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Linux, Solaris, AIX, and HP-UX

Workflows for Oracle MySQL

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Contents

| | |
|-----------------------------------------------|----|
| MySQL | 5 |
| MySQL - Compliance Audit | 6 |
| Prerequisites for this Workflow | 7 |
| How this Workflow Works | 8 |
| How to Run this Workflow | 10 |
| Sample Scenarios | 14 |
| Parameters for MySQL - Compliance Audit | 19 |
| MySQL - SQL Release | 20 |
| Prerequisites for this Workflow | 21 |
| How this Workflow Works | 22 |
| How to Run this Workflow | 23 |
| Parameters for MySQL - SQL Release | 26 |
| MySQL - Upgrade Instance | 28 |
| Prerequisites for this Workflow | 29 |
| How this Workflow Works | 30 |
| How to Run this Workflow | 32 |
| Parameters for MySQL - Upgrade Instance | 37 |
| MySQL Drop Database | 41 |
| Prerequisites for this Workflow | 42 |
| How this Workflow Works | 43 |
| How to Run this Workflow | 44 |
| Parameters for MySQL - Drop Database | 45 |
| MySQL - Install Instance | 46 |
| Prerequisites for this Workflow | 47 |
| How this Workflow Works | 48 |
| How to Run this Workflow | 49 |
| Parameters for MySQL - Install Instance | 51 |
| MySQL - Create Database | 52 |
| Prerequisites for this Workflow | 53 |
| How this Workflow Works | 54 |
| How to Run this Workflow | 55 |
| Parameters for MySQL - Create Database | 57 |
| MySQL - Start or Stop | 58 |
| Prerequisites for this Workflow | 59 |
| How this Workflow Works | 60 |
| How to Run this Workflow | 61 |
| Parameters for MySQL - Start or Stop | 63 |

Send documentation feedback64

MySQL

| Workflow type | Workflow name |
|--------------------|---------------------------------------------|
| Provisioning | "MySQL - Install Instance" on page 46 |
| | "MySQL - Create Database" on page 52 |
| | "MySQL - Start or Stop" on page 58 |
| | "MySQL Drop Database" on page 41 |
| | MySQL - Upgrade Instance |
| Release Management | MySQL - SQL Release |
| Compliance | "MySQL - Compliance Audit" on the next page |

MySQL - Compliance Audit

The MySQL - Compliance Audit workflow enables you to audit an instance of MySQL database for compliance with the following Center for Internet Security (CIS) benchmarks and, optionally, compare the audit results to the related Payment Card Industry (PCI) and Sarbanes-Oxley (SOX) requirements:

- CIS Security Benchmark for MySQL Enterprise Edition 5.6, June 2015
- Payment Card Industry Data Security Standard Version 3.1, April 2015
- Sarbanes-Oxley Act of 2002 Section 302

This workflow audits an instance of MySQL database using CIS Level 1 and Level 2 benchmarks. It will then compare the results to the pertinent PCI and SOX requirements, where applicable. The audit identifies compliance related problems with a MySQL instance.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 8 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| "How to Run this Workflow" on page 10 | Instructions for running this workflow in your environment |
| "Sample Scenarios" on page 14 | Examples of typical parameter values for this workflow |
| "Parameters for MySQL - Compliance Audit" on page 19 | List of input parameters for this workflow |

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the MySQL - Compliance Audit workflow:

- The latest DMA solution packs require the latest DMA platform. To use the latest solution packs, update the DMA platform. DMA10.60.000.000 solution packs are supported on DMA10.60.000.000 (and later).
- You have installed the Database Compliance solution pack.

The information presented here assumes the following: show assumptions

- DMA is installed and operational.
- At least one suitable target server (database) is available.
- You are logged in to the DMA web interface.
- You have permission to create, edit, and deploy copies of the workflows included in this solution pack.

For more information about prerequisites for MySQL database, refer to the [MySQL Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

- Prepares to run the workflow by gathering information about the target MySQL server instance and validating parameter values.
- Audits the various configuration settings specified in the pertinent CIS, SOX, or PCI benchmark.
- Composes and sends an email containing the results of the audit.

Note: The emails are sent through the mail server configured on the HPE DMA server. You can configure the mail server in the path below:

DMA setup > Configuration > Outgoing Mail > Server.

Validation Checks Performed show

This workflow validates the following conditions:

1. Any Excluded Checks specified by the user refer to actual CIS, SOX, or PCI benchmark checks.
2. Any email addresses specified are valid addresses.
3. The workflow can create the temporary file that will store the compliance check results.

Steps Executed show

The MySQL - Compliance Audit workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by Run MySQL Compliance Audit

| Workflow Step | Description |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MySQL - Gather Parameters for MySQL Compliance | This step gathers two pieces of information: (1) the type of compliance audit to perform and (2) the list of compliance checks to exclude from the audit. |
| MySQL - Gather Advanced Parameters for MySQL Compliance | This step gathers the optional parameters for MySQL compliance. |
| Validate Compliance Parameters v2 | <p>This step validates the input parameters specified in the previous steps. It validates the list of excluded checks to ensure that all specified checks in the list correspond to actual Center for Internet Security (CIS) benchmark items. It also validates the email information to ensure that all specified email addresses are valid.</p> <p>The step then creates the path to the temporary file that will store the results of the current audit as the workflow is running. This file is deleted after the audit report is sent.</p> |

Steps Used by Run MySQL Compliance Audit, continued

| Workflow Step | Description |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MySQL - Prepare MySQL Compliance Check | <p>This step determines whether workflow can perform the following actions on the target system:</p> <ul style="list-style-type: none"> • Check database connectivity • Check if MySQL configuration path is a valid file path. <p>If the workflow can perform these actions, it is capable of running the Center for Internet Security (CIS) Security Configuration Benchmark compliance tests.</p> |
| MySQL - Audit Operating System Level Configuration | This step audits the recommendations related to the operating system on which the MySQL database server is running. |
| MySQL - Audit File System Permissions | This step audits the file system permissions that are critical for keeping the data and configuration of the MySQL server secure. |
| MySQL - Audit General Settings | This step audits the recommendations related to various parts of the database server. |
| MySQL - Audit MySQL Permissions | This step audits the recommendations related to user privileges. |
| MySQL - Audit Auditing and Logging | This step audits the guidance with respect to MySQL's logging behavior. |
| MySQL - Audit Authentication | This step validates the configuration recommendations that pertain to the authentication mechanisms of MySQL. |
| MySQL - Audit Network | This step validates the recommendations related to how the MySQL server uses the network. |
| MySQL - Audit Replication | This step validates the recommendations related to replicating data from one server to another. |
| Validate Post Compliance Checks | <p>This step reads the temporary file that contains the results of the compliance audit and prints the audit results to the DMA Console. It also creates (or updates) the compliance metadata fields for the target.</p> <p>If email addresses were specified, it also creates a report in HTML format that will be emailed to those addresses by a later step in the workflow.</p> |
| Send Compliance Email v2 | If email addresses are provided, this step sends the previously generated compliance audit report to the specified email addresses. |
| Delete File | This step deletes the specified file on the target server. |

Note: For input parameter descriptions and defaults, see "[Parameters for MySQL - Compliance Audit](#)" on page 19.

