integrating it into the ALM environment using native COM development tools.
HP ALM .NET Custom Test Type Developer Guide	Provides a complete online guide for creating your own testing tool and integrating it into the ALM environment using a combination of DCOM and .NET classes.

Additional Online Resources

The following additional online resources are available from the ALM **Help** menu:

Part	Description
Troubleshooting & Knowledge Base	Opens the Troubleshooting page on the HP Software Support Web site where you can search the Self-solve knowledge base. Choose **Help** > **Troubleshooting & Knowledge Base**. The URL for this Web site is http://h20230.www2.hp.com/troubleshooting.jsp.
HP Software Support	Opens the HP Software Support Web site. This site enables you to browse the Self-solve knowledge base. You can also post to and search user discussion forums, submit support requests, download patches and updated documentation, and more. Choose **Help** > **HP Software Support**. The URL for this Web site is www.hp.com/go/hpsoftwaresupport. Most of the support areas require that you register as an HP Passport user and sign in. Many also require a support contract. To find more information about access levels, go to: http://h20230.www2.hp.com/new_access_levels.jsp To register for an HP Passport user ID, go to: http://h20229.www2.hp.com/passport-registration.html
HP Software Web site	Opens the HP Software Web site. This site provides you with the most up-to-date information on HP Software products. This includes new software releases, seminars and trade shows, customer support, and more. Choose **Help** > **HP Software Web site**. The URL for this Web site is www.hp.com/go/software.
Add-ins Page	Opens the HP Application Lifecycle Management Add-ins Page, which offers integration and synchronization solutions with HP and third-party tools.

Part 1

Installation Overview

1

Installation Process Overview

This chapter provides an overview of the HP Application Lifecycle Management (ALM) installation process.

How to Install and Manage ALM

This procedure describes the steps involved in installing, customizing, troubleshooting, and uninstalling ALM.

This task includes the following steps:

1 Verify system configurations

Verify that your server machine meets the ALM system configurations. For the recommended and supported system configurations for your ALM server machine, refer to the *HP Application Lifecycle Management 11.50 Readme*.

Note: The supported environment information in the *HP Application Lifecycle Management 11.50 Readme* is accurate for the ALM 11.50 release, but there may be subsequent updates. For the most up-to-date supported environments, refer to the HP Software Web site using the following URL: http://www.hp.com/go/TDQC_SysReq

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2 Review information relevant to upgrading the Site Administration schema or projects

If you worked with a previous version of ALM/Quality Center, you must upgrade your Site Administration database schema and projects. For more information, see Chapter 3, "Upgrade Overview."

3 Review the installation checklist

Ensure that you have all the information for installing ALM on a server machine. For more information, see Chapter 4, "Pre-Installation Checklist."

4 Verify that you meet all relevant prerequisites

Ensure that you meet the prerequisites for installing ALM on a server machine, and for running ALM on client machines. In addition to general prerequisites, there are specific prerequisites depending on your operating system and database server type.

For more information, see the following:

- **Windows operating systems:** Chapter 5, "Prerequisites: Windows Operating Systems."

- **Linux/Oracle Solaris operating systems:** Chapter 6, "Prerequisites: Linux/Oracle Solaris Operating Systems."
- **Oracle database servers:** Chapter 7, "Prerequisites: Oracle Database Servers."
- **Microsoft SQL database servers:** Chapter 8, "Prerequisites: Microsoft SQL Database Servers."
- **Miscellaneous prerequisites:** Chapter 9, "Prerequisites: Miscellaneous."
- **Client-side prerequisites:** Chapter 10, "Prerequisites: Client-side."

5 Install ALM

You can install ALM on one of the following operating systems: Windows, Linux, or Oracle Solaris. For more information, see the following:

- **Windows operating systems:** Chapter 11, "Installing on Microsoft Windows Systems."
- **Linux/Oracle Solaris operating systems:** Chapter 12, "Installing on Linux/Oracle Solaris Systems."

6 Start Application Lifecycle Management

After the installation completes, you launch ALM from your Web browser. For more information, see Chapter 13, "Getting Started."

7 Customize and configure the ALM installation - Optional

You can customize and configure the following aspects of the ALM installation:

- **Apache Web server:** Configure the ALM Application Server to work with the Apache Web server. For more information, see Chapter 14, "Integrating the ALM Application Server with Apache."
- **Add-ins:** You can install ALM add-ins to enhance existing functionality. For more information, see Chapter 15, "Installing HP ALM Add-ins".
- **ALM Application Server:** ALM comes with built-in application server capability. You can perform the following actions on the internal application server: update the heap memory value, change default port numbers, and configure secure access to ALM. For more information, see Chapter 16, "Managing the ALM Application Server".
- **System files:** You can customize various aspects of ALM by creating or configuring system files. For more information, see Chapter 17, "Customizing System Files".

8 Install Performance Center Server and components - Optional

To work with HP ALM Performance Center, install the Performance Center server and components. For more information, refer to the *HP ALM Performance Center Installation Guide*.

9 Troubleshoot the ALM Server installation

Additional suggestions for dealing with issues relating to the ALM installation are described in Appendix A, "Troubleshooting the ALM Installation".

10 Uninstall ALM

For information on how to uninstall ALM from your server machine, see Chapter 18, "Uninstalling ALM."

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About ALM

This chapter provides information about the available ALM editions and ALM technology.

This chapter includes:

Application Lifecycle Management Editions

HP Application Lifecycle Management (ALM) is also available in several editions which provide subsets of ALM functionality — HP ALM Essentials Edition, HP Quality Center Enterprise Edition, and HP ALM Performance Center Edition.

HP ALM Edition	Description
HP ALM Edition	A unified platform for managing and automating processes, activities, and assets for building, testing, delivering, and maintaining applications. It includes modules for requirements, test, defect, and development management, and overall release and project planning. HP ALM helps organizations drive consistent processes, shared best-practices, and asset sharing across projects.
HP ALM Essentials Edition	Provides a subset of HP ALM product functionality, and is designed to help smaller teams get up and running quickly. It provides core functionality for requirements management, test management, and defect management.
HP Quality Center Enterprise Edition	Resides on the same unified platform as HP ALM. It delivers core functionality for quality management. It supports building a quality center of excellence through tight integrations with HP Unified Functional Testing, HP Business Process Testing, and HP Sprinter.
HP ALM Performance Center Edition	Functionality for the complete management, scheduling, running, and monitoring of performance test scripts. It resides on the same platform as HP ALM and integrates directly with HP ALM and HP LoadRunner.

For detailed information about the functionality available for each edition, refer to the *HP Application Lifecycle Management User Guide*.

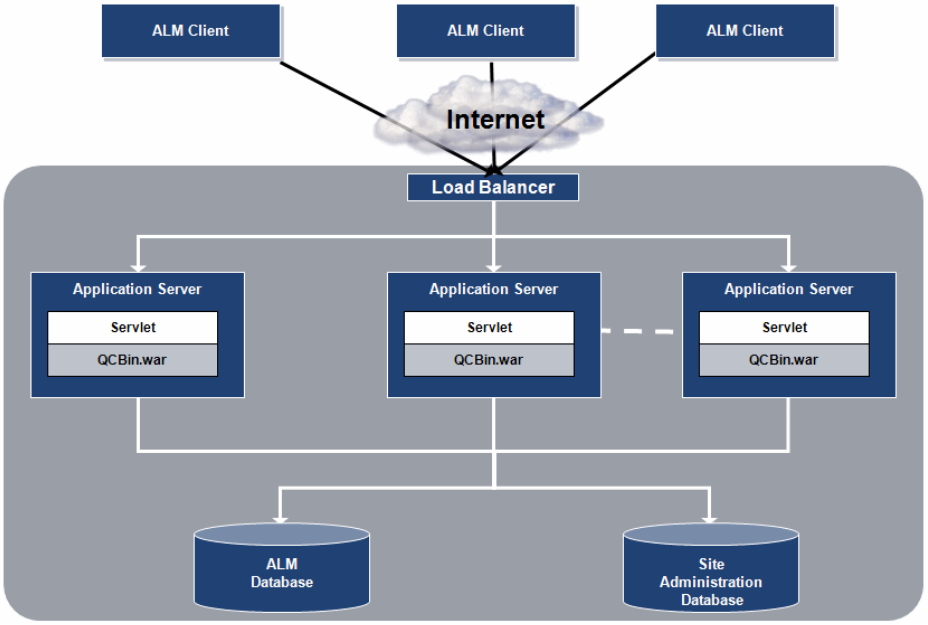
About the ALM Technology

ALM is an enterprise-wide application that is based on Java 2 Enterprise Edition (J2EE) technology. J2EE technology provides a component-based approach to the design, development, assembly, and deployment of enterprise applications.

Within the J2EE framework, ALM supports clustering. A **cluster** is a group of application servers that run ALM as if they were a single entity. Each application server in a cluster is referred to as a **node** or a **cluster node**.

Clusters provide mission-critical services to ensure maximum scalability. The load balancing technique within the cluster is used to distribute client requests across multiple application servers, making it easy to scale to an infinite number of users. The cluster of servers can run on Windows, Linux, and Oracle Solaris based platforms.

The following diagram illustrates how ALM client requests are transmitted within a cluster.



- **HP ALM Client.** When users select Application Lifecycle Management or Site Administration on their client machine, client components are downloaded to their client machine. ALM uses the Component Object Model (COM) interface as an interprocess communicator among the components.
- **Internet.** Client requests are transmitted via the HTTP protocol to the server.
- **Load Balancer.** When working with a load balancer, client requests are transmitted to the load balancer and distributed according to server availability within the cluster.
- **Application Server.** Client requests are dispatched by servlets to the deployed ALM Server. ALM comes with built-in application server capability.

  The deployed application contains Application Lifecycle Management, Site Administration, and associated files which are packaged into a Web Application Archive (WAR) file. Client requests from Application Lifecycle Management are dispatched to the deployed application.

  The Java Database Connectivity (JDBC) interface is used to communicate between the application server and the databases.
- **Databases.** The Application Lifecycle Management Site Administration schema stores project information, such as domain, project, and user data. The schemas can reside on an Oracle or Microsoft SQL Server. For detailed guidelines for deploying ALM on database servers, refer to the *HP ALM Database Best Practices Guide*.

Part 2

Upgrade

3

Upgrade Overview

This section describes the process for upgrading ALM.

Performance Center: To work with projects created in Performance Center versions 9.52 or earlier, you must migrate your projects to align them with the required configurations of ALM. For details, refer to the "Upgrade and Migration" section in the *HP Application Lifecycle Management Performance Center Installation Guide*.

This chapter includes:

The Upgrade Process

The upgrade process consists of the following main stages:

1. **Planning the upgrade.** Define the scope of your upgrade and plan an upgrade strategy. For details, see "Planning the Upgrade" on page 31.
2. **Server installation.** Install the new version of ALM. This creates or upgrades the site administration schema. There is one schema for the ALM site. This schema is created the first time ALM is installed and maintains all site administration tables. For details, see:
   - ➤ "Server Installation" on page 32
   - ➤ "Upgrading Existing Schema" on page 32
3. **Restoring projects.** If you chose to install ALM on a new server, remove your projects from the original server, and restore them on the new server. For details on backing up, removing, and restoring projects, refer to the *upgrade* section of the *HP Application Lifecycle Management Administrator Guide*.
4. **Project upgrade.** Upgrade the projects that were created in a previous version of ALM. Each project has its own project database user schema. This schema maintains all data related to the specific project. For details, see "Project Upgrade" on page 40.
5. **Project repository migration**. If you are upgrading from Quality Center 10.00 to ALM 11.50, the project repository is automatically upgraded to the new optimized repository format. For details, see "Project Repository Migration" on page 46.

It is important to be familiar with the upgrade process and plan your course of action before you begin. In addition, there may be some steps you must take before you perform the actual upgrade. This chapter guides you through the process and directs you to the more detailed information and instructions for each step.

Planning the Upgrade

To upgrade from a previous Quality Center or ALM version with minimal interruption to your system operations, first become familiar with the considerations and recommendations involved in the upgrade process. The following guides provide information on upgrade, and are available on the HP Software Product Manuals site (http://h20230.www2.hp.com/selfsolve/manuals):

HP Application Lifecycle Management Upgrade Best Practices. This guide provides information on upgrade methodology and can assist you in planning your upgrade. The *Upgrade Best Practices* guide is available on the installation DVD.

The *Upgrade Best Practices* guide discusses the following:

- Determining the need for ALM upgrade
- Defining upgrade scope and strategy
- Upgrading infrastructure
- Upgrading ALM
- Choosing the upgrade method
- Upgrading projects
- Configuring and customizing projects
- Upgrading in a testing environment
- Planning for production upgrade

HP ALM Database Best Practices Guide. This guide provides best practices for implementing HP ALM. Following these best practices can help you when upgrading your database or moving to a different database as a part of your overall upgrade plan.

Server Installation

In this stage of the upgrade process you install the new version of ALM.

1. Before you begin, thoroughly review all prerequisite actions and considerations. For details, see Part 3, "Pre-Installation Prerequisites" of this guide.
2. If you choose to upgrade a copy of the existing Site Administration schema, see "Upgrading Existing Schema" on page 32.
3. Review the prerequisites for upgrading a project. For details, see "Project Upgrade" on page 40.
4. Review "Project Repository Migration" on page 46.
5. Install ALM 11.50. For details, see Part 4, "Installation" of this guide.
6. Complete any post-installation tasks, such as installing HP ALM Add-ins. For details, see Part 5, "Post-Installation", of this guide.

Upgrading Existing Schema

When installing ALM 11.50, you can choose to upgrade a copy of an existing Site Administration schema.

This option creates a copy of the existing Site Administration database schema, and then upgrades the copy. Upgrading a copy of the existing schema enables you to work with new and upgraded projects, as well as with projects from previous versions that have not been upgraded. This allows you to upgrade your existing projects incrementally.

Note:

- **Oracle:** The new database schema is created in the same tablespace as the existing Site Administration database.
- This scenario does not apply to working with Performance Center projects. After you upgrade LAB_PROJECT, you must then upgrade Performance Center projects before they can be used.

For more information on using an existing database schema, see Chapter 7, "Prerequisites: Oracle Database Servers," or Chapter 8, "Prerequisites: Microsoft SQL Database Servers."

This section also includes:

- Guidelines for Upgrading a Copy of the Existing Schema
- Recovering a Lost Confidential Data Passphrase
- Changes to the Existing Schema and Upgrade Failure

Guidelines for Upgrading a Copy of the Existing Schema

When you choose to upgrade a copy of the existing schema, the copy that is created is independent of the existing schema. Any changes subsequently made to the original schema through updates in your previous version of Quality Center or ALM are not reflected in the upgraded copy of the schema that ALM 11.50 uses.

Therefore, consider the following guidelines:

ALM users	After you install ALM 11.50, if you add or delete users or update user details in your previous version of ALM/Quality Center, you must make the same changes in ALM 11.50.
ALM configuration parameters	After you install ALM 11.50, if you modify configuration parameters in your previous version of ALM/Quality Center, you must make the same changes in ALM 11.50.

Server node configuration	If you are working with server nodes, in the Servers tab in Site Administration for ALM 11.50, you must reconfigure the settings for the ALM log file and the maximum number of database connections.
ALM repository path	The repository path in your previous version must be defined as a network path, so that it can be accessed by both the previous ALM/Quality Center installations and by ALM 11.50. Make sure that different repository paths are defined for both versions.
DATACONST table	The following constants must be set as network paths in the **DATACONST** table: ➤ db_directory, tests_directory ➤ unix_db_directory ➤ unix_tests_directory This enables them to be accessed by both the previous ALM/Quality Center installations and by ALM 11.50.
Confidential data passphrase	If you are upgrading an ALM 11.00 version of the schema, when configuring the installation you must enter the same passphrase as was used in the previous installation. If you do not know the passphrase, see "Recovering a Lost Confidential Data Passphrase" on page 35.
Schema exceptions	If you have made changes to the existing schema, such as the addition of tables or columns, the upgrade process may fail. To upgrade the existing schema successfully, you can create an exception file that instructs ALM to ignore these changes during the upgrade process. For more information, see "Changes to the Existing Schema and Upgrade Failure" on page 36.

Recovering a Lost Confidential Data Passphrase

If there is an existing installation of ALM, and you do not know the Confidential Data Passphrase, perform the following steps:

Notes:

- The procedure must be performed before beginning the ALM 11.50 installation.
- The procedure can be performed whether you are installing ALM 11.50 on the same machine as the existing installation, or on a separate machine, for example, if you are adding a node to a cluster.

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1 On the machine where the ALM is currently installed, navigate to the following directory:

- **Windows:** c:\ProgramData\HP\ALM\conf
- **Linux/Solaris:** /var/opt/HP/ALM/conf

2 If you are installing ALM 11.50 on a different machine, copy the **qcConfigFile.properties** file and place the copy on the machine where you plan to install the latest version of ALM. Place the file in the same location on the new machine.

Note: If the <**Deployment path**>**\HP\ALM\conf** (Windows) or <**Deployment path**>**/HP/ALM/conf** (Linux/Solaris) directories do not exist on the new machine, manually create them. In such a case, make sure that the new directories have the required permissions to be accessed by the configuration tool.

If you are installing ALM 11.50 on the same machine, create a copy of the **qcConfigFile.properties** file.

3 Open the copy of the **qcConfigFile.properties** file and delete all information except for the line that starts with **initstring**.

4. Save the copy. If you are installing ALM on a new machine, skip to step 6.
5. If you are upgrading ALM on the same machine as the previous installation:
   a. Uninstall the current version of ALM. For information about uninstalling ALM, see Chapter 18, "Uninstalling ALM." The uninstallation procedure does not remove the existing **qcConfigFile.properties** file.
   b. Overwrite the existing **qcConfigFile.properties file** with the version you edited in step 3.
6. When you run the Configuration Wizard after the installation, the wizard detects a previous ALM installation and prompt you to accept the current settings. Accept the current settings. When the wizard reaches the Security page the previous Confidential Data Passphrase appears.

Changes to the Existing Schema and Upgrade Failure

If changes have been made to the existing Site Administration database schema, these changes may cause the upgrade process to fail. Examples of such changes are the addition of tables or columns, or changes to field types.

To prevent the upgrade process from failing, perform one of the following actions:

Note: It is advisable to perform these actions in this order.

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1. Manually repair inconsistencies between the old schema and the new schema. For more information about manually repairing the old schema, refer to the "Changing the Database User Schema" section in the appendix to the *HP Application Lifecycle Management Administrator Guide*.

2 If it is not feasible to manually repair the existing schema, you can create an exception file that instructs ALM to ignore these changes during the upgrade process. After creating the exception file, save it in an accessible location on your system. After installing ALM the **Site Administration Database Schema** page in the configuration wizard prompts you to add the file to the configuration process. As a result, the changes to the existing schema do not cause the upgrade process to fail.

For information about how to create an exception file, see "Creating an Exception File" below.

3 If you cannot manually repair the inconsistencies, or create an exception file, create a new schema and then migrate the projects using the **Restore Project** option in Site Administration.

To create a new schema, in the ALM Server Configuration Wizard, Site Administration Database Schema page, select the **Create a New Schema** option.

If ALM is already installed on the server machine, you can rerun the ALM Server Configuration Wizard as follows:

- **Windows:** Select **Start** > **Programs** > **HP ALM Server** > **Server Configuration Wizard**
- **Linux/Solaris:** Navigate to the **/opt/HP/HP_ALM_Server** directory and run the **run_after_install.sh** file.

For information on migrating projects, refer to the "Upgrading Projects to a New Version" chapter in the *HP Application Lifecycle Management Administrator Guide*.

Creating an Exception File

The following procedure describes how to create an exception file.

To create an exception file:

1. Copy the **SchemaExceptions.xml** file from the ALM installation directory. By default, the file is located in **<ALM installation path>\data\sa\Admin\MaintenanceData**.
2. Place the copy of **SchemaExceptions.xml** in an accessible location on your system.
3. Edit the file and define exceptions. For example:
   - **For an extra table:**

     ```
     <TableMissing>
         <object pattern="MY_Table" type="extra"/>
     </TableMissing>
     ```
   - **For an extra view:**

     ```
     <ViewMissing>
         <object pattern="MY_VIEW" type="extra"/>
     </ViewMissing>
     ```
   - **For an extra column:**

     ```
     <ColumnMissing>
         <object pattern="MY_COLUMN" type="extra"/>
     </ColumnMissing>
     ```
   - **For an extra index:**

     ```
     <IndexMissing>
         <object pattern="MY_INDEX" type="extra">
     </IndexMissing>
     ```

- **For an extra constraint:**

  ```
  <ConstraintMissing>
      <object pattern="MY_CONSTRAINT" type="extra">
  </ConstraintMissing>
  ```

- **For multiple occurrences of extra elements:**

  For example, multiple extra columns:

  ```
  <ColumnMissing>
      <object pattern="MY_COLUMN_1" type="extra"/>
      <object pattern="MY_COLUMN_2" type="extra"/>
  </ColumnMissing>
  ```

4 Save the **SchemaExceptions.xml** file.

Project Upgrade

After installing the latest version of ALM, you must upgrade your projects to the new version. This section provides an overview of the project upgrade process.

For details on how to run these upgrade processes in Site Administration, refer to the upgrade section of the *HP Application Lifecycle Management Administrator Guide*.

