BigFix Update

Middleware Applications - User's Guide

Special notice

Before using this information and the product it supports, read the information in Notices *(on page xxxvi)*.

Edition notice

This edition applies to BigFix version 11 and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

Chapter 1. Updates for Linux applications - middleware

With Updates for Linux applications - middleware content site, customer can deploy updates to a vast number of third-party middleware applications.

Note: Support for *"N"*, *"N-1"*, and *"N-2"* versions are available for Middleware Patch update fixlets.

Prerequisite of Oracle weblogic

Before running the Fixlet, make sure that these prerequisites are met on the Linux system:

1. Ensure you have the recommended version of JDK for Oracle WebLogic installed during installation and for patching Oracle WebLogic 12C.

Steps to determine Oracle weblogic details on Linux system

These steps involve locating specific configuration files, extracting information from them, and filtering based on certain criteria:

Note: We have customized the WebLogic fixlet to meet customer needs by modifying its relevance.

1. The fixlet retrieves the `oraInventory` path from the `/etc/environment` file using the `ORACLE_WEBLOGIC_HOME` key.
2. Customers can specify the `oraInventory` path for WebLogic by setting the `ORACLE_WEBLOGIC_HOME` key in the `/etc/environment` file. This enables the fixlet to use this path for applying the WebLogic patches.
3. This enhancement serves as an optional feature where the default paths remain functional.
4. The fixlet looks for the `ORACLE_WEBLOGIC_HOME` key within the `/etc/environment` file. For example, if the `oraInventory` path is `/Weblogic/Oracle/Middleware/oraInventory`, the `ORACLE_WEBLOGIC_HOME` value would be `/WebLogic/Oracle`.

Steps to determine RedHat JBoss details on Linux system

These steps involve locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. Search in installed folder for `version.txt`. For example, `/opt/jboss`.
2. Check directories specified by environment variables `EAP_HOME` and `JBOSS_HOME`.
3. Search directories containing "**eap**" or "**jboss**" at installed folder. For example, `/home`.
4. Check `/etc/default/jboss-eap.conf` and `/etc/environment` for files containing the key `JBOSS_HOME`.

Steps to determine Apache Tomcat details on Linux (systemd-based)

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. You need to find `.service` files in `/etc/systemd/system` that contain the `CATALINA_HOME` variable, which specifies the installation location of the software.

Steps to determine MariaDB details on Linux (RPM or Debian packages)

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. For Linux systems, you can use package management tools to check for the presence and version of `mariadb-server`.

Steps to determine MongoDB details on Linux (RPM or Debian packages)

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. For Linux systems, you can use package management tools to check for the presence and version of `mongodb-org`.

Steps to determine Postgresql details on Linux (RPM or Debian packages)

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. For Linux systems, you can use package management tools to check for the presence and version of `postgresql`.

Steps to determine IBM MQ details on Linux (RHEL or AIX packages)

These steps involve locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. For RHEL systems, check the installed version of the `MQSeriesRuntime` package using the RPM package manager.
2. For AIX systems, check the installed version of the `mqm.server.rte` using the AIX object repository.

Steps to determine IBM WebSphere details on Linux

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. For Linux and Unix systems, it checks for files named `installed.xml` in the installed folders. For example, `/opt/IBM/WebSphere/AppServer/properties/version` or `/usr/IBM/WebSphere/AppServer/properties/version`.

Steps to determine Oracle JDK details on Linux

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. For Linux, it can check the RPM or Debian packages on the machine for `jdk` and its version.

Steps to determine MySQL details on Linux

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. For Linux, it can check the RPM or Debian packages on the machine for `("MySQL-server";"mysql-community-server")` and its version.

Steps to determine IBM DB2 details on Linux

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. It checks for files named `spec` within the `.metadata/BASE_DB2_ENGINE` directories located under the installed folder `/opt/ibm/db2`.

Pre-caching required for Linux applications

Table 1. Software pre-caching required

Software name	Pre-caching required (Yes/No)
Oracle WebLogic	Yes, needs manual caching.
RedHat JBoss	Yes, needs manual caching.
Apache Tomcat	No, files automatically cached to server by fixlets.
MariaDB	No, files automatically cached to server by fixlets.
MongoDB	No, files automatically cached to server by fixlets.
Postgresql	No, files automatically cached to server by fixlets.
IBM MQ	Yes, needs manual caching.
IBM WebSphere	Yes, needs manual caching.
Oracle JDK	• Yes, JDK 8 and 11 needs manual caching. • No, JDK 17 and 21 are automatically cached using fixlets.
MySQL	No, files automatically cached to server by fixlets.

Table 1. Software pre-caching required (continued)

Software name	Pre-caching required (Yes/No)
IBM DB2	Yes, needs manual caching.

Supported applications

You can update supported Linux middleware applications.

The following Linux middleware application products are supported for updates:

- MariaDB
- MongoDB
- MySQL
- Oracle Database
- Postgresql
- Apache Tomcat
- Oracle WebLogic
- IBM MQ
- IBM WebSphere
- RedHat JBoss
- IBM DB2
- Oracle JDK

Supported versions

- BigFix supports Oracle WebLogic Server versions 12c and 14c.
- BigFix supports RedHat JBoss version 7.4.
- BigFix supports Apache Tomcat versions 8, 9, and 10.
- BigFix supports MariaDB versions 10.11 and 11.3.
- BigFix supports MongoDB version 7.0.
- BigFix supports PostgreSQL version 16.
- BigFix supports IBM MQ versions 9.1, 9.2, and 9.3.
- BigFix supports IBM WebSphere versions 8.5.5 and 9.0.5.
- BigFix supports Oracle JDK versions 8, 11, 17, and 21.
- BigFix supports MySQL versions 8.0 and 8.3.
- BigFix supports IBM DB2 version 11.5.

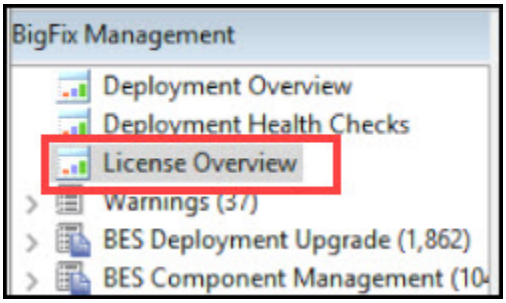
For an updated list of supported applications and current versions, see BigFix-provided content for Operating Systems and Applications or Updates-for-linux-applications-middleware.

Site Subscription - Enabling updates for Linux middleware applications

You can enable updates for Linux middleware applications from BigFix console.

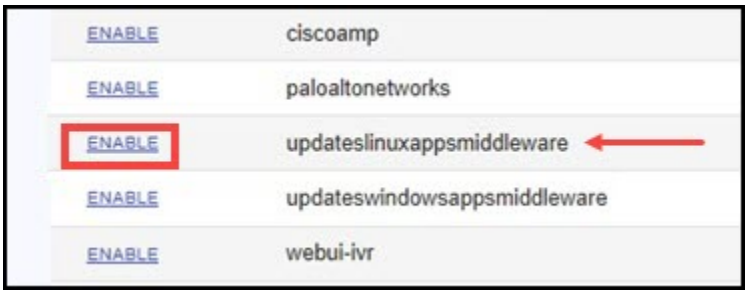
Complete the following steps to enable Updates for Linux applications from the BigFix console licence overview dashboard:

1. Click **Licence Overview** on the BigFix Management navigation tree.



2. Click **Compliance** or **Lifecycle** tab on the Licence Overview dashboard.

3. Navigate the site list and click **Enable**.



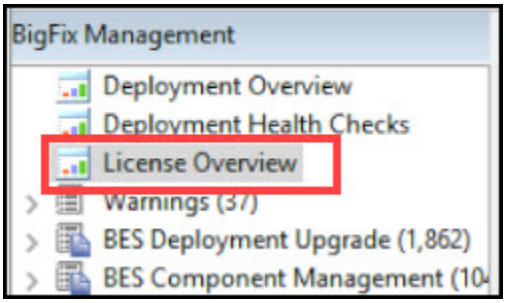
Note: The site name is *updateslinuxappsmiddleware* or *Updates for Linux Applications Middleware*.

Gathering updates for Linux middleware applications

Use updates from the **Linux middleware applications** content site to submit a gather request to the BigFix server.

