



Red Hat JBoss Enterprise Application Platform 7.4-Beta

Management CLI Guide

Instructions and command examples for using the Red Hat JBoss Enterprise Application Platform management CLI to configure, use, and administer JBoss EAP.

Red Hat JBoss Enterprise Application Platform 7.4-Beta Management CLI Guide

Instructions and command examples for using the Red Hat JBoss Enterprise Application Platform management CLI to configure, use, and administer JBoss EAP.

Legal Notice

Copyright © 2021 Red Hat, Inc.

The text of and illustrations in this document are licensed by Red Hat under a Creative Commons Attribution–Share Alike 3.0 Unported license ("CC-BY-SA"). An explanation of CC-BY-SA is available at

<http://creativecommons.org/licenses/by-sa/3.0/>

. In accordance with CC-BY-SA, if you distribute this document or an adaptation of it, you must provide the URL for the original version.

Red Hat, as the licensor of this document, waives the right to enforce, and agrees not to assert, Section 4d of CC-BY-SA to the fullest extent permitted by applicable law.

Red Hat, Red Hat Enterprise Linux, the Shadowman logo, the Red Hat logo, JBoss, OpenShift, Fedora, the Infinity logo, and RHCE are trademarks of Red Hat, Inc., registered in the United States and other countries.

Linux[®] is the registered trademark of Linus Torvalds in the United States and other countries.

Java[®] is a registered trademark of Oracle and/or its affiliates.

XFS[®] is a trademark of Silicon Graphics International Corp. or its subsidiaries in the United States and/or other countries.

MySQL[®] is a registered trademark of MySQL AB in the United States, the European Union and other countries.

Node.js[®] is an official trademark of Joyent. Red Hat is not formally related to or endorsed by the official Joyent Node.js open source or commercial project.

The OpenStack[®] Word Mark and OpenStack logo are either registered trademarks/service marks or trademarks/service marks of the OpenStack Foundation, in the United States and other countries and are used with the OpenStack Foundation's permission. We are not affiliated with, endorsed or sponsored by the OpenStack Foundation, or the OpenStack community.

All other trademarks are the property of their respective owners.

Abstract

This document provides general information about the JBoss EAP management CLI. It includes many examples that demonstrate how to use the CLI to administer and configure Red Hat JBoss Enterprise Application Platform. The Configuration Guide, Configuring Messaging, and other JBoss EAP documentation provide additional CLI command examples and detailed instructions for using the management CLI to accomplish specific administration tasks.

Table of Contents

CHAPTER 1. MANAGEMENT CLI OVERVIEW	5
CHAPTER 2. GETTING STARTED WITH THE MANAGEMENT CLI	6
2.1. LAUNCH THE MANAGEMENT CLI	6
2.2. CONNECT TO THE SERVER	6
2.3. GETTING HELP	7
2.4. QUIT THE MANAGEMENT CLI	7
2.5. RUN IN NON-INTERACTIVE MODE	7
Pass in Commands	8
Pass in a File of Commands	8
CHAPTER 3. NAVIGATING THE MANAGEMENT CLI	10
3.1. CHANGE THE CURRENT PATH	10
3.2. PRINT THE CURRENT PATH	10
3.3. LIST CONTENTS	10
3.4. VIEW MULTI-PAGE OUTPUT	11
Navigating Multi-page Output	12
Searching Multi-page Output	12
3.5. USE KEYBOARD NAVIGATION SHORTCUTS	12
CHAPTER 4. CREATING AND EXECUTING REQUESTS	15
Construct an Operation Request	15
4.1. DISPLAY RESOURCE VALUES	17
Include Runtime Attributes	17
Read Child Resources Recursively	18
Exclude Default Values	18
Resolve Expressions	19
4.2. DISPLAY RESOURCE DESCRIPTIONS	20
4.3. DISPLAY AN ATTRIBUTE VALUE	21
4.4. UPDATE AN ATTRIBUTE	22
4.5. UNDEFINE AN ATTRIBUTE	22
4.6. DISPLAY OPERATION NAMES	23
4.7. DISPLAY AN OPERATION DESCRIPTION	24
4.8. ADD A VALUE WITH SPECIAL CHARACTERS	24
Whitespace	25
Quotation Marks	25
Commas	25
Parentheses	25
Braces	25
Brackets	26
Diacritic Marks	26
4.9. SPECIFY OPERATION HEADERS	26
4.10. USE IF-ELSE CONTROL FLOW	27
4.11. USE TRY-CATCH-FINALLY CONTROL FLOW	29
4.12. USE FOR-DONE CONTROL FLOW	29
4.13. QUERY A RESOURCE	30
4.14. REDIRECT OUTPUT	32
Redirect Output to a File	32
Redirect Output to a Command	32
CHAPTER 5. USING THE MANAGEMENT CLI WITH A MANAGED DOMAIN	33
Specify the Profile for Subsystem Configuration	33