This section includes:

- Upgrading Projects from Previous Versions and Editions
- Upgrading LAB_PROJECT
- Upgrading Projects
- Upgrading Version Control
- The Project Upgrade Tools

Upgrading Projects from Previous Versions and Editions

The following table describes the process required for working with a project created in an earlier version:

From version:	To ALM 11.50:
Quality Center 10.00 or ALM 11.00	**1** Install ALM 11.50. The installation process updates your Site Administration schema. **2** If you were working with Performance Center 11.00, you must upgrade LAB_PROJECT using ALM Site Administration 11.50. For details, refer to the *HP Application Lifecycle Management Administrator Guide*. **3** Upgrade your projects using ALM Site Administration 11.50. For details, refer to the *HP Application Lifecycle Management Administrator Guide*.
Quality Center 9.2	First upgrade projects to Quality Center 10.00 or ALM 11.00. For details, refer to the relevant the *Installation Guide*.
Quality Center 9.0	Projects must first be upgraded to Quality Center 10.00. For details, refer to the *HP Quality Center 10.00 Installation Guide*.
ALM Essentials Edition 11.50 or Performance Center Edition 11.50	If you are upgrading to HP Quality Center Enterprise Edition or HP ALM Edition, you do not need to upgrade your projects.
Quality Center Enterprise Edition 11.50	If you are upgrading to HP ALM Edition, you do not need to upgrade your projects.

Upgrading LAB_PROJECT

If you were previously working with Performance Center 11.00, upgrade LAB_PROJECT before upgrading any Performance Center projects. You manage LAB_PROJECT project details from the Lab Management tab in Site Administration.

Upgrading LAB_PROJECT includes the following stages:

Note: This procedure describes the flow for performing a gradual upgrade on a new server.

---

1. On the original Quality Center or ALM server in Site Administration, disable LAB_PROJECT.
2. Back up the LAB_PROJECT schema and file system.
3. On the new ALM server, remove LAB_PROJECT. (If you chose to create a new Site Administration schema during installation, a new LAB_PROJECT was created. To work with your ALM/Performance Center 11.00 LAB_PROJECT, you must first remove the new LAB_PROJECT from the ALM 11.50 server.)
4. Restore the ALM Performance Center 11.00 LAB_PROJECT on the new ALM 11.50 server.
5. On the new ALM server, in Site Administration, run the Verify tool. The Verify tool checks if LAB_PROJECT contains any common problems.
6. If problems are detected, run the Repair tool to fix problems that can be resolved automatically. Manually fix any problems that cannot be handled automatically by the Repair tool.
7. Run the Upgrade tool on the new ALM server to upgrade LAB_PROJECT to ALM 11.50.
8. When the upgrade process completes, activate LAB_PROJECT.

Upgrading Projects

Upgrading a project includes the following stages:

Note:

- This procedure describes the flow for performing a gradual upgrade on a new server.
- If you were previously working with ALM/Performance Center 11.00, first upgrade LAB_PROJECT, and then any Performance Center template projects, before upgrading Performance Center projects.

---

1. **Version Control:** Make sure that all entities in the project are checked in. Version control enabled projects from Quality Center 10.00 or ALM/Performance Center 11.00 cannot be upgraded to ALM 11.50 while there are checked out entities. For more details, see "Upgrading Version Control" on page 44.
2. On the original Quality Center or ALM server, in Site Administration, disable the project.
3. Back up the project schema and file system.
4. Restore the project on the new ALM server.
5. On the new ALM server, in Site Administration, run the Verify tool. The Verify tool checks if the project contains any common problems.
6. If problems are detected, run the Repair tool to fix problems that can be resolved automatically. Manually fix any problems that cannot be handled automatically by the Repair tool.
7. Run the Upgrade tool on the new ALM server to upgrade the project to ALM 11.50.
8. To enable Lab Management or Performance Center functionality in the project, enable **ALM Lab Extension**.
9. Finally, activate the project.

Upgrading Version Control

Upgrading Quality Center 10.00 or ALM 11.00 version control enabled projects. Version control enabled projects from Quality Center 10.00 or ALM 11.00 cannot be upgraded to ALM 11.50 while there are checked out entities. All entities must be checked in in the corresponding version of Quality Center or ALM.

Upgrading from legacy version control projects. To work with projects from Quality Center 9.0 or Quality Center 9.2 that use version control, you must first upgrade to Quality Center 10.00, migrate legacy version control data, and then upgrade to ALM 11.50. For information on migrating legacy version control data to Quality Center 10.00, see HP Software Self-solve knowledge base article KM632120 (http://h20230.www2.hp.com/selfsolve/document/KM632120). (Requires HP Passport sign-in credentials)

The Project Upgrade Tools

Project upgrade can fail due to various reasons. ALM provides two preparation tools that reduce the risk of failure: **Verify Project** and **Repair Project**.

Note: These tools are also applicable when upgrading LAB_PROJECT.

For details on how to run these tools, refer to the upgrade section of the *HP Application Lifecycle Management Administrator Guide*.

Verify Project

The Verify Project tool searches for the most common causes of failure. The tool runs a number of tests and produces a list of problems that are detected in the project. The report is displayed on-screen and you can choose to save it to file.

The Verify Project tool is designed to ensure that the upgrade process runs smoothly. However, be aware that there may be specialized cases (primarily related to customization or integrations) that the Verify Project tool may not identify, and this may lead to post-upgrade challenges.

Repair Project

Use the Repair Project tool to fix those detected problems that can be resolved automatically.

Upgrade Project

When you launch the Upgrade Project tool, it runs a sequence of internal steps:

1. **Pre-Upgrade Verification and Repair.** The sequence begins by running the Verify Project tool to check the project for problems. If the Verify Project tool detects only problems that can be fixed automatically, the Repair Project tool is launched.

   When the Repair Project tool ends its run, the Verify Project tool is rerun, to ensure that project is now ready for upgrade.

2. **Upgrade**. After checking that the project is clear of problems, the actual upgrade process is launched. The Upgrade Project tool performs the following actions:

   - Modifies the project schema. This usually involves adding new tables and columns.
   - Modifies the data in the project schema, usually by adding new records.
   - Modifies the project repository, which stores the project files.

3. **Post-Upgrade Verification.** After the Upgrade Project tool ends successfully, the Verify Project tool runs once more, to check the project's state after upgrade.

Project Repository Migration

HP ALM introduces an advanced architecture to store project files on the file system – the optimized repository.

When upgrading projects from Quality Center 10.00 to ALM 11.50, the project repository is automatically upgraded to the optimized repository format. This is carried out in two stages:

1. The first stage is performed during the actual upgrade of the project. In this stage, all files in the repository are scanned and their names are stored in a project table.
2. After upgrade is completed the project is reactivated. The repository files are gradually migrated to the new system. In this stage, the files are moved from their old location to their new location in the optimized repository.

   This second phase of the repository migration is carried out behind the scenes. Users can work in the project even while it is in progress. Depending on various factors, such as the size of the repository and the network speed, the file migration may take up to several days.

For more details, refer to the upgrade and repository migration sections of the *HP Application Lifecycle Management Administrator Guide*.

Documentation Resources on the Upgrade Process

The following additional upgrade resources are available from the HP Manuals Site at the following URL: http://h20230.www2.hp.com/selfsolve/manuals.

- *HP Application Lifecycle Management Administrator Guide*
- *HP ALM Upgrade Best Practices (*also available on the installation DVD)
- *HP ALM Database Best Practices*

Additional resources are available on the HP Software Support Site at the following URL: http://www.hp.com/go/hpsoftwaresupport (Requires HP Passport sign-in credentials). You can search the Self-solve knowledge base for additional articles related to upgrade, such as:

- KM1302383 - *Error codes referenced in the Verify and Upgrade process*
- KM189834 - *How to switch database servers for Quality Center server*
- KM194388 - *Can the database back-end used by Quality Center be migrated from Oracle to MS SQL or vice versa*
- KM1281892 - *Useful information about the upgrade process in ALM11.* Provides links to many additional resources on upgrade, performance, database issues, troubleshooting, and more.

Part 3

Pre-Installation Prerequisites

4

Pre-Installation Checklist

Review and verify the following checklist before installing ALM. This checklist outlines the information that you must supply during the installation process. For more detailed prerequisite information, see the following:

- **Windows operating systems:** Chapter 5, "Prerequisites: Windows Operating Systems."
- **Linux/Oracle Solaris operating systems:** Chapter 6, "Prerequisites: Linux/Oracle Solaris Operating Systems."
- **Oracle database servers:** Chapter 7, "Prerequisites: Oracle Database Servers."
- **Microsoft SQL database servers:** Chapter 8, "Prerequisites: Microsoft SQL Database Servers."
- **Miscellaneous prerequisites:** Chapter 9, "Prerequisites: Miscellaneous."
- **Client-side prerequisites:** Chapter 10, "Prerequisites: Client-side."

✔	Check	Information Required
	Installation Machine	➤ Operating system version ➤ CPU type ➤ Free disk space ➤ Free memory For the list of supported system environments, refer to: http://www.hp.com/go/TDQC_SysReq.
	Setup Paths	➤ Installation path ➤ Deployment path **Notes:** ➤ You can accept the default paths offered by the Installation and Configuration wizards, or enter alternative paths. ➤ The installation path must not include folders with accented characters (for example, ä, ç, ñ). ➤ You must have full permissions on the installation and deployment directories. For more information, see the following: ➤ **Windows operating systems:** "Required Permissions: Windows" on page 56. ➤ **Linux/Solaris operating systems:** "Required Permissions: Linux/Solaris" on page 60.
	License Key	➤ License file ➤ Maintenance key
	Cluster Description	➤ Is clustering used? ➤ Cluster hosts
	Encryption Passphrases	➤ Confidential data storage passphrase **Notes:** ➤ In a cluster, use the same passphrase on all nodes. ➤ When upgrading from an ALM 11.00 version of the Site Administration database schema, you must enter the same passphrase as was used for the previous installation. ➤ Communication security passphrase

✔	Check	Information Required
	Application Server	The port number.
	Mail Server	➤ Server type ➤ Server host ➤ Server port
	Demo Project	➤ Do you require the Web-based demo application for work with the HP Application Lifecycle Management Tutorial?
	Database Server	➤ Database type ➤ Database version ➤ Database server name ➤ Database administrator user name ➤ Database administrator user password ➤ Database port If you use Oracle: ➤ Database SID ➤ Default tablespace ➤ Temp tablespace
	Site Administration	➤ Site administrator user name ➤ Site administrator password

✔	Check	Information Required
	Existing ALM/ Quality Center Installation	If there is an existing Site Administration schema, provide the following information for the existing version: ➤ ALM/Quality Center version ➤ ALM/Quality Center host ➤ Will the same Site Administration schema be used in the new version? ➤ Confidential data passphrase ➤ Database server name ➤ Database administrator user name ➤ Database administrator password ➤ Site Administration database schema name ➤ Site Administration database schema password ➤ Repository folder ➤ Site administrator user name ➤ Site administrator password
	Repository	➤ Repository folder

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Prerequisites: Windows Operating Systems

This chapter provides an overview of the prerequisites for installing ALM on Windows-based operating systems.

This chapter includes:

System Configurations: Windows

Verify that your server machine meets the ALM system configurations. For the recommended and supported system configurations for your ALM server machine, refer to the *HP Application Lifecycle Management 11.50 Readme*.

Important: The supported environment information in the *HP Application Lifecycle Management 11.50 Readme* is accurate for the ALM 11.50 release, but there may be subsequent updates. For the most up-to-date supported environments, refer to the HP Software Web site using the following URL: http://www.hp.com/go/TDQC_SysReq

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ALM can be deployed on a VMware ESX/ESXi server according to the VMWare guest operating system compatibility matrix.

Required Permissions: Windows

Verify that you have the required permissions to install ALM on a server machine.

If you are upgrading from a previous version of ALM/Quality Center with a remote repository, the ALM/Quality Center application server user account must have network access to the remote repository. For more information. contact your network administrator.

To install ALM on Windows, you must be logged on as a local or domain user with administrator permissions. The user name of the logged on user installing ALM cannot include a pound sign ("#") or accented characters (for example, ä, ç, ñ).

Notes:

- If the repository is on a remote machine, or to use a Microsoft SQL server with Windows authentication, you must log on as a domain user and local administrator.
- You must disable User Account Control (UAC) during the ALM installation and configuration.

You must have the following file system and registry key permissions:

- Full read permissions to all the files and directories under the directory in which ALM is installed. The installation directory path is specified by the user during installation. By default, ALM writes the installation files to: **C:\Program Files\HP\HP Application Lifecycle Management**.
- Full read, write, and execute permissions to the directory on which ALM is deployed. The deployment directory is specified by the user during installation. By default, ALM is deployed in **C:\Users\All Users\HP\ALM**.
- Full read and write permissions to the **repository** directory which contains the **sa** and **qc** directories. The repository path is specified by the user during installation. By default, it is located under the ALM deployment directory. For more information on the repository, refer to the *HP Application Lifecycle Management Administrator Guide*.

- Full read permissions to the system root (**%systemroot%**) directory. If you do not have these permissions, you can still install ALM, but you cannot install any patches.
- Full read and write permissions to the installation and configuration log files directory. Installation and configuration log files are written to **C:\Users\All Users\HP\ALM\log**.
- Full read and write permissions to all the keys under **HKEY_LOCAL_MACHINE\SOFTWARE\Mercury Interactive**.

Clustering Configuration: Windows

Check with your system administrator whether you are installing ALM on a single node or as a cluster. For more information on cluster nodes, see Chapter 11, "Installing on Microsoft Windows Systems."

If you are installing ALM on cluster nodes, verify which machine to use as the first node to start the installation and the number of machines you should use. This depends on the number of users and availability considerations. When installing ALM on additional nodes, install the same version of ALM on all nodes, and insert the same repository and database details that you used on the first node. You must use the same Confidential data passphrase on all nodes.

ALM Repository Path: Windows

The location of the repository directory is specified by the user during installation. The default location is: **C:\ProgramData\HP\ALM\repository**. You must have full control permissions to the ALM repository path as described in "Required Permissions: Windows" on page 56.

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Prerequisites: Linux/Oracle Solaris Operating Systems

This chapter provides an overview of the prerequisites for installing ALM on a Linux or an Oracle Solaris operating system.

This chapter includes:

System Configurations: Linux/Solaris

Verify that your server machine meets the ALM system configurations. For the recommended and supported system configurations for your ALM server machine, refer to the *HP Application Lifecycle Management 11.50 Readme*.

Important: The supported environment information in the *HP Application Lifecycle Management 11.50 Readme* is accurate for the ALM 11.50 release, but there may be subsequent updates. For the most up-to-date supported environments, refer to the HP Software Web site using the following URL: http://www.hp.com/go/TDQC_SysReq

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Consider the following for implementing ALM configurations:

- Verify that you have a supported kernel by running `uname -a`.
- ALM can be deployed on a VMware ESX/ESXi server according to the VMWare guest operating system compatibility matrix.

Note: Only Linux operating systems can be deployed on a VMware server. Solaris operating systems are not supported.

Required Permissions: Linux/Solaris

Verify that you have the required permissions to install ALM on a server machine.

If you are upgrading from a previous version of ALM/Quality Center with a remote repository, the ALM/Quality Center application server user account must have network access to the remote repository. For more information. contact your network administrator.

Note:

The instructions in this chapter apply if you are installing ALM as a **root** user. For non-root user related information, see the following HP Software Self-solve knowledge base articles (Requires HP Passport sign-in credentials):

- Installing ALM without root user permissions (sudo installation): http://support.openview.hp.com/selfsolve/document/KM916123
- Installing ALM with root user permissions, but starting ALM without root user permissions: http://support.openview.hp.com/selfsolve/document/KM1365972

You must have the following file system permissions:

- Full read and write permissions for all the files and directories under the directory on which ALM is installed. The installation files are used for configuring the server. By default, the ALM installation files are written to: **/var/opt/HP/HP_ALM_Server**.
- Full read and write permissions to the directory on which ALM is deployed. The deployment directory is specified by the user during installation. By default, ALM is deployed on: **/var/opt/HP/ALM**.
- Full read and write permissions to the **repository** directory which contains the **sa** and **qc** directories. The repository path is specified by the user during installation. By default, it is located under the ALM deployment directory. For more information on the repository, refer to the *HP Application Lifecycle Management Administrator Guide*.
- Full read and write permissions to the installation and configuration log files directory. Installation and configuration log files are written to: **/var/opt/HP/ALM/log**.
- Full read and write permissions to the file delivery logs. The log files are written to **/var/log**.
- If the file repository is located on a remote machine:
  - On the file server machine, share the file repository directory so that the user running the installation is the owner of the files.
  - On the ALM machine, or on each cluster node, create a mount directory that points to the file repository directory.

Minimum Disk Space Requirements

The following partitions have minimum disk space requirements:

- **/opt:** Requires at least enough free space to accommodate the size of ALM after it has been installed. The approximate size of an installation is 300MB, though the exact amount of space may vary from installation to installation.
- **/var:** Requires at least enough free space equal to the space on the installation DVD, approximately 150MB. A copy of the installation is stored in this partition.
- **/tmp:** Requires a large amount of free space. The exact amount cannot be specified as this partition is also consumed by the operating system. It is advisable that the amount of free space is equal in size to ALM after it has been installed, which is approximately 300MB.

Clustering Configuration: Linux/Solaris

Check with your system administrator whether you are installing ALM on a single node or as a cluster. For more information on cluster nodes, see Chapter 12, "Installing on Linux/Oracle Solaris Systems."

If you are installing ALM on cluster nodes, verify which machine to use as the first node to start the installation, and the number of machines you should use. This depends on the number of users and availability considerations. When installing ALM on additional nodes, install the same version of ALM on all nodes, and insert the same repository and database details that you used on the first node. You must use the same Confidential data passphrase on all nodes.

ALM Repository Path: Linux/Solaris

The location of the repository directory is specified by the user during installation. The default location is: **/var/opt/HP/ALM/repository**. You must have full control permissions to the ALM repository path as described in "Required Permissions: Linux/Solaris" on page 60.

7

Prerequisites: Oracle Database Servers

This chapter provides an overview of the prerequisites for connecting HP Application Lifecycle Management (ALM) to an Oracle database server.

In addition to the information presented in this chapter, you can find more information on configuring the database server, including information on supported character sets, in the *HP ALM Database Best Practices Guide*.

This chapter includes:

Connecting ALM to an Oracle Database Server

Verify the following:

Database type and version	Verify that ALM supports your database type and version. For the list of supported databases, refer to: http://www.hp.com/go/TDQC_SysReq.
Database server name	Verify the name of the database server.
Database user permissions	Verify that you have the database permissions required to install ALM on the Oracle database server. For a list of required permissions, see "User Permissions for Connecting ALM to an Oracle Database" on page 64.

Site Administration database schema	To install ALM on an existing Site Administration database schema (second node or upgrade), you must have: ➤ The existing database schema name and the database administrator permissions required to connect ALM to the database server. ➤ Full read/write permissions on the existing repository. ➤ ALM must have access to the previous Site Administration schema repository path. ➤ Full read/write permissions for the ALM user to the previous schema repository path. ➤ The Confidential data passphrase that was used to create the existing schema. For schema name and password considerations, see "Site Administration database schema considerations" on page 68.
Database tablespace name and size	➤ Verify the name of the database server, and check the connection to the database server. Ping the database server machine name to test DNS resolution. ➤ Verify you have the tablespace names (default and temporary) and the minimum tablespace sizes for storing the Site Administration database schema. ➤ Verify that the tablespace is not locked.
Database Column Length Semantics	Ensure that column length is defined according to characters, and not according to bytes.

User Permissions for Connecting ALM to an Oracle Database

To connect ALM to an Oracle database server, the installing database user must have sufficient permissions to perform certain administrative tasks in Oracle. These tasks include creating the ALM project user schema, copying data between projects, and checking that there is sufficient storage in a specific tablespace.

If you are unable to use the Oracle system user due to security reasons, it is recommended that your database administrator create an ALM database administrative user, for example qc_admin_db, with the specific privileges required to install ALM.

Your database administrator can create an ALM database administrative user using the example script, **qc_admin_db___oracle.sql**, which is located in the **\Utilities\Databases_scripts** directory on the installation DVD. This script creates the ALM database administrative user with the recommended grants required on the database. Your database administrator should run the script and create this user on the staging database server.

This section includes:

Database Administrative User Privileges

Following are the privileges required by the ALM database administrative user. Additional explanations about these privileges can be found in the notes at the end of the table.

Privilege	Description
CREATE SESSION WITH ADMIN OPTION (1)	ALM uses this privilege to connect to the database as the ALM database administrative user.
CREATE USER	Required to create a new project user schema when creating a new ALM project.
DROP USER	When deleting an ALM project, ALM attempts to remove the Site Administration database schema from the database server. If there is an insufficient privileges error, ALM ignores the error and requests that the user notify the database administrator to delete (drop) the database user schema.
CREATE TABLE WITH ADMIN OPTION (1)	Required for granting this permission to a newly created ALM project user schema.
CREATE VIEW WITH ADMIN OPTION (1)	Required to create views for ALM projects.

Privilege	Description
CREATE TRIGGER WITH ADMIN OPTION (1)	Required to create triggers for ALM projects. ALM uses database triggers to collect change history for specific tables.
CREATE SEQUENCE WITH ADMIN OPTION (1)	Required to create sequences for ALM projects.
CREATE PROCEDURE WITH ADMIN OPTION (1)	Required to create stored packages for ALM projects. ALM uses packages to collect change history for specific tables.
CTXAPP ROLE WITH ADMIN OPTION (1)	Enables ALM to use the Oracle text searching feature. This role exists only if the Oracle text search component was installed and enabled on the database server.
SELECT ON DBA_FREE_SPACE (2)	Required to check free space on the database server prior to creating a new Site Administration database schema or a new project.
SELECT ON SYS.DBA_TABLESPACES (2)	Required to collect a list of tablespaces that exist on the database server prior to creating a new Site Administration database schema or a new project.
SELECT ON SYS.DBA_USERS (2)	Required to verify the existence of specific database project users. For example, you might want to verify the existence of an Oracle CTXSYS user before creating a new ALM project.
SELECT ON SYS.DBA_REGISTRY (2)	Required to verify that the text search component is installed on the database server.
SELECT ON SYS.DBA_ROLES (2)	Required to verify that the text search role (CTXAPP) is installed on the database server.