Complete the following steps to gather Updates for Linux applications:

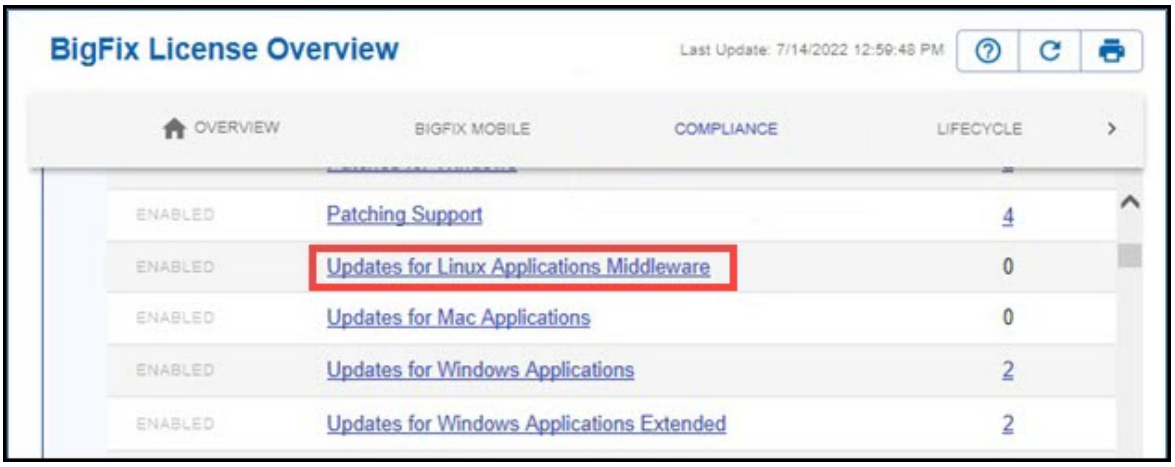
1. Click **Licence Overview** on the BigFix Management navigation tree.



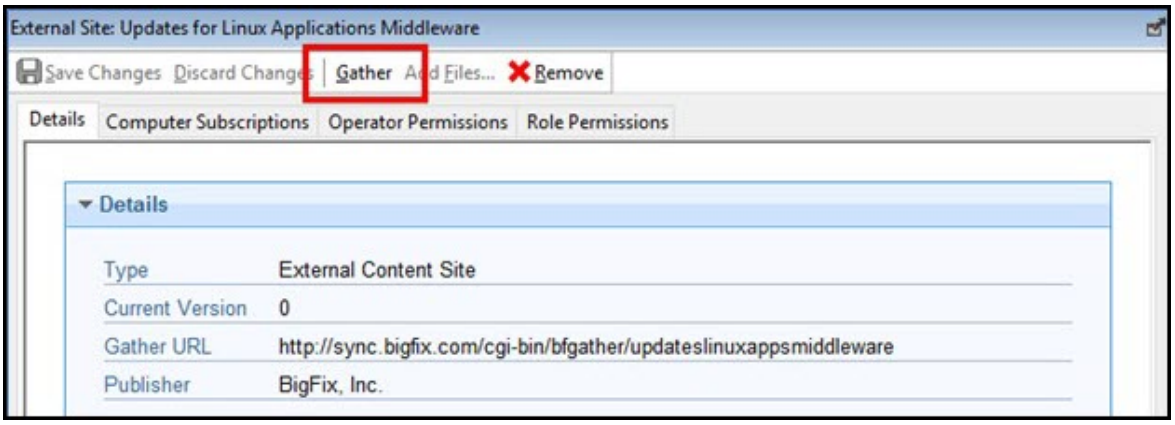
2. On the Licence Overview dashboard, click **Compliance** or **Lifecycle** domain.

A list of enabled sites is displayed.

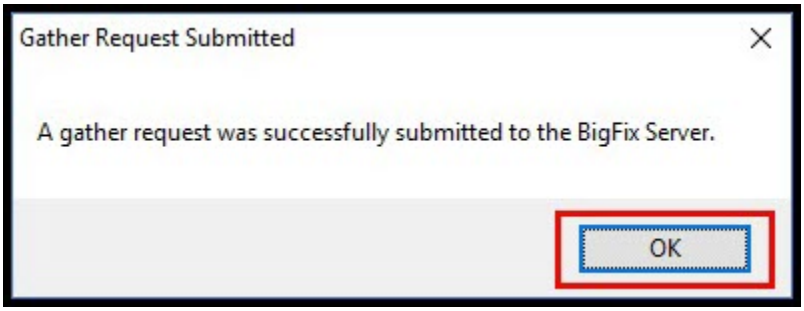
3. Navigate the site list and click **Updates for Linux Applications Middleware**.



4. On the site details pane, click **Gather**.



5. In the **Gather Request Submitted** dialog box, click **OK**.



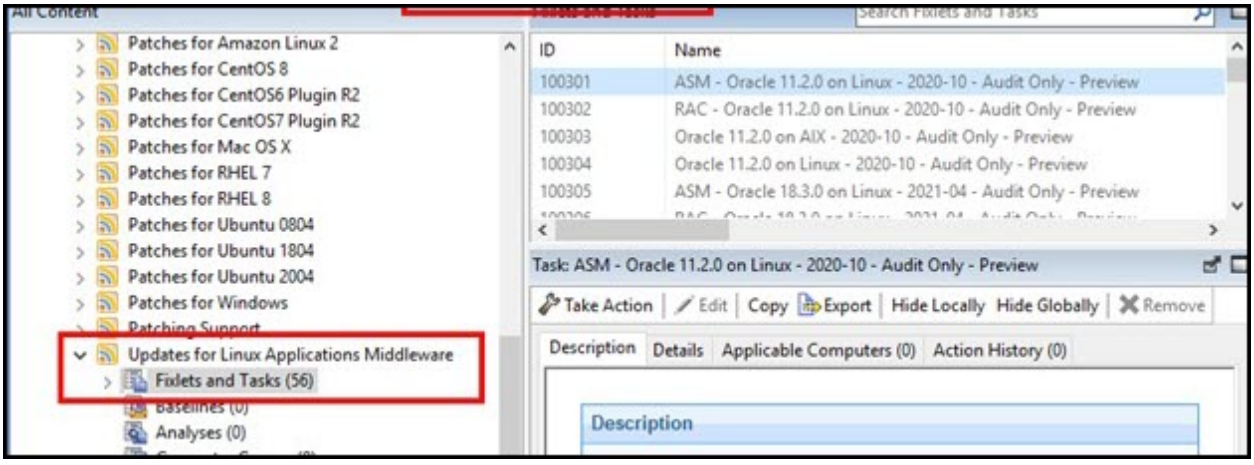
Viewing updates for Linux middleware applications

You can view all the contents of the site after the site gathers the required information. Use **Show Non-Relevant Content** to view all available contents. The contents includes both the relevant and non-relevant items.

To view the Fixlets and tasks, click **Sites > External Sites > Updates for Linux Applications Middleware** in the **All content** tab.

Note: Use **Show Non-Relevant Content** to view all available contents. The contents includes both the relevant and non-relevant content.

Click **Fixlets and Tasks**.



Note: You can expand the **Fixlets and Tasks** node on the navigation tree to view the Fixlets and tasks that you can act on.

Note: When performing a patch upgrade, it is recommended to stop the services and create a backup of essential data and configurations.

Note: Some software, like Redhat JBoss, performs relevance checks on specified folders and paths.

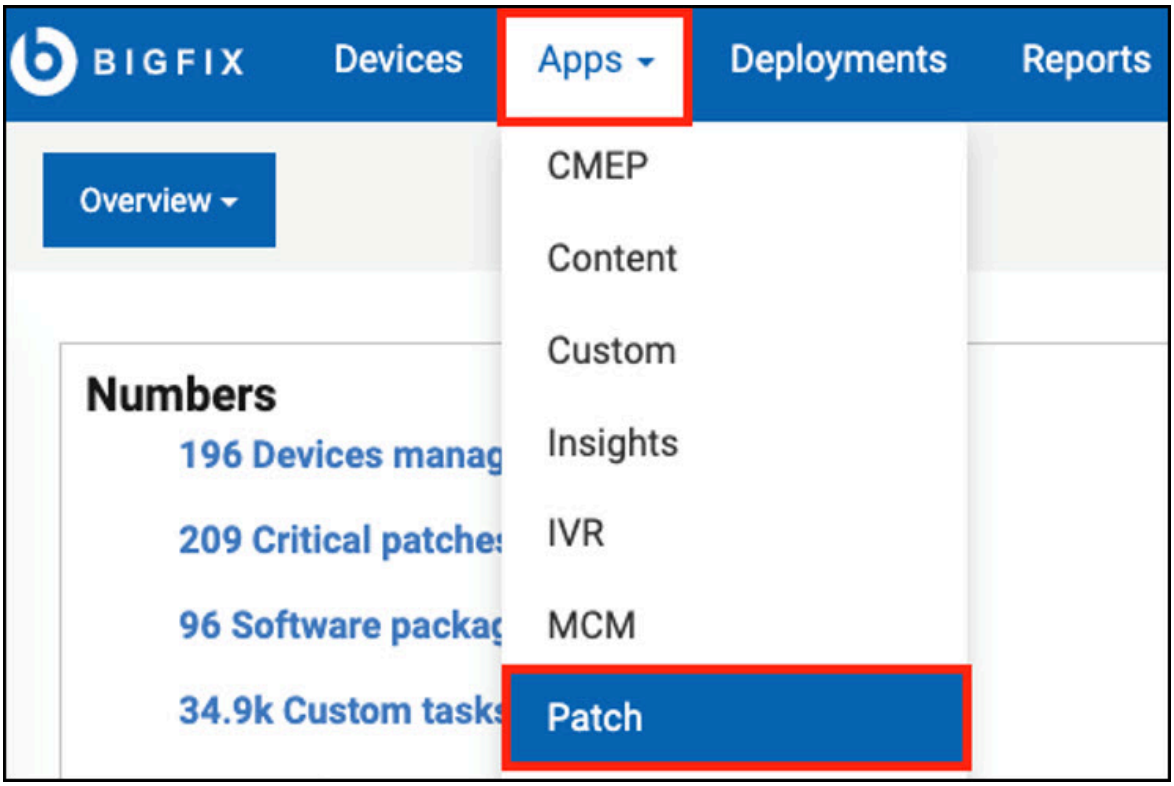
Updates for Linux middleware applications in the WebUI

You can view content about updates for Linux middleware applications in the WebUI.