How to Run this Workflow

The following instructions show you how to customize and run the MySQL - Compliance Audit workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for MySQL - Compliance Audit" on page 19](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 7](#), and ensure that all requirements are satisfied.

To use the Run MS SQL Compliance Audit workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

Parameters Defined in this Step: MySQL - Gather Parameters for MySQL Compliance

| Parameter Name | Default Value | Required | Description |
|----------------------------|---------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Compliance Type | CIS | optional | Type of compliance report that will be generated by the workflow. Supported types are: CIS = Center for Internet Security (CIS) Security Configuration Benchmark PCI = Payment Card Industry (PCI) Data Security Standard SOX = Sarbanes-Oxley (SOX) sections 302.2, 302.4b, 302.4c, and 302.5 requirements |
| Excluded Compliance Checks | no default | optional | Comma-separated list of compliance checks to exclude from the audit. For example: 1.2, 2, 3.*, 5*, 6.1.2 Note: Make sure that the checks specified here correspond with the compliance audit type (CIS, PCI, or SOX) that you are running. |

Parameters Defined in this Step: MySQL - Gather Parameters for MySQL Compliance, continued

| Parameter Name | Default Value | Required | Description |
|--------------------------|---------------|----------|------------------------------------------------------------------------------------------------|
| MySQL Configuration File | no default | optional | Absolute path of the my.cnf file for the given instance. For example: /usr/my.cnf, /etc/my.cnf |
| MySQL Password | no default | required | MySQL password for the given MySQL account. |
| MySQL User Name | no default | required | MySQL user account that has access to the 'mysql' and 'information_schema' databases. |

Parameters Defined in this Step: MySQL - Gather Advanced Parameters for MySQL Compliance

| Parameter Name | Default Value | Required | Description |
|-----------------------------------|---------------|----------|---------------------------------------------------------------------------------------------------------------------------------|
| Email Addresses to Receive Report | no default | required | Comma-separated list of email addresses for those individuals or groups who will receive a copy of the compliance audit report. |
| Latest MySQL Version Number | no default | required | Latest MySQL version number containing the latest security patch. For example: 5.6.25. |

Note: This is the minimum set of parameters required to run this workflow. You may need to expose additional parameters depending on your objectives.

See "[Parameters for MySQL - Compliance Audit](#)" on page 19 for detailed descriptions of all input parameters for this workflow, including default values.

- In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
- Save the changes to the workflow (click **Save** in the lower right corner).
- Create a new deployment.
- On the Parameters tab, specify values (or set the type to Runtime Value) for the required

parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.

7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Information about each compliance check is displayed in the step output on the Console (and the History page) for each of the audit steps.

A summary of the compliance audit is also displayed in the step output for the Validate Post Compliance Checks step.

To view the reports:

A compliance audit summary in HTML format is emailed to all parties on the Email Addresses to Receive Report list.

After you run this workflow, you can generate two types of compliance reports on the Reports page:

- Database Compliance Report
- Database Compliance Detail Report

To access the Database Compliance reports:

1. Go to the Reports page.
2. At the bottom of the page, specify the following settings:

For the Database Compliance Report:

- a. Select the Database Compliance report.
- b. Select the organization where your target resides.
- c. Because this report lists the latest compliance audit reports for all targets in the specified organization, you do not specify a Server, Database, or Time span.

For the Database Compliance Detail Report:

- a. Select the Database Compliance Details report.
- b. Select the organization where your target resides.
- c. Specify the Server and Instance that you selected when you created your deployment.

3. Click **Run report**.

Sample Scenarios

This topic shows you how to use various parameters to achieve the following compliance audit scenarios in your environment using the MySQL - Compliance Audit workflow.

Scenario 1: Perform a Partial CIS Compliance Audit and Email the Results show

In the scenario, the following checks are excluded from the audit:

- Section 7: Replication
- Section 9: Surface Area Configuration Tool

A summary report is sent to the three parties listed in the Email Addresses to Receive Report parameter.

| Parameter Name | Example Value | Description |
|-----------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Compliance Type | CIS | Type of compliance report that will be generated by the workflow. Supported types are: CIS = Center for Internet Security (CIS) Security Configuration Benchmark PCI = Payment Card Industry (PCI) Data Security Standard SOX = Sarbanes-Oxley (SOX) sections 302.2, 302.4b, 302.4c, and 302.5 requirements |
| Excluded Compliance Checks | 7.*,9.* | Comma-separated list of compliance checks to exclude from the audit. For example: 1.2, 2, 3.*, 5*, 6.1.2 Note: Make sure that the checks specified here correspond with the compliance audit type (CIS, PCI, or SOX) that you are running. |
| Email Addresses to Receive Report | MySQLDBAdminTeam@mycompany.com, MySQLDBAdminMgr@mycompany.com, CustomerSupportTeam@mycompany.com | Comma-separated list of email addresses for those individuals or groups who |

| Parameter Name | Example Value | Description |
|----------------|---------------|-----------------------------------------------------|
| | | will receive a copy of the compliance audit report. |

Note: Some of these parameters are not exposed by default in the deployment.

Be sure that the default values for all remaining input parameters are appropriate for your environment.

Scenario 2: Perform a Full PCI Compliance Audit and Email the Results show

A summary report is sent to the three parties listed in the Email Addresses to Receive Report parameter.

| Parameter Name | Example Value | Description |
|-----------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Compliance Type | PCI | Type of compliance report that will be generated by the workflow. Supported types are: CIS = Center for Internet Security (CIS) Security Configuration Benchmark PCI = Payment Card Industry (PCI) Data Security Standard SOX = Sarbanes-Oxley (SOX) sections 302.2, 302.4b, 302.4c, and 302.5 requirements |
| Email Addresses to Receive Report | MySQLDBAdminTeam@mycompany.com, MySQLDBAdminMgr@mycompany.com, CustomerSupportTeam@mycompany.com | Comma-separated list of email addresses for those individuals or groups who will receive a copy of the compliance audit report. |

Note: Some of these parameters are not exposed by default in the deployment.