Privilege	Description
SELECT ANY TABLE WITH ADMIN OPTION (1) and **INSERT ANY TABLE**	Required for various administrative operations when upgrading the Site Administration database schema during installation using the copy and upgrade method, and for enhancing performance when copying a project that has the same source and target database server.
Notes: ➤ (1) An ALM database administrative user must have privileges **with Admin Option**. ➤ (2) The **SELECT ON SYS** privileges can be given directly by the table owner, or through a database application role. To avoid giving these privileges each time, you can grant this role to the ALM database administrative user. The recommended name for this role is QC_SELECT_ON_SYS_OBJECTS. You can create this role using the **qc_sys_db___oracle.sql** example script, which is located in the **\Utilities\Databases_scripts** directory on the installation DVD. You should run this script before you run the **qc_admin_db___oracle.sql** script.	

Project User Schema Privileges

When creating a new project or restoring an existing project, ALM creates a project user schema. This user schema hosts all the tables that are used by the project for storing and retrieving data. Following are the required privileges for an ALM project user schema:

Project User Schema Privilege	Description
QUOTA UNLIMITED ON <default tablespace>	Required for creating database objects that are owned by the ALM project user schema. This privilege allows users to create tables in the default tablespace. It replaces the **UNLIMITED TABLESPACE** system privilege that gave users system privileges to create tables in any tablespace, including the **SYSTEM** tablespace.
CREATE SESSION	ALM uses this privilege to connect to the database user schema in order to perform required operations. For example creating database objects such as tables, and using them to insert, retrieve, and delete data.

Project User Schema Privilege	Description
➤ **CREATE TABLE** ➤ **CREATE VIEW** ➤ **CREATE TRIGGER** ➤ **CREATE SEQUENCE** ➤ **CREATE PROCEDURE** ➤ **CTXAPP Role**	For a description of these privileges, see the table of required ALM database administrative user privileges on page 65.

Tip: The installation DVD contains an example script that describes the recommended permissions required for the ALM database project user schema. This script contains information and does not need to be run. It is located at **\Utilities\Databases_scripts\qc_project_db___oracle.sql**.

Site Administration database schema considerations

Be aware of the following schema name and password considerations:

- The default Site Administration database schema name is qcsiteadmin_db. If you want to rename the schema, you can change the name in the configuration wizard. For more information, see the following:
  - **Windows systems:** Step 18 on page 96.
  - **Linux/Solaris systems:** Step 19 on page 125.
- You can create your own ALM user password for accessing the Site Administration database schema.

➤ If there is an existing Site Administration database schema, you can create a copy of the existing schema and upgrade the copy. This enables you to work with ALM 11.50 and previous versions of ALM/Quality Center simultaneously.

Note: This scenario does not apply to working with Performance Center projects. After you upgrade LAB_PROJECT, you must then upgrade Performance Center projects before they can be used.

Oracle RAC Support

Oracle RAC is a way to enhance Oracle database availability and scalability, allowing it to interact with more than one database instance.

ALM RAC support includes:

- Load balancing between Oracle instances.
- Failover between all specified Oracle RAC nodes at initial connection.

ALM RAC support does not include:

- TAF (Transparent Application Failover) support. A user failing to complete a request upon an Oracle instance crash is required to perform the activity again with a working Oracle instance.

To enable Oracle RAC support:

1 Verify that a file containing information of Oracle database addresses is saved on your ALM machine. The file is named **tnsnames.ora**. The file should contain information similar to the following examples:

- This first example shows an RAC TNS Alias using all cluster nodes in the ADDRESS sub-section and a sample of utilizing the Load balance and Failover features:

```
OrgRAC =
(DESCRIPTION =
    (ADDRESS_LIST=
        (FAILOVER = on)
        (LOAD_BALANCE = on)
        (ADDRESS= (PROTOCOL = TCP)(HOST = server1)(PORT = 1521))
        (ADDRESS= (PROTOCOL = TCP)(HOST = server2)(PORT = 1521))
        (ADDRESS= (PROTOCOL = TCP)(HOST = server3)(PORT = 1521))
    )
    (CONNECT_DATA=
        (SERVICE_NAME = myrac.yourcompany.com)
    )
)
```

➤ This second example shows an RAC TNS Alias using Single Client Access Name (SCAN). This enables Oracle 11gR2 clients to connect to the database with the ability to resolve multiple IP addresses, reflect multiple listeners in the cluster and handle public client connections. For more information on working with RAC SCAN, refer to the Oracle documentation.

```
OrgRAC_Scan =
(DESCRIPTION =
    (ADDRESS_LIST=
        (FAILOVER = on)
        (LOAD_BALANCE = on)
        (ADDRESS= (PROTOCOL = TCP)(HOST = myrac-cluster-scan)(PORT =
        1521))
    (CONNECT_DATA=
    (SERVICE_NAME = myrac.yourcompany.com)
    )
)
```

2 Verify that you have the address of the TNS server to which ALM should refer, for example, OrgRAC.

8

Prerequisites: Microsoft SQL Database Servers

This chapter provides an overview of the prerequisites for connecting HP Application Lifecycle Management (ALM) to a Microsoft SQL database server.

In addition to the information presented in this chapter, you can find more information on configuring the database server, including information on supported character sets, in the *HP ALM Database Best Practices Guide*.

This chapter includes:

Connecting ALM to a Microsoft SQL Database Server

Verify the following:

Database type and version	➤ Verify that ALM supports your database type and version. For the list of supported databases, refer to: http://www.hp.com/go/TDQC_SysReq. ➤ Verify the database server authentication type: Windows authentication or Microsoft SQL Server authentication. If you upgrade to ALM 11.50, you must use the same type of Microsoft SQL Server authentication that you used before the upgrade. ➤ For Microsoft SQL Server Windows Authentication, check that you can log in to the database.

Database server name	Verify the name of the database server.
Database user permissions	Verify that you have the database permissions required to connect ALM to the Microsoft SQL database server (not applicable for Windows Authentication). For a list of required permissions, see "User Permissions for Connecting ALM to a Microsoft SQL Server" on page 75.
Site Administration database schema	To install ALM on an existing Site Administration database schema (second node or upgrade), you must have: ➤ The existing database schema name and the database administrator permissions required to connect ALM to the database server. ➤ Full read and write permissions on the existing repository. ➤ ALM must have access to the previous schema repository path. ➤ Full read/write permissions for the ALM user to the previous schema repository path. ➤ The Confidential data passphrase that was used to create the existing schema. For schema name and password considerations, see "Site Administration database schema considerations" on page 77.
Text Search	Verify that the text search component is installed on the server, even if you do not intend to use it.

User Permissions for Connecting ALM to a Microsoft SQL Server

To connect ALM to a Microsoft SQL database server, the installing database user must have sufficient permissions to perform certain administrative tasks in SQL.

If you have the SQL sa user, you can use this user to install ALM. If you are unable to use the SQL sa user due to security reasons, it is recommended that your database administrator create an ALM database administrative user, for example td_db_admin, with the specific privileges required to install ALM.

The td_db_admin user must have the **Database Creators** role. You can also grant the td_db_admin user the **Security Administrators** role, which will allow it to create a td user with only those privileges required for running ALM.

Alternatively, you can create a td user before installing ALM. To create a td user, follow steps 1-3 below, and type td as the user name. The td user should be assigned the database db_ddladmin role. It is important that the td user is not assigned any server role.

This section contains the following procedures:

- "To create an ALM database administrative user on a Microsoft SQL Server:" on page 76
- "To test the ALM database administrative user (SQL Server Authentication):" on page 76
- "To test the ALM database administrative user permissions (Windows Authentication):" on page 77

To create an ALM database administrative user on a Microsoft SQL Server:

1. Open the **SQL Server Management Studio**.
2. In the **Object Explorer** pane, under the ALM database server, expand the **Security** folder.
3. Right-click the **Logins** folder, and select **New Login**.
4. Type td_db_admin as the user name, and select the authentication type (enter password if necessary).
5. Click the **Server Roles** tab, and select the **dbcreator** option.
6. Click **OK**.

To test the ALM database administrative user (SQL Server Authentication):

➤ Verify the select sysdatabases table permission in the master database:

```
SELECT name FROM sysdatabases where name=<db_name>
```

➤ Verify the create database permission:

```
CREATE DATABASE <dbName> -- the database name must not already exist
```

➤ Verify the drop database permission:

```
DROP DATABASE <database_name> -- the database name must exist
```

➤ Verify the select syslogins permission:

```
SELECT COUNT(*) FROM master..syslogins WHERE name=<dbOwnerName>
```

Note: The dbOwnerName must be set to **td**.

To test the ALM database administrative user permissions (Windows Authentication):

➤ Verify the change database context permission:

```
USE <dbName>
```

➤ Verify the create database permission:

```
CREATE DATABASE <dbName> -- the database name must not already exist
```

➤ Verify the select on syslogins permission:

```
SELECT COUNT(*) FROM master..syslogins WHERE name='<dbOwnerName>'
```

➤ Verify the select on sysusers permission:

```
SELECT COUNT(*) FROM master..sysusers WHERE name='<dbOwnerName>'
```

Site Administration database schema considerations

Be aware of the following schema name and password considerations:

➤ The default Site Administration database schema name is qcsiteadmin_db. If you want to rename the schema, you can change the name in the configuration wizard. For more information, see the following:

  ➤ **Windows systems:** Step 18 on page 96.

  ➤ **Linux/Solaris systems:** Step 19 on page 125.

➤ You can create your own ALM user password for accessing the Site Administration database schema.

➤ If there is an existing Site Administration database schema, you can create a copy of the existing schema and upgrade the copy. This enables you to work with ALM 11.50 and previous versions of ALM/Quality Center simultaneously.

Note: This scenario does not apply to working with Performance Center projects. After you upgrade LAB_PROJECT, you must then upgrade Performance Center projects before they can be used.

9

Prerequisites: Miscellaneous

This chapter provides an overview of miscellaneous prerequisites for installing HP Application Lifecycle Management (ALM).

This chapter includes:

License File and Maintenance Key

Verify that you have the ALM license file and maintenance key.

- To activate your license, visit the HP Software Licensing Portal (http://www.hp.com/software/licensing) and enter your Entitlement Order Number.

  The license file has a **.dat** file extension by default. Make a note of where you save the file, as during the ALM configuration process you need to specify a path to it.

  If you do not have a license, visit the HP Software Licensing Portal (http://www.hp.com/software/licensing) and click the **Contact Licensing Support** link.

- The maintenance key was supplied to you with the product package when you purchased ALM. This field is not mandatory.

Security Passphrases

Verify that you have passphrases for confidential data and communication security encryption.

For secondary cluster nodes, verify that you have the confidential data encryption passphrase that you used to install the primary cluster.

When upgrading from an ALM 11.00 version of the Site Administration database schema, you must use the same confidential data passphrase as was used for the previous installation.

Performance Center: You must use the same communication security passphrase for the ALM and Performance Center server configurations.

Mail Server Information

A mail server enables ALM users to send emails to other users in a project. You select which server to use as part of the installation configuration process.

Decide before installing ALM which mail server to use. Ask your system administrator for assistance. If you are using an SMTP Server, check that you have the SMTP Server name and port. The installer checks that the specified mail server name and port are valid and that the mail server is running.

10

Prerequisites: Client-side

This chapter provides an overview of the prerequisites for working with HP Application Lifecycle Management (ALM) on a client machine. The steps described in this chapter are performed on the client, and not on the machine on which ALM is installed.

This chapter includes:

System Configurations

Verify that client machines meet the ALM system configurations. For the supported and recommended system configurations for ALM clients, refer to the *HP Application Lifecycle Management 11.50 Readme*.

Important: The supported environment information in the *HP Application Lifecycle Management 11.50 Readme* is accurate for the ALM 11.50 release, but there may be subsequent updates. For the most up-to-date supported environments, refer to the HP Software Web site: http://www.hp.com/go/TDQC_SysReq

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Required Software

The following must be installed on client machines:

- Microsoft Visual C++ 2005 SP1 Redistributable Package MFC Security Update (32-bit version)
- Microsoft .NET Framework 4

Additional Considerations

The following considerations must also be taken into account:

- You must download the 32-bit version of Microsoft Visual C++ even if you are using a 64-bit operating system.
- If you are integrating ALM with other HP testing tools, you must modify the DCOM permissions on your client machine. For more information, see HP Software Self-solve knowledge base article KM187086 (http://h20230.www2.hp.com/selfsolve/document/KM187086). (Requires HP Passport sign-in credentials)

  ALM Edition: Modifying DCOM permissions is not required for running Functional test sets (server-side test execution).
- You can work with the ALM client using a remote desktop.

- For customers using remote or mass distribution mechanisms, ALM client components can be deployed locally on workstations by running a self-extracting **msi** file. You build the **msi** file by running the **HP ALM Client MSI Generator** available from the **More HP Application Lifecycle Management Add-ins** page. For more information on running add-ins, see Chapter 15, "Installing HP ALM Add-ins".

Permissions Required to Download ALM Client Components

To enable ALM to work with HP testing tools as well as various other integrations and third-party tools, you need to log in to the client machine with administrator privileges. These privileges are required to install the HP ALM Client Registration add-in, which you use to register ALM client components and Site Administration client components on your client machine. For more information, see "Registering ALM on a Workstation" on page 151.

File System Permissions

You must have the following file system permissions:

- Full read and write permissions on the **HP\ALM-Client** deployment folder.

  This is located at:

  - **Windows 7/2008/2008R2:** %ALLUSERSPROFILE%
  - **Windows XP:** %ALLUSERSPROFILE%\Application Data

- Full read and write permissions to the **Temp** (%TEMP% or %TMP%) directory. The installer program writes installation and log files to this directory. This is generally located at:

  - **Windows XP:**
    C:\Documents and Settings\<username>\Local Settings\Temp.
  - **Windows 7/2008/2008R2:**
    C:\Users\<username>\AppData\Local\Temp

Internet Explorer Configuration

Before you download Application Lifecycle Management on a client machine, you must perform the following configurations to the Internet Explorer browser on the client machine.

- Configure the Custom Level security settings. The Custom Level security setting should be configured for the specific zone of the ALM server.
- Set Internet Explorer as the default Web browser. This ensures that external links to ALM entities can open in ALM.

To configure security settings on the client machine:

1. In Internet Explorer, select **Tools** > **Internet Options**. The Internet Options dialog box opens.
2. Click the **Security** tab. The Web content zone of the ALM server (**Internet** or **Local intranet**) is automatically selected. Click **Custom Level**.
3. In the Security Settings dialog box, configure the following settings:

   Under **.NET Framework-reliant components**:

   - Set **Run components not signed with Authenticode** to **Enable**.
   - Set **Run components signed with Authenticode** to **Enable**.

   Under **ActiveX controls and plug-ins**:

   - Set **Run ActiveX controls and plug-ins** to **Enable**.
   - Set **Download signed ActiveX controls** to **Enable** or **Prompt**.

Note: You do not need to enable **Download signed ActiveX controls** if you install the ALM client using the HP ALM Client MSI Generator Add-in. This allows you to install all ALM modules on a client machine without downloading them through a browser. For more information on installing add-ins, see Chapter 15, "Installing HP ALM Add-ins".

---

4 On **Windows 7**:

   a It is suggested that you add the ALM server site to the Trusted Sites security zone. This is not mandatory.

   b Disable the **Protected Mode** for the Trusted Sites security zone.

5 Click **OK**.

To set Internet Explorer as the default web browser:

1 In Internet Explorer, select **Tools** > **Internet Options**. The Internet Options dialog box opens.

2 Click the **Programs** tab.

3 Under **Default web browser**, make sure that Internet Explorer is set as the default browser. If not, click the **Make default** button.

Enabling User Account Control (UAC)

If you enable UAC on a Microsoft Windows 7, 2008, or 2008R2 operating system, be aware of the following considerations:

- To register ALM client components, you must run Internet Explorer as the administrator.
- To register ALM client components on a shared location of a client machine, you must run Internet Explorer as the administrator.
- Administrator permissions are required to run the **ClientMSIGenerator.exe** file. In addition, you must run the .exe file as the administrator.

Part 4

Installation

11

Installing on Microsoft Windows Systems

This chapter describes how to install HP Application Lifecycle Management (ALM) on Windows operating systems. It also describes how to install ALM silently.

Note: For information on installing ALM on Linux/Solaris systems, see "Installing on Linux/Oracle Solaris Systems" on page 115.

This chapter includes:

About Installing ALM

You can install ALM on a single node or as a cluster. When you install ALM on cluster nodes, all nodes must be identical. For example, all nodes must use the same operating system, ALM repository location, and Site Administration database. In addition, you must install the same version of ALM on all nodes.

Note: When you are installing ALM on a secondary node of a cluster, you are not required to set up the database, because it was set up when you installed the primary node. Some of the dialog boxes described in this installation procedure are needed only for the primary node and are not displayed if you are installing a secondary node.

Installing ALM

This section describes how to install ALM 11.50.

Before installing ALM, consider the following:

- Verify that you meet the various installation prerequisites. For prerequisite information, see the relevant chapters in Part 3, "Pre-Installation Prerequisites."
- If you encounter problems during the ALM installation process, see Appendix A, "Troubleshooting the ALM Installation," for troubleshooting suggestions.

To install ALM:

1. If you have been working with a previous version of Quality Center or ALM, back up your existing projects before installing the new version. For more information, refer to the *HP Application Lifecycle Management Administrator Guide*.
2. Log in to the ALM server machine with the appropriate permissions. For a list of required permissions, see "Required Permissions: Windows" on page 56.
3. If Quality Center or ALM is installed on the machine, uninstall it. For more information, see Chapter 18, "Uninstalling ALM."
4. Make sure the following services are started on the machine:
   - Secondary Logon
   - Windows Management Instrumentation
5. Insert the ALM 11.50 Software installation DVD into the DVD drive and navigate to, and run the appropriate **.msi** installation file for your operating system (32-bit or 64-bit).
6. The HP ALM Installation wizard starts, displaying the Welcome page. Click **Next**.
7. The License Agreement page opens.

   Read the license agreement. To accept the terms of the license agreement, select **I Agree**.

   Click **Next**.
8. The Customer Information page opens. Type your **Name** and **Organization**. Click **Next**.
9. The Select Installation Folder page opens. Specify the location to which you want to deliver ALM installation files. Click the browse button to choose a location, or accept the default location.

   Make sure to enter a case-sensitive unique name for the installation folder.

   For more information on the required installation directory permissions, see "Required Permissions: Windows" on page 56.

   Click **Next**.

10 The Confirm Installation page opens.

To review or change any settings, click **Back**.

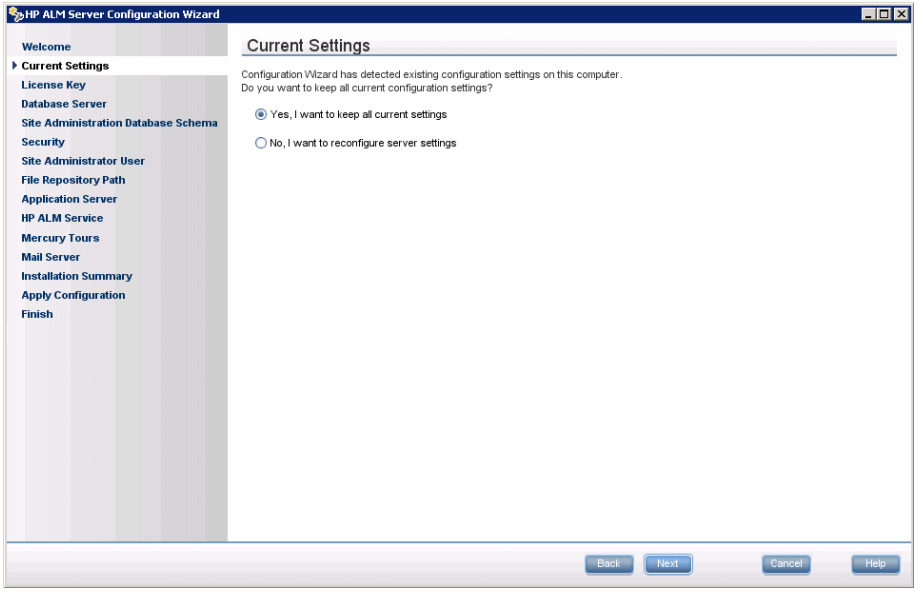
To accept the settings and start the installation process, click **Next**. The ALM files are installed on the server machine.

Note: If anti-virus software is installed on the server machine, it checks every file as it is being copied. Therefore, deployment may take longer than expected.

When the installation process completes, the Installation Complete page opens. Click **Finish**.

11 The ALM Configuration wizard opens, displaying the Welcome page. Click **Next**.

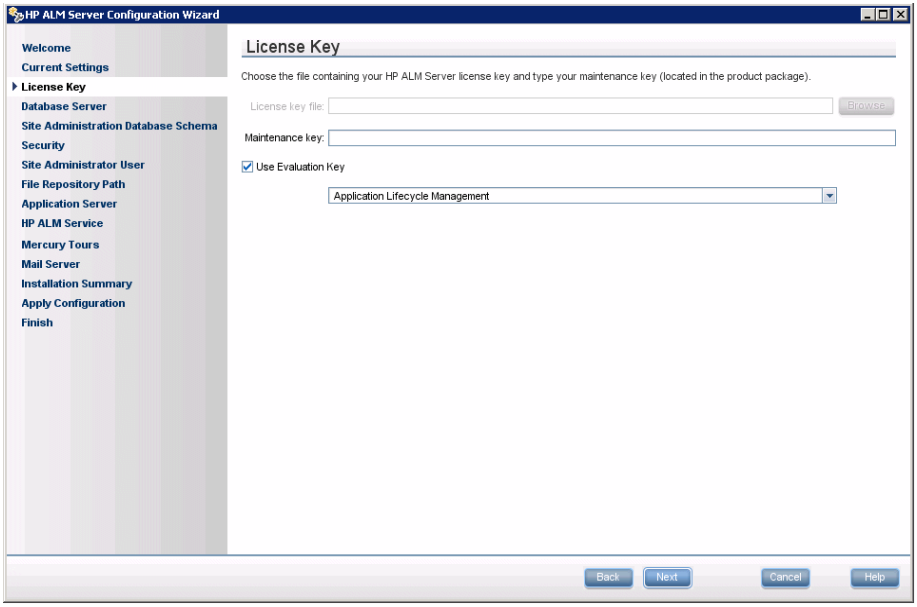
12 If the Configuration wizard detects settings from a previous ALM installation, the Current Settings page opens.