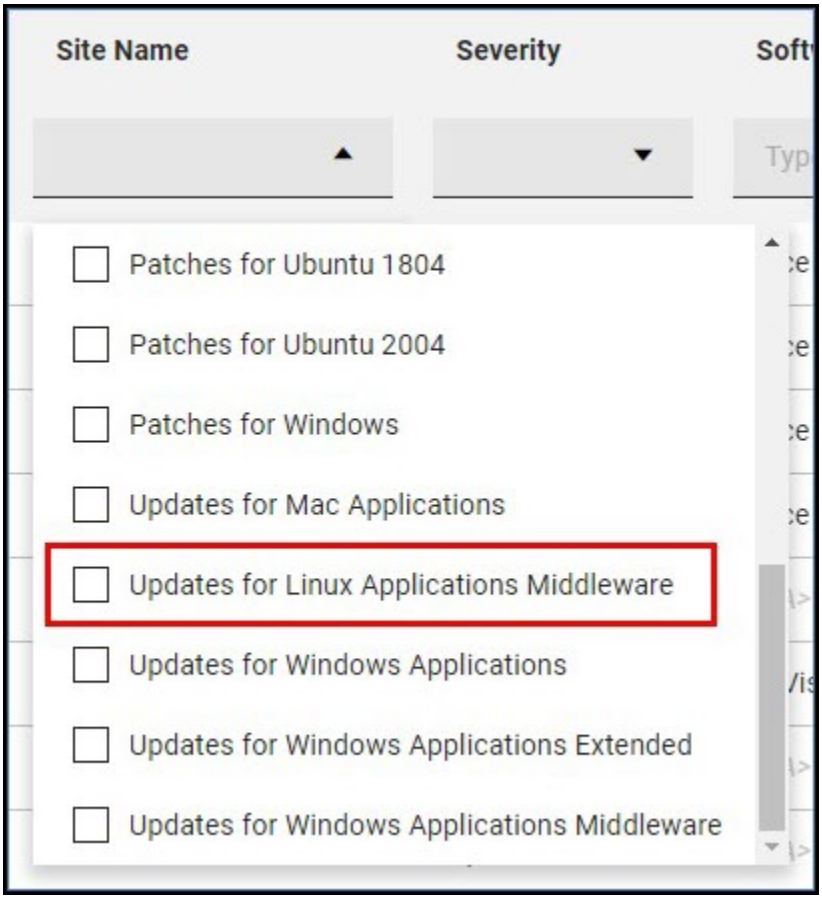
1. Log in to the WebUI.

   Note: Use the same credentials that you use for BigFix console.

2. From the **Apps** menu, select **Patch**.



3. Use the filter in **Site Name** and select **Updates for Linux Applications Middleware**.



You applied a filter to view only content that applies to Updates for Linux middleware applications.

Chapter 2. Updates for Windows applications - middleware

With Updates for Windows applications - middleware content site, customer can deploy updates to a vast number of third-party middleware applications.

Note: Support for *"N"*, *"N-1"*, and *"N-2"* versions are available for Middleware Patch update fixlets.

Prerequisite of Oracle weblogic

Before running the Fixlet, make sure that these prerequisites are met on the windows system:

1. Make sure that the archive extraction software is installed on the Windows system before proceeding with the installation of Oracle software.

   Note: Ensure the **LongPathsEnabled** registry key is enabled in "**HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\FileSystem of registry**".

2. Ensure you have the recommended version of JDK for Oracle WebLogic 14C installed during installation and for patching Oracle WebLogic 12C.

Steps to manage Oracle weblogic on Window system

These steps involve locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. Locate the Oracle Inventory directory typically at any folder location, for example, `C:\Program Files\Oracle\Inventory`.
2. Use the obtained inventory location to access the `inventory.xml` file in the `ContentsXML` directory.
3. Extract information from `inventory.xml` to locate specific files, such as `registry.xml`, in the inventory directory.
4. Within `registry.xml` files, filter based on certain criteria:
   a. Nodes with a specific version (e.g., `12.2.1.4.0`) at certain XPath locations (e.g., `/a:registry/a:distributions/a:distribution[@status='installed']`).
   b. Nodes with names containing "WebLogic".

Steps to manage RedHat JBoss on Window system

These steps involve locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. Search for `version.txt` in the installed folders named `eap` or `jboss`. For example, within subdirectories of `C:\Users`.
2. Search in folders named `eap` or `jboss` within the installed folder. For example, `C:\Program Files`.

Prerequisite of Apache Tomcat

Before running the Fixlet, make sure that these prerequisites are met on the Window system:

1. For Windows, you should have the latest JDK installed, and its path must be set in the environment variables under "JAVA_HOME".

Steps to manage Apache Tomcat on Windows

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. You will find the software details in Windows Registry Service.

Steps to manage MariaDB on Windows (Registry)

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. You will find the software details in Windows Registry Service.

Steps to manage MongoDB on Windows (Registry)

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. You will find the software details in Windows Registry Service.

Steps to manage Postgresql on Windows (Registry)

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. You will find the software details in Windows Registry Service.

Steps to manage IBM MQ on Windows

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. For Windows systems, check the installed version of IBM MQ under the `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall`.

Steps to manage IBM WebSphere on Windows

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. For Windows systems, it searches within Windows folders for files named `.was.installlocations.registry`. Specifically, it looks for `properties\version\installed.xml` files, particularly those ending with `appserver`.

Steps to manage MySQL on Windows

This step involves locating specific configuration files, extracting information from them, and filtering based on certain criteria:

1. You will find the software details in Windows Registry Service.

Pre-caching required for Windows applications

Table 2. Software pre-caching required

Software name	Pre-caching required (Yes/No)
Oracle WebLogic	Yes, needs manual caching.
RedHat JBoss	Yes, needs manual caching.
Apache Tomcat	No, files automatically cached to server by fixlets.
MariaDB	No, files automatically cached to server by fixlets.
MongoDB	No, files automatically cached to server by fixlets.
Postgresql	No, files automatically cached to server by fixlets.
IBM MQ	Yes, needs manual caching.
IBM WebSphere	Yes, needs manual caching.
MySQL	No, files automatically cached to server by fixlets.

Supported applications

Find a list of supported applications for Windows middleware applications.

The following are supported applications by Windows middleware:

- Apache Tomcat
- MongoDB
- Oracle WebLogic
- Oracle Database
- IBM MQ
- IBM WebSphere
- RedHat JBoss
- Postgresql
- MariaDB
- MySQL

Supported versions

- BigFix supports Oracle WebLogic Server versions 12c and 14c.
- BigFix supports RedHat JBoss version 7.4.
- BigFix supports Apache Tomcat versions 8, 9, and 10.
- BigFix supports MariaDB versions 10.11 and 11.3.
- BigFix supports MongoDB version 7.0.
- BigFix supports PostgreSQL version 16.
- BigFix supports IBM MQ versions 9.1, 9.2, and 9.3.
- BigFix supports IBM WebSphere versions 8.5.5 and 9.0.5.
- BigFix supports MySQL versions 8.0 and 8.3.
- BigFix supports IBM DB2 version 11.5.

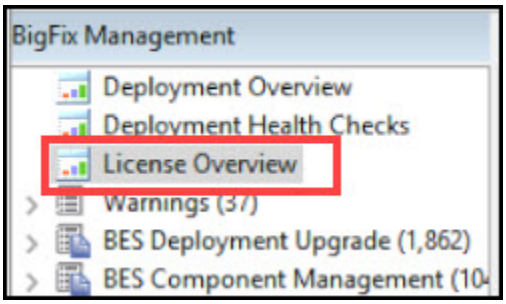
For an updated list of supported applications and current versions, see BigFix-provided content for Operating Systems and Applications or Updates-for-windows-applications-middleware.

Site Subscription - Enabling updates for Windows middleware applications

You can enable updates for Windows middleware applications from BigFix console.