Be sure that the default values for all remaining input parameters are appropriate for your environment.

Scenario 3: Perform a Full SOX Compliance Audit, Email the Results, and Configure Windows Domain User Using Runtime Parameters show

A summary report is sent to the three parties listed in the Email Addresses to Receive Report parameter.

Note: By using a runtime parameter for the password, you can ensure that the password used is always the latest.

To specify the password at the time you execute a deployment with runtime parameters, perform the following additional steps:

1. When you make a copy of the workflow, expand the appropriate step, and then set the MySQL Instance Account and MySQL Password to **- User selected -**.
2. When you create a deployment from the copy of the workflow, set the parameter types to **Runtime Value**.
3. When you execute the deployment, specify the MySQL Instance User and MySQL Password.

| Parameter Name | Example Value | Description |
|-----------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Compliance Type | SOX | Type of compliance report that will be generated by the workflow. Supported types are: CIS = Center for Internet Security (CIS) Security Configuration Benchmark PCI = Payment Card Industry (PCI) Data Security Standard SOX = Sarbanes-Oxley (SOX) sections 302.2, 302.4b, 302.4c, and 302.5 requirements |
| Email Addresses to Receive Report | MySQLDBAdminTeam@mycompany.com, MySQLDBAdminMgr@mycompany.com, CustomerSupportTeam@mycompany.com | Comma-separated list of email addresses for those individuals or groups who will receive a copy of the compliance audit report. |
| Latest MySQL Version Number | 5.6.25 | The latest build of MySQL. Example value would be "5.6.25". If no value is given, the related |

| Parameter Name | Example Value | Description |
|----------------|---------------|-----------------------------------|
| | | Compliance check will be skipped. |

Note: Some of these parameters are not exposed by default in the deployment.

Be sure that the default values for all remaining input parameters are appropriate for your environment.

Scenario 4: Perform a Full CIS Compliance Audit and Display the Results on the DMA

Consoleshow

In the scenario, all scorable checks are performed, and the compliance audit report is displayed only on the DMA Console. In this case, a summary report is not emailed. This scenario would be appropriate for initial testing.

It is not necessary to specify any input parameters in this scenario unless the MySQL inventory file is located in a non-standard directory.

| Parameter Name | Example Value | Description |
|-----------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Compliance Type | CIS | Type of compliance report that will be generated by the workflow. Supported types are: CIS = Center for Internet Security (CIS) Security Configuration Benchmark PCI = Payment Card Industry (PCI) Data Security Standard SOX = Sarbanes-Oxley (SOX) sections 302.2, 302.4b, 302.4c, and 302.5 requirements |

Be sure that the default values for all remaining input parameters are appropriate for your environment.

Parameters for MySQL - Compliance Audit

The following tables describe the required and optional input parameters for this workflow. Some of these parameters are not initially visible in a deployment. For most parameters, if you do not specify a value for a parameter, a default value is assigned.

Only those parameters that are configurable in a standard deployment are listed here. Input parameters that must be mapped to output parameters of previous steps are not listed.

Parameters Defined in this Step: Gather Parameters for MySQL Compliance

| Parameter Name | Default Value | Required | Description |
|----------------------------|---------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Compliance Type | CIS | optional | Type of compliance report that will be generated by the workflow. Supported types are: <ul style="list-style-type: none"> • CIS = Center for Internet Security (CIS) Security Configuration Benchmark • PCI = Payment Card Industry (PCI) Data Security Standard • SOX = Sarbanes-Oxley (SOX) sections 302.2, 302.4b, 302.4c, and 302.5 requirements |
| Excluded Compliance Checks | no default | optional | Comma-separated list of compliance checks to exclude from the audit. For example: 1.2, 2, 3.*, 5*, 6.1.2 Note: Make sure that the checks specified here correspond with the compliance audit type (CIS, PCI, or SOX) that you are running. |
| MySQL Configuration File | no default | optional | Absolute path of the my.cnf file for the given instance. For example: /usr/my.cnf, /etc/my.cnf |
| MySQL Password | no default | optional | MySQL password for the given MySQL account. |
| MySQL User Name | no default | optional | MySQL user account that has access to the 'mysql' and 'information_schema' databases. |

Parameters Defined in this Step: Gather Advanced Parameters for MySQL Compliance

| Parameter Name | Default Value | Required | Description |
|-----------------------------------|---------------|----------|---------------------------------------------------------------------------------------------------------------------------------|
| Email Addresses to Receive Report | no default | optional | Comma-separated list of email addresses for those individuals or groups who will receive a copy of the compliance audit report. |
| Latest MySQL Version Number | no default | optional | Latest MySQL version number containing the latest security patch. For example: 5.6.25. |

MySQL - SQL Release

The MySQL - SQL Release workflow enables you to execute the given MySQL scripts on the target database. The given scripts are executed one by one. When any one of the script fails, the workflow exits with failure status.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Parameters for MySQL - SQL Release" | List of input parameters for this workflow |

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the MySQL - Upgrade Instance workflow:

- This solution requires DMA version 10.40 (or later).
- You have installed the Database Release Management solution pack.

The workflow must be able to:

- Log in to the MySQL instance using MySQL login credentials.
- The MySQL login credentials used in the workflow needs to have necessary permissions to perform the operations specified in the SQL scripts.

For more information about prerequisites for MySQL database, refer to the [MySQL Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Executes the given MySQL scripts on the target database.

Steps Executed by the Workflow

The MySQL - SQL Release workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps executed by MySQL - SQL Release workflow

| Workflow Step | Description |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MySQL - Gather Parameters for SQL Release | This step gathers the parameters required to execute the MySQL – SQL Release workflow. |
| MySQL - Validate Parameters for SQL Release | This step validates the input parameters to MySQL – SQL Release workflow. |
| MySQL - Check Prohibited Grant Privileges | This step checks for existence of prohibited grant privileges in the script files. |
| Download Software | This step automates the transfer of files from the HP SA Software Library to individual managed servers for use in downstream workflow steps. Verifies checksum of each file transferred. |
| MySQL - Check Prohibited Database Commands | This step checks for existence of prohibited database commands in the script file. |
| Cleanup Downloaded Files | This step removes all the downloaded files and archives. |
| MySQL - Check Prohibited Regular Expression | This step checks for existence of prohibited regular expression in the script file. |
| MySQL - Check MySQL Syntax | This step checks for syntax errors in the script files. It displays the total count of errors in all the script files. |
| MySQL - Execute Scripts | This step executes the MySQL scripts on the target database. |
| MySQL - Execute Rollback Scripts | This step executes the rollback scripts on the target database. |

Note: For input parameter descriptions and defaults, see "[Parameters for MySQL - SQL Release](#)" on page 26.