- ➤ Select **Yes** to use the current settings as default settings for the current installation. You can make changes to any of the default settings during the wizard.
- ➤ Select **No** to clear all settings in the Configuration wizard.

Click **Next**.

13 The License Key page opens.



License key file. Select one of the following options:

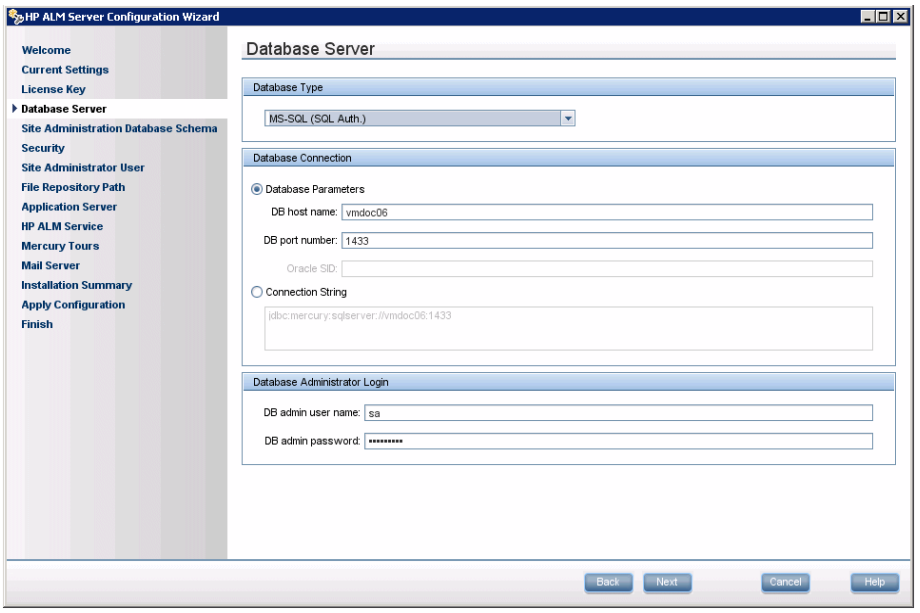
- ➤ Browse to or enter the ALM license file path.
- ➤ If you do not have a license file, select **Use Evaluation Key** for a 30-day trial version of ALM. From the drop-down list, select the edition to install for the trial period.

Maintenance key. Type the maintenance number supplied to you when you purchased ALM.

For more information on the license file and maintenance key, see "License File and Maintenance Key" on page 79.

Click **Next**.

14 The Database Server page opens.



Under Database Type, select the database type for the Site Administration database schema.

If you select a Microsoft SQL Server, choose the authentication type:

- **Microsoft SQL Server (SQL Server Auth.).** Authenticates the user to the database using a database user name and password.
- **Microsoft SQL Server (Windows Auth.).** Windows authentication relies on the user being authenticated by the operating system.

For more information on database requirements, see Chapter 7, "Prerequisites: Oracle Database Servers," and Chapter 8, "Prerequisites: Microsoft SQL Database Servers."

Note: When upgrading a project to ALM 11.50, you must use the same type of SQL authentication that you used before the upgrade.

---

15 Under Database Connection, specify database connection information.

To use an Oracle RAC database, proceed to step 16.

Select one of the following options:

- **Database Parameters.** Select this option to enter database server information using the following fields:
  - **DB host name.** Type the database server name. For example, dbsrv01.
  - **DB port number.** Type the database server port number, or accept the default port number.
  - **Oracle SID.** Type the Oracle system identifier. This is an Oracle parameter that identifies the specific Oracle instance on the host machine on which the Oracle server is installed.
- **Connection String.** Select this option to type a formulated database server connection string.

16 To use an Oracle RAC database, select **Connection String**, and enter a connection string, specifying the location of the **tnsnames.ora** file, and the TNS server to which ALM should refer. Use the following example:

```
jdbc:mercury:oracle:TNSNamesFile=<tnsnames.ora location>;
TNSServerName=OrgRAC
```

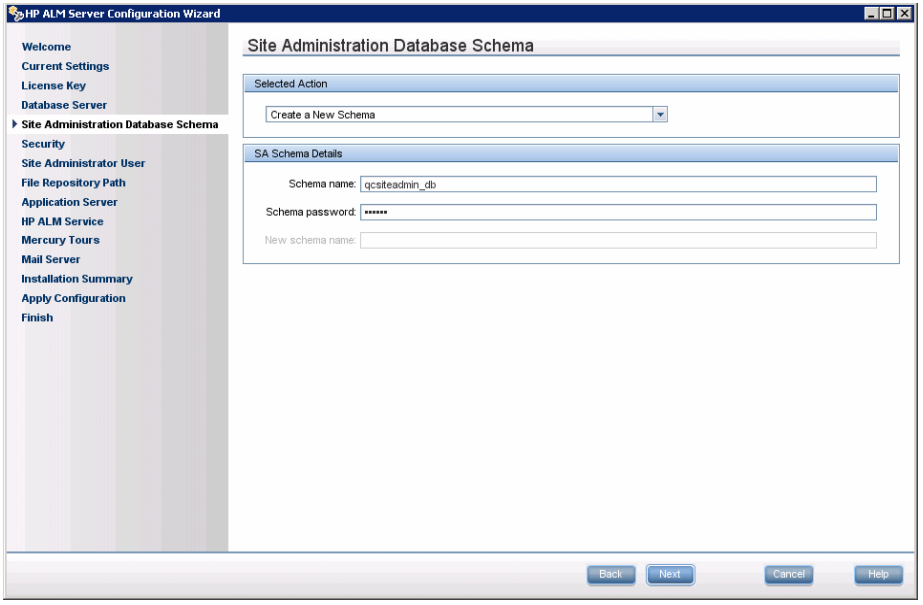
For more information on prerequisites for Oracle RAC support, see "Oracle RAC Support" on page 70.

17 Under Database Administrator Login, specify the following database connection information (Not applicable for **Microsoft SQL Server Windows Authentication**):

- **DB admin user name.** Type the name of the user with the administrative permissions required to install ALM on the database server.
- **DB admin password.** Type the database administrator password.

Click **Next**.

18 The Site Administration Database Schema page opens.



Under **Selected Action**, choose one of the following:

- **Create a New Schema.** Creates a new schema.
- **Upgrade a copy of the existing schema.** Creates a copy of the existing Site Administration database schema, and upgrades the copy. Choose this option to work in ALM 11.50 and previous versions of ALM/Quality Center simultaneously. For more information, see "Upgrading Existing Schema" on page 32.

  If you select this option, the **Schema Exceptions File** option appears. If you have defined an exception file for the upgrade process, click **Browse** and navigate to the location where it was saved before the installation. For more information about exception files, see "Changes to the Existing Schema and Upgrade Failure" on page 36.

- **Connect to existing schema / second node.** This option can be used in two scenarios:
  - If you are reinstalling ALM and would like to reconnect to the same Site Administration database schema.
  - If you have an existing node and you want to install ALM on another node to create a cluster. For more information on cluster configuration, see "Clustering Configuration: Windows" on page 57.

Note: This option enables you to connect to an ALM 11.50 Site Administration database schema only. To connect to an earlier version, you must first upgrade the schema. For more information, see "Upgrading Existing Schema" on page 32.

---

19 When connecting ALM to an Oracle database server:

If you are installing ALM on a secondary node or if the Site Administration database already exists, the new Site Administration database schema is created in the same tablespace as the existing schema. Proceed to step 23.

Type the following information:

- **Default Tablespace.** Select a default storage location from the list.
- **Temporary Tablespace.** Select a temporary storage location from the list.

20 Under SA Schema Details, type the following information:

- **Schema name.** Type a Site Administration database schema name, or accept the default schema name.

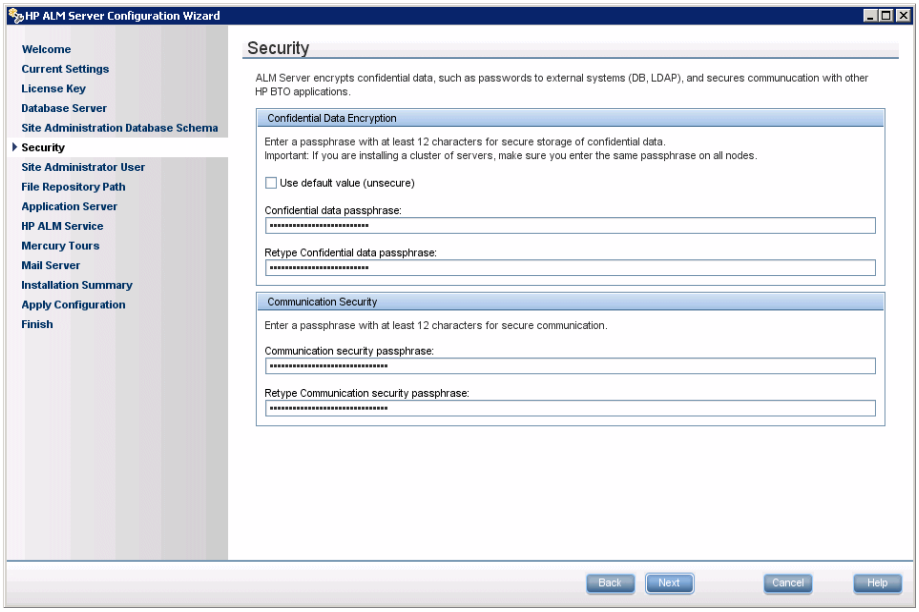
Note: When upgrading an existing Site Administration database schema to work in ALM 11.50, you must use the same name that you used before the upgrade.

- **Schema password.** Enter the following information, depending on your database type:
  - **Oracle:** A default password is created which you can accept or change.
  - **Microsoft SQL Server (SQL Auth.):** ALM uses the td user to create the Site Administration database schema. For more details on the td user, see "User Permissions for Connecting ALM to a Microsoft SQL Server" on page 75.

    Type a password for the td user that complies with your organization's password policy, or keep the default tdtdtd password.
  - **Microsoft SQL Server (Windows Auth.):** Not applicable.
- **New Schema name.** If you selected **Upgrade a copy of the existing schema**, type a name for the upgraded copy of the database schema.

Click **Next**.

21 The Security page opens.



Passwords for accessing external systems (databases and LDAP) are stored by ALM after encryption. Enter a **Confidential data passphrase** that ALM uses to encrypt the information.

Make a note of the passphrase for future support calls. You will also need the passphrase if you choose to redeploy ALM and choose to upgrade a copy of the existing Site Administration Database Schema.

Select **Use default value** to use the default confidential data encryption passphrase. By selecting this option however, the encrypted information is more vulnerable to unauthorized access.

Confidential Data Passphrase Considerations

- When upgrading from an ALM 11.00 version of the Site Administration database schema, you must enter the same passphrase as was used for the previous installation. If you do not have a note of the passphrase, there is a workaround to recover it. However, you will have to abort the configuration process and then begin again once complete. For details, see "Recovering a Lost Confidential Data Passphrase" on page 35.
- If you are planning to migrate Performance Center and/or Lab Management enabled projects onto the server on which you are performing the installation, you must use the same Confidential Data Passphrase that was defined on the server on which the projects were created.
- If you are installing ALM on a cluster, you must use the same passphrase for all nodes.
- After completing the server configuration wizard, you cannot change the confidential data encryption passphrase.
- The passphrase is case-sensitive. Also check that there are no empty spaces before or after the passphrase.

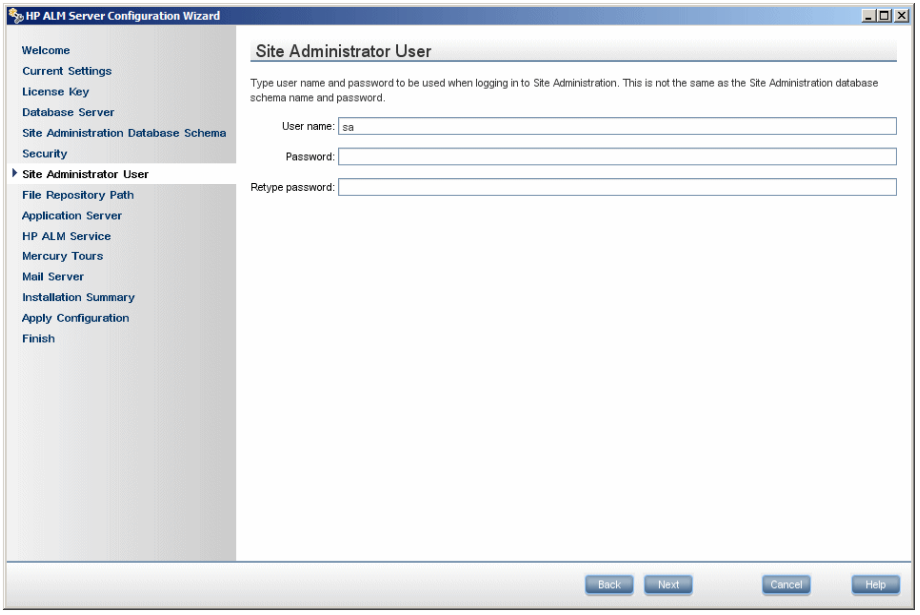
22 Communication between ALM and other HP BTO applications is enabled after authentication by a Single Sign-On (SSO) token. Enter a **Communication security passphrase** that ALM uses to encrypt the SSO token.

Notes:

- The communication security passphrase is stored as the value of the **COMMUNICATION_SECURITY_PASSPHRASE** site configuration parameter. For more information, refer to the *HP Application Lifecycle Management Administrator Guide*.
- **Performance Center:** You must use the same communication security passphrase for the Performance Center server configuration.

Click **Next**.

23 The Site Administrator User page opens.



You use the site administrator name and password that you define here to log in to Site Administration for the first time. After installation, you can change the site administrator or add other site administrators. Type a site administrator **User name** (maximum length 60 characters) and **Password**, and retype the password to confirm.

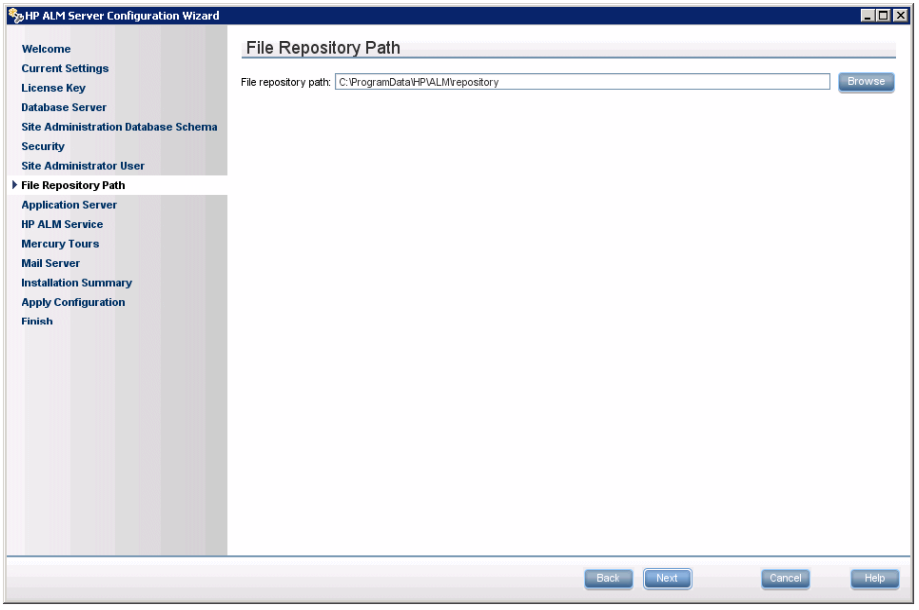
If you are upgrading a copy of the existing Site Administration database schema, by default the same user and credentials are applied to the upgraded schema. To create an additional user, select **Create additional Site Administrator user** (this field appears only when you are upgrading a copy of the existing schema).

Notes:

- The user name cannot include the following characters: \ / : * ? " < > |
- It is important that you remember the site administrator user name and password so you can log in to Site Administration.

Click **Next**.

24 The File Repository Path page opens.



In the **File repository path** box, click the browse button to choose a repository path, or accept the default path. Make sure to enter a unique case-sensitive name for the repository folder.

Notes:

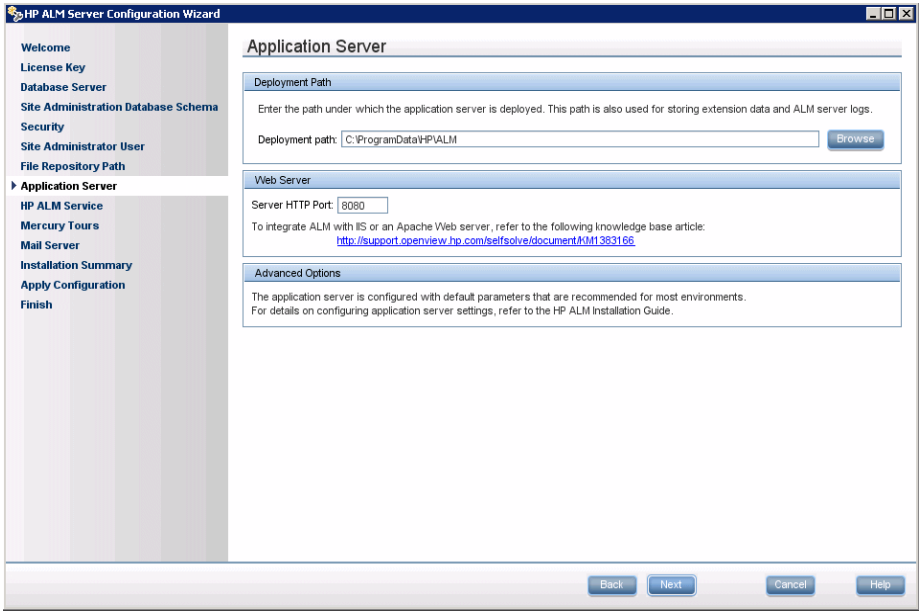
- Make sure you select a path where you have full read and write permissions.
- To work with cluster nodes, make sure that all nodes have access to the file repository path and that the path is UNC. All nodes in the cluster must have the same repository path.

Using the BASE_REPOSITORY_PATH site configuration parameter, you can create a location for a repository path where new projects will be located. Performing this action, therefore, means there will be two repository paths - the previous path containing older projects, and a second path containing projects created subsequently. For details, refer to the *HP Application Lifecycle Management Administrator Guide*.

For more information on the Repository path, see "ALM Repository Path: Windows" on page 57.

Click **Next**.

25 The Application Server page opens.



In the **Deployment path** box, specify the location in which you want to deploy ALM application files. Click the browse button to choose a location, or accept the default location. It is recommended that you keep the default.

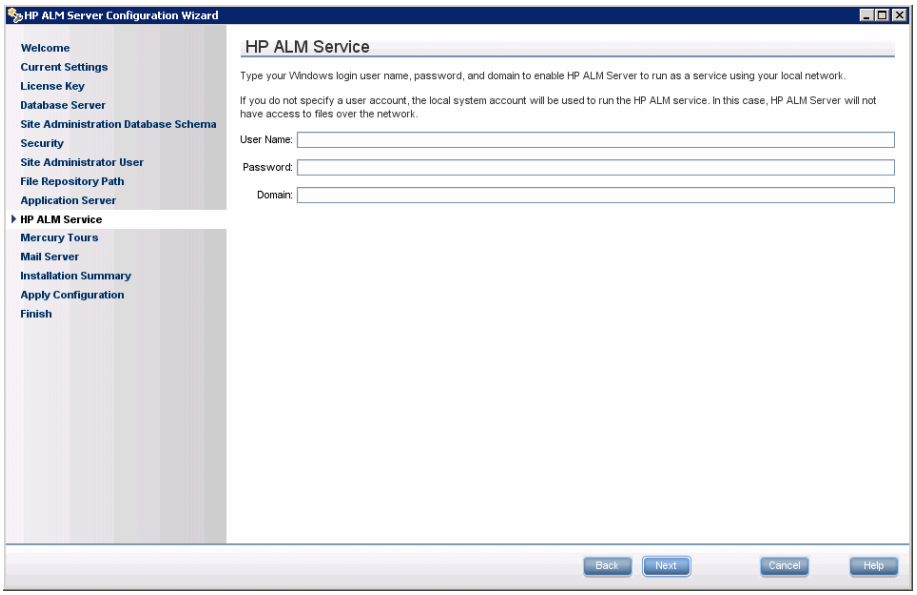
26 In the **Web Server** box, you can change or keep the default HTTP port number. The default port is 8080.

Notes:

- To integrate ALM with IIS or an Apache Web server, see the HP Software Self-solve knowledge article KM1383166: (http://h20230.www2.hp.com/selfsolve/document/KM1383166). (Requires HP Passport sign-in credentials)
- If an error message is displayed that the default port is unavailable, the port may be in use by another application running on the server machine. Either locate the application and stop it, or enter a different port number. To enter a different port number, you must first change the port number on the application server. For details, see "Changing the Application Server Port Number" on page 165. Then proceed with the configuration as normal.
- You can update the heap memory value after you have installed ALM. For details, see Chapter 16, "Managing the ALM Application Server."