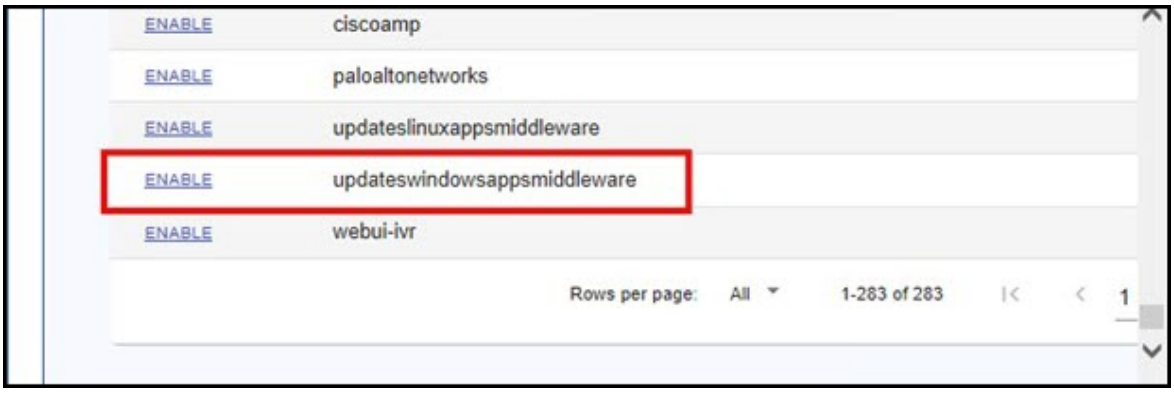
Complete the following steps to enable Updates for Windows applications from the BigFix console licence overview dashboard:

1. Click **Licence Overview** on the BigFix Management navigation tree.



2. On the Licence Overview dashboard, click the **Compliance** or **Lifecycle** tab.

3. Navigate the site list and click **Enable**.



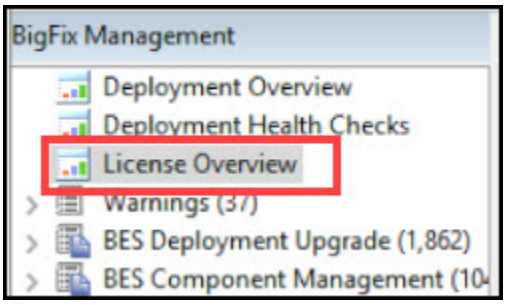
Note: The site name is *updateswindowsappsmiddleware* or *Updates for Windows Applications Middleware*.

Gathering updates for Windows middleware applications

Use updates from the Windows middleware applications content site to submit a gather request to the BigFix server.

Complete the following steps to gather **Updates for Windows applications**:

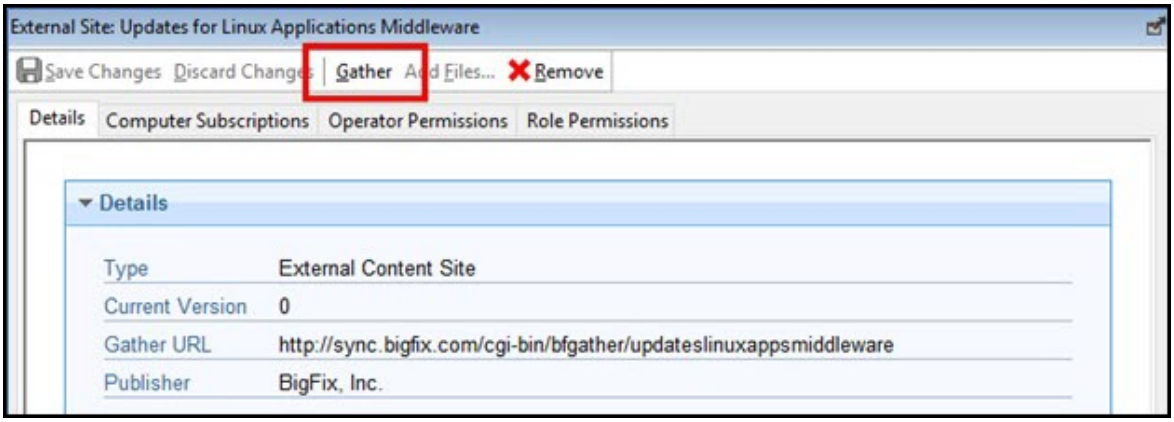
1. Click **License Overview** on the BigFix Management navigation tree.



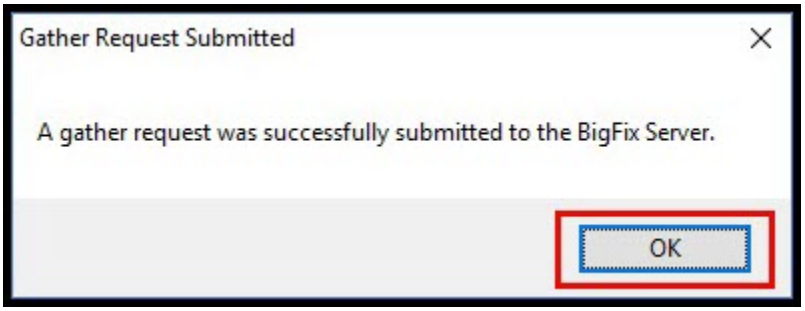
2. Click **Compliance** or **Lifecycle** domain on the Licence Overview dashboard.

   A list of enabled site appears.
3. Navigate the site list and click **Updates for Windows Applications Middleware**.

4. Click **Gather** on the site details pane.



5. Click **OK** on the Gather Request Submitted dialog box.

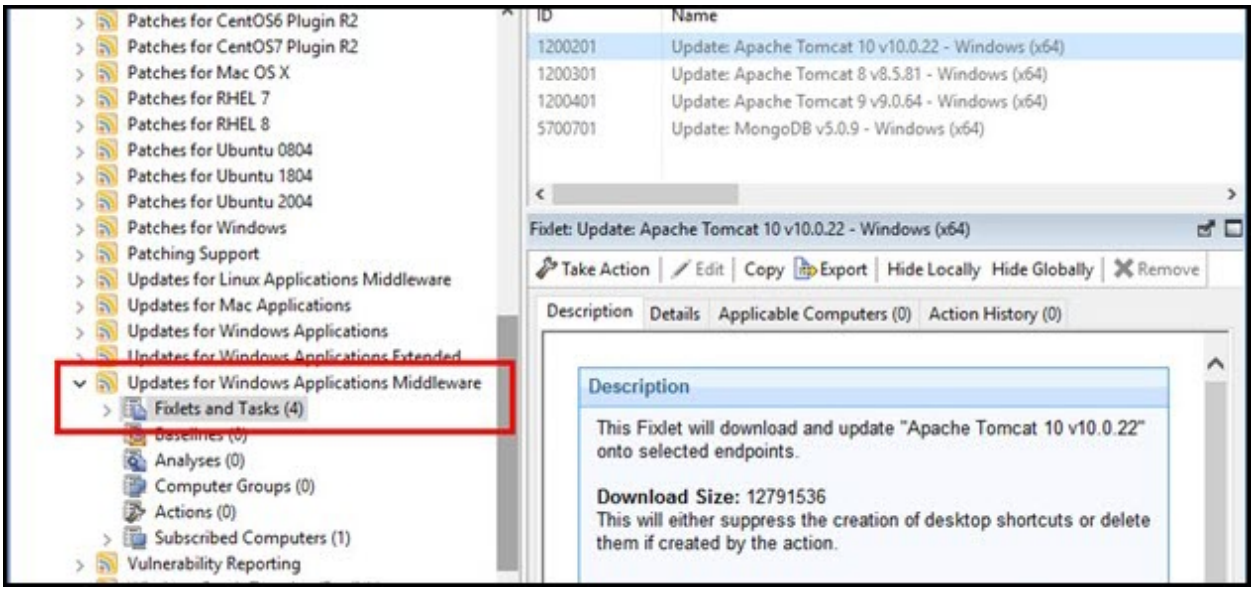


Viewing updates for Windows middleware applications

You can view all the content on the site after the site is gathered. Use **Show Non-Relevant Content** to view all available content. The display shows both relevant and non-relevant content.

To view Fixlets and tasks, in the **All content** tab, click **Sites > External Sites > Updates for Windows Applications Middleware**.

Click **Fixlets and Tasks**.



Note: You can expand the **Fixlets and Tasks** node on the navigation tree to view the Fixlets and tasks that you can act on.

Note: When performing a patch upgrade, it is recommended to stop the services and create a backup of essential data and configurations.

Note: Some software, like Redhat JBoss, performs relevance checks on specified folders and paths.