Specify the Host for Core Management and Runtime Commands	33
Specify the Server for Core Management and Runtime Commands	33
CHAPTER 6. CONFIGURING THE MANAGEMENT CLI	35
6.1. PROPERTY SUBSTITUTION	37
6.2. CREATING ALIASES	38
6.3. .JBOSSECLIRC CONFIGURATION FILE	39
Example .jbossclirc File	39
6.4. USING VARIABLES	40
Using the Set Command	40
Using the Unset Command	40
Using the jbossclirc File	40
Using the Echo Command	40
Example	41
CHAPTER 7. MANAGEMENT CLI COMMAND HISTORY	42
View the Management CLI Command History	42
Clear the Management CLI Command History	42
Enable the Management CLI Command History	42
Disable the Management CLI Command History	42
CHAPTER 8. MANAGEMENT CLI LOGGING	43
Configure Management CLI Logging	43
CHAPTER 9. BATCH PROCESSING	44
Batch Commands in External Files	44
CHAPTER 10. EMBEDDING A SERVER FOR OFFLINE CONFIGURATION	45
Start an Embedded Standalone Server	45
Specifying the Server Configuration	45
Starting in Admin-only Mode	45
Controlling Standard Output	46
Boot Timeout	46
Starting with a Blank Configuration	46
Start an Embedded Host Controller	46
Specifying the Host Controller Configuration	47
Controlling Standard Output	47
Boot Timeout	47
Non-Modular Class Loading with the Management CLI	47
CHAPTER 11. HOW TO...	49
11.1. ADD A DATASOURCE	49
11.2. ADD AN EXTENSION	49
11.3. ADD A JMS QUEUE	49
11.4. ADD A JMS TOPIC	49
11.5. ADD A MODULE	49
11.6. ADD A SERVER	50
11.7. ADD A SERVER GROUP	50
11.8. ADD A SYSTEM PROPERTY	50
11.9. CLONE A PROFILE	50
11.10. CREATE A HIERARCHICAL PROFILE	50
11.11. DEPLOY AN APPLICATION TO A MANAGED DOMAIN	50
11.12. DEPLOY AN APPLICATION TO A STANDALONE SERVER	51
11.13. DISABLE ALL APPLICATIONS	51
11.14. DISPLAY THE ACTIVE USER	51

11.15. DISPLAY THE CONTENTS OF AN ATTACHMENT	51
11.16. DISPLAY SCHEMA INFORMATION	52
11.17. DISPLAY SYSTEM AND SERVER INFORMATION	52
11.18. ENABLE ALL DISABLED DEPLOYMENTS	53
11.19. GET THE COMMAND TIMEOUT VALUE	53
11.20. RELOAD A HOST CONTROLLER	53
11.21. RELOAD A HOST CONTROLLER IN ADMIN-ONLY MODE	53
11.22. RELOAD ALL SERVERS IN A SERVER GROUP	54
11.23. RELOAD A SERVER	54
11.24. RELOAD A STANDALONE SERVER	54
11.25. REMOVE AN EXTENSION	54
11.26. REMOVE A MODULE	54
11.27. RESET THE COMMAND TIMEOUT VALUE	55
11.28. RESTART ALL SERVERS IN A SERVER GROUP	55
11.29. RESTART A SERVER	55
11.30. SAVE THE CONTENTS OF AN ATTACHMENT	56
11.31. SET THE COMMAND TIMEOUT VALUE	56
11.32. SHUT DOWN A HOST CONTROLLER	56
11.33. SHUT DOWN THE SERVER	56
11.34. START ALL SERVERS IN A SERVER GROUP	57
11.35. START A SERVER	57
11.36. STOP ALL SERVERS IN A SERVER GROUP	57
11.37. STOP A SERVER	57
11.38. TAKE A CONFIGURATION SNAPSHOT	57
11.39. UNDEPLOY ALL APPLICATIONS	57
11.40. UNDEPLOY AN APPLICATION FROM A MANAGED DOMAIN	58
11.41. UNDEPLOY AN APPLICATION FROM A STANDALONE SERVER	58
11.42. UPDATE A HOST NAME	58
11.43. UPLOAD AN ATTACHMENT	58
11.44. VIEW A SERVER LOG	58
APPENDIX A. REFERENCE MATERIAL	59
A.1. MANAGEMENT CLI STARTUP ARGUMENTS	59
A.2. MANAGEMENT CLI BATCH MODE COMMANDS	61
A.3. MANAGEMENT CLI COMMANDS	61
A.4. MANAGEMENT CLI OPERATIONS	64
A.5. RESOURCE ATTRIBUTE DETAILS	67

CHAPTER 1. MANAGEMENT CLI OVERVIEW

The management command-line interface (CLI) is a command-line administration tool for JBoss EAP.

Use the management CLI to start and stop servers, deploy and undeploy applications, configure system settings, and perform other administrative tasks. Operations can be performed in batch mode, allowing multiple tasks to be run as a group.

Many common terminal commands are available, such as **ls**, **cd**, and **pwd**. The management CLI also supports tab completion.

CHAPTER 2. GETTING STARTED WITH THE MANAGEMENT CLI

The management CLI is included with the JBoss EAP distribution. Once you [launch](#) the management CLI, you can [connect](#) to a running server instance or managed domains to [perform management operations](#).

2.1. LAUNCH THE MANAGEMENT CLI

You can launch the management CLI by running the **jboss-cli** script provided with JBoss EAP.

```
$ EAP_HOME/bin/jboss-cli.sh
```



NOTE

For Windows Server, use the **EAP_HOME\bin\jboss-cli.bat** script to launch the management CLI.

See [Connect to the Server](#) for details on launching the management CLI and connecting to the server in one step using the **--connect** argument.



IMPORTANT

The **jboss-cli** scripts set the **com.ibm.jsse2.overrideDefaultTLS** property to **true**. This setting is important if you are using the IBM JDK to prevent authentication issues when using SSL configured by Elytron.

Be sure to set this property if you are using the IBM JDK and using another method to start a CLI session, for example, programmatically using the classes available in **EAP_HOME/bin/client/jboss-cli-client.jar**.

For a complete listing of all available **jboss-cli** script arguments and their purposes, use the **--help** argument or see the [Management CLI Startup Arguments](#) section.