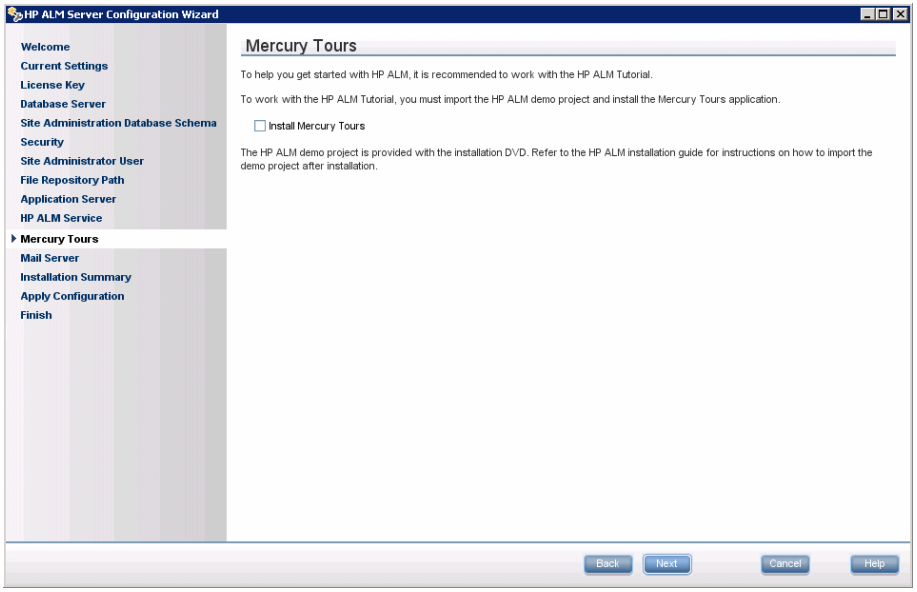
Click **Next**.

27 The HP ALM Service page opens.



Type the **User Name**, **Password**, and **Domain** to be used to run the application server as a service. This enables the service to access your local network.

28 The Mercury Tours page opens.

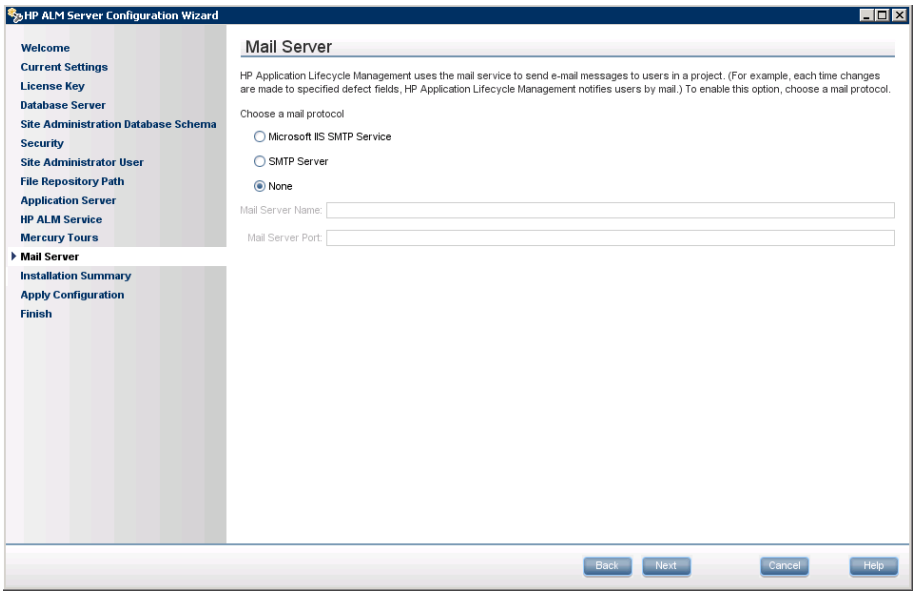


To help you get started with ALM, install the sample Web-based travel reservation application, Mercury Tours. This is a prerequisite for working with the *HP Application Lifecycle Management Tutorial*.

Note: It is recommended that you import the ALM Demo Project available with the ALM 11.50 installation DVD. Importing this project enables you to run all lessons in the *HP Application Lifecycle Management Tutorial*. In Site Administration, import the **ALM_Demo.qcp** file. For more information on importing projects, refer to the *HP Application Lifecycle Management Administrator Guide*.

Click **Next**.

29 The Mail Server page opens.



To enable ALM to send emails to users in an ALM project, select a mail protocol. For **SMTP Server**, type the server name.

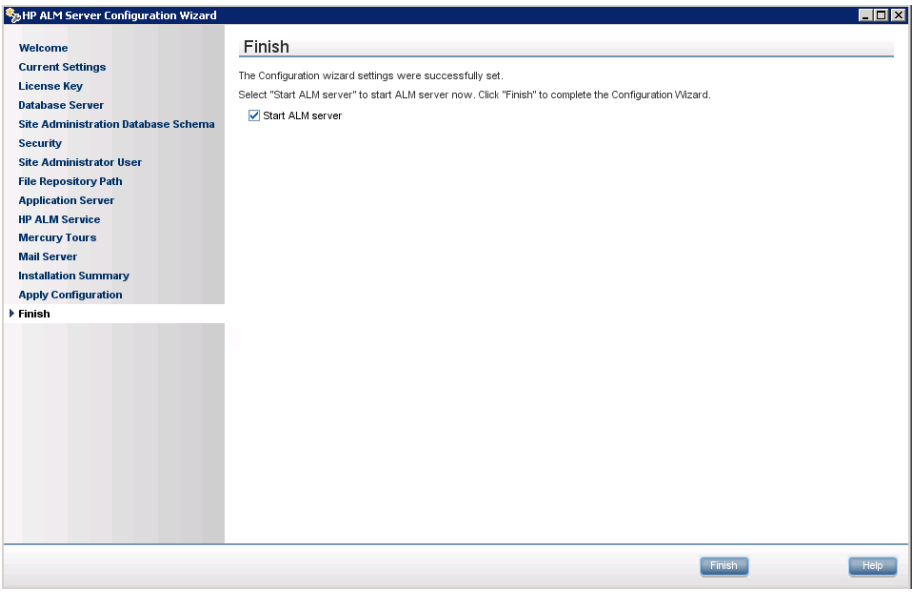
If you selected **Microsoft IIS SMTP Service**, you must configure the Microsoft IIS SMTP service. For more information, see "Configuring the IIS Mail Service" on page 113.

Click **Next**.

30 The Installation Summary page opens. To change any settings, click **Back**.

To accept the settings and start the configuration process, click **Next**.

31 The Finish page opens.



Click **Finish**.

If the installation process fails, check the installation logs for details. For more information see "Checking the Installation and Configuration Log Files" on page 186.

If you selected to upgrade a copy of the existing Site Administration database schema, it is possible that an upgrade related issue caused the configuration to fail. Check the following files located in the **<file repository path>/sa/Admin/maintenancedata/out** directory for more information:

- **upgrade.txt**
- **verifyreport.html**

If it is clear from these files that the failure was due to changes made to the existing Site Administration database schema, you need to create an exceptions file that excludes these changes from the upgrade process. You then need to run the configuration wizard again. For more information, see "Changes to the Existing Schema and Upgrade Failure" on page 36.

32 If you are prompted to restart your computer, you can choose to restart your computer at a later time, but you must restart your computer before you use ALM. You must also restart your computer before you install any ALM related files, such as integration add-ins.

33 If you are using an Oracle RAC database, verify that the **ORACLE_RAC_SUPPORT** site configuration parameter is set to "Y". For more information, refer to the *HP Application Lifecycle Management Administrator Guide*.

Notes:

- To work with ALM, you may need to disable conflicting applications that are running on the ALM machine. For a list of these applications, see HP Software Self-solve knowledge base article KM176429 (http://h20230.www2.hp.com/selfsolve/document/KM176429). (Requires HP Passport sign-in credentials).
- The Configuration Wizard creates the **qcConfigFile.properties** file in the following directory: **c:\ProgramData\HP\ALM\conf**. The file should not be moved from this location.
- The Configuration Wizard creates the **repid.txt** file in the **<ALM Repository path>\qc** folder. The file should not be moved from this location.

---

34 The installation of ALM is now complete. Proceed to Chapter 13, "Getting Started."

Installing ALM in Silent Mode

You can install ALM using a silent installation. A silent installation runs the entire setup process in the background without requiring you to navigate through the setup screens and input your selections. Instead, all configuration parameters are assigned values that you define in a configuration file. To run silent installations for different configurations, you can create multiple configuration files.

When running an installation in silent mode, no messages are displayed. Instead, you can view installation information in the log file, including information on whether the installation was successful. The installation log file can be found under the **%tmp%** directory.

To run a silent installation:

1. Uninstall any previous installations of Quality Center or ALM from the server machine.
2. Create the **qcConfigFile.properties** file.

   The **qcConfigFile.properties** file defines the configuration values that are used during the installation.

   It is recommended that you use an existing **qcConfigFile.properties** file from a prior installation of ALM.

   If there is no existing file, you can create one manually. However, this can be a complicated process that is open to errors. We suggest that you create one by running a normal installation. During the installation process, the file is automatically created. The configuration values you define during the installation process are recorded in the file. Even if you subsequently uninstall ALM, you can keep and edit the file as needed for future installations.

   The file is automatically saved in the following path:
   c:\ProgramData\HP\ALM\conf

3 From the command line, run the run_silent.bat file on the installation DVD. The file is located in the appropriate **.zip** folder for your operating system (32-bit or 64-bit).

In the command line, add the **-c <configuration file full path>** parameter to specify the path of the configuration file, for example, **c:\Users\qcadmin\Desktop\qcConfigFile.properties**.

Optionally, add the **-i** parameter to specify an alternative installation path.

Configuring the IIS Mail Service

If you selected **Microsoft IIS SMTP Service** in the Mail Server Properties dialog box, you must configure the Microsoft IIS SMTP service.

To configure the IIS mail service:

1 Open the Internet Information Services (IIS) Manager window.

2 In the Tree pane, right-click **Default SMTP Virtual Server** and select **Properties**. The Default SMTP Virtual Server Properties dialog box opens.

3 In the Access tab, click the **Connection** button. The Connection dialog box opens. Select **All except the list below** and click **OK**.

4 Click the **Relay** button. The Relay Restrictions dialog box opens. Select **All except the list below** and click **OK**.

5 Click **OK** to close the Default SMTP Virtual Server Properties dialog box.

12

Installing on Linux/Oracle Solaris Systems

This chapter describes how to install HP Application Lifecycle Management (ALM) on a Linux or an Oracle Solaris operating system.

Note: For information on installing ALM on Windows systems, see "Installing on Microsoft Windows Systems" on page 89.

This chapter includes:

About Installing ALM

You can install ALM on a single node or as a cluster. When you install ALM on cluster nodes, all nodes must be identical. For example, all nodes must use the same operating system, ALM repository location, and Site Administration database. In addition, you must install the same version of ALM on all nodes.

If you are working in a clustered environment, you must mount the file system repository before you start the ALM installation process. The mount should not use any cache mechanisms. For details, contact your network administrator.

Note: When you are installing ALM on a secondary node of a cluster you are not required to set up the database, because it was set up when you installed the primary node. Some of the dialog boxes described in this installation procedure are needed only for the primary node and are not displayed if you are installing a secondary node.

Installing ALM

This section describes how to install ALM 11.50.

Before installing ALM, consider the following:

- Verify that you meet the various installation prerequisites. For prerequisite information, see the relevant chapter in Part 3, "Pre-Installation Prerequisites."
- If you worked with a previous version of ALM/Quality Center, you must upgrade your Site Administration database schema and projects. For more information, see Chapter 3, "Upgrade Overview."
- If you encounter problems during the ALM installation process, see Appendix A, "Troubleshooting the ALM Installation," for troubleshooting suggestions.
- By default, the installation and configuration processes run in console mode. Navigating from one wizard step to the next requires familiarity with the various console mode command types. For explanations of the various command types and the methods for entering configuration settings, see "Working in Console Mode" on page 140.

To install ALM:

1. If you have been working with a previous version of Quality Center or ALM, back up your existing projects before installing the new version. For more information, refer to the *HP Application Lifecycle Management Administrator Guide*.

2 Log in to the ALM host machine with the appropriate permissions. For a list of required permissions, see "Required Permissions: Linux/Solaris" on page 60.

3 If Quality Center or ALM is installed on the machine, uninstall it. For more information, see Chapter 18, "Uninstalling ALM."

4 The installation process can be run in console mode only. After the installation is complete, the ALM Server Configuration wizard enables you to configure the installation. By default, the wizard runs in console mode.

To run the wizard using a graphical user interface, make sure that the **DISPLAY** environment variable is configured accordingly on the ALM host machine and that the machine from which you are installing is running an X-server (for example, Exceed).

If the variable is already configured and you want to run the configuration wizard in console mode, make sure the variable is changed accordingly.

For help with the variable settings, contact your technical support team.

5 Create an installation directory on the server, for example: **/usr/Install/ALM.**

6 Insert the ALM 11.50 Software installation DVD into the DVD drive. Under the mount folder, navigate to the appropriate installation subfolder for your system. For example:

- **Linux:** /mnt/dvd/ALM-Linux
- **Solaris:** /mnt/dvd/ALM-Solaris

7 Copy the entire contents of the subfolder to the installation directory you created on the server.

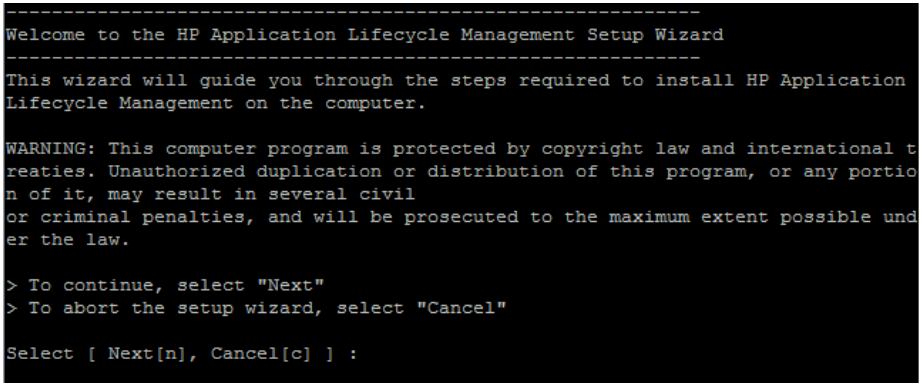
8 Run the following **chmod** command to allow permissions for the installation files: **chmod -R 777 <installation directory>.**

9 From the installation directory on the server, navigate to, and run the **installer.sh** file.

Note: If anti-virus software is installed on the server machine, it checks every file as it is being copied. Therefore, deployment may take longer than expected.

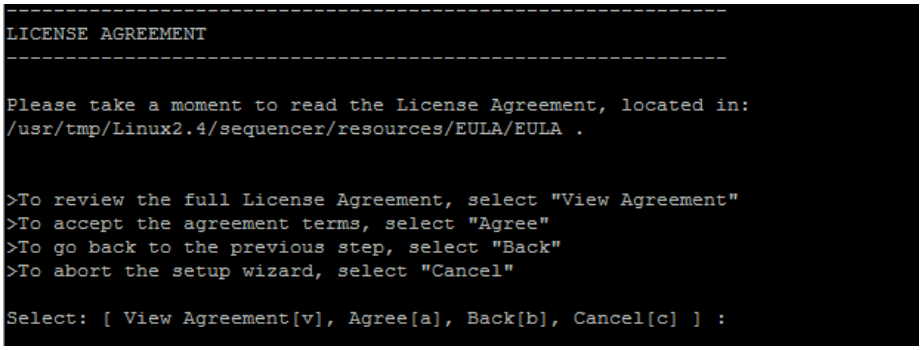
---

10 The HP Application Lifecycle Management Setup Wizard page opens, displaying the Welcome page.



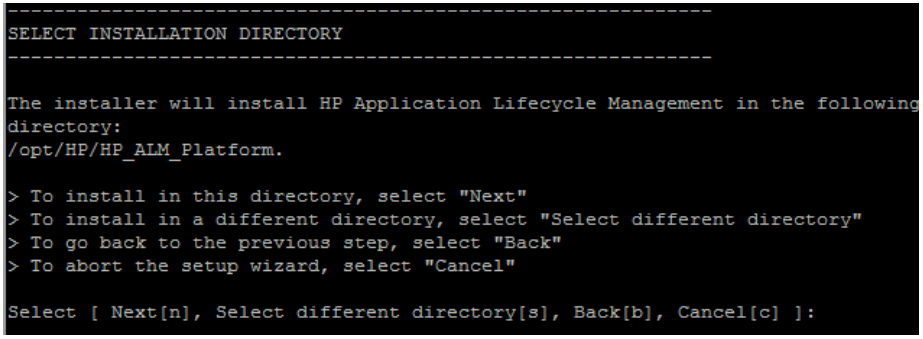
Select **Next** to continue.

11 The License Agreement page is displayed.



Read the agreement. To accept the terms of the agreement, select **Agree**.

12 The Select Installation Directory page is displayed, displaying the default location for the installation files.

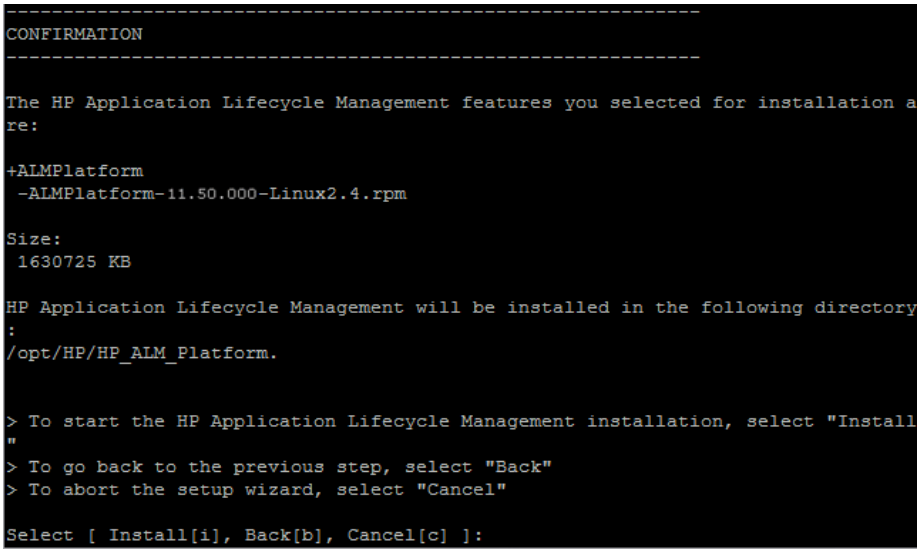


To keep the default path, select **Next**, or select **Select a different directory** to define another directory.

Note: If you change the default, a soft link (symbolic link) with the default directory path is created which points to the directory you define.

---

13 The Confirmation page is displayed.



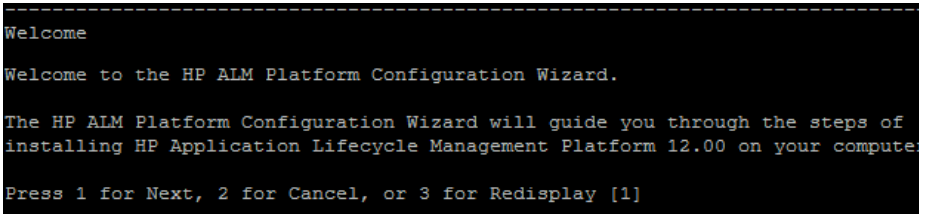
If you do not wish to change any of the settings, select **Install** to proceed with the installation. Alternatively, select **Back** to change a previous setting, or **Cancel** to abort the installation.

If you select **Install**, ALM files are installed on the server machine.

14 When the installation process completes, the Finish page is displayed.

To complete the Setup Wizard, select **Finish**.

15 The HP ALM Server Configuration wizard starts, displaying the Welcome page.

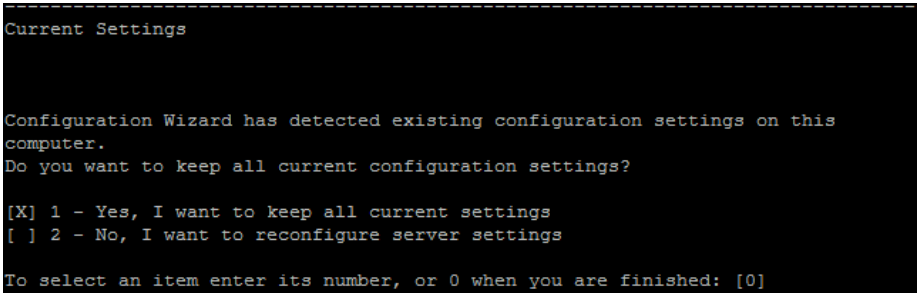


Select **Next** to proceed to the next page.

Note: If you are performing a **sudo** installation, close the wizard and run the **run_after_install.sh** file as a non-root user. For more information on running a sudo installation, see the following HP Software Self-solve knowledge base article (Requires HP Passport sign-in credentials): http://support.openview.hp.com/selfsolve/document/KM916123

---

16 If the wizard detects settings from a previous ALM installation, the Current Settings page is displayed.

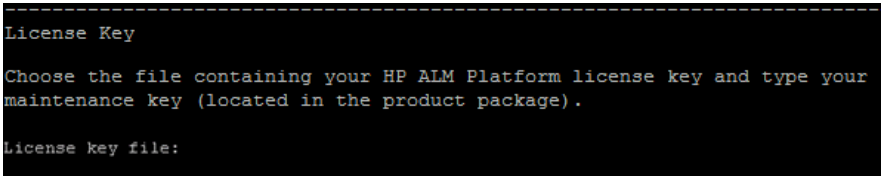


By default, current settings are used. The current settings appear as defaults in subsequent wizard screens. You can then make changes to any of the previous settings.

Choose to keep or clear the current settings, then proceed to the next page.

17 The License Key page is displayed.

a Enter the ALM License file path.