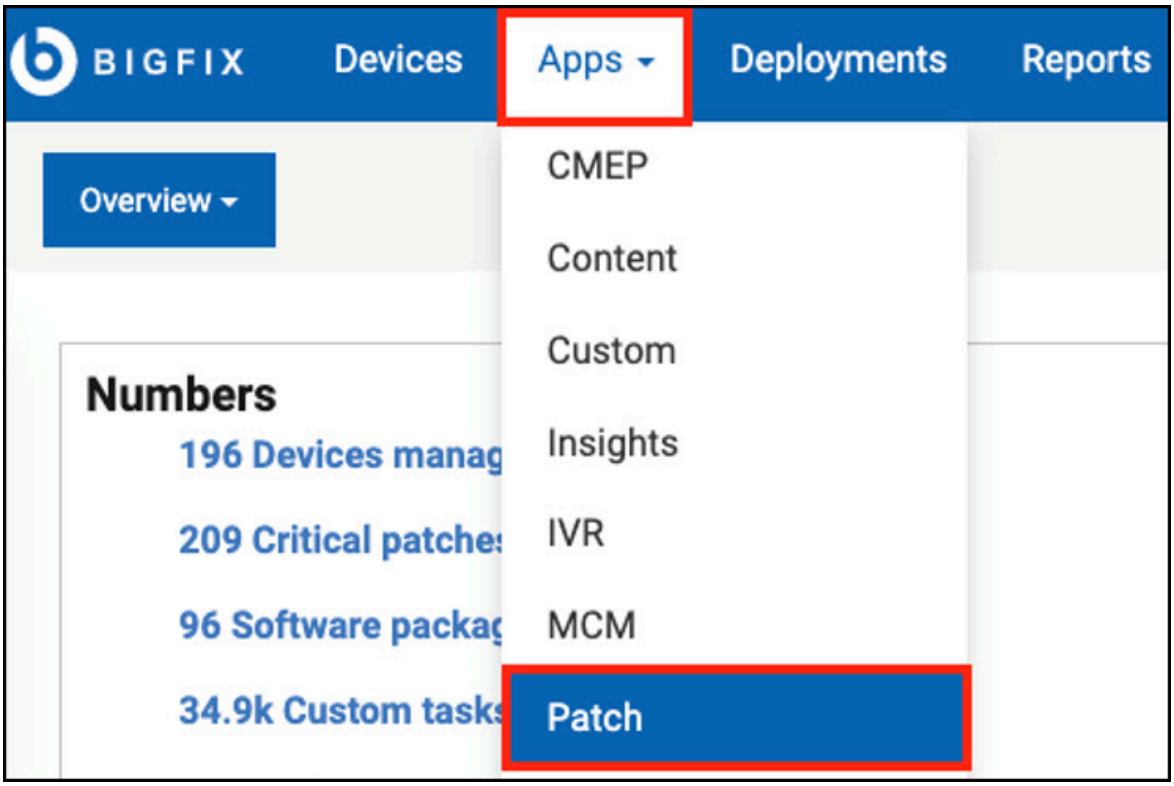
Finding updates for Windows middleware applications in the WebUI

You can view content on the **Updates for Windows Application - middleware** WebUI.

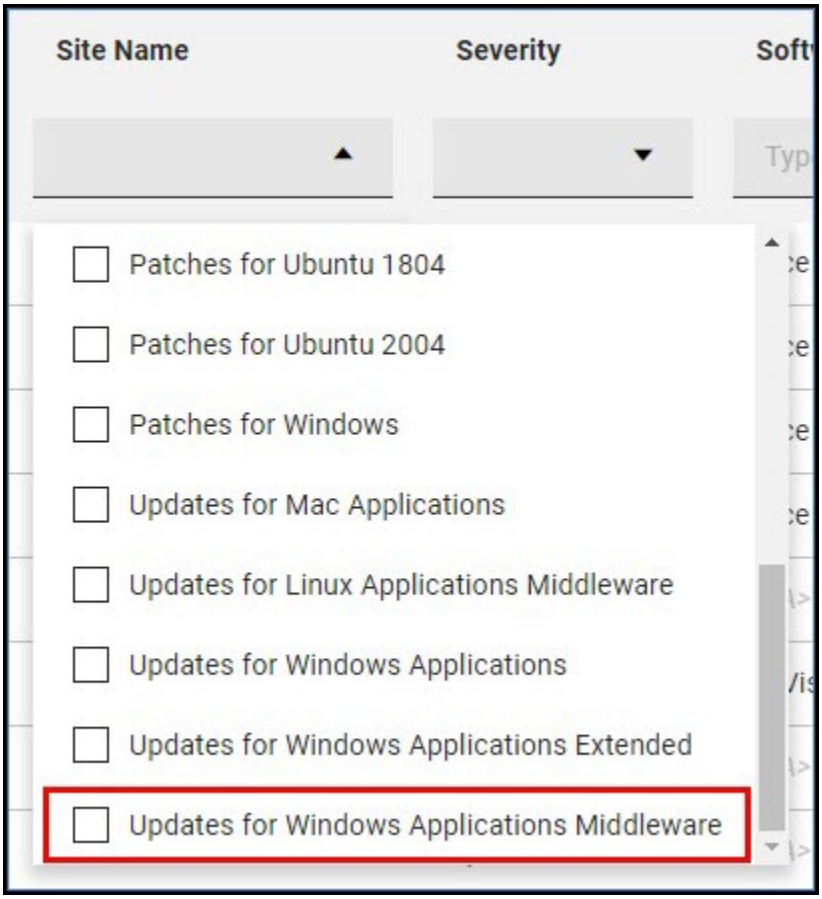
1. Log in to the WebUI.

   Note: Use the same credentials that you use for BigFix console.

2. From the **Apps** menu, select **Patch**.


BIGFIX
Devices
Apps
Deployments
Reports
Overview
CMEP
Content
Custom
Insights
IVR
MCM
Patch
Numbers
196 Devices manag
209 Critical patches
96 Software packag
34.9k Custom tasks

3. Use the filter in **Site Name** and select **Updates for Windows Applications Middleware**.



You applied a filter to view only content that relates to updates for Windows middleware applications.

Chapter 3. Manual caching

Manual caching refers to manually storing and managing data in a cache. Users can put patch files into a folder structure or just manually cache the files.

- To manually cache the files on BigFix Server, refer to How do I manually cache a file on the BigFix Server?
- To know about Linux softwares requiring pre-caching, refer to Pre-caching required for Linux applications *(on page 7)*.
- To know about Windows softwares requiring pre-caching, refer to Pre-caching required for Windows applications *(on page 16)*.

Chapter 4. Oracle WebLogic

Oracle WebLogic Server is a unified and extensible platform for developing, deploying, and running enterprise applications. Oracle WebLogic Server is a software application that runs on a middleware tier, between back-end databases and related applications and browser-based thin clients.

Note: Follow the similar methods for IBM MQ, IBM WebSphere, and RedHat JBoss which also require manual caching.

By completing this procedure, you prepare for downloading Oracle Weblogic Server patches.

1. Navigate to the support.oracle.com page.
2. Log in to your account.
3. Click the **Patches & Updates** tab.
4. Search for the applicable version of Oracle WebLogic Server.
5. Download the newest cumulative update that matches the Fixlet deploy. For example, download the `WLS STACK PATCH BUNDLE` patch.
6. Click **Download**.
7. Save the files to your computer.
8. After you download the files, copy them to the `BigFix Root Server` folder. There are two ways to download the files to the `BigFix Root Server` folder.
    a. You can use the `BigFix REST API` to upload the file.
    b. Rename the file to its SHA1 value and place it in the `www` folder.
9. Deploy the required Fixlets to update Oracle WebLogic Server by using the manually cached files as mentioned in the following link.
   To manually cache a file on the BigFix server, refer to https://support.hcltechsw.com/csm?id=kb_article&sysparm_article=KB0023289.

Chapter 5. Oracle Database

An Oracle Database (DB) is a collection of data treated as a unit. A database stores and retrieves related information. Oracle Database is widely used and known for its reliability, scalability, and extensive features.

Patching an Oracle Database with BigFix involves three basic steps:

Deploying an "Update" Fixlet as a Policy Action

This action captures information about all databases in the oratab file (or Oracle services on Windows) along with their respective patch levels.

Deploying a "Precheck" Fixlet

This steps includes updating the Oracle opatch utility to the version required by the patch, and to verify the prerequisites (disk space, patch conflicts, etc) for installing the patch.

Deploying a "Patch" Fixlet

The final step is to deploy a "Patch" Fixlet that installs both the binary and database patches.

Note: On non-Windows systems, the Update Fixlet can only capture information about databases that are in the oratab file. If a database is not in the oratab file, the patch Fixlet will not include it in the patching process.

Note: The Precheck and Patch Fixlets are specific to OS, Oracle version, and specific patch level such as "OracleDB 19c on Linux - 2023-10 Patch". (There are also Fixlet variants specific to ASM and RAC.) When a Precheck or Patch Fixlet is deployed to a database server, it performs prechecks or patches on all the targeted databases on that server. For example, "OracleDB 19c on Linux - 2023-10 Patch" will patch all 19c databases on the server to 2023-10, that are listed in the oratab file.