2.2. CONNECT TO THE SERVER

You can connect to a running standalone server or managed domain by using the **connect** command.

```
connect
```

The default host and port configuration is **localhost:9990**. If the server is listening on a different host and port, then these need to be provided to the **connect** command.

```
connect 192.168.0.1:9991
```

You can also launch the management CLI and connect to the server in one step using the **--connect** argument (and the **--controller** argument if necessary).

```
$ EAP_HOME/bin/jboss-cli.sh --connect --controller=192.168.0.1:9991
```

In JBoss EAP 7.4, to connect using the **http-remoting** protocol, use:

```
connect http-remoting://192.168.0.1:9990
```

2.3. GETTING HELP

The management CLI provides several ways for you to get help with using the management CLI.

- View general help on using the management CLI.

```
help
```

This provides detailed help with launching, navigating, and generating operation requests.

- View help for a particular command or operation:

```
help COMMAND_OR_OPERATION
```

This provides the usage, description, and arguments for the particular command or operation.

For example:

- View help for the **patch** command:

```
help patch
```

- View help for the **apply** action of the **patch** command:

```
help patch apply
```

- View help for the Elytron **key-store** resource **add** operation:

```
help /subsystem=elytron/key-store=? :add
```

- View the list of available commands in the current context:

```
help --commands
```



NOTE

Commands that require a connection to either a standalone server or domain controller do not appear in the list unless the connection has been established.

See the [Management CLI Commands](#) section for a listing of management CLI commands.

2.4. QUIT THE MANAGEMENT CLI

You can quit the management CLI by entering the **quit** command.

```
quit
```

2.5. RUN IN NON-INTERACTIVE MODE

You can issue management CLI commands without launching and interacting with the management CLI. This is useful for processing batches of commands and executing commands from scripts. You can either [pass in the commands](#) or [pass in a file that contains commands](#) to the **jboss-cli** startup script.

Pass in Commands

You can use the **--command** argument to provide a single CLI command to execute. The management CLI will terminate once the commands have completed.

```
$ EAP_HOME/bin/jboss-cli.sh --connect --command="/interface=public:read-attribute(name=inet-address,resolve-expressions=true)"
```

The output from each command provided is displayed as it executes.

```
{
  "outcome" => "success",
  "result" => "127.0.0.1"
}
```

You can also use the **--commands** argument to provide a comma-separated list of CLI commands to execute.

Pass in a File of Commands

You can use the **--file** argument to pass in a text file of CLI commands to execute, with each command on a separate line in the file.

```
$ EAP_HOME/bin/jboss-cli.sh --connect --file=/path/to/cli_commands.txt
```

The output from each command in the file is displayed as it executes.

Example Output

```
{
  "outcome" => "success",
  "result" => "NORMAL"
}
helloworld.war
```



NOTE

You can include comments in a CLI script to aid understanding and maintenance. Comments are denoted by a pound sign (#) at the beginning of the line. While executing the script, JBoss EAP ignores the comments you included.

You can use the **--echo-command** argument to include the prompt and command with the output. This can be useful when resolving failures by matching the output to the command that was executed.

```
$ EAP_HOME/bin/jboss-cli.sh --connect --file=/path/to/cli_commands.txt --echo-command
```

The command and its output are displayed as it executes.

Example Output With Command Echo

```
[standalone@localhost:9990 /] :read-attribute(name=running-mode)
```

```
{  
  "outcome" => "success",  
  "result" => "NORMAL"  
}  
[standalone@localhost:9990 /] ls /deployment  
helloworld.war
```

CHAPTER 3. NAVIGATING THE MANAGEMENT CLI

Many common terminal commands are available in the management CLI, such as **ls** to [list the contents of a node path](#), **cd** to [change the node path](#), and **pwd** to [print the full node path](#). The management CLI also supports [keyboard shortcuts](#).

3.1. CHANGE THE CURRENT PATH

You can change to a different node path by using the **cd** command and providing the desired path. When the management CLI is first launched, it is at the root level (*/*).

```
cd /subsystem=datasources
cd data-source=ExampleDS
```

3.2. PRINT THE CURRENT PATH

You can print the path of the current node by using the **pwd** command. When the management CLI is first launched, the path is at the root level (*/*).

```
cd /subsystem=undertow
cd server=default-server
pwd
```

The above example changes the path using the **cd** command and then outputs the following to the console:

```
/subsystem=undertow/server=default-server
```

3.3. LIST CONTENTS

You can list the contents of a particular node path by using the **ls** command. If the path ends on a node name, that resource's attributes will be listed as well.

The below example navigates the **standard-sockets** socket binding group and then lists its contents.

```
cd /socket-binding-group=standard-sockets
ls -l
```

ATTRIBUTE	VALUE	TYPE
default-interface	public	STRING
name	standard-sockets	STRING
port-offset	#{jboss.socket.binding.port-offset:0}	INT

CHILD	MIN-OCCURS	MAX-OCCURS
local-destination-outbound-socket-binding	n/a	n/a
remote-destination-outbound-socket-binding	n/a	n/a
socket-binding	n/a	n/a

The same result can be achieved from anywhere in the resource tree hierarchy by specifying the node path to the **ls** command.

```
ls -l /socket-binding-group=standard-sockets
```

ATTRIBUTE	VALUE	TYPE
default-interface	public	STRING
name	standard-sockets	STRING
port-offset	<code>{jboss.socket.binding.port-offset:0}</code>	INT

CHILD	MIN-OCCURS	MAX-OCCURS
local-destination-outbound-socket-binding	n/a	n/a
remote-destination-outbound-socket-binding	n/a	n/a
socket-binding	n/a	n/a

You can also use the **--resolve-expressions** parameter to resolve the expressions of the returned attributes to their value on the server.

```
ls -l /socket-binding-group=standard-sockets --resolve-expressions
```

ATTRIBUTE	VALUE	TYPE
default-interface	public	STRING
name	standard-sockets	STRING
port-offset	0	INT

CHILD	MIN-OCCURS	MAX-OCCURS
local-destination-outbound-socket-binding	n/a	n/a
remote-destination-outbound-socket-binding	n/a	n/a
socket-binding	n/a	n/a

In this example, the **port-offset** attribute shows its resolved value (**0**) instead of the expression (`{jboss.socket.binding.port-offset:0}`).