How to Run this Workflow

The following instructions show you how to customize and run the MySQL - SQL Release workflow in your environment.

Tip: For detailed instructions to run DMA workflows, see *DMA Quick Start Tutorial*.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for MySQL - SQL Release" on page 26](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 21](#), and ensure that all requirements are satisfied.

To use the Run MySQL - SQL Release workflow:

1. Create a deployable copy of the workflow (see "Create a Deployable Workflow" in *DMA Quick Start Tutorial*)
2. Determine the values that you will specify for the following parameters.

Parameters Defined in this Step: MySQL - Gather Parameters for SQL Release

| Parameter Name | Default Value | Required | Description |
|----------------------------------------------|---------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Check MySQL Syntax Run Flag | Y | Required | Boolean parameter to specify whether syntax check needs to be executed on the MySQL Scripts and on the Rollback Scripts. Default Value is Y. |
| Check Prohibited Grant Privileges Run Flag | Y | Required | Boolean parameter to specify whether the MySQL Script file needs to be checked for prohibited grant privilege commands. Default Value is Y. |
| Check Prohibited MySQL Commands Run Flag | Y | Required | Boolean parameter to specify whether the MySQL Script file needs to be checked for prohibited MySQL commands. |
| Check Prohibited Regular Expression Run Flag | Y | Required | Boolean parameter to specify whether the MySQL Script file needs to be checked for user specified regular expression. |

Parameters Defined in this Step: MySQL - Gather Parameters for SQL Release, continued

| Parameter Name | Default Value | Required | Description |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------|
| Database Password | no default | Required | Password to connect to the database. |
| Database User Name | no default | Required | User Account to connect to the database. |
| Display MySQL Script Output | | Required | Boolean parameter to specify whether the output of MySQL Script file is to be displayed on DMA console. |
| Display SQL Length | 200 | Required | Integer specifying the length of the MySQL script file to be displayed on DMA console in case of exception. |
| Execute Rollback on Failure | N | Required | Boolean parameter to specify whether rollback script is to be executed on failure of execution of MySQL script files. |
| MySQL Script List | no default | Required | Comma separated list of script files to be executed on the target database. |
| Prohibited Grant Privileges | grant all, grant insert, grant create user, grant delete, grant select , grant create routine, grant execute on | Required | Comma separated list of prohibited grant privilege commands. |
| Prohibited MySQL Commands | create database, drop database, create user, drop user | Required | Comma separated list of prohibited MySQL commands. |
| Prohibited Regular Expression | no default | Required | Regular pattern that should not exist in the MySQL Script file. |
| Rollback Script List | no default | Required | Comma separated list of rollback scripts to be executed on failure of execution of MySQL scripts. |
| Staging Directory | /tmp/mysql_sql_release | Required | Directory to place the Scripts downloaded from SA core. |

- In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
- Save the changes to the workflow (click **Save** in the lower right corner).

5. Create a new deployment. See "Create a Deployment" in *DMA Quick Start Tutorial* for instructions.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters. See "Run Your Workflow" in *DMA Quick Start Tutorial* for instructions.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Parameters for MySQL - SQL Release

The following tables describe the required and optional input parameters for this workflow.

Parameters Defined in this Step: MySQL - Gather Parameters for SQL Release

| Parameter Name | Default Value | Required | Description |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------------------------------------|
| Check MySQL Syntax Run Flag | Y | required | If yes (Y), specifies whether syntax check needs to be executed on the MySQL Scripts and on the Rollback Scripts. |
| Check Prohibited Grant Privileges Run Flag | Y | required | If yes (Y), specifies whether the MySQL Script file needs to be checked for prohibited grant privilege commands. |
| Check Prohibited MySQL Commands Run Flag | Y | required | If yes (Y), specifies whether the MySQL Script file needs to be checked for prohibited MySQL commands. |
| Check Prohibited Regular Expression Run Flag | Y | required | If yes (Y), specifies whether the MySQL Script file needs to be checked for user specified regular expression. |
| Database Password | no default | required | Password to connect to the database. |
| Database User Name | no default | required | User Account to connect to the database. Example: root |
| Display MySQL Script Output | Y | required | If yes (Y), specifies whether the output of MySQL Script file is to be displayed on DMA console. |
| Display SQL Length | 250 | required | Specifies the length of the MySQL script file as an integer value to be displayed on DMA console in case of exception. |
| Execute Rollback on Failure | Y | required | If yes (Y), specifies whether rollback script is to be executed on failure of execution of MySQL script files. |
| MySQL Script List | ProperScript.sql | required | Specifies a comma separated list of script files to be executed on the target database. |
| Prohibited Grant Privileges | grant all, grant insert, grant create user, grant delete, grant select , grant create routine, grant execute on | required | Specifies a comma separated list of prohibited grant privilege commands. |
| Prohibited MySQL | create user, drop user | required | Specifies a comma separated list of prohibited MySQL commands. |

Parameters Defined in this Step: MySQL - Gather Parameters for SQL Release, continued

| Parameter Name | Default Value | Required | Description |
|-------------------------------|------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------|
| Commands | | | |
| Prohibited Regular Expression | | required | Specifies a regular pattern that should not exist in the MySQL Script file. |
| Rollback Script List | Rollbackscript.sql | required | Specifies a comma separated list of rollback scripts to be executed on failure of execution of MySQL scripts. |
| Staging Directory | /tmp/mysql_sql_release_hello | required | Specifies a directory to place the scripts downloaded from SA core. |

MySQL - Upgrade Instance

This workflow upgrades the MySQL instance. The existing instance is taken as a backup and is stored in the location specified by the user. In-place RPM upgrade is performed if the upgrades are minor. The existing version is removed and a new installation is done for any major upgrades. After the RPM upgrade, upgrading the databases and the table is performed by running the `mysql_upgrade` utility.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Parameters for MySQL - Upgrade Instance" | List of input parameters for this workflow |

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the MySQL - Upgrade Instance workflow:

- This solution requires DMA version 10.40 (or later).
- You have installed the Database Release Management solution pack.
- If the MySQL client is not installed on the server, include the MySQL client in list of RPMs to be installed.