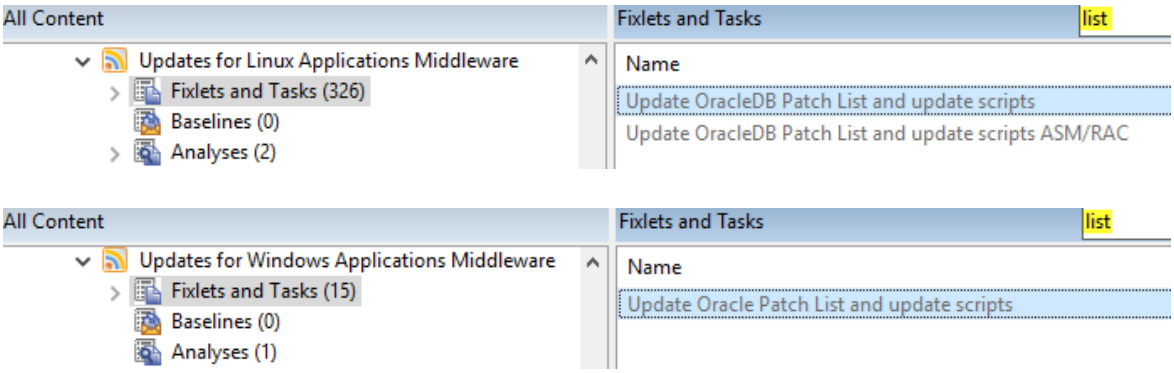
Note: The Precheck Fixlet is designed to be run multiple times as needed prior to patching. Running the Precheck Fixlet allows you to verify that all the prerequisites are met before deploying the corresponding Patch Fixlet.

Configuring Oracle DB patching for your deployment

You can configure Oracle DB patching for your deployment from BigFix console.

Complete the following steps to configure Oracle DB patching for your deployment from the BigFix console licence overview dashboard:

1. In the BigFix console, click the **Updates for Linux Applications Middleware site** or the **Updates for Windows Applications Middleware site** to open the required sites.

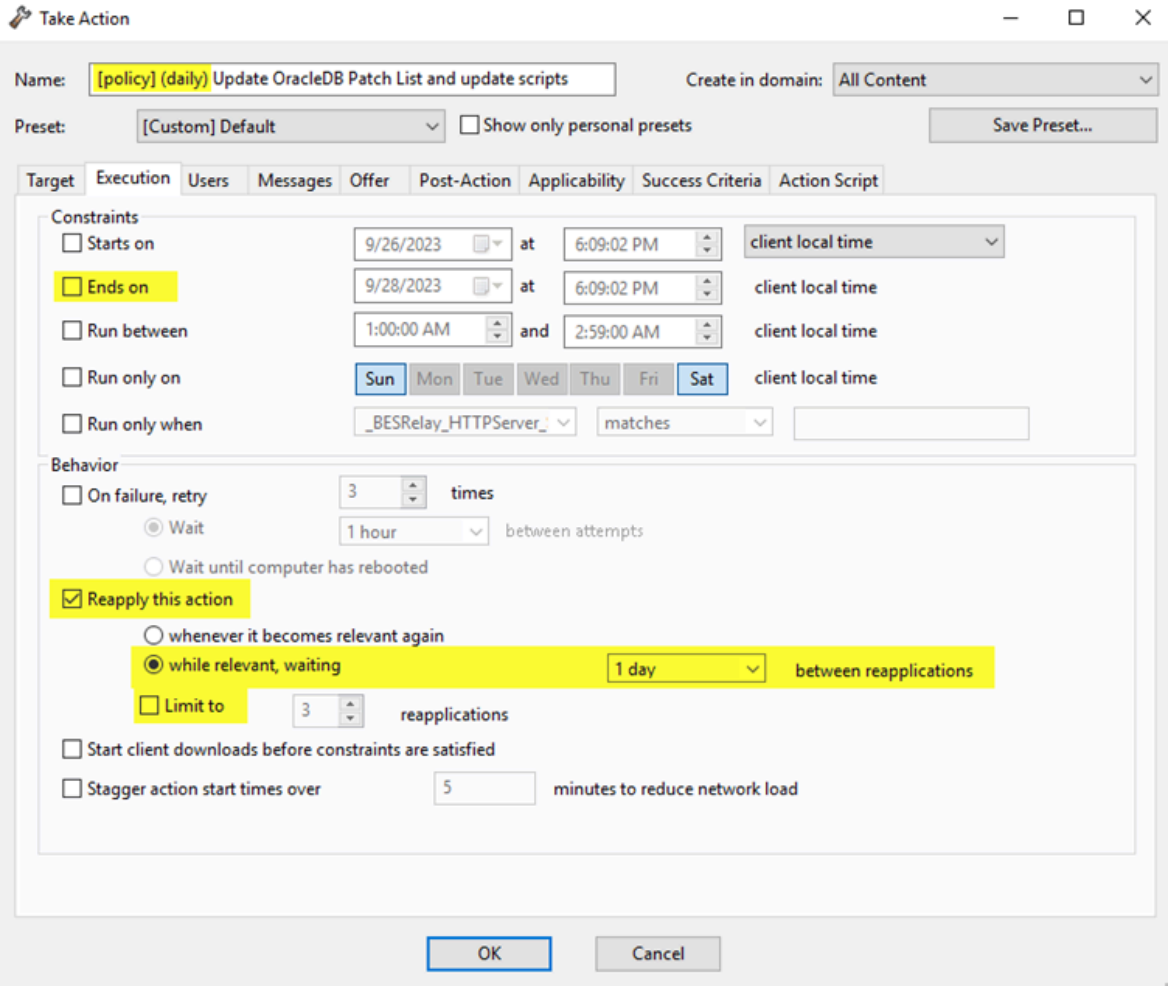


2. Click **Fixlets and Tasks** and choose the appropriate **Update Oracle DB Patch List and update scripts** Fixlet from your Oracle DB installation.

   Note: If you are using Oracle ASM or Oracle RAC, select the ASM/RAC Fixlet version.

   Note: If you are running a standalone Oracle DB, choose the plain Fixlet version.

3. Click a **Update Oracle DB Patch List and update scripts** Fixlet and select **Take Action**.



4. Set the input fields in the **Execution** tab of the **Take Action** window.

   End Date

   Leave the end date field empty or unspecified.

   Reapply Action

   Click **While Relevant** to enable this option to ensure the action is reapplied whenever it becomes relevant.

   Reapply Interval

   Set the reapply interval to `1 day` to wait one day between reapplications.

   Maximum Allowed Reapplications

   Choose `Unlimited` to accept unlimited reapplications.

   Action Name

   Update the action's name to clearly indicate that it is a policy action.

5. By configuring the action on the **Execution** tab as described, you create a policy action that runs daily.

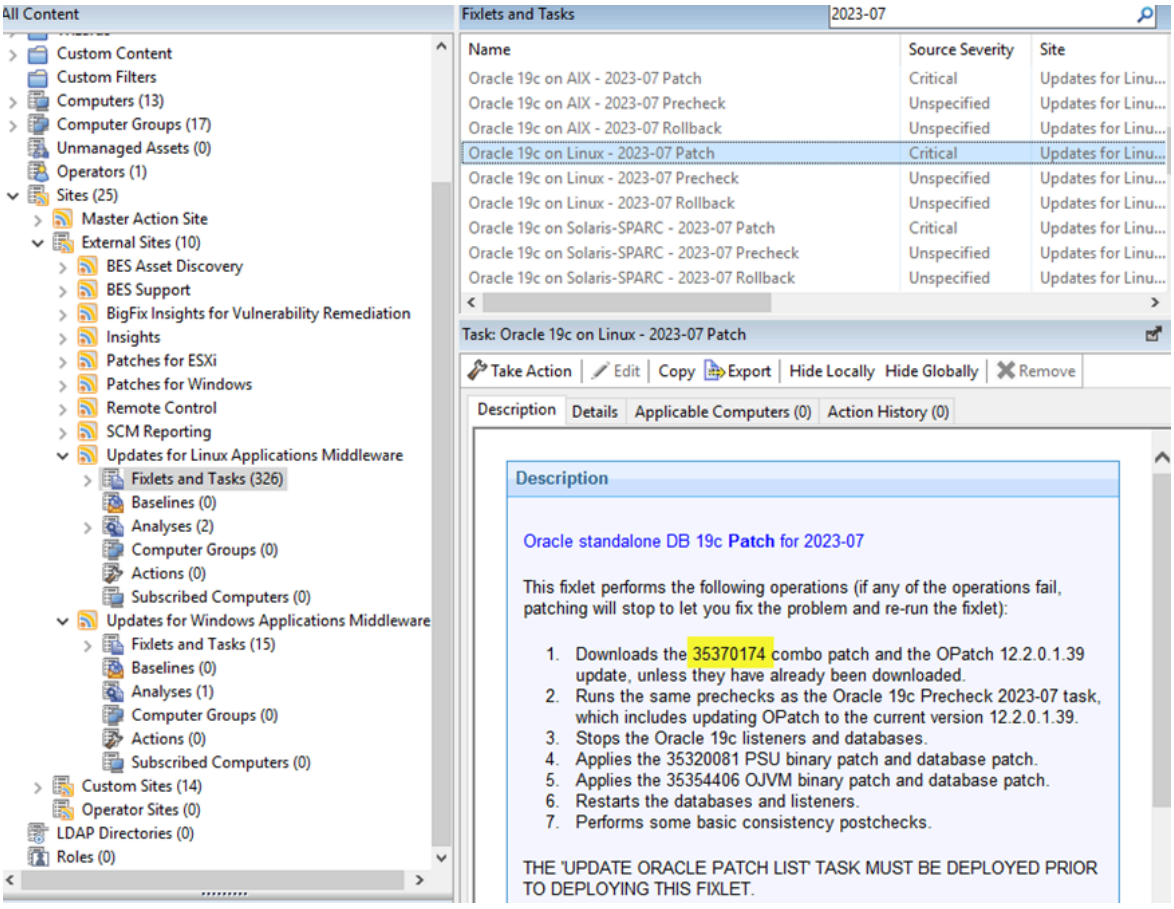
6. When you finish editing, click **OK** to deploy the action.
7. After the policy action runs on the database servers, Oracle DB patch actions can become relevant.