3.4. VIEW MULTI-PAGE OUTPUT

When you run the management CLI in interactive mode and the operation results in multiple pages of output, the command processor pauses the screen at the end of the first page. This allows you to page through the output one line or page at a time. The occurrence of multiple pages of output is indicated by a line of text displaying **--More(NNN%)--** at the end of the output.

The following is an example of a management CLI command that provides more than one page of output.

```
/subsystem=undertow:read-resource(recursive=true)
{
  "outcome" => "success",
  "result" => {
    "default-security-domain" => "other",
    "default-server" => "default-server",
    "default-servlet-container" => "default",
    "default-virtual-host" => "default-host",
    "instance-id" => expression "${jboss.node.name}",
    "statistics-enabled" => false,
  }
  Pre "application-security-domain" => {"other" => {
    "enable-jacc" => false,
    "http-authentication-factory" => "application-http-authentication",
```

```

    "override-deployment-config" => false,
    "setting" => undefined
  }},
  "buffer-cache" => {"default" => {
    "buffer-size" => 1024,
    "buffers-per-region" => 1024,
--More(7%)--

```

Navigating Multi-page Output

When you encounter the line of text indicating that there is more output, you can proceed using one of the following options.

- Press **Enter** or the down arrow to page through the output one line at a time.
- Press the Spacebar or **PgDn** to skip to the next page of output.
- Press **PgUp** to return to the previous page of output.
- Press **Home** to return to the beginning of the output.
- Press **End** to skip to the final line of the output.
- Type **q** to interrupt the command and exit.



NOTE

On Windows the **PgUp**, **PgDn**, **Home**, and **End** keys are available beginning with Windows Server 2016. There are no issues with other operating systems.

Searching Multi-page Output

You can search for text within multi-page output.

1. Use a forward slash (/) to initiate searching.
2. Type the desired text and press **Enter** to search.
 - Press **n** to go to the next match.
 - Press **N** to go to the previous match.

You can also use the up and down arrows to browse through the search history.

3.5. USE KEYBOARD NAVIGATION SHORTCUTS

When running the management CLI in interactive mode, you can use keyboard shortcuts to quickly edit a management CLI command.



NOTE

You can also use the Tab key to autocomplete a portion of a management CLI command or view the available options.

The keyboard shortcuts you can use vary depending on which supported platform you are running:

- [Red Hat Enterprise Linux](#)

- [Windows Server](#)
- [Solaris](#)

Table 3.1. Red Hat Enterprise Linux Keyboard Navigation Shortcuts

Navigation	Keyboard Shortcut
Left one word	Alt+B or Ctrl+left arrow
Right one word	Alt+F or Ctrl+right arrow
Beginning of the line	Ctrl+A or Home
End of the line	Ctrl+E or End
Left one character	Ctrl+B or left arrow
Right one character	Ctrl+F or left arrow

Table 3.2. Windows Server Keyboard Navigation Shortcuts

Navigation	Keyboard Shortcut
Left one word	Alt+B
Right one word	Alt+F
Beginning of the line	Ctrl+A or Home
End of the line	Ctrl+E or End
Left one character	Ctrl+B or left arrow
Right one character	Ctrl+F or left arrow

Table 3.3. Solaris Keyboard Navigation Shortcuts

Navigation	Keyboard Shortcut
Left one word	Alt+B or Ctrl+left arrow
Right one word	Alt+F or Ctrl+right arrow
Beginning of the line	Ctrl+A or Home
End of the line	Ctrl+E or End

Navigation	Keyboard Shortcut
Left one character	Ctrl+B or left arrow
Right one character	Ctrl+F or left arrow

CHAPTER 4. CREATING AND EXECUTING REQUESTS

JBoss EAP configuration is presented as a hierarchical tree of addressable resources, each offering their own set of operations. Management CLI operation requests allow for low-level interaction with the management model and provide a controlled way to edit server configurations.

Operation requests use the following format:

```
| /NODE_TYPE=NODE_NAME:OPERATION_NAME(PARAMETER_NAME=PARAMETER_VALUE)
```

An operation request consists of three parts:

address

The address specifies the resource node on which to perform the operation. *NODE_TYPE* maps to an element name and *NODE_NAME* maps to that element's **name** attribute in the configuration XML. Each level of the resource tree is separated by a slash (/).

operation name

The operation to perform on the resource node. It is prefixed with a colon (:).

parameters

The set of required or optional parameters that vary depending on the operation. They are contained within parentheses ().

Construct an Operation Request

1. Determine the address

You can reference the XML configuration files (**standalone.xml**, **domain.xml**, or **host.xml**) to assist in determining the required address. You can also use tab completion to view the available resources.

Below are several common addresses for resources at the root (/) level.