The workflow must be able to:

- Take dump of the existing databases.
- Upgrade the MySQL RPMs.
- Run the `mysql_upgrade` utility on all the databases.

For more information about prerequisites for MySQL database, refer to the [MySQL Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Steps Executed by the Workflow

The MySQL - Upgrade Instance workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps executed by MySQL - Upgrade Instance workflow

| Workflow Step | Description |
|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MySQL - Gather Parameters for MySQL Upgrade Instance | This step gathers parameters for MySQL Upgrade. |
| MySQL - Gather Advanced Parameters for MySQL Upgrade Instance | This step gathers advanced parameters for MySQL Upgrade. This step has few selected parameters that can be passed as an option to 'mysql_upgrade' command. |
| MySQL - Gather Advanced Parameters for Backup Dump | This step gathers advanced parameters for MySQL Dump. This step has few selected parameters that can be passed as an option to 'mysqldump' command. |
| MySQL - Validate Parameters for Download File | This step consolidates the list of files required to execute the MySQL - Upgrade Instance workflow. |
| Download Software | This step automates the transfer of files from the HP SA Software Library to individual managed servers for use in downstream workflow steps. |
| MySQL - Validate Upgrade | This step validates the pre-requisites for upgrading MySQL instance. For example, whether a direct upgrade from the existing version to the required version is possible or whether the dump file and the software binaries need to be deleted after the execution of the workflow. |
| Cleanup Downloaded Files | This step removes all downloaded files and archives. |
| MySQL - Validate Upgrade and Dump Parameters | This step validates the parameters passed as input for the mysqldump and mysql_upgrade utilities and consolidates all the input parameters in a single string. |
| MySQL - Backup Database | This step takes a dump of the MySQL databases for backup purpose. |
| MySQL - Start or Stop | This step starts or stops the MySQL service based on the action specified as input. |
| Cleanup Downloaded Files | This step removes all downloaded files and archives. |

Steps executed by MySQL - Upgrade Instance workflow, continued

| Workflow Step | Description |
|-------------------------------------|--------------------------------------------------------------------------------------------------|
| MySQL - Upgrade Installation | This step does an in-place rpm upgrade or fresh installation of RPM. |
| MySQL - Clean Dump File | This step removes the MySQL dump file from the system. |
| MySQL - Upgrade Database and Tables | This step runs the 'mysql_upgrade' utility on the upgraded MySQL instance. |
| MySQL - Verify Upgrade | This step verifies the version of the installed MySQL with the version that was to be installed. |
| Discover MySQL Databases | This step discovers the MySQL instances and databases on the target machine. |

Note: For input parameter descriptions and defaults, see "[Parameters for MySQL - Upgrade Instance](#)" on page 37.

How to Run this Workflow

The following instructions show you how to customize and run the MySQL - Upgrade Instance workflow in your environment.

Tip: For detailed instructions to run DMA workflows, see *DMA Quick Start Tutorial*.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for MySQL - Upgrade Instance" on page 37](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 29](#), and ensure that all requirements are satisfied.

To use the Run MySQL - Upgrade Instance workflow:

1. Create a deployable copy of the workflow (see "Create a Deployable Workflow" in *DMA Quick Start Tutorial*)
2. Determine the values that you will specify for the following parameters.

Parameters Defined in this Step: MySQL - Gather Parameters for MySQL Instance Upgrade

| Parameter Name | Default Value | Required | Description |
|----------------------------|---------------|----------|---------------------------------------------------------------------------|
| MySQL Backup Dump Location | /tmp | required | Specifies the location to store the dump of databases for backup purpose. |
| Software Binaries | no default | optional | Specifies a comma separated list of RPMs which needs to be installed. |

Parameters Defined in this Step: MySQL - Gather Advanced Parameters for MySQL Instance Upgrade

| Parameter Name | Default Value | Required | Description |
|----------------------------|---------------|----------|---------------------------------------------------------------------------------------------------------|
| Clean Dump File on Failure | False | optional | Specify if the dump file created as backup needs to be deleted on failure of the workflow |
| Clean Dump File | False | optional | Specify if the dump file created as backup needs to be deleted on successful execution of the workflow. |

Parameters Defined in this Step: MySQL - Gather Advanced Parameters for MySQL Instance Upgrade, continued

| Parameter Name | Default Value | Required | Description |
|------------------------------------|---------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| on Success | | | |
| Clean Software Binaries on Failure | False | optional | Specify if the software binaries or configuration files downloaded from SA core needs to be deleted on failure of the workflow. |
| Clean Software Binaries on Success | False | optional | Specify if the software binaries or configuration files downloaded from SA core needs to be deleted on successful execution of the workflow. |
| MySQL Force Upgrade | True | optional | Force execution of mysql_upgrade utility, even if it has already been executed for current version of MySQL. |
| MySQL Upgrade Additional Options | no default | optional | Pipe delimited additional options that can be passed as input to mysql_upgrade utility. Example: --fields-enclosed-by , --no-autocommit True. |
| MySQL Upgrade Debug Info | no default | optional | Print debugging information, memory, and CPU statistics when program exits. |
| MySQL Upgrade Debug Log | no default | optional | Write debugging log to the given file. Example: d:t:o,/tmp/MySQL_Sample.log. |
| MySQL Upgrade Defaults Extra File | no default | optional | Read named option file in addition to usual option files. |
| MySQL Upgrade Defaults File | no default | optional | Read only named option file. |
| MySQL Upgrade Host | no default | optional | Machine Name or IP Address on which the MySQL server is to be upgraded. |
| MySQL Upgrade Parameter File | no default | optional | File containing additional parameters that needs to be passed as input to mysql_upgrade utility. |
| MySQL Upgrade Password | no default | optional | Password of the MySQL User account that can access the MySQL server that needs to be upgraded |

Parameters Defined in this Step: MySQL - Gather Advanced Parameters for MySQL Instance Upgrade, continued

| Parameter Name | Default Value | Required | Description |
|-----------------------------|---------------|----------|-------------------------------------------------------------------------|
| MySQL Upgrade Port | no default | optional | Port on which the MySQL service that needs to be upgraded is running. |
| MySQL Upgrade User | no default | optional | User Account of the MySQL server that needs to be upgraded. |
| MySQL Upgrade Verbose | no default | optional | Run mysql_upgrade utility in verbose mode. |
| MySQL Upgrade Write Bin Log | no default | optional | Write all statements from mysql_upgrade utility to binary log. |
| Staging Directory | no default | optional | Directory where the software binaries or configuration files available. |