Note: The Fixlet detects only databases that are configured in `/etc/oratab (or /var/opt/oracle/oratab on Solaris)`.

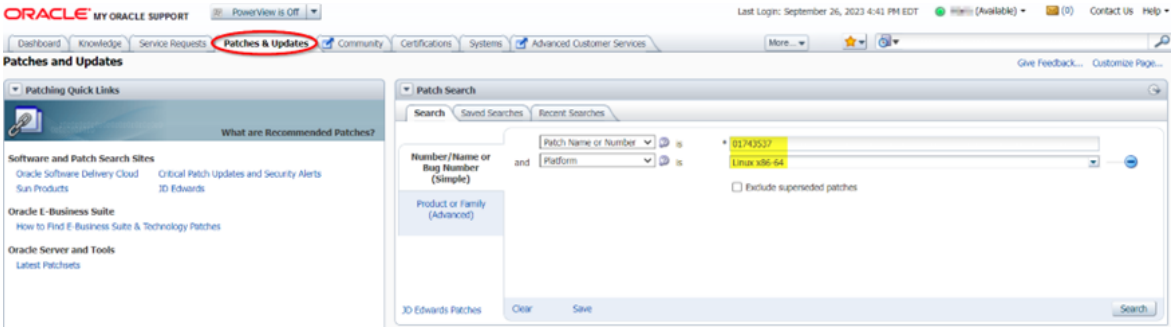
Preparing Oracle DB patch downloads

Complete these steps to prepare for downloading Oracle DB patches.

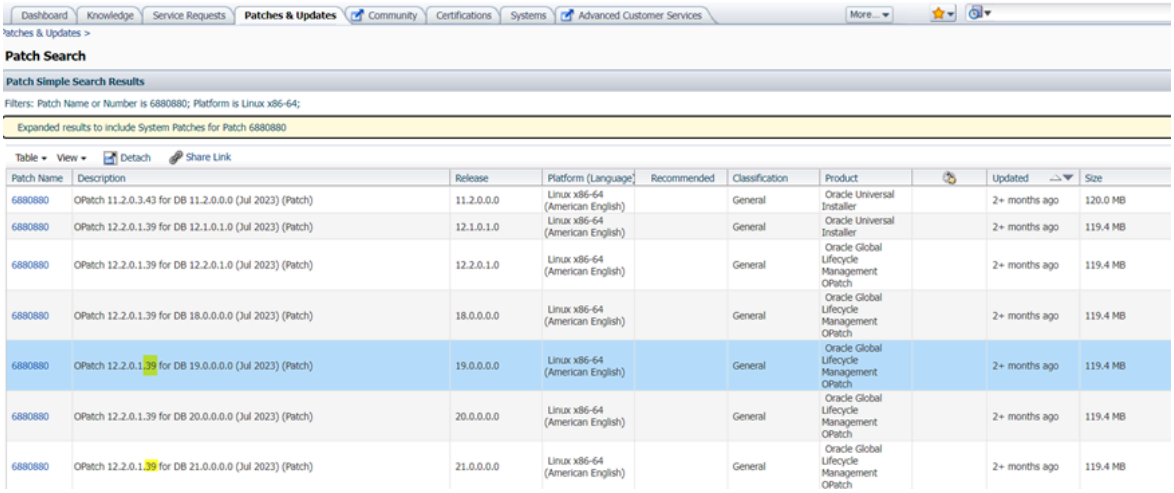
1. In the BigFix console, click **Updates for Linux Applications Middleware site** or **Updates for Windows Applications Middleware site** to view the updates for **Fixlets and Tasks**.
2. To view the **Fixlets and Tasks**, click **Sites > External Sites > Updates for Linux Applications Middleware** or **Updates for Windows Applications Middleware site** in the **All content** pane.
3. From the **Fixlets and Tasks** list, select the **Precheck** or **Patch Fixlet** item associated with the required patch level to deploy. Then, click the **Description** tab.
4. The Fixlet description displays the patch ID that the Fixlet will download.



5. Navigate to support.oracle.com, log in to your account, and then click **Patches & Updates**. In the **Search** tab, enter the required information in the **Patch Name or Number** and **Platform** fields. Then, click **search** to find the patch ID from the Fixlet description and download it.

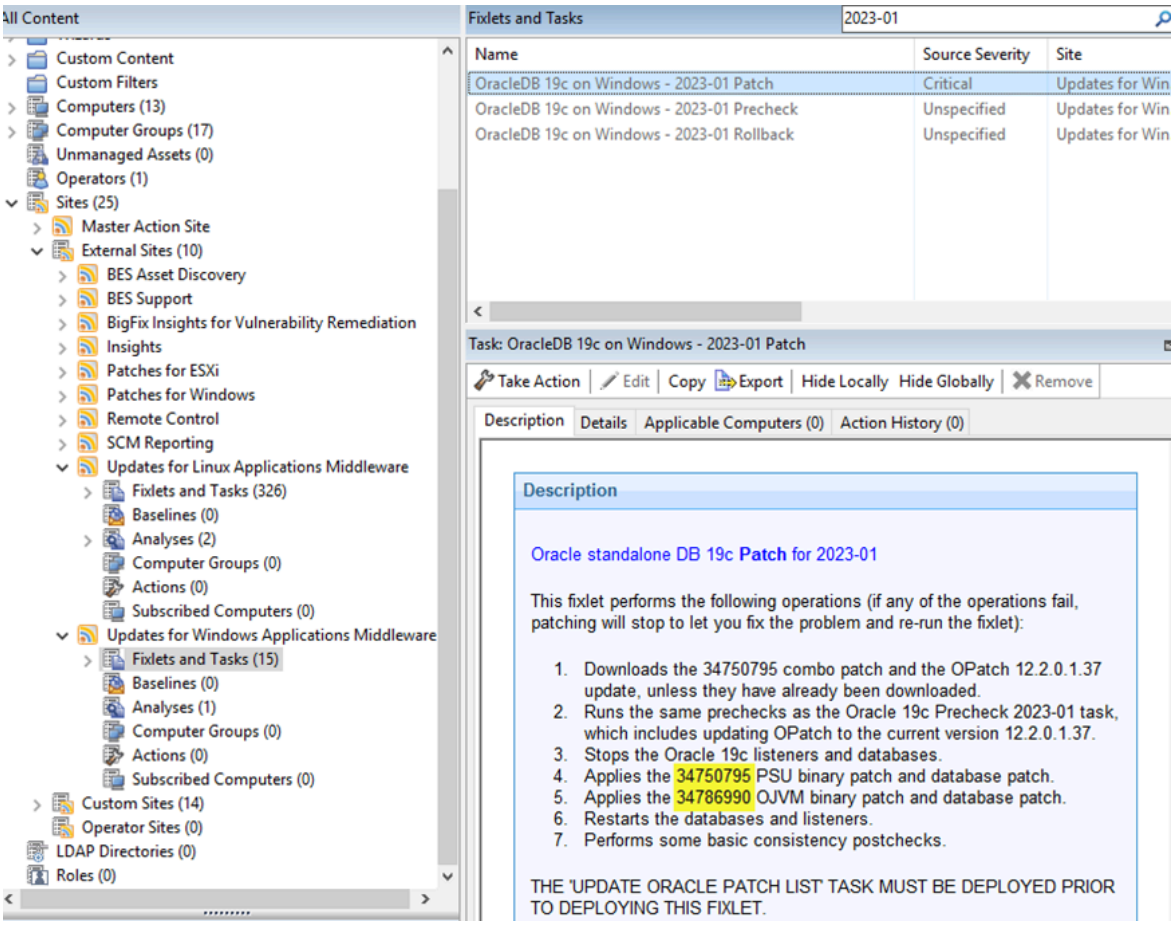


6. The latest OPatch update contains only the patch ID 6880880. Search for this patch ID and make sure it's for the same platform as the main patch ID.
7. Confirm that the OPatch version in the file listing matches the OPatch version stated in the Fixlet description before you download the OPatch update for Version 19.0.0.0.