- **/deployment=DEPLOYMENT_NAME** - Deployment configurations.
- **/socket-binding-group=SOCKET_BINDING_GROUP_NAME** - Socket binding configurations.
- **/interface=INTERFACE_NAME** - Interface configurations.
- **/subsystem=SUBSYSTEM_NAME** - Subsystem configuration when running as a standalone server.
- **/profile=PROFILE_NAME/subsystem=SUBSYSTEM_NAME** - Subsystem configuration for the selected profile when running in a managed domain.
- **/host=HOST_NAME** - Server configuration for the selected host when running in a managed domain.

The below address is for the **ExampleDS** datasource.

```
| /subsystem=datasources/data-source=ExampleDS
```

2. Determine the operation

The available operations differ for each type of resource node. You can use the **:read-operation-names** operation on a resource address to view the available operations. You can also use tab completion.

Use the **:read-operation-description** operation to get information on a particular operation for a resource.

The below operation (once the appropriate parameters are included) will set the value of an attribute for the **ExampleDS** datasource.

```
/subsystem=datasources/data-source=ExampleDS:write-attribute
```

3. Determine the parameters

Each operation has its own set of available parameters. If you attempt to perform an operation without a required parameter, you will receive an error message that the parameter cannot be **null**.

Multiple parameters are separated by commas (,). If an operation does not have any parameters, then the parentheses are optional.

Use the **:read-operation-description** operation on a resource, passing in the operation name, to determine the required parameters for that operation. You can also use tab completion to list the available parameters.

The below operation disables the **ExampleDS** datasource by setting its **enabled** attribute to **false**.

```
/subsystem=datasources/data-source=ExampleDS:write-attribute(name=enabled,value=false)
```

Once entered, the management interface will perform the operation request on the server configuration. Depending on the operation request, you will receive output to the terminal that contains the outcome and the result or response of the operation.

The following response from disabling the **ExampleDS** datasource shows that the operation was successful and requires a reload of the server in order to take effect.

```
{
  "outcome" => "success",
  "response-headers" => {
    "operation-requires-reload" => true,
    "process-state" => "reload-required"
  }
}
```

You can use the **read-attribute** operation to read the value of the **ExampleDS** datasource's **enabled** attribute.

```
/subsystem=datasources/data-source=ExampleDS:read-attribute(name=enabled)
```

The following response shows that the operation was successful and that the value of **enabled** is **false**.

```
{
  "outcome" => "success",
```

```
"result" => false,
}
```

4.1. DISPLAY RESOURCE VALUES

You can use the **read-resource** operation to view a resource's attribute values.

```
:read-resource
```

You can specify parameters to provide complete information about child resources, recursively. You can also specify parameters to include runtime attributes, resolve expressions, and include aliases. Use **read-operation-description(name=read-resource)** to see the description of all available parameters for **read-resource**.

The following example reads the attributes for a deployment. It includes details such as the deployment name, whether it is enabled, and the last time it was enabled.

```
/deployment=DEPLOYMENT_NAME:read-resource
{
  "outcome" => "success",
  "result" => {
    ...
    "enabled" => true,
    "enabled-time" => 1453929902598L,
    "enabled-timestamp" => "2016-01-27 16:25:02,598 EST",
    "name" => "DEPLOYMENT_NAME",
    "owner" => undefined,
    "persistent" => true,
    "runtime-name" => "DEPLOYMENT_NAME",
    "subdeployment" => undefined,
    "subsystem" => {
      "undertow" => undefined,
      "logging" => undefined
    }
  }
}
```

Include Runtime Attributes

The **include-runtime** parameter can be used to retrieve runtime attributes.

The following example reads the attributes for a deployment. In addition to persistent attributes, it also includes runtime attributes, such as the deployment status and the last time it was disabled.

```
/deployment=DEPLOYMENT_NAME:read-resource(include-runtime=true)
{
  "outcome" => "success",
  "result" => {
    ...
    "disabled-time" => undefined,
    "disabled-timestamp" => undefined,
    "enabled" => true,
    "enabled-time" => 1453929902598L,
    "enabled-timestamp" => "2016-01-27 16:25:02,598 EST",
    "name" => "DEPLOYMENT_NAME",
  }
}
```

```

"owner" => undefined,
"persistent" => true,
"runtime-name" => "DEPLOYMENT_NAME",
"status" => "OK",
"subdeployment" => undefined,
"subsystem" => {
  "undertow" => undefined,
  "logging" => undefined
}
}
}

```

You can also use the *not* operator (!) when passing in boolean parameters. For example:

- **:read-resource(include-runtime=false)** can be entered as **:read-resource(!include-runtime)**
- **:read-resource(include-runtime=true)** can be entered as **:read-resource(include-runtime)**

Read Child Resources Recursively

The **recursive** parameter can be used to retrieve attributes recursively from child resources.

The following example reads the attributes for a deployment. In addition to the resource's own attributes, it recursively returns the attributes for its child resources, such as the **undertow** subsystem configuration.

```

/deployment=DEPLOYMENT_NAME:read-resource(recursive=true)
{
  "outcome" => "success",
  "result" => {
    ...
    "enabled" => true,
    "enabled-time" => 1453929902598L,
    "enabled-timestamp" => "2016-01-27 16:25:02,598 EST",
    "name" => "DEPLOYMENT_NAME",
    "owner" => undefined,
    "persistent" => true,
    "runtime-name" => "DEPLOYMENT_NAME",
    "subdeployment" => undefined,
    "subsystem" => {
      "undertow" => {
        "context-root" => "/test",
        "server" => "default-server",
        "virtual-host" => "default-host",
        "servlet" => undefined,
        "websocket" => undefined
      },
      "logging" => {"configuration" => undefined}
    }
  }
}
}

```

Exclude Default Values

The **include-defaults** parameter can be used to show or hide default values when reading attributes for a resource. This is **true** by default, meaning that default values will be shown when using the **read-resource** operation.