Parameters Defined in this Step: MySQL - Gather Advanced Parameters for Backup Dump

| Parameter Name | Default Value | Required | Description |
|-------------------------------|---------------|----------|-----------------------------------------------------------------------------------------------------------------------|
| MySQL Dump Additional Options | no default | optional | Pipe delimited additional options for mysqldump. Example: --defaults-group-suffix abc --ignore-table ABC.SampleTable. |
| MySQL Dump All Database | True | optional | Dump all tables in all databases. |
| MySQL Dump Compatible Output | no default | optional | Produce output that is more compatible with other database systems or with older MySQL servers. |
| MySQL Dump Date | True | optional | Include dump date as "Dump completed on" comment if --comments is given. |
| MySQL Dump Debug Info | no default | optional | Print debugging information, memory, and CPU statistics when program exits. |
| MySQL Dump Debug Log | no default | optional | Write debugging log to the given file. Example : d:t:o,/tmp/MySQL_Sample.log. |
| MySQL | no | optional | Read named option file in addition to usual option files. |

Parameters Defined in this Step: MySQL - Gather Advanced Parameters for Backup Dump, continued

| Parameter Name | Default Value | Required | Description |
|-----------------------------|---------------|----------|----------------------------------------------------------------------------------------------|
| Dump Defaults Extra File | default | | |
| MySQL Dump Defaults File | no default | optional | Read only named option file. |
| MySQL Dump Events | True | optional | Dump events from dumped databases. |
| MySQL Dump Flush logs | no default | optional | Flush MySQL server log files before starting dump. |
| MySQL Dump Flush Privileges | no default | optional | Emit a FLUSH PRIVILEGES statement after dumping MySQL database. |
| MySQL Dump Host | no default | optional | Machine Name or IP Address of the MySQL Server. |
| MySQL Dump Lock All Tables | True | optional | Lock all tables across all databases. |
| MySQL Dump Log Error | no default | optional | Append warnings and errors to named file. |
| MySQL Dump Parameter File | no default | optional | File containing additional parameters that needs to be passed as input to mysqldump command. |
| MySQL Dump Password | no default | optional | Password for MySQL User. |
| MySQL Dump Result File | no default | optional | Name of the file to store the results of the mysqldump command. |
| MySQL Dump Routines | True | optional | Dump stored routines (procedures and functions) from dumped databases. |
| MySQL Dump User | no default | optional | MySQL User Account. |

Parameters Defined in this Step: MySQL - Gather Advanced Parameters for Backup Dump, continued

| Parameter Name | Default Value | Required | Description |
|--------------------|---------------|----------|--------------------------------------------|
| MySQL Dump Verbose | no default | optional | Run the mysqldump command in verbose mode. |

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment. See "Create a Deployment" in *DMA Quick Start Tutorial* for instructions.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters. See "Run Your Workflow" in *(DMA Quick Start Tutorial* for instructions.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Parameters for MySQL - Upgrade Instance

The following tables describe the required and optional input parameters for this workflow.

Parameters Defined in this Step: MySQL - Gather Parameters for MySQL Upgrade Instance

| Parameter Name | Default Value | Required | Description |
|----------------------------|---------------|----------|---------------------------------------------------------------------------|
| MySQL Backup Dump Location | /tmp | required | Specifies the location to store the dump of databases for backup purpose. |
| Software Binaries | no default | optional | Specifies a comma separated list of RPMs which needs to be installed. |

Parameters Defined in this Step: MySQL - Gather Advanced Parameters for MySQL Upgrade Instance

| Parameter Name | Default Value | Required | Description |
|------------------------------------|---------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Clean Dump File on Failure | False | optional | Specify if the dump file created as backup needs to be deleted on failure of the workflow |
| Clean Dump File on Success | False | optional | Specify if the dump file created as backup needs to be deleted on successful execution of the workflow. |
| Clean Software Binaries on Failure | False | optional | Specify if the software binaries or configuration files downloaded from SA core needs to be deleted on failure of the workflow. |
| Clean Software Binaries on Success | False | optional | Specify if the software binaries or configuration files downloaded from SA core needs to be deleted on successful execution of the workflow. |
| MySQL Force Upgrade | True | optional | Force execution of mysql_upgrade utility, even if it has already been executed for current version of MySQL. |
| MySQL Upgrade Additional Options | no default | optional | Pipe delimited additional options that can be passed as input to mysql_upgrade utility. Example: --fields-enclosed-by , --no-autocommit True. |
| MySQL Upgrade Debug Info | no default | optional | Print debugging information, memory, and CPU statistics when program exits. |

Parameters Defined in this Step: MySQL - Gather Advanced Parameters for MySQL Upgrade Instance, continued

| Parameter Name | Default Value | Required | Description |
|-----------------------------------|---------------|----------|--------------------------------------------------------------------------------------------------|
| MySQL Upgrade Debug Log | no default | optional | Write debugging log to the given file. Example: d:t:o,/tmp/MySQL_Sample.log. |
| MySQL Upgrade Defaults Extra File | no default | optional | Read named option file in addition to usual option files. |
| MySQL Upgrade Defaults File | no default | optional | Read only named option file. |
| MySQL Upgrade Host | no default | optional | Machine Name or IP Address on which the MySQL server is to be upgraded. |
| MySQL Upgrade Parameter File | no default | optional | File containing additional parameters that needs to be passed as input to mysql_upgrade utility. |
| MySQL Upgrade Password | no default | optional | Password of the MySQL User account that can access the MySQL server that needs to be upgraded |
| MySQL Upgrade Port | no default | optional | Port on which the MySQL service that needs to be upgraded is running. |
| MySQL Upgrade User | no default | optional | User Account of the MySQL server that needs to be upgraded. |
| MySQL Upgrade Verbose | no default | optional | Run mysql_upgrade utility in verbose mode. |
| MySQL Upgrade Write Bin Log | no default | optional | Write all statements from mysql_upgrade utility to binary log. |
| Staging Directory | no default | optional | Directory where the software binaries or configuration files available. |

Parameters Defined in this Step: MySQL - Gather Advanced Parameters for Backup Dump

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|-----------------------------------------------------------------------------------------------------------------------|
| MySQL Dump | no default | optional | Pipe delimited additional options for mysqldump. Example: --defaults-group-suffix abc --ignore-table ABC.SampleTable. |