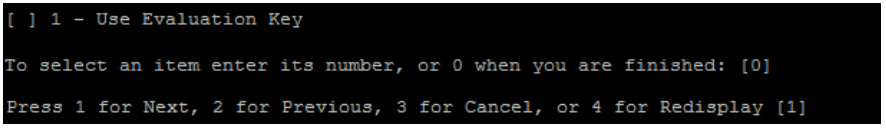


If you have a License key file, enter the ALM License file path. If you do not have a key file, you can leave this field empty and proceed with an evaluation key.

b Enter the Maintenance key.

If you have a Maintenance key, enter it now. If you do not have a key file, you can leave this field empty and proceed.

c Use an evaluation key.



If you do not have a License key, you can use an evaluation key for a 30-day trial version of ALM. A list of available ALM editions is displayed.

From the editions list, choose the edition you want to use.

18 The Database Server page is displayed.

a **Select the database type**.

```
--------------------------------------------------------------------------------
Database Server

Database Type

[X] 1 - MS-SQL (SQL Auth.)
[ ] 2 - Oracle

To select an item enter its number, or 0 when you are finished: [0]
```

For more information on database requirements, see Chapter 7, "Prerequisites: Oracle Database Servers" or Chapter 8, "Prerequisites: Microsoft SQL Database Servers".

b **Select a database connection method**.

```
Database Connection


[X] 1 - Database Parameters
[ ] 2 - Connection String

To select an item enter its number, or 0 when you are finished: [0]
```

Select one of the following:

- **Database Parameters**. Enables you to enter database server information.
- **Connection String**. Enables you to type a formulated database server connection string. If you select this option, proceed to step d on page 124.

  Choose **Connection String** to use an Oracle RAC database, and enter a string, specifying the location of the **tnsnames.ora** file, and the TNS server that ALM should refer to. Use the following example:

  ```
  jdbc:mercury:oracle:TNSNamesFile=<tnsnames.ora location>;
  TNSServerName=OrgRAC
  ```

  For more information on prerequisites for Oracle RAC support, see "Oracle RAC Support" on page 70.

c Enter **Database Parameters**:

```
DB host name: [m35.com] 0

DB port number: [1433] 0
```

If you select the Database Parameters connection method, enter the following information:

- **DB host name.** Type the database server name.
- **DB port number.** Type the database server port number, or accept the default port number. To accept the default, enter **1**, then press **Enter**.
- **Oracle SID.** Type the Oracle system identifier. This is an Oracle parameter that identifies the specific Oracle instance on the host machine on which the Oracle server is installed.

d Enter Database Administrator Login information.

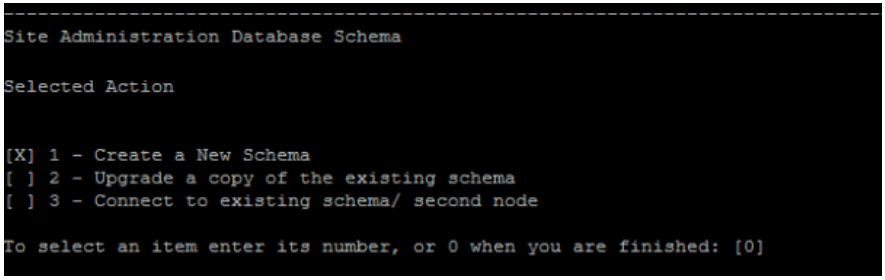
```
Database Administrator Login


DB admin user name: [sa] sa

DB admin password: [*********]

Press 1 for Next, 2 for Previous, 3 for Cancel, or 4 for Redisplay [1] 1
```

Specify the following:

- **DB admin user name.** The name of the user with the administrative permissions required to connect ALM to the database server.
- **DB admin password.** The database administrator password.

19 The Site Administration Database Schema page opens.

a Select a Site Administration database schema option.



Select one of the following:

- **Create a New Schema.** Creates a new Site Administration database schema. This is the default option.
- **Upgrade a copy of the existing schema.** Creates a copy of the existing Site Administration database schema, and upgrades the copy. Choose this option to work in ALM 11.50 and previous versions of ALM/Quality Center simultaneously. For more information, see "Upgrading Existing Schema" on page 32.

  If you select this option, you are prompted to add an exceptions file to the upgrade process. If you have defined an exceptions, enter the location of where it was saved prior to the installation process. For more information about exceptions files, see "Changes to the Existing Schema and Upgrade Failure" on page 36.

➤ **Connect to existing schema / second node.** This option can be used in two scenarios:

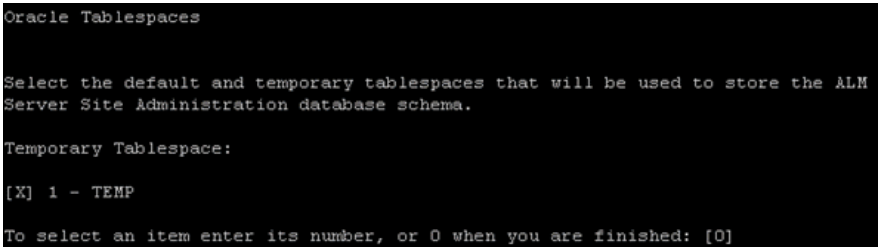
If you are reinstalling ALM and would like to reconnect to the same Site Administration database schema.

If you have an existing node and you want to install ALM on another node to create a cluster. For more information on cluster configuration, see "Clustering Configuration: Linux/Solaris" on page 62.

Note: This option enables you to connect to an ALM 11.50 Site Administration database schema only. To connect to an earlier version of Site Administration, you must first upgrade the schema. For more information, see "Upgrading Existing Schema" on page 32.

---

b Enter Oracle Tablespace information.



If you are using an Oracle database, enter the following information. If you are using a Microsoft SQL database, proceed to step c on page 127:

Note: If you are installing ALM on a secondary node or if the Site Administration database already exists, the new Site Administration database schema is created in the same tablespace as the existing schema. Proceed to step 22.

- **Temporary Tablespace.** The Temporary Tablespace is the location on the database where temporary tables are created in order to facilitate internal database functionality, such as large sorting tasks. It is recommended that you accept the default location.
- **Default Tablespace.** The Default Tablespace is the location on the database where database objects will be created, unless specified otherwise.

```
Default Tablespace:

[X] 1 - QC_DATA 5107MB
[ ] 2 - QCQA 367MB
[ ] 3 - TDQC 86MB
[ ] 4 - OTAL 99MB
[ ] 5 - QUALCTR_DATA_2 936MB
[ ] 6 - TDDATA 430MB
[ ] 7 - TD50_DATA 1689MB
[ ] 8 - BSTATS_DATA 6149MB
[ ] 9 - QC_PROJECTS 12726MB
[ ] 10 - TD 1678MB
[ ] 11 - USERS 137MB
[ ] 12 - NETAPP 22918MB
[ ] 13 - USER_DATA 468MB
[ ] 14 - QUALITY_CTR_DATA 1008MB
[ ] 15 - QC_92 4568MB
[ ] 16 - QCPD 6336MB
[ ] 17 - QCTB01 99MB
[ ] 18 - TESTDIR_DATA_01 17381MB
[ ] 19 - QC_DATA_03 4501MB

To select an item enter its number, or 0 when you are finished: [0]
```

Select a location from the list.

c Enter Site Administration database schema details.

```
SA Schema Details


Schema name: [ilana_linux_vmqcrnd67] new_ALM_sa_schema

Schema password: [******]
Press 1 for default value, or 2 for no value: [1]

Press 1 for Next, 2 for Previous, 3 for Cancel, or 4 for Redisplay [1]
```

Enter the following information:

➤ **Schema name.** Enter a name for the Site Administration database schema, or accept the default.

If you selected **Upgrade a copy of the existing schema**, the **New Schema name** option appears. Type a name for the upgraded copy of the Site Administration database schema.

Note: When upgrading an existing Site Administration database schema to work in ALM 11.50, you must use the same name that you used before the upgrade.

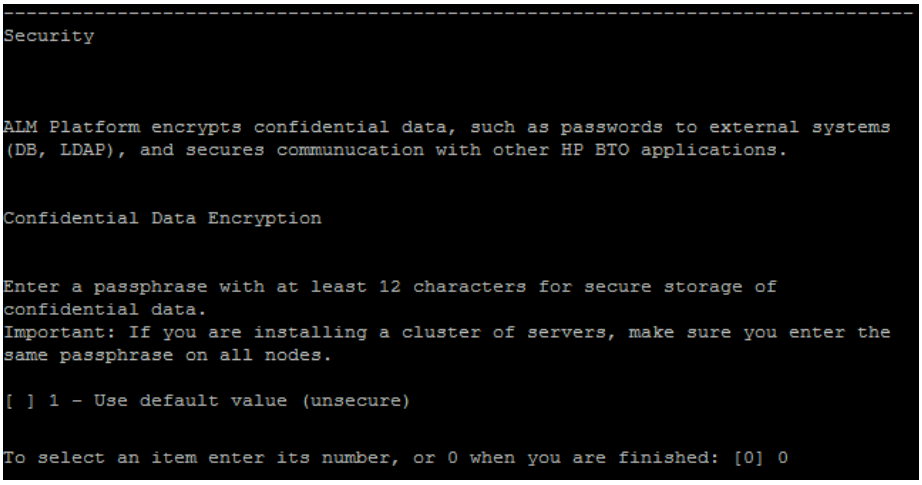
➤ **Schema password.** Enter the following information, depending on your database type:

Oracle: A default password is created which you can accept or change.

Microsoft SQL Server (SQL Auth.): ALM uses the td user to create the Site Administration database schema. For more details on the td user, see "User Permissions for Connecting ALM to a Microsoft SQL Server" on page 75.

Type a password for the td user that complies with your organization's password policy, or keep the default tdtdtd password.

20 The Security page is displayed.



Passwords for accessing external systems (databases and LDAP) are stored by ALM after encryption. Enter a **Confidential data passphrase** that ALM uses to encrypt the information or choose to use the default value. If you use the default value however, the encrypted information is more vulnerable to unauthorized access.

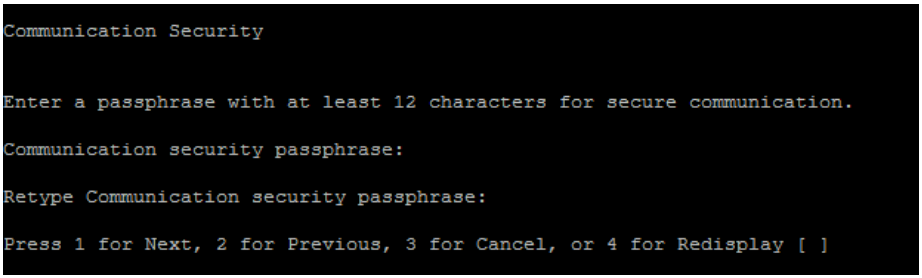
Make a note of the passphrase for future support calls. You will also need the passphrase if you choose to redeploy ALM and choose to upgrade a copy of the existing Site Administration Database Schema.

Confidential Data Passphrase Considerations

- When upgrading from an ALM 11.00 version of the Site Administration database schema, you must enter the same passphrase as was used for the previous installation. If you do not know the passphrase, there is a workaround to recover it. However, you will have to abort the configuration process and then begin again once the workaround is complete. For details, see "Recovering a Lost Confidential Data Passphrase" on page 35.
- If you are planning to migrate Performance Center and/or Lab Management enabled projects onto the server on which you are performing the installation, you must use the same Confidential Data Passphrase that was defined on the server on which the projects were created.

- If you are installing ALM on a cluster, you must use the same passphrase for all nodes.
- After completing the server configuration wizard, you cannot change the confidential data encryption passphrase.
- The passphrase is case-sensitive. Check that there are no empty spaces before or after the passphrase.

21 Enter a Communication Security Passphrase:



Communication between ALM and other HP BTO applications is enabled after authentication by a Single Sign-On (SSO) token. Enter a **Communication security passphrase** that ALM uses to encrypt the SSO token.

Notes:

- The communication security passphrase is stored as the value of the **COMMUNICATION_SECURITY_PASSPHRASE** site configuration parameter. For more information, refer to the *HP Application Lifecycle Management Administrator Guide*.
- **Performance Center:** You must use the same communication security passphrase for the Performance Center server configuration.

---

22 The Site Administrator User page is displayed.

You use the site administrator name and password that you define here to log in to Site Administration for the first time. After installation, you can change the site administrator or add other site administrators. Type a site administrator **User name** (maximum length 60 characters) and **Password**, and retype the password to confirm.

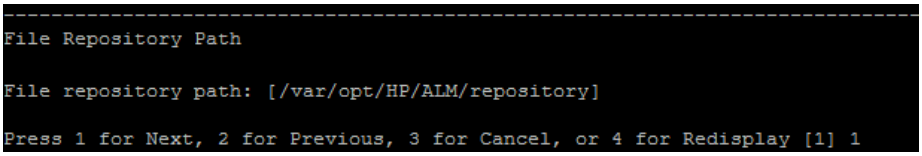
If you are upgrading a copy of the existing Site Administration database schema, by default the same user and credentials are applied to the upgraded Site Administration database schema. The **Create additional Site Administrator user** option is displayed, enabling you ignore this default and create an additional user.

Notes:

- The user name cannot include the following characters: \ / : * ? " < > |
- It is important that you remember the site administrator user name and password as otherwise you cannot log in to Site Administration.

---

23 The File Repository Path page is displayed.



Accept the default path or enter a new path. If you choose to ignore the default, make sure to enter a unique case-sensitive path.

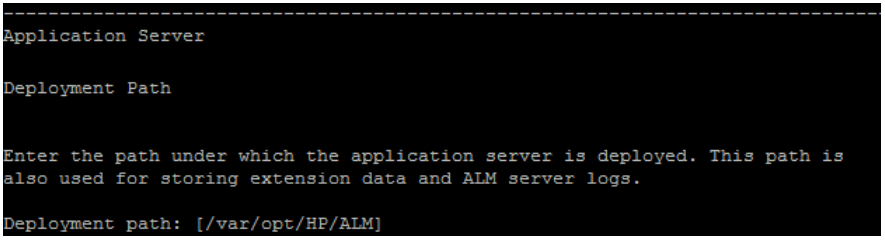
Notes:

- Make sure you select a path where you have full read and write permissions.
- To work with cluster nodes, make sure that all nodes have access to the file repository path and that the path is UNC. All nodes in the cluster must have the same repository path.

Using the BASE_REPOSITORY_PATH site configuration parameter, you can create a location for a repository path where new projects will be located. Performing this action, results in the creation of two repository paths - the previous path containing older projects, and a second path containing projects created subsequently. For details, refer to the *HP Application Lifecycle Management Administrator Guide*.

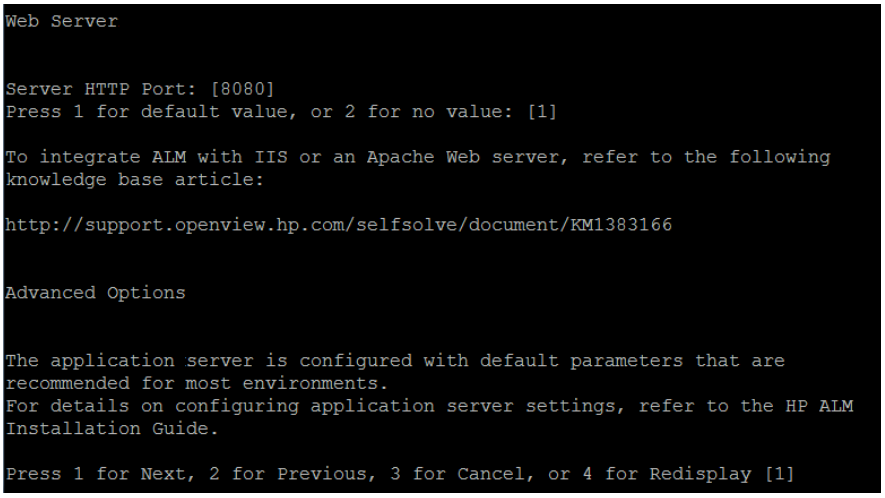
24 The Application Server page opens.

a Enter Deployment Path information.



Enter a **Deployment path**, where you specify the location in which you want to deploy ALM application files. It is recommended that you keep the default.

b Enter Web server information.

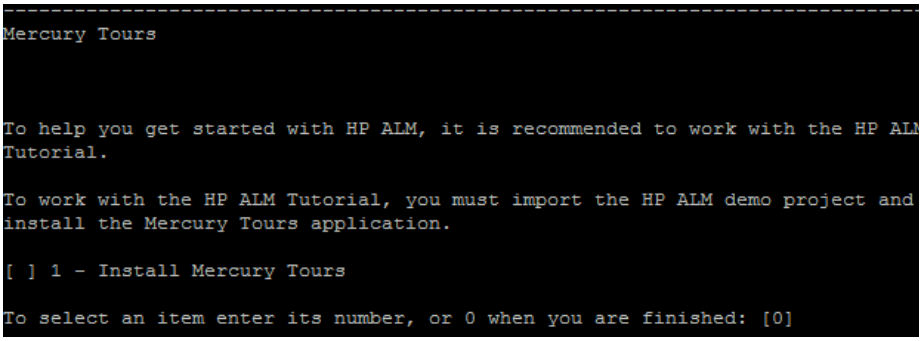


Change or keep the default HTTP port number. The default port is 8080.

Notes:

- To integrate ALM with IIS or an Apache Web server, see the HP Software Self-solve knowledge article KM1383166: (http://h20230.www2.hp.com/selfsolve/document/KM1383166). (Requires HP Passport sign-in credentials)
- If an error message is displayed that the default port is unavailable, it may be the port is in use by another application running on the server machine. Either locate the application and stop it, or enter a different port number. To enter a different port number, you must first change the port number on the application server. For details, see "Changing the Application Server Port Number" on page 165. Then proceed with the configuration as normal.
- You can update the heap memory value after you have installed ALM. For details, see Chapter 16, "Managing the ALM Application Server."

25 The Mercury Tours page is displayed.

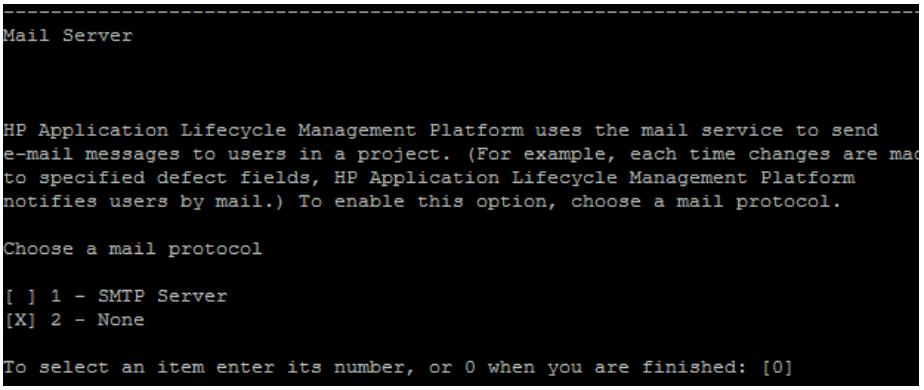


To help you get started with ALM, install the sample Web-based travel reservation application, Mercury Tours. This is a prerequisite for working with the *HP Application Lifecycle Management Tutorial*.

Note: It is recommended that you import the ALM Demo Project available with the ALM 11.50 installation DVD. Importing this project enables you to run all lessons in the *HP Application Lifecycle Management Tutorial*. In Site Administration, import the **ALM_Demo.qcp** file. For more information on importing projects, refer to the *HP Application Lifecycle Management Administrator Guide*.

---

26 The Mail Server page is displayed.

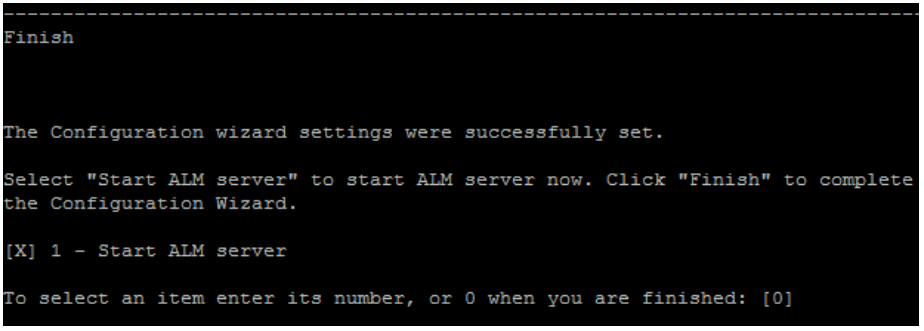


To enable ALM to send emails to users in an ALM project, choose **SMTP Server**. Then when prompted, enter the server name.

27 The Installation Summary page is displayed. To change any settings, select **Back**.

To accept the settings and start the configuration process, select **Next**.

28 The Finish page is displayed.



Enter **1**, then press **Enter** to start ALM.

If the installation process fails, check the installation logs for details. For more information see "Checking the Installation and Configuration Log Files" on page 186.

If you selected to upgrade a copy of the existing Site Administration database schema, it is possible that an upgrade related issue caused the configuration to fail. Check the following files located in the **<file repository path>/sa/Admin/maintenancedata/out** directory for more information:

- upgrade.txt
- verifyreport.html

If it is clear from these files that the failure was due to changes made to the existing Site Administration database schema, you will need to create an exceptions file that excludes these changes from the upgrade process. You will then need to run the configuration wizard again. For more information, see "Changes to the Existing Schema and Upgrade Failure" on page 36.

29 If you are prompted to restart your computer you can choose to restart your computer at a later time but you must restart your computer before you use ALM. You must also restart your computer before you install any ALM related files, such as integration add-ins.

30 If you are using an Oracle RAC database, verify that the **ORACLE_RAC_SUPPORT** site configuration parameter is set to "Y". For more information, refer to the *HP Application Lifecycle Management Administrator Guide*.