The following example uses the **read-resource** operation on the **undertow** subsystem.

```
/subsystem=undertow:read-resource
{
  "outcome" => "success",
  "result" => {
    "default-security-domain" => "other",
    "default-server" => "default-server",
    "default-servlet-container" => "default",
    "default-virtual-host" => "default-host",
    "instance-id" => expression "${jboss.node.name}",
    "statistics-enabled" => false,
    "buffer-cache" => {"default" => undefined},
    "configuration" => {
      "filter" => undefined,
      "handler" => undefined
    },
    "server" => {"default-server" => undefined},
    "servlet-container" => {"default" => undefined}
  }
}
```

The following example also uses the **read-resource** operation on the **undertow** subsystem, but sets the **include-defaults** parameter to **false**. Several attributes, such as **statistics-enabled** and **default-server**, now display **undefined** as their value instead of the default value.

```
/subsystem=undertow:read-resource(include-defaults=false)
{
  "outcome" => "success",
  "result" => {
    "default-security-domain" => undefined,
    "default-server" => undefined,
    "default-servlet-container" => undefined,
    "default-virtual-host" => undefined,
    "instance-id" => undefined,
    "statistics-enabled" => undefined,
    "buffer-cache" => {"default" => undefined},
    "configuration" => {
      "filter" => undefined,
      "handler" => undefined
    },
    "server" => {"default-server" => undefined},
    "servlet-container" => {"default" => undefined}
  }
}
```

Resolve Expressions

The **resolve-expressions** parameter can be used to resolve the expressions of the returned attributes to their value on the server.

Attributes with expressions as their values use the format **`\${PARAMETER:DEFAULT_VALUE}**. See [Property Replacement](#) in the *Configuration Guide* for more information.

The following example reads the attributes for a deployment. The **instance-id** attribute shows its resolved value (**test-name**) instead of the expression (**`\${jboss.node.name}**).

```

/subsystem=undertow:read-resource(resolve-expressions=true)
{
  "outcome" => "success",
  "result" => {
    "default-security-domain" => "other",
    "default-server" => "default-server",
    "default-servlet-container" => "default",
    "default-virtual-host" => "default-host",
    "instance-id" => "test-name",
    "statistics-enabled" => false,
    "buffer-cache" => {"default" => undefined},
    "configuration" => {
      "filter" => undefined,
      "handler" => undefined
    },
    "server" => {"default-server" => undefined},
    "servlet-container" => {"default" => undefined}
  }
}

```

4.2. DISPLAY RESOURCE DESCRIPTIONS

You can use the **read-resource-description** operation to a description about a resource and its attributes.

```
:read-resource-description
```

You can specify parameters to provide complete descriptions about child resources, recursively. You can also specify parameters to include details of the resource's operations and notifications. Use **read-operation-description(name=read-resource-description)** to see the description of all available parameters for **read-resource-description**.

The following example displays the attribute details for a buffer cache.

```

/subsystem=undertow/buffer-cache=default:read-resource-description
{
  "outcome" => "success",
  "result" => {
    "description" => "The buffer cache used to cache static content",
    "attributes" => {
      "buffer-size" => {
        "type" => INT,
        "description" => "The size of an individual buffer",
        "expressions-allowed" => true,
        "nillable" => true,
        "default" => 1024,
        "min" => 0L,
        "max" => 2147483647L,
        "access-type" => "read-write",
        "storage" => "configuration",
        "restart-required" => "resource-services"
      },
      "buffers-per-region" => {
        "type" => INT,

```



```

    "description" => "The numbers of buffers in a region",
    "expressions-allowed" => true,
    "nillable" => true,
    "default" => 1024,
    "min" => 0L,
    "max" => 2147483647L,
    "access-type" => "read-write",
    "storage" => "configuration",
    "restart-required" => "resource-services"
  },
  "max-regions" => {
    "type" => INT,
    "description" => "The maximum number of regions",
    "expressions-allowed" => true,
    "nillable" => true,
    "default" => 10,
    "min" => 0L,
    "max" => 2147483647L,
    "access-type" => "read-write",
    "storage" => "configuration",
    "restart-required" => "resource-services"
  }
},
"operations" => undefined,
"notifications" => undefined,
"children" => {}
}
}

```

See [Resource Attribute Details](#) to learn more about the fields returned for attributes.

4.3. DISPLAY AN ATTRIBUTE VALUE

You can use the **read-attribute** operation to view the current value of a single attribute.

```
:read-attribute(name=ATTRIBUTE_NAME)
```

The following example displays the log level for the root logger by reading the **level** attribute.

```

/subsystem=logging/root-logger=ROOT:read-attribute(name=level)
{
  "outcome" => "success",
  "result" => "INFO"
}

```

One advantage of using the **read-attribute** operation is the ability to expose the current runtime value of an attribute.

```

/interface=public:read-attribute(name=resolved-address)
{
  "outcome" => "success",
  "result" => "127.0.0.1"
}

```

The **resolved-address** attribute is a runtime attribute. This attribute is not displayed when using the **read-resource** operation on the public interface unless you pass in the **include-runtime** parameter. And even then, it is displayed with the rest of the resource's other attributes.

You can also use the **include-defaults** and **resolve-expressions** parameters. See [Display Resource Values](#) for details on these parameters.