Parameters Defined in this Step: MySQL - Gather Advanced Parameters for Backup Dump, continued

| Parameter Name | Default Value | Required | Description |
|--------------------------------|---------------|----------|-------------------------------------------------------------------------------------------------|
| Additional Options | | | |
| MySQL Dump All Database | True | optional | Dump all tables in all databases. |
| MySQL Dump Compatible Output | no default | optional | Produce output that is more compatible with other database systems or with older MySQL servers. |
| MySQL Dump Date | True | optional | Include dump date as "Dump completed on" comment if --comments is given. |
| MySQL Dump Debug Info | no default | optional | Print debugging information, memory, and CPU statistics when program exits. |
| MySQL Dump Debug Log | no default | optional | Write debugging log to the given file. Example : d:t:o,/tmp/MySQL_Sample.log. |
| MySQL Dump Defaults Extra File | no default | optional | Read named option file in addition to usual option files. |
| MySQL Dump Defaults File | no default | optional | Read only named option file. |
| MySQL Dump Events | True | optional | Dump events from dumped databases. |
| MySQL Dump Flush logs | no default | optional | Flush MySQL server log files before starting dump. |
| MySQL Dump Flush Privileges | no default | optional | Emit a FLUSH PRIVILEGES statement after dumping MySQL database. |
| MySQL Dump Host | no default | optional | Machine Name or IP Address of the MySQL Server. |
| MySQL Dump Lock All Tables | True | optional | Lock all tables across all databases. |
| MySQL Dump Log Error | no default | optional | Append warnings and errors to named file. |

Parameters Defined in this Step: MySQL - Gather Advanced Parameters for Backup Dump, continued

| Parameter Name | Default Value | Required | Description |
|---------------------------|---------------|----------|----------------------------------------------------------------------------------------------|
| MySQL Dump Parameter File | no default | optional | File containing additional parameters that needs to be passed as input to mysqldump command. |
| MySQL Dump Password | no default | optional | Password for MySQL User. |
| MySQL Dump Result File | no default | optional | Name of the file to store the results of the mysqldump command. |
| MySQL Dump Routines | True | optional | Dump stored routines (procedures and functions) from dumped databases. |
| MySQL Dump User | no default | optional | MySQL User Account. |
| MySQL Dump Verbose | no default | optional | Run the mysqldump command in verbose mode. |

MySQL Drop Database

The MySQL Drop Database workflow enables you to remove the target database from the MySQL instance and from the DMA environment.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 43 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 44 | Instructions for running this workflow in your environment |
| "Parameters for MySQL - Drop Database" on page 45 | List of input parameters for this workflow |

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the MySQL Drop Database workflow:

- This solution requires DMA version 10.60.000.000 (or later).
The latest DMA solution packs require the latest DMA platform. To use the latest solution packs, update the DMA platform. DMA10.60.000.000 solution packs are supported on DMA10.60.000.000 (and later).
- You have installed the Database Provisioning solution pack.

The workflow must be able to:

- Log in to the MySQL instance using MySQL login credentials.
- Drop the database upon connecting to the MySQL instance.

The information presented here assumes the following: show assumptions

- DMA is installed and operational.
- At least one suitable target server (database) is available.
- You are logged in to the DMA web interface.
- You have permission to create, edit, and deploy copies of the workflows included in this solution pack.

For more information about prerequisites for MySQL database, refer to the [MySQL Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

- Drops a MySQL database and removes it from the DMA environment.

Steps Executed by the Workflow

The MySQL Drop Database workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by MySQL Drop Database

| Workflow Step | Description |
|--------------------------------------|----------------------------------------------------------|
| Gather Advanced Parameters for MySQL | This step gathers parameters to drop a MySQL database. |
| MySQL - Drop Database | This steps drops the database from the target machine. |
| Remove Database from Environment V2 | This step removes the database from the DMA environment. |

How to Run this Workflow

The following instructions show you how to customize and run the MySQL Drop Database workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for MySQL - Drop Database" on the next page](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 42](#), and ensure that all requirements are satisfied.

To use the Run MySQL Drop Database workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

Parameters for MySQL - Drop Database

There are no mandatory parameters required to run this workflow. All parameters are optional. Some of these parameters are not initially visible in a deployment. For most parameters, if you do not specify a value for a parameter, a default value is assigned.

MySQL - Install Instance

The MySQL - Install Instance workflow installs software for MySQL 5.6 Enterprise x64 edition on RedHat Linux 6. This includes the server, client files, and any other optional components included in RPM files.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 48 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 49 | Instructions for running this workflow in your environment |
| "Parameters for MySQL - Install Instance" on page 51 | List of input parameters for this workflow |

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the MySQL - Install Instance workflow:

- This solution requires DMA version 10.60.000.000 (or later).

The latest DMA solution packs require the latest DMA platform. To use the latest solution packs, update the DMA platform. DMA10.60.000.000 solution packs are supported on DMA10.60.000.000 (and later).

- You have installed the Database Provisioning solution pack.
- SE linux must be turned off.
- RPM files must be mounted locally, available through an external download server, or a combination of both.

The information presented here assumes the following: show assumptions

- DMA is installed and operational.
- At least one suitable target server (database) is available.
- You are logged in to the DMA web interface.
- You have permission to create, edit, and deploy copies of the workflows included in this solution pack.

For more information about prerequisites for MySQL database, refer to the [MySQL Server Documentation](#).

How this Workflow Works

This workflow installs software for MySQL 5.6 Enterprise x64 edition on RedHat Linux 6.

Steps Executed by the Workflow

The MySQL - Install Instance workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by MySQL - Install Instance

| Workflow Step | Description |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MySQL - Gather Parameters for Install Instance | This step gathers parameters to install software for MySQL - Install Instance workflow. |
| MySQL - Gather Advanced Parameters for Install Instance | This steps accepts parameters for advanced MySQL install server and sets defaults. |
| MySQL - Prepare Install Instance | This step prepares server for MySQL instance installation. |
| MySQL - Install Instance | This step installs list of RPMs to create a MySQL instance. |
| Download Software | This step automates the transfer of files from the HP SA Software Library to individual managed servers for use in downstream workflow steps. Verifies checksum of each file transferred. |
| MySQL - Verify Install Instance | This step verifies that MySQL and its components were installed correctly. |
| Cleanup Downloaded Files v2 | This step removes all downloaded files and archives. |
| Discover MySQL Databases | This step discovers the MySQL instances and databases on the target machine. |

How to Run this Workflow

The following instructions show you how to customize and run the MySQL - Install Instance workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for MySQL - Install Instance" on page 51](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 47](#), and ensure that all requirements are satisfied.

To use the MySQL - Install Instance workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

To verify that MySQL process is running after the workflow is successfully completed, run the command **ps aux | grep mysql**.