Notes:

- To work with ALM, you may need to disable conflicting applications that are running on the ALM machine. For a list of these applications, see HP Software Self-solve knowledge base article KM176429 (http://h20230.www2.hp.com/selfsolve/document/KM176429). (Requires HP Passport sign-in credentials)
- The Configuration Wizard creates the **qcConfigFile.properties** file in the following directory: **/var/opt/HP/ALM/conf**. The file should not be moved from this location.
- The Configuration Wizard creates the **repid.txt** file in the **<ALM Repository path>\qc** folder. The file should not be moved from this location.

---

31 The installation of ALM is now complete. Proceed to Chapter 13, "Getting Started."

Installing ALM in Silent Mode on Linux/Solaris Systems

You can install ALM using a silent installation. A silent installation runs the entire setup process in the background without requiring you to navigate through the setup screens and input your selections. Instead, all configuration parameters are assigned values that you define beforehand in a configuration file. To run silent installations for different configurations, you can create multiple configuration files.

Note: When running an installation in silent mode, no messages are displayed. Instead, you can view installation information in the log file, including information on whether the installation was successful. The installation log file can be found under the home directory (~) of the user installing ALM.

To run a silent installation:

1. Uninstall any previous installations of Quality Center or ALM from the server machine.
2. Create the **qcConfigFile.properties** file.

   The **qcConfigFile.properties** file defines the configuration values that are used during the installation.

   It is recommended that you use an existing **qcConfigFile.properties** file from a prior installation of ALM.

   If there is no existing file, you can create one manually. However, this can be a complicated process that is open to errors. We suggest that you create one by running a normal installation. During the installation process, the file is automatically created. The configuration values you define during the installation process are recorded in the file. Even if you subsequently uninstall ALM, you can keep and edit the file as needed for future installations.

   The file is automatically saved in the following path:
   /var/opt/HP/ALM/conf

3. Create an installation directory on the server, for example: **/usr/Install/ALM**
4. Insert the ALM 11.50 Software installation DVD into the DVD drive and under the mount folder, navigate to the appropriate installation subfolder for your system. For example:
   - **Linux:** /mnt/dvd/ALM-Linux
   - **Solaris:** /mnt/dvd/ALM-Solaris
5. Copy the entire contents of the subfolder to the installation directory you created on the server.
6. Run the following **chmod** command to allow permissions for the installation files: **chmod -R 777 <installation directory>**
7. From the installation directory on the server, navigate to, and run the **silent.sh** file.

   In the command line, add the **-c <configuration file full path>** parameter to specify the path of the configuration file.

Working in Console Mode

By default, the ALM Server Configuration Wizard runs in console mode. Navigating from one wizard step to the next requires familiarity with the various console mode command types. This section explains the various command types and the methods for entering configuration settings.

List Options

Some wizard screens present a set of options in the form of a list, where you can select only one option. For example:

```
-------------------------------------------------------------------------------
Database Server

Database Type

[X] 1 - MS-SQL (SQL Auth.)
[ ] 2 - Oracle

To select an item enter its number, or 0 when you are finished: [0]
```

To make your selection, type the numeric value of the option you wish to select, then press Enter.

The page appears again, this time with the checkmark placed by the option you selected. In this example, if you enter **2**, then press Enter, the following appears:

```
--------------------------------------------------------------------------------
Database Server

Database Type

[ ] 1 - MS-SQL (SQL Auth.)
[X] 2 - Oracle

To select an item enter its number, or 0 when you are finished: [0]
```

To confirm your selection, type **0** then press Enter.

For information about how to move to the next step, see "Moving to the Next Step" on page 142.

Text Options

Some wizard screens require you to enter text. For example:

```
DB port number:
```

If the wizard detects a pre-existing value for the required field, or if there is a default value, that value appears in brackets. For example:

```
DB port number: [1521]
```

To ignore the existing value:

Type a new value then press Enter. The new value overrides the existing value.

For information about how to move to the next step, see "Moving to the Next Step" below.

To keep the current value, or leave the field empty:

Press Enter. The following option appears:

```
Press 1 for default value, or 2 for no value: [1]
```

To proceed to the next step with the existing value, type **1** then press Enter.

To proceed to the next step and leave the field empty, type **2** then press Enter.

For information about how to move to the next step, see "Moving to the Next Step" below.

Moving to the Next Step

After entering information, either from a list or by entering text, you are prompted with the following options to proceed:

```
Press 1 for Next, 2 for Previous, 3 for Cancel, or 4 for Redisplay [1]
```

Type a number and press Enter.

- **Next.** ALM validates the settings you have entered. If the validation is successful, the next step is displayed. If the validation fails, an error message is displayed.
- **Previous.** Displays the beginning of the previous configuration step. Values that you have already entered for the previous step appear as existing values.
- **Cancel.** Cancels the configuration.
- **Redisplay.** Displays the beginning of the current configuration step. Values that you have already entered for the step appear as existing values.

Part 5

Post-Installation

13

Getting Started

This chapter introduces HP Application Lifecycle Management (ALM) options and resources. It also explains how to start Application Lifecycle Management.

This chapter includes:

Browsing the ALM Program Folder

In Windows, after the ALM setup process is complete, the following items are added to your ALM program folder (**Start** > **Programs** > **HP ALM Server**):

Option (A-Z)	Description
ALM Server	Opens ALM. For more information, refer to the *HP Application Lifecycle Management User Guide*.
Mercury Tours	Opens a sample flight reservation Web application. This Web application is used as a basis for the *HP Application Lifecycle Management Tutorial*. For more information, refer to the *HP Application Lifecycle Management Tutorial*. **Note:** This application is only available if you selected it during the ALM installation.

Option (A-Z)	Description
Online Documentation	Opens the Documentation Library, providing access to ALM guides and references that are available online, in PDF format, or both.
Readme	Opens the *HP Application Lifecycle Management Readme*, which provides the latest news and information about ALM.
Server Configuration Wizard	Runs the HP ALM Server Configuration Wizard, enabling you to reconfigure ALM. **Caution:** Use this option only if you have not yet started working in ALM.
Server Deployment Wizard	Redeploys ALM. Run after making changes to the Site Administration repository or application folders. For more information, see Chapter 17, "Customizing System Files."
Site Administration	Opens the Site Administration application. For more information, refer to the *HP Application Lifecycle Management Administrator Guide*.

Starting and Stopping ALM Services

This section describes how to start or stop ALM services.

To start or stop ALM services from Windows:

In the system tray, right-click the ALM icon and choose **Start Application Lifecycle Management** or **Stop Application Lifecycle Management**.

Starting Application Lifecycle Management on a Client

You launch HP Application Lifecycle Management (ALM) on your workstation from your Web browser.

You can work with multiple versions of ALM side-by-side on a workstation. This includes multiple ALM 11.00/11.50 clients connecting to different ALM servers, and a single Quality Center 10.00 or 9.2 client.

To enable you to log in to Application Lifecycle Management, you must first create a project in Site Administration. For more information, refer to the *HP Application Lifecycle Management Administrator Guide*.

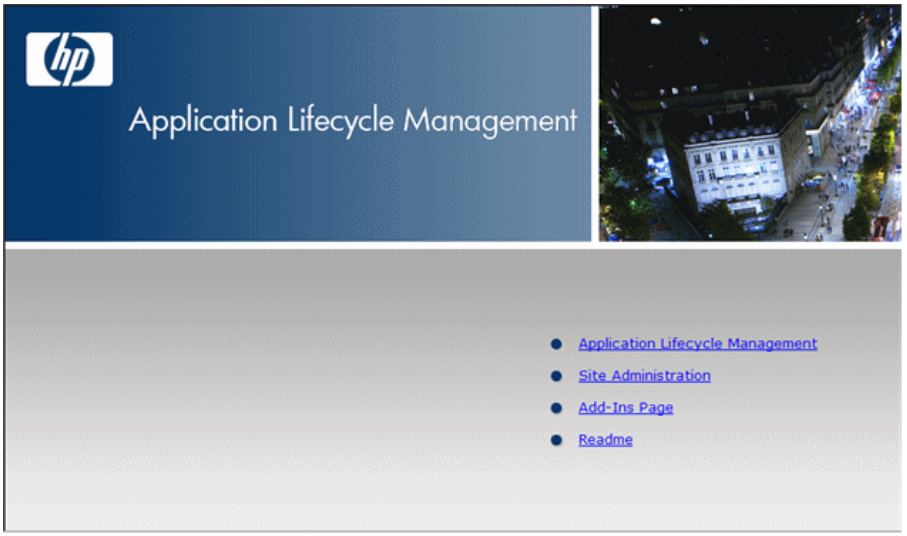
Notes:

- To enable ALM to work with HP testing tools as well as third-party and custom tools, you must run the **HP ALM Client Registration** add-in, which registers ALM components on the client machine. For more information, see "Registering ALM on a Workstation" on page 151.
- If your users connect to ALM over a virtual environment, such as Citrix or VMware, you can deploy ALM components on a shared location that all users can access. To enable a shared deployment, run the **Shared Deployment for Virtual Environments** add-in from the **HP Application Lifecycle Management Add-ins** page. For more information, see Chapter 15, "Installing HP ALM Add-ins."

To start Application Lifecycle Management:

1 Open your Web browser and type your ALM URL http://<ALM server name>[<:port number>]/qcbin.

The Application Lifecycle Management Options window opens.



The Application Lifecycle Management Options window contains the following links:

Option	Description
Application Lifecycle Management	Opens the ALM application. For more information, refer to the *HP Application Lifecycle Management User Guide*.
Site Administration	Opens the Site Administration application. For more information, refer to the *HP Application Lifecycle Management Administrator Guide*.
Add-ins Page	Opens the HP Application Lifecycle Management Add-ins page. For more information, see "Installing HP ALM Add-ins" on page 159.
Readme	Opens the ALM Readme, which provides the latest news and information about ALM.

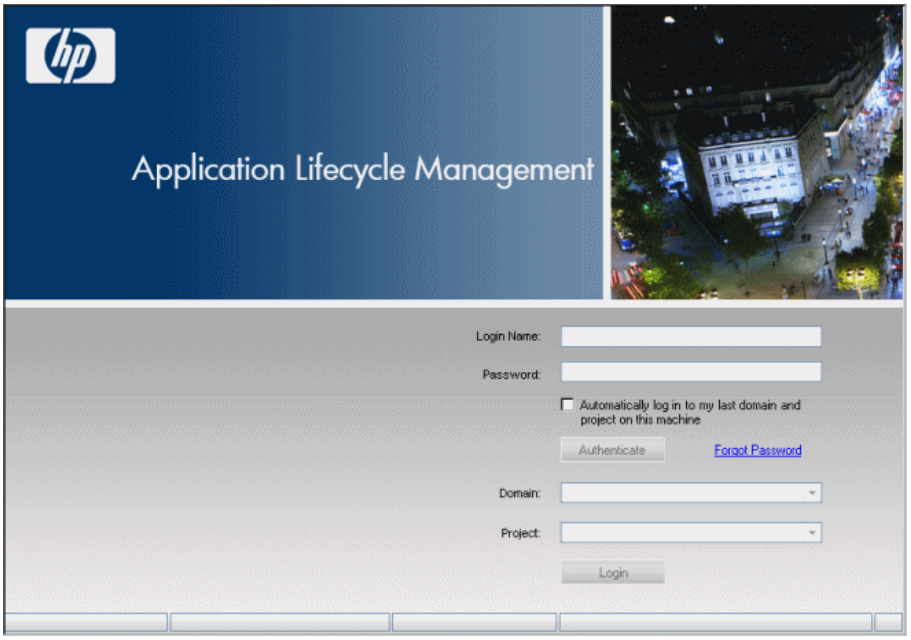
2 Click the **Application Lifecycle Management** link. Each time ALM is run, it carries out a version check. If it detects a newer version, it downloads the necessary files to your machine.

Follow the on-screen instructions.

Notes:

- **Windows 7/2008/2008R2**: If you do not have administrator privileges on your machine and a Security Warning displays, click **Don't Install**. You will be redirected to the Install screen.
- If you run ALM over a virtual environment such as Citrix, only the system administrator can install a new version.
- If files are downloaded but the Login window does not display, you must install a Microsoft Hotfix on your machine. For more information, see the HP Software Self-solve knowledge base article: http://h20230.www2.hp.com/selfsolve/document/KM905289. (Requires HP Passport sign-in credentials)

After the ALM version has been checked and files have been updated as necessary, the Application Lifecycle Management Login window opens.



3 In the **Login Name** box, type your user name.

4 In the **Password** box, type the password. If you cannot remember your password, click the **Forgot Password** link. For more information, refer to the *HP Application Lifecycle Management User Guide*.

5 Select the **Automatically log in to my last domain and project on this machine** check box if you want ALM to automatically log in to the last project in which you were working.

6 Click **Authenticate**. ALM verifies your user name and password and determines which domains and projects you can access. If you specified automatic login, ALM opens.

If authentication fails, check that your user name and password are correct and try again.

7 In the **Domain** list, select a domain. By default, the last domain in which you were working is selected.

8 In the **Project** list, select a project. By default, the last project in which you were working is selected.

9 Click **Login**. ALM opens and displays the module in which you last worked during your previous session.

Registering ALM on a Workstation

To enable you to work with other HP testing tools as well as third-party and custom tools, ALM must be registered on the client machine.

Note: If you are running previous versions of ALM/Quality Center on your machine, before registering ALM 11.50, make sure that all instances of ALM/Quality Center and any integration tools are closed.

For a list of the tools that require registering ALM on a machine, see "Tools that Require Registering ALM Client Components" on page 153.

To register ALM on a workstation:

1 Log on to the machine as a local user or a domain user with administrator privileges. Ensure that you have the registry and file system permissions listed below.

Windows 7/2008/2008R2: Open the Web browser as an administrator (right-click the Internet Explorer icon and select **Run as Administrator**).

2 Run **HP ALM Client Registration** from the **HP Application Lifecycle Management Add-ins** page. For more information, see Chapter 15, "Installing HP ALM Add-ins."

3 Close and reopen the Web browser.

Permissions Required to Register ALM on a Workstation

You must have full read and write permissions on the following registry keys:

- **HKEY_CLASSES_ROOT**
- **HKEY_CURRENT_USER\Software**
- **HKEY_LOCAL_MACHINE\SOFTWARE**

You must have the following file system permissions:

- Full read and write permissions on the **HP\ALM-Client** deployment folder. This is located at:
  - **Windows 7/2008/2008R2:** %ALLUSERSPROFILE%
  - **Windows XP:** %ALLUSERSPROFILE%\Application Data
- Full read and write permissions to the **Temp** (%TEMP% or %TMP%) directory. The installer program writes installation and log files to this directory. This is generally located at:
  - **Windows XP:** C:\Documents and Settings\<username>\Local Settings\Temp
  - **Windows 7:** C:\Users\<username>\AppData\Local\Temp

Tools that Require Registering ALM Client Components

The following tools require that ALM client components be registered on the client machine.

HP ALM Add-ins	➤ QuickTest Professional Add-in **Note:** Requires that Data Execution Prevention (DEP) be disabled in Windows 7. ➤ Microsoft Word Add-in ➤ Microsoft Excel Add-in ➤ HP Screen Recorder Add-in ➤ Service Test Add-in ➤ HP ALM Synchronizer ➤ Defects and Requirements Exchange with HP Service Manager and HP ALM
HP ALM Extensions	➤ HP Business Process Testing Enterprise Extension **Note:** Required only if working with QTP/STM agents remotely.
Other	QuickTest Professional tests **Notes:** ➤ Required to run tests, and to submit defects from the Run Results Viewer. ➤ Requires that Data Execution Prevention (DEP) be disabled in Windows 7.

14

Integrating the ALM Application Server with Apache

To use HP Application Lifecycle Management (ALM) with an Apache Web server, you need to configure the Apache Web server to redirect requests to the ALM Application Server. You configure the Apache Web server to work in proxy HTTP mode.

Note: It is recommended that you use Apache HTTP Server version 2.2 or below.

To configure Apache to work in proxy http mode:

1. Make sure the Apache Web server is stopped.
2. Navigate to the **<Apache Home directory>\conf** directory.
3. Open the **httpd.conf** file.
4. Uncomment or add the following load module commands:

```
LoadModule proxy_module modules/mod_proxy.so
LoadModule proxy_http_module modules/mod_proxy_http.so
```

Note: Make sure that both modules exist in your Apache installation.

---

5 Add the following section to the file:

```
# Turn off support for true Proxy behavior as we are acting as
# a transparent proxy
ProxyRequests Off

# Turn off VIA header as we know where the requests are proxied
ProxyVia Off

# Turn on Host header preservation so that the servlet container
# can write links with the correct host and rewriting can be avoided.
ProxyPreserveHost On

# Set the permissions for the proxy
<Proxy *>
  AddDefaultCharset off
  Order deny,allow
  Allow from all
</Proxy>

# Turn on Proxy status reporting at /status
# This should be better protected than: Allow from all
ProxyStatus On
<Location /status>
  SetHandler server-status
  Order Deny, Allow
  Allow from all
</Location>

# Configuring mod_proxy_http
# To connect to servlet container with HTTP protocol, the ProxyPass directive can be
# used to send requests received on a particular URL to a Jetty instance.

ProxyPass /qcbin http://localhost:8080/qcbin
ProxyPass /mtours http://localhost:8080/mtours
```

Note: If you are connecting to ALM on a remote machine, replace **localhost** with the IP address or name of the server on which ALM is installed.

---

6. Save the changes to the file.
7. Restart the Apache Web server.

   You can now connect to your ALM site using the following URL: http://<ALM server name>[<:apache port number>]/qcbin.

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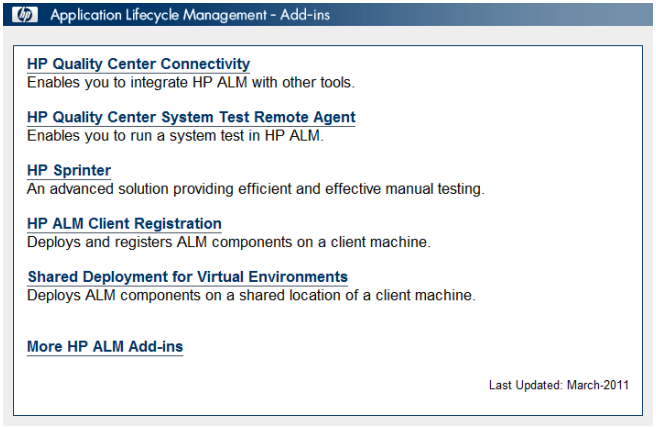
Installing HP ALM Add-ins

HP Application Lifecycle Management (ALM) offers integration and synchronization solutions with HP and third-party tools. To integrate ALM with other tools, you may need to install appropriate add-ins from the HP Application Lifecycle Management Add-ins page.

Note: If you are integrating ALM with another tool, you can verify that you are using a supported version of the tool. On the Add-ins page, click the **More HP Application Lifecycle Management Add-ins** link, and choose the appropriate integrations matrix.

To install an ALM add-in:

1 Click **Add-ins Page** in the Application Lifecycle Management Options window when logging into ALM, or choose **Help** > **Add-ins Page** in the ALM main window. The HP Application Lifecycle Management Add-ins page opens.



The following ALM add-ins are available:

- **HP ALM Connectivity.** Enables you to integrate ALM with other tools.
- **HP ALM System Test Remote Agent.** Enables you to run a system test on a machine. You can run a system test to retrieve a machine's system information, view a captured desktop image of a test run on a machine, or restart a machine.
- **HP Sprinter.** Provides advanced functionality and a variety of tools to assist in the manual testing process.
- **HP ALM Client Registration.** Registers ALM components on the client machine, enabling you to work with HP testing tools as well as third-party and custom tools.
- **Shared Deployment for Virtual Environments.** Deploys ALM components on a shared location that can be accessed by all users. This is useful if users connect to ALM over a virtual environment, such as Citrix or VMware.

➤ **More HP ALM Add-ins.** Enables you to install additional add-ins. The add-ins include integration and synchronization solutions with HP and third-party tools.

2 Click an add-in link. A page with additional information about the add-in opens. If you click the More HP ALM Add-ins link, the More HP ALM Add-ins page opens, enabling you to select additional add-ins.

3 Click the add-in guide link (where applicable) for instructions on using the add-in.

4 Click the **Download Add-in** link to download and install the add-in. Follow the instructions on your screen.

16

Managing the ALM Application Server

From ALM 11.50 and above, application server functionality is included with core ALM capability as opposed to the use of an integrated third-party application server, as was the case in previous versions of ALM. The internal application server is referred to as the ALM Application Server.

This chapter contains information relating to managing the ALM Application Server, as well as information regarding general Java management tools.

This chapter includes:

Changing the Heap Memory Size

After you install ALM, you may need to change the heap memory values. For example, you may want to increase the heap size if there is an increase in the number of active projects in ALM, or an increase in the number of concurrent user sessions.

Note:

- The maximum heap value cannot exceed your maximum memory (RAM) size.
- On a machine running on a 32-bit operating system, the heap memory size should not exceed 1024MB.

To change the heap memory size:

1. Verify that all users have logged out of ALM projects and stop the ALM Service as follows:
   - **Windows.** In the system tray, right click the ALM icon and choose **Stop Application Lifecycle Management**.
   - **Linux/Solaris.** Navigate to the **/var/opt/HP/ALM/wrapper** directory, and run the following command: **HPALM stop.**
2. In the **ALM deployment path**, open the **wrapper.conf** file.
3. Change the **wrapper.java.maxmemory** value as necessary.
4. Restart the ALM Service as follows:
   - **Windows.** In the system tray, right click the ALM icon and choose **Start Application Lifecycle Management**.
   - **Linux/Solaris.** Navigate to the **/var/opt/HP/ALM/wrapper** directory, and run the following command: **HPALM start**.

Changing the Application Server Port Number

After you install ALM, you may need to change the application server port number.

It is possible that the default application server port may be in use by another application that is running on the same machine. In this case, you can either locate the application that is using the port and stop it, or you can change the application server port on the machine.