4.4. UPDATE AN ATTRIBUTE

You can use the **write-attribute** operation to update the value of an attribute for a resource.

```
:write-attribute(name=ATTRIBUTE_NAME, value=ATTRIBUTE_VALUE)
```

The following example disables the deployment scanner by setting the **scan-enabled** attribute to **false**.

```
/subsystem=deployment-scanner/scanner=default:write-attribute(name=scan-enabled,value=false)
{"outcome" => "success"}
```

The response from the operation request shows that it was successful. You can also confirm the result by using the **read-attribute** operation to read the **scan-enabled** attribute, which now shows as **false**.

```
/subsystem=deployment-scanner/scanner=default:read-attribute(name=scan-enabled)
{
  "outcome" => "success",
  "result" => false
}
```

4.5. UNDEFINE AN ATTRIBUTE

You can set the value of an attribute to **undefined**. If this attribute has a default value, that will be used.

The following example undefines the **level** attribute for the root logger.

```
/subsystem=logging/root-logger=ROOT:undefine-attribute(name=level)
```

The default value for the **level** attribute is **ALL**. You can see that this default is used when performing the **read-resource** operation.

```
/subsystem=logging/root-logger=ROOT:read-resource
{
  "outcome" => "success",
  "result" => {
    "filter" => undefined,
    "filter-spec" => undefined,
    "handlers" => [
      "CONSOLE",
      "FILE"
    ],
    "level" => "ALL"
  }
}
```

To view the resource without the default values being read, you must use set the **include-defaults** parameter to **false**. You can now see that the value of **level** is **undefined**.

```
/subsystem=logging/root-logger=ROOT:read-resource(include-defaults=false)
{
  "outcome" => "success",
  "result" => {
    "filter" => undefined,
    "filter-spec" => undefined,
    "handlers" => [
      "CONSOLE",
      "FILE"
    ],
    "level" => undefined
  }
}
```

4.6. DISPLAY OPERATION NAMES

You can use the **read-operation-names** list the available operations for a given resource.

```
:read-operation-names
```

The following example lists the available operations to perform on a deployment.

```
/deployment=DEPLOYMENT_NAME:read-operation-names
{
  "outcome" => "success",
  "result" => [
    "add",
    "deploy",
    "list-add",
    "list-clear",
    "list-get",
    "list-remove",
    "map-clear",
    "map-get",
    "map-put",
    "map-remove",
    "query",
    "read-attribute",
    "read-attribute-group",
    "read-attribute-group-names",
    "read-children-names",
    "read-children-resources",
    "read-children-types",
    "read-operation-description",
    "read-operation-names",
    "read-resource",
    "read-resource-description",
    "redeploy",
    "remove",
    "undefine-attribute",
    "undeploy",
  ]
}
```

```

    "whoami",
    "write-attribute"
  ]
}

```

Use the **read-operation-description** operation to [display an operation description](#).

4.7. DISPLAY AN OPERATION DESCRIPTION

You can use the **read-operation-description** operation to display a description of a certain operation for a resource. This also includes parameter descriptions and which parameters are required.

```
:read-operation-description(name=OPERATION_NAME)
```

The following example provides the description and parameter information for the **add** operation on a system property.

```

/system-property=SYSTEM_PROPERTY:read-operation-description(name=add)
{
  "outcome" => "success",
  "result" => {
    "operation-name" => "add",
    "description" => "Adds a system property or updates an existing one.",
    "request-properties" => {"value" => {
      "type" => STRING,
      "description" => "The value of the system property.",
      "expressions-allowed" => true,
      "required" => false,
      "nillable" => true,
      "min-length" => 0L,
      "max-length" => 2147483647L
    }},
    "reply-properties" => {},
    "read-only" => false,
    "runtime-only" => false
  }
}

```

4.8. ADD A VALUE WITH SPECIAL CHARACTERS

Occasionally when creating management CLI requests, you may need to add a value that contains special characters. Certain special characters, such as those used in the syntax of a management CLI request, must be entered in a particular manner.

In many cases, but not all, enclosing the value in double quotes (""") is sufficient. If you are unsure whether your special character was accepted properly, be sure to read the attribute or resource after adding the value to verify that it was saved correctly.

See the sections below for information on how to process the following special characters.

- [Whitespace](#)
- [Quotation Marks](#)

- [Commas](#)
- [Parentheses](#)
- [Braces](#)
- [Brackets](#)
- [Diacritic Marks](#)

Whitespace

By default, whitespace is trimmed from values added through the management CLI. You can include a space in a value by enclosing the value in double quotes (""), or braces ({}), or by escaping it using a backslash (\).

```
/system-property=test1:add(value="Hello World")
/system-property=test2:add(value={Hello World})
/system-property=test3:add(value=Hello\ World)
```

This will set the value to **Hello World**.

Quotation Marks

You can use a single quotation mark (') in a value by enclosing the value in double quotes (""), or by escaping it using a backslash (\). The following examples set the value of system properties to **server's**.

```
/system-property=test1:add(value="server's")
/system-property=test2:add(value=server\s)
```

You can use a double quotation mark (") in a value by escaping it using a backslash (\). Depending on the location of the quotation mark in the value, you might also need to enclose the value in double quotes (""), or by escaping it using a backslash (\). The following example sets the value of a system property to **"quote"**.

```
/system-property=test1:add(value="\\"quote\\")
```

Commas

You can use a comma (,) in a value by enclosing the value in double quotes ("").

```
/system-property=test:add(value="Last,First")
```

This will set the value to **Last,First**.