Parameters for MySQL - Install Instance

The following tables describe the required and optional input parameters for this workflow. Some of these parameters are not initially visible in a deployment. For most parameters, if you do not specify a value for a parameter, a default value is assigned.

Parameters Defined in this Step: MySQL - Gather Parameters for Install Instance

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------|
| List of RPMs | no default | required | Comma-delimited list of RPMs that are either available in the staging directory or will need to be downloaded from the software repository. |

Parameters Defined in this Step: MySQL - Gather Advanced Parameters for Install Instance

| Parameter Name | Default Value | Required | Description |
|---------------------|------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Backup Zipfile | no default | optional | ZIP file to be used for installing the backup utility. |
| MySQL Root Password | no default | optional | Password for the MySQL user. |
| Staging Director | /tmp/mysql_stage | optional | Fully qualified path of the directory where MySQL installer will be downloaded to. Will be cleaned up at end of workflow execution. Default directory /tmp/mysql_stage will be created if no input is provided. |
| Template File | no default | optional | A template file to be used for custom configurations. |

MySQL - Create Database

The MySQL - Create Database workflow creates a MySQL database and to add it to the DMA environment.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 54 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 55 | Instructions for running this workflow in your environment |
| "Parameters for MySQL - Create Database" on page 57 | List of input parameters for this workflow |

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the MySQL - Create Database workflow:

- This solution requires DMA version 10.60.000.000 (or later).

The latest DMA solution packs require the latest DMA platform. To use the latest solution packs, update the DMA platform. DMA10.60.000.000 solution packs are supported on DMA10.60.000.000 (and later).

- You have installed the Database Provisioning solution pack.
- An existing MySQL instance to be used as the target instance.

The information presented here assumes the following: show assumptions

- DMA is installed and operational.
- At least one suitable target server (database) is available.
- You are logged in to the DMA web interface.
- You have permission to create, edit, and deploy copies of the workflows included in this solution pack.

For more information about prerequisites for MySQL database, refer to the [MySQL Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

- Creates a MySQL database and to add it to the DMA environment.

Steps Executed by the Workflow

The MySQL - Create Database workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by MySQL - Create Database

| Workflow Step | Description |
|-----------------------------------------------|----------------------------------------------------------------------------------------|
| MySQL - Gather Parameters for Create Database | This step gathers parameters to install software for MySQL - Create Database workflow. |
| MySQL - Create Database | This steps accepts parameters for advanced MySQL install server and sets defaults. |
| Discover MySQL Databases | This step prepares server for MySQL instance installation. |

How to Run this Workflow

The following instructions show you how to customize and run the MySQL - Create Database workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for MySQL - Create Database" on page 57](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 53](#), and ensure that all requirements are satisfied.

To use the MySQL - Create Database workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

To display a list of databases, including the newly created one, run the command **show databases** within the MySQL program.

Parameters for MySQL - Create Database

The following tables describe the required and optional input parameters for this workflow. Some of these parameters are not initially visible in a deployment. For most parameters, if you do not specify a value for a parameter, a default value is assigned.

Parameters Defined in this Step: MySQL - Gather Parameters for Create Database

| Parameter Name | Default Value | Required | Description |
|----------------------|---------------|----------|----------------------------------------------------------------------------------------------------------------|
| Database Name | no default | required | The name of the database to be created. |
| MySQL Password | no default | optional | The password for the specified MySQL user, this is valid only if used in conjunction with the MySQL user. |
| MySQL Unix User | no default | optional | The UNIX user that owns the MySQL daemon. |
| MySQL Username | no default | optional | The username for the MySQL user. This is not required if the .my.cnf file is configured for the instance user. |
| Web Service Password | no default | required | The password for the discovery web service API. |
| Web Service URL | no default | required | The URL for the discovery web service API. |
| Web Service User | no default | required | The user capable of modifying the managed environment through the discovery web service API. |

MySQL - Start or Stop

The MySQL - Start or Stop workflow starts or stops an existing MySQL daemon.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 60 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 61 | Instructions for running this workflow in your environment |
| "Parameters for MySQL - Start or Stop" on page 63 | List of input parameters for this workflow |

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the MySQL - Start or Stop workflow:

- This solution requires DMA version 10.60.000.000 (or later).

The latest DMA solution packs require the latest DMA platform. To use the latest solution packs, update the DMA platform. DMA10.60.000.000 solution packs are supported on DMA10.60.000.000 (and later).

- You have installed the Database Provisioning solution pack.
- Must target an existing MySQL instance.

The information presented here assumes the following: show assumptions

- DMA is installed and operational.
- At least one suitable target server (database) is available.
- You are logged in to the DMA web interface.
- You have permission to create, edit, and deploy copies of the workflows included in this solution pack.

For more information about prerequisites for MySQL database, refer to the [MySQL Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

- Starts or stops an existing MySQL daemon.

Steps Executed by the Workflow

The MySQL - Start or Stop workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by MySQL - Start or Stop

| Workflow Step | Description |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| MySQL - Gather Parameters for Start or Stop | This step gathers parameters to install software for MySQL - Start or Stop workflow. |
| MySQL - Gather Advanced Parameters for Start or Stop | This step gathers advanced parameters for MySQL - Start or Stop workflow and sets defaults. |
| MySQL - Check Status | This step checks the status of the MySQL to ensure that it matches Desired Status in the input parameter. |
| MySQL - Start or Stop | This step starts or stops an existing MySQL daemon, based on the value set for the parameter "Action". |

How to Run this Workflow

The following instructions show you how to customize and run the MySQL - Start or Stop workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for MySQL - Start or Stop" on page 63](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 59](#), and ensure that all requirements are satisfied.

To use the MySQL - Start or Stop workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

To verify MySQL daemon is indeed started/stopped based on workflow's outcome, run the command **service mysql status**.

Parameters for MySQL - Start or Stop

The following tables describe the required and optional input parameters for this workflow.

Parameters Defined in this Step: MySQL - Gather Parameters for Start or Stop

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|-------------------------------------------------------------------------------------------------------------|
| Action | no default | required | If set to "Start", the MySQL daemon will be started. If set to "Stop", the MySQL daemon will be stopped. |

Send documentation feedback

If you have comments about this document, you can [contact the documentation team](#) by email. If an email client is configured on this system, click the link above and an email window opens with the following information in the subject line:

**Feedback on Workflows for Oracle MySQL (Database and Middleware Automation
10.60.000.000)**

Just add your feedback to the email and click send.

If no email client is available, copy the information above to a new message in a web mail client, and send your feedback to hpe_dma_docs@hpe.com.

We appreciate your feedback!