8. If you find that the downloaded OPatch version doesn't match the OPatch ID mentioned in the Fixlet description, then you proceed as follows:
    a. Create a custom copy of the patch Fixlet.
    b. Change the **OSIZE** parameter to match the size of the p680880 patch file size in bytes.
    c. Change the **OSHA1** parameter to match the SHA1 hash of the p680880 patch file.
    d. Save this customized copy and use it in place of the original Fixlet.
9. If you use Windows Oracle DB patch Fixlets, you must download an extra patch. The Fixlet description contains IDs for both the PSU and the OJVM patches.

Important: You must download both patches because the patching process requires both.



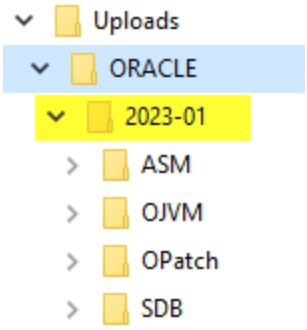
10. After you download all the required files, create the required folder structure in the `BigFix Enterprise\BES Server\wwwrootbes\Uploads` directory. To create the folder structure:
    a. Create an `ORACLE` folder in the `Uploads` folder.
    b. In the `ORACLE` folder, create a folder with the patch level, for example, `2023-01`.
    c. In the patch-level folder, create the following subfolders and copy the patch files into them:

        `OPatch`: Copy all the p680880 `zip files for each OS` into this folder.

        `SDB`: Copy the combo patch `zip files for each OS` into this folder.

`ASM`: Copy the combo grid patch `zip files for each OS` into this folder if you are patching ASM or RAC.

`OJVM`: Copy the OJVM patch `zip files for each OS` into this folder if you are patching Oracle on Windows.



Check servers for Oracle DB patch readiness by using the precheck Fixlets

For each Oracle DB patch Fixlet a corresponding precheck Fixlet is available. The precheck Fixlets check that your Oracle DB servers are ready to accept the the specified Oracle patch level.

Each precheck Fixlet performs the following activities:

1. Downloads the PSU and OJVM combination patch file and the current OPatch file from the BigFix server.
2. Verifies dependencies, such as (Perl is installed, Oracle home permissions permit patching, and so on.
3. Verifies at least one listener is running.
4. Verifies all databases that are defined in the `/etc/oratab (or /var/opt/oracle/oratab on Solaris)` folder are running.
5. Verifies all databases are online if you are patching grid/ASM/RAC.
6. Verifies that each Oracle home has enough space to install the patches.
7. Verifies there are no invalid *dba_objects* or *dba_registry* rows. (The `ORACLE_ALLOW_INVALIDS` client setting disables this check.)
8. Indicates whether the PSU binary patch or the OJVM binary patch or both pactches are required.
9. Indicates whether the PSU database patch or the OJVM database patch or both patches are required.
10. Installs a current OPatch if the version installed doesn't meet the minimum required for the patches.
11. Verifies that no installed interim patches conflict with the installation of PSU or OJVM patches. The `ORACLE_ALLOW_CONFLICTS` client setting disables this check.
12. Removes inactive patches to minimize the time required for actual patching. Inactive patches are patches that have already been superseded by another patch installed on the system, as identified by the Oracle opatch tool.

A successful precheck action reports a `Completed` status. If any of the preceding activities fails, the precheck action reports a `Failed` status. If the Oracle patching results analysis is activated, the `Oracle Prechecks Failed` property reports a summary of the checks that failed.

The `/var/opt/BESClient/ORACLE` folder contains files that can help you troubleshoot an failed precheck, including `PRECHECK-<OracleVersion>.log (e.g. PRECHECK-19.0.0.0.log)` , which is a detailed log of the latest precheck action.

Patch files are downloaded to the *`ORACLE HOME`*`/PATCHING` folder. With the `ORACLE_PATCH_FOLDER` client setting you can override this placement by specifying a different folder for the downloads.

Important: The patch downloads are not removed at the end of the precheck action> A subsequent precheck and patch actions re-use the downloaded files. The downloads are removed after a successful patch action.

You can run a precheck Fixlet as many times as required to prepare to run a patch action.

Patch Oracle databases

Oracle Database Patch Fixlets are specific to OS, Oracle version, and specific patch level such as "OracleDB 19c on Linux - 2023-10 Patch". (There are also Patch Fixlet variants specific to ASM and RAC.) When a Patch Fixlet is deployed to a database server, it attempts to patch all the targeted databases on that server; for example, "OracleDB 19c on Linux - 2023-10 Patch" will patch all 19c databases listed in the server's oratab file to 2023-10.

Each patch Fixlet performs the following activities:

1. Downloads the PSU and OJVM combination patch file and the current OPatch file from the BigFix server, if you haven't downloaded them already during a precheck action or a previous failed patch action.
2. Reruns all the same prechecks as the corresponding precheck Fixlet.
3. Applies the PSU and OJVM binary patches and verifies that they were successfully applied.
4. Applies the PSU and OJVM database patches and verifies that they were successfully applied for grid/ASM/ RAC patches. This action runs during the binary patch phase by the Oracle autopatch tool.
5. Runs some basic post-patch database consistency checks, such as verifying that the run didn't result in invalid dba_objects or dba_registry rows.
6. Removes the patch downloads if the patch was successful.

A successful patch action reports a `Completed` status. If any of the preceding activities fails, the patch action reports a `Failed` status. If you activated the Oracle patching results analysis, the `Oracle Patching Failed` property reports a summary of the patching activities that failed.

The `/var/opt/BESClient/ORACLE` folder contains files that can help you troubleshoot an unsuccessful patch, including the `PATCH-<OracleVersion>.log (e.g. PATCH-19.0.0.0.log)` file, which is a detailed log of the latest patch action.

The corresponding rollback Fixlet becomes applicable after the patch Fixlet deployment.

Important: The patch Fixlets will only patch the databases that they know about. They only know about the databases listed in the oratab file. Only the databases explicitly mentioned in the oratab file will be patched.

Rolling back an Oracle DB patch

You can roll back most Oracle DB patches with Fixlets that HCL provides. However, rollbacks are not officially supported.

Patch rollback Fixlets remove the Fixlets that the corresponding patch Fixlet applied. For example, if an Oracle DB server is initially at the 2023-01 patch level, and the patch Fixlet for 2023-07 is applied, then the rollback Fixlet for 2023-07 removes the 2023-07 patches. After the Fixlet removes the 2023-07 patches, the DB server returns to the 2023-01 patch level.

Important: Patch rollback Fixlets do not roll back the OPatch version upgrades that a precheck patch Fixlet installed.

The corresponding precheck and patch Fixlets become applicable again after a a rollback Fixlet deployment.

Troubleshooting

Troubleshooting in Oracle DB involves diagnosing and resolving issues that might arise while you work with the database server, applications, or related components.

The following files found in the `/var/opt/BESClient/ORACLE` folder are useful for troubleshooting issues:

1. The `SIDlist.txt` file contains the database information from `/etc/oratab` or `/var/opt/oracle/oratab` (Solaris) folders. The file also contains useful information that the `Update` policy action added: PSU patch level, OJVM patch level, the current OPatch version, and the Oracle user. These are the databases that the precheck, patch, and rollback Fixlets recognize, so Fixlets act on these databases.

   Important: If a database is not in the `/etc/oratab` or `/var/opt/oracle/oratab` (Solaris) then it is not included in the *SIDlist.txt* file., which means that Fixlets do not patch that database. Likewise, if the +ASM or +ASMn databases are not in the `oratab` file then they are not included in the *SIDLIST.txt* file, which means the server is not identified as RAC or ASM. Servers with no +ASM* database in the `oratab` folder are assumed to be standalone database servers. If a database looks like it's not getting prechecked or patched, verify that it's in the `oratab` file.

2. The `PRECHECK-OracleVersion.log` file, for example, `PRECHECK-19.0.0.0.log`, is a detailed log of the latest precheck action.
3. The `PATCH-OracleVersion.log` file, for example, `PATCH-19.0.0.0.log`, is a detailed log of the latest patch action.

4. The `ROLLBACK-OracleVersion.log file` file, for example, `ROLLBACK-19.0.0.0.log`, is a detailed log of the latest rollback action.
5. The logs folder contains a 6-month history of precheck, patch, and rollback logs.

Appendix A. Support

For more information about this product, see the following resources:

- BigFix Support Portal
- BigFix Developer
- BigFix Playlist on YouTube
- BigFix Tech Advisors channel on YouTube
- BigFix Forum

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