To change the application server port number:

1. Verify that all users have logged out of ALM projects and stop the ALM Service as follows:
   - **Windows.** In the system tray, right click the ALM icon and choose **Stop Application Lifecycle Management**.
   - **Linux/Solaris.** Navigate to the **/var/opt/HP/ALM/wrapper** directory, and run the following command: **HPALM stop.**
2. Navigate to the **<ALM deployment path>/HP/ALM/server/conf/jetty.xml** file.
3. Change the **jetty.port** value.
4. Restart the ALM Service as follows:
   - **Windows.** In the system tray, right click the ALM icon and choose **Start Application Lifecycle Management**.
   - **Linux/Solaris.** Navigate to the **/var/opt/HP/ALM/wrapper** directory, and run the following command: **HPALM start**.

Configuring Secure Access on Windows Systems

The following procedure describes how to configure a Secure Socket Layer (SSL) connection when ALM is installed on a Windows system.

To configure SSL:

1. Verify that all users have logged out of ALM projects and stop the ALM Service as follows: In the system tray, right click the ALM icon and choose **Stop Application Lifecycle Management**.
2. Navigate to the **<ALM deployment path>\server\conf** directory and make a backup of the **jetty.xml** file.

Caution: Make sure that you back up the **jetty.xml** file located in this directory.

---

3. Open the **jetty.xml** file and add the following section under the **Configure** element:

```
<Call name="addConnector">
  <Arg>
    <New class="org.eclipse.jetty.server.ssl.SslSocketConnector">
      <Set name="host"><Property name="jetty.host" /></Set>
      <Set name="Port">8443</Set>
      <Set name="maxIdleTime">30000</Set>
      <Set name="keystore">C:\CAs\server.keystore</Set>
      <Set name="password">changeit</Set>
      <Set name="keyPassword">changeit</Set>
      <Set name="truststore">C:\CAs\server.keystore</Set>
      <Set name="trustPassword">changeit</Set>
    </New>
  </Arg>
</Call>
```

4. Replace the **C:\CAs\server.keystore** path with the location of your keystore file.
5. If you want to change the port number, replace **8443** with the new port number.

6 If you have changed the default keystore password, replace **changeit** with the new password.

7 (Optional) To encrypt the password, perform the following steps:

a Open Command Prompt and run the following command:

```
<JAVA_HOME>\java \ -cp "<DEPLOYMENT_HOME>\server\lib\*"
org.eclipse.jetty.http.security.Password <password>
```

For example, if you run the following command:

```
java -cp "C:\ProgramData\HP\ALM\server\lib*"
org.eclipse.jetty.http.security.Password changeit
```

The output will appear as follows:

```
changeit
OBF:1vn21ugu1saj1v9i1v941sar1ugw1vo0
MD5:b91cd1a54781790beaa2baf741fa6789
```

b Replace the plain text password in the **jetty.xml** file with the output above, including the **OBF** and **MD5** prefix.

8 (Optional) To disable non-HTTP access to the ALM Application Server, in the **jetty.xml** file, locate the following section and comment it out by placing **<!--** at the beginning of the section, and **-->** at the end.

Note: It is possible that this section in your **jetty.xml** file is slightly different.

```
<!--
<Call name="addConnector">
  <Arg>
    <New class="org.eclipse.jetty.server.nio.SelectChannelConnector">
      <Set name="host"><Property name="jetty.host" /></Set>
      <Set name="port"><Property name="jetty.port" default="8080"/></Set>
      <Set name="maxIdleTime">300000</Set>
      <Set name="Acceptors">2</Set>
      <Set name="statsOn">false</Set>
      <Set name="confidentialPort">8443</Set>
      <Set name="lowResourcesConnections">20000</Set>
      <Set name="lowResourcesMaxIdleTime">5000</Set>
    </New>
  </Arg>
</Call>
-->
```

9 Save the **jetty.xml** file.

10 Restart the ALM Service as follows: In the system tray, right click the ALM icon and choose **Start Application Lifecycle Management**.

11 Connect to ALM using port 8443, or the number of the new port if you changed it in step 5 on page 166.

Configuring Secure Access on Linux/Solaris Systems

The following procedure describes how to configure a Secure Socket Layer (SSL) connection when ALM is installed on a Linux/Solaris system.

To configure SSL:

1. Verify that all users have logged out of ALM projects, and stop the ALM Service. To stop the service, navigate to the **/var/opt/HP/ALM/wrapper** directory, and run the following command: **HPALM stop**.
2. Navigate to the **/var/opt/HP/ALM/server/conf/** directory and make a backup of the **jetty.xml** file.

Caution: Make sure that you back up the **jetty.xml** file located in this directory.

---

3. Open the **jetty.xml** file and add the following section under the **Configure** element:

```
<Call name="addConnector">
  <Arg>
    <New>
      <Set name="host"><Property name="jetty.host" /></Set>
      <Set name="Port">8443</Set>
      <Set name="maxIdleTime">30000</Set>
      <Set name="keystore">/home/admin/Downloads/server.keystore</Set>
      <Set name="password">changeit</Set>
      <Set name="keyPassword">changeit</Set>
      <Set name="truststore">/home/admin/Downloads/server.keystore</Set>
      <Set name="trustPassword">changeit</Set>
    </New>
  </Arg>
</Call>
```

4. Replace the **/home/admin/downloads** path with the location of your keystore file.
5. If you want to change the port number, replace **8443** with the new port number.

6. If you have changed the default keystore password, replace **changeit** with the new password.
7. (Optional) To encrypt the password, perform the following steps:
   a. Open Command Prompt and run the following command:

```
./java -cp ".:/var/opt/HP/ALM/server/lib/*:/var/opt/HP/ALM/server/lib/ext/"
org.eclipse.jetty.http.security.Password <password>
```

   For example, if you run the following command:

```
./java -cp ".:/var/opt/HP/ALM/server/lib/*:/var/opt/HP/ALM/server/lib/ext/"
org.eclipse.jetty.http.security.Password changeit
```

   The output appears as follows:

```
changeit
OBF:1vn21ugu1saj1v9i1v941sar1ugw1vo0
MD5:b91cd1a54781790beaa2baf741fa6789
```

   b. Replace the plain text password in the **jetty.xml** file with the output above, including the **OBF** and **MD5** prefix.

8 (Optional) To disable non-HTTP access to the ALM Application Server, in the **jetty.xml** file, locate the following section and comment it out by placing **<!--** at the beginning of the section, and **-->** at the end.

Note: It is possible that this section in your **jetty.xml** file is slightly different.

```
<!--
<Call name="addConnector">
  <Arg>
    <New class="org.eclipse.jetty.server.nio.SelectChannelConnector">
      <Set name="host"><Property name="jetty.host" /></Set>
      <Set name="port"><Property name="jetty.port" default="8080"/></Set>
      <Set name="maxIdleTime">300000</Set>
      <Set name="Acceptors">2</Set>
      <Set name="statsOn">false</Set>
      <Set name="confidentialPort">8443</Set>
      <Set name="lowResourcesConnections">20000</Set>
      <Set name="lowResourcesMaxIdleTime">5000</Set>
    </New>
  </Arg>
</Call>
-->
```

9 Save the **jetty.xml** file.

10 Restart the ALM Service by navigating to the **/var/opt/HP/ALM/wrapper** directory running the following command: **HPALM start**.

11 Connect to ALM using port 8443, or the number of the new port if you changed it in step 5 on page 169.

Application Server Management Tools

Since the ALM Application Server is a Java-based, we recommend the following Java tools to enable you to effectively manage ALM:

jconsole:

http://java.sun.com/developer/technicalArticles/J2SE/jconsole.html

jstack:

http://download.oracle.com/javase/1.5.0/docs/tooldocs/share/jstack.html

jmap:

http://download.oracle.com/javase/1.5.0/docs/tooldocs/share/jmap.html

jvisualvm:

http://download.oracle.com/javase/6/docs/technotes/tools/share/jvisualvm.html

---

Notes:

- **Jvisualvm** is an all-in-one tool that was added in Java 1.6. However the other tools may still be useful as there may be implications regarding memory and CPU usage with **jvisualvm** as it is a heavier tool.
- To troubleshoot issues relating to the management tools, see "Monitoring ALM Server Fails" on page 189.

17

Customizing System Files

You can customize various aspects of HP Application Lifecycle Management (ALM), by creating or configuring system files.

This chapter includes:

Customizing Site Administration

Customization of the Site Administration repository and the **qcbin** application must be performed in the ALM deployment directory. For example, if you edit **.xsl** mail stylesheets, or create custom test types. After customizing any of the files in the deployment directory, you must redeploy ALM.

Caution: You must not modify, add, or delete files in the ALM installation directory.

This section includes:

Customizing the Site Administration Repository

Perform the following procedure to customize the Site Administration repository.

1. On the machine on which ALM is installed, open a file browser, and navigate to **<ALM installation path>\data\sa**.
2. Open another file browser, and navigate to **<ALM repository path>\customerData**.
3. In the installation directory, navigate to the file that you want to customize.
4. In the repository directory, under **customerData**, create the same folder structure that contains the file in the installation directory.
5. Copy the file from the installation directory and paste the file in the appropriate folder in the repository directory.
6. Edit the file in the repository directory.
7. Run the **Server Deployment Wizard**:

   On **Windows** systems: Choose one of the following:

   - **Start** > **HP ALM Server** > **Server Deployment Wizard**
   - **<installation path>\bin\run_server_deploy_tool.bat**

   On **Linux/Solaris** systems:
   <installation path>/bin/run_server_deploy_tool.sh

Customizing the qcbin Application

Perform the following procedure to customize the qcbin application.

To customize the qcbin application:

1. On the machine on which ALM is installed, open a file browser, and navigate to **<ALM installation path>\application\20qcbin.war**.
2. Open another file browser, and navigate to **<ALM deployment path>\application\20qcbin.war**.
3. In the installation directory, navigate to the file that you want to customize.

4. In the deployment directory, under **20qcbin.war** create the same folder structure that contains the file in the installation directory.
5. Copy the file from the installation directory and paste the file in the appropriate folder in the deployment directory.
6. Edit the file in the deployment directory.
7. Run the **Server Deployment Wizard**:

   On **Windows** systems: Choose one of the following:

   - **Start** > **HP ALM Server** > **Server Deployment Wizard**
   - **<installation path>\bin\run_server_deploy_tool.bat**

   On Linux/Solaris systems:
   <installation path>/bin/run_server_deploy_tool.sh
8. Repeat the procedure on each cluster node.

Customizing Menus

You can customize the Application Lifecycle Management Tools and Help menus by modifying the **ALM-Client.exe.config** file on the machine on which ALM is installed.

To customize ALM:

1. On the machine on which ALM is installed, extract the **ALM-Client.exe.config** file from **Client.cab**. This file is located in:
   <ALM deployment path>\deployment\20qcbin.war\Install
2. Open the **ALM-Client.exe.config** file (this is in **.xml** format).

3 You can change or delete the Document Generator item in the Tools menu. This is defined in the Tools section of the file. In the same section you can also add new items to the Tools menu.

The following is the syntax of an entry in the Tools line:

```
<TDFrame
    Tools="<Tool_Name>,{<Tool_ID>}"
    Workflow="{<Workflow_ID>}"
    Parameters="<parameters>"
 />
```

4 To change, delete, or rearrange the list of items in the Help menu, change the default names, IDs, and URLs listed in the OnlineHelpItem line. The following is the syntax of an entry in the OnlineHelpItem line:

```
<OnlineHelpItem
ID="<Help_ID>"
Name="<Help_Name>"
Url="<Help_URL>"
```

To create a separator line between two items in the Help menu, use the following syntax:

```
<OnlineHelpItem
ID="<Help_ID>"
Name="<Help_Name>"
Url="<Help_URL>"
IsFirstInGroup="true" />
```

Note: The first two menu items in the Help menu, **Help on this page** and **Documentation Library**, and the last Help menu item, **About HP Application Lifecycle Management Software**, cannot be moved or changed. They do not have corresponding entries in the **QualityCenter.exe.config** file. The above step only affects the menu items between them.

---

5. Unzip the **Client.cab** file to a temporary folder named **Client** which must be under the temp folder. For example, C:\temp\Client.
6. Replace the **ALM-Client.exe.config** file with the modified file.
7. Store the temporary folder on a logical drive, for example X, by running the following command:

```
subst [X]: <temp folder>
```

   For example, subst X: C:\temp

8. Create a new **Client.cab** file with the command:

```
cabarc -r -p -P Client\ -s 6144 N <temp folder>\Client.cab X:\Client\*.*
```

Note: To use this command you must first download **cabsdk.exe** (the Cabinet Software Development Kit) from the Microsoft Download Center.

---

9. Add a class 3 digital signature to the new **Client.cab** file.

Note: The digital signature must be a signature of a trusted provider.

---

10. Under **<ALM deployment path>\application\20qcbin.war**, create a new **Installation** folder, if it does not already exist.
11. Save the new cab file under the **Installation** folder.
12. Run the **Server Deployment Wizard**:

    On **Windows** systems: Choose one of the following:

    - **Start** > **HP ALM Server** > **Server Deployment Wizard**
    - **<installation path>\bin\run_server_deploy_tool.bat**

On Linux/Solaris systems:
<installation path>/bin/run_server_deploy_tool.sh

13 Repeat the procedure on each cluster node.

Understanding the ALM System Tray Icon

The ALM system tray icon indicates the current status of ALM. It also indicates the current action that ALM is performing.

You can customize the behavior of the icon by modifying the **trayConfigFile.properties** file.

To customize the system tray icon:

1 Navigate to the following directory:
C:\ProgramData\HP\ALM\server\conf

2 Open the **trayConfigFile.properties** file.

3 Change the following properties as necessary:

- **pollingintervalMillis.** Defines, in milliseconds, how often the ALM system tray icon checks the status (started or stopped) of ALM. The default value is 5,000.
- **logDebugMode.** Defines whether debugging information is included in the system tray log. The default value is **false**.
- **timeoutintervalMillis.** Defines, in milliseconds, the maximum amount of time ALM takes to change the status of ALM when you right-click the icon and choose **Start/Stop ALM Server**. If ALM is not able to perform the action in the allotted time the status changes to **Error**. The default value is 180,000.

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Uninstalling ALM

You can uninstall HP Application Lifecycle Management (ALM) from the server machine. When uninstalling ALM, projects are not deleted. You can also uninstall ALM client components from a workstation that has been used to access Application Lifecycle Management.

This chapter includes:

Uninstalling ALM from Windows systems

This section describes how to uninstall ALM from your Windows server machine.

1. Choose **Start** > **Control Panel**.
2. Depending on your operating system:
   - **2008:** In **Home** view, under **Programs**, click **Uninstall a program**. In **Classic** view, double-click **Programs and Features**.
   - **2008 R2**: In Category view, under **Programs**, click **Uninstall a program**. In **Large/Small icons** view, click **Programs and Features**.
3. In the programs list, right-click **HP Application Lifecycle Management** and select **Uninstall.**
4. Follow the instructions on your screen.

5 (Optional) To remove all traces of ALM from the machine, delete all remaining files in the installation directory as well as the deployment path. Also delete the **\HP\ALM** folders in the **c:\ProgramData** directory and their files.

Uninstalling ALM from Linux/Solaris Systems

This section describes how to uninstall ALM from your Linux/Solaris server machine.

Note: You must log in as the same user that installed ALM.

To uninstall ALM from Linux/Solaris systems:

1 Navigate to the **/var/opt/HP/iHP/HP_ALM_Server/<version number>** directory.

2 Run the **install.sh** file.

3 (Optional) To remove all traces of ALM from the machine, delete all remaining files in the installation directory as well as the deployment path. Also delete the **/HP/ALM** folders in the **/var/opt** directory and their files.

Uninstalling ALM Client Components from a Workstation

When you run ALM on your client computer, client components are downloaded to your workstation. You can use the client uninstall utility to remove all ALM client components, including files and registry keys. To download the utility, see the HP Software Self-solve knowledge base article KM176290 (http://h20230.www2.hp.com/selfsolve/document/KM176290). (Requires HP Passport sign-in credentials)

If the workstation is used to access ALM after the uninstall utility has been run, all necessary components are downloaded again from the ALM server.

Part 6

Appendix

A

Troubleshooting the ALM Installation

This chapter contains troubleshooting suggestions for issues relating to the HP Application Lifecycle Management (ALM) installation.

This chapter includes:

Disabling Validation Checks for the Configuration Wizard

The ALM Server Configuration Wizard automatically performs validation checks to verify that particular system configurations requirements are met. If the ALM configuration does not complete due to a failed validation, you can disable selected validation checks and rerun the ALM Server Configuration Wizard.

Caution: You should disable validation checks only if you are sure that the validation result is wrong.

Notes:

- To resolve failures that occur during the ALM Server Installation Wizard, see "Checking the Installation and Configuration Log Files" on page 186, or "ALM Installation Already Exists" on page 187.
- For troubleshooting tips on database validations, see "Database Validator Fails" on page 188.

To disable configuration validators and rerun the ALM Server Configuration Wizard:

1. In the ALM installation directory, locate the **run_after_finish.bat** file (Windows) or the **run_after_install.sh** (Linux/Solaris) file. The purpose of these files is to start the ALM Server Configuration Wizard.
2. In the installation directory, create a copy of the file. Make sure to save the copy using a different name, for example: **run_after_finish_skip_validation.bat**
3. Edit the new file by adding skip validation flags as required. The file itself contains instructions how to add the flags.
4. Save and then execute the new file.

Configuration Validators

Validator	Checks	To disable
Operating system and license	Checks that the operating system is supported.	-wOsValidator
Existing installation	Checks if an older version of ALM or Quality Center is installed. For troubleshooting tips, see "ALM Installation Already Exists" on page 187.	-wPreviousInstallationValidator
License file	Checks license file key.	-wLicenseTypeValidator

Validator	Checks	To disable
Security passphrases	Checks encryption passphrases.	-wEncryptionStepValidator
Mail server	Checks that the mail server name is valid.	-wMailServerValidator
Database connectivity	Checks database connectivity.	-wDbSettingsStepValidator
Database settings	Checks Site Administration database settings.	-wSaSchemaValidator
Site administrator	Checks site administrator user settings.	-wSiteAdminUserValidator
Repository folder	Checks that the repository folder is accessible, and has sufficient space.	-wRepositoryValidator

Checking the Installation and Configuration Log Files

If you encounter problems installing ALM, check for errors in the following log files:

Linux/Solaris File Delivery Logs

Log	Path
Native package installation log	**/var/log/<date>_HP_ALM_Server_install_log.txt**
Installation sequencer wizard log	**/var/log/<date>_HP_ALM_Server_11.50.000_iHP_log**
Prerequisites log	**/var/log/<date>_HP_ALM_Server_11.50.000_ prerequisites_iHP_log.txt**

Windows File Delivery Logs

Log	Path
Custom actions logs	**%temp%\ihp_custom_batches.log** **%temp%\iHP.Runtime.CustomActions.HP_Application_ Lifecycle_Management_Server.log**

Application Logs

Log	Path
Configuration logs	Windows: **C:\Users\All Users\HP\ALM\log** Linux/Solaris: **\var\opt\HP\ALM\log**
Site Administration database schema creation logs	**<ALM deployment folder>\log\sa**

ALM Installation Already Exists

If during installation, an error message displays, indicating that an ALM installation already exists, verify that ALM is not installed and that there are no traces of an old installation.

To verify that ALM is not installed:

1. From the **Start** menu, choose **Control Panel** > **Add/Remove Programs**.
2. In the program list, check for **HP Quality Center** or **HP Application Lifecycle Management Platform**.
3. If either appears in the program list, click **Remove** and follow the instructions on your screen.
4. After you uninstall ALM Server, check that the **<ALM Server home>\application** directory was deleted. If it was not deleted, delete the directory before you re-install ALM Server.

To remove traces of an old ALM Server installation:

1. Navigate to the system root (**%systemroot%**) directory (on Linux/Solaris systems, go to the **/home** directory).
2. Back up the **vpd.properties** file.
3. Open the **vpd.properties** file for editing and delete any lines that mention **ALM Server**.

Database Validator Fails

During ALM Server configuration, if the database validator fails perform the following checks:

- Check that the input parameters are correct.
- Check that the Site Administration database schema name was provided.
- If upgrading a Microsoft SQL Server Site Administration database schema, check whether the same authentication type was used as the one used in the previous installation.

To check whether the parameters are correct:

1. Read the error message that displays during installation and try to understand and resolve the problem from the root cause.
2. For further clarifications, check with your database administrator.
3. If no error was found and you are sure that the parameters are correct, disable the DB parameters validator as described in "Disabling Validation Checks for the Configuration Wizard" on page 183.

To check that the Site Administration database schema name was provided:

1. Open a database query tool.
2. Make sure the **PROJECTS** table exists in the schema. This table exists in the schema only and not in the project schema.

To check the SQL authentication type of a previous installation (when upgrading an SQL Server site schema):

1. Navigate to **C:\Program Files\HP\ALM Server** on Windows, and **/opt/HP/HP_ALM_Server** on Linux/Solaris and open the **application** folder.
2. Extract the contents of **qcbin.war** into a temp file, and open the **siteadmin.xml** file in a text editor.
3. Search for the “native” property. If its value is set to “Y”, Windows authentication was used. Make sure that the new installation uses the same authentication type (Microsoft SQL Server authentication or Windows authentication) as the previous installation.

Monitoring ALM Server Fails

Problem: When running one of the Java-based tools to monitor ALM you receive the following message:

Not enough storage is available to process this command.

Reason: This problem is caused because the JVM running ALM Server is running with a service account.

Solution: Choose one of the following, depending on which tool you are running:

- **jmap and jstack.** See the suggestion in the following link:

  http://stackoverflow.com/questions/906620/jstack-and-not-enough-storage-is-available-to-process-this-command

  You will be required to download the **pstools** tool from the following address:

  http://technet.microsoft.com/en-us/sysinternals/bb897553

- **jconsole and jvisualvm.** Download the following tool from the following address:

  http://www.iopus.com/guides/srvany.htm

  Also refer to the following Microsoft article: http://support.microsoft.com/kb/137890


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