Parentheses

You can include parentheses (()) in a value by enclosing the value in double quotes (""), or braces ({}), or by escaping the parenthesis using a backslash (\).

```
/system-property=test1:add(value="one(1)")
/system-property=test2:add(value={one(1)})
/system-property=test3:add(value=one\1\)
```

This will set the value to **one(1)**.

Braces

You can include braces ({}), or by enclosing the value in double quotes ("").

```
/system-property=test:add(value="{braces}")
```

This will set the value to **{braces}**.

Brackets

You can include brackets (`[]`) in a value by enclosing the value in double quotes (`""`).

```
/system-property=test:add(value="[brackets]")
```

This will set the value to **[brackets]**.

Diacritic Marks

Diacritic marks, such as **ñ**, **ř**, or **ý**, can be used when adding a value using the management CLI.

```
/system-property=test1:add(value=Año)
```

However, do not enclose the value in double quotes (`""`). This can cause the diacritic mark to be replaced with a question mark (`?`). If the value has whitespace that needs to be maintained, instead enclose the value in braces (`{}`) or escape the space with a backslash (`\`).

```
/system-property=test2:add(value={Dos años})
/system-property=test3:add(value=Dos\ años)
```

This will set the value to **Dos años**.

4.9. SPECIFY OPERATION HEADERS

You can specify operation headers to control certain aspects of how an operation executes. The following operation headers are available:

allow-resource-service-restart

Whether to restart runtime services that require a restart in order for the operation's changes take effect. This defaults to **false**.



WARNING

Using the **allow-resource-service-restart=true** header can disrupt end-user request handling until the required services have been restarted.

blocking-timeout

The maximum time in seconds that the operation should block at any one point in its completion process before the operation is rolled back. This defaults to **300** seconds.

roles

The list of RBAC roles that should be used when making access control decisions instead of those from the roles normally associated with the user invoking the operation. Note that this can only be used to reduce permissions for a caller, not to increase permissions.

rollback-on-runtime-failure

Whether persistent configuration changes should be reverted if applying the changes to runtime services fails. This defaults to **true**.

rollout

The rollout plan for a managed domain deployment. For more information, see the [Using Rollout Plans](#) section of the JBoss EAP *Configuration Guide*.

Example: Deploy an Application Using an Operation Header

```
deployment deploy-file /path/to/DEPLOYMENT.war --headers={allow-resource-service-restart=true}
```

Example: Remove a Resource Using an Operation Header

```
/subsystem=infinispan/cache-container=test:remove() {allow-resource-service-restart=true}
```

Use a semicolon (;) to separate multiple operation headers.

4.10. USE IF-ELSE CONTROL FLOW

The management CLI supports **if-else** control flow, which allows you to choose which set of commands and operations to execute based on a condition. The **if** condition is a boolean expression which evaluates the response of the management command or operation specified after the **of** keyword.

**NOTE**

The use of nested **if-else** statements is not supported.

Expressions can contain any of the following items:

- Parentheses to group and prioritize expressions
- Conditional operators
 - and (**&&**)
 - or (**||**)
- Comparison operators
 - equal to (**==**)
 - not equal to (**!=**)
 - greater than (**>**)
 - greater than or equal to (**>=**)
 - less than (**<**)
 - less than or equal to (**<=**)
 - match regular expression (**~=**)



IMPORTANT

The match regular expression (`~=`) operator is provided as Technology Preview only. Technology Preview features are not supported with Red Hat production service level agreements (SLAs), might not be functionally complete, and Red Hat does not recommend to use them for production. These features provide early access to upcoming product features, enabling customers to test functionality and provide feedback during the development process.

See [Technology Preview Features Support Scope](#) on the Red Hat Customer Portal for information about the support scope for Technology Preview features.

The below example uses the match regular expression (`~=`) operator to check whether the value of the **features** system property contains **jgroups**.

```
if (result ~= ".*jgroups.*") of /:resolve-expression(expression=${features})
  echo Configuring JGroups
end-if
```

The below example attempts to read the system property **test**. If **outcome** is not **success** (meaning that the property does not exist), then the system property will be added and set to **true**.

```
if (outcome != success) of /system-property=test:read-resource
  /system-property=test:add(value=true)
end-if
```

The condition above uses **outcome**, which is returned when the CLI command after the **of** keyword is executed, as shown below:

```
/system-property=test:read-resource
{
  "outcome" => "failed",
  "failure-description" => "JBAS014807: Management resource '[(\\"system-property\\" => \\"test\\")]' not
found",
  "rolled-back" => true
}
```

The below example issues the appropriate management CLI command to enable the **ExampleDS** datasource by checking the launch type of the server process (**STANDALONE** or **DOMAIN**).

```
if (result == STANDALONE) of /:read-attribute(name=launch-type)
  /subsystem=datasources/data-source=ExampleDS:write-attribute(name=enabled, value=true)
else
  /profile=full/subsystem=datasources/data-source=ExampleDS:write-attribute(name=enabled,
value=true)
end-if
```

Management CLI commands with **if-else** control flow can be specified in a file, with each command on a separate line in the file. You can then pass the file to the **jboss-cli** script to be executed non-interactively using the **--file** parameter.

```
$ EAP_HOME/bin/jboss-cli.sh --connect --file=CLI_FILE
```


4.11. USE TRY-CATCH-FINALLY CONTROL FLOW

The management CLI provides a simplified **try-catch-finally** control flow. It consists of three sets of operations and commands corresponding to the **try**, **catch**, and **finally** blocks. The **catch** and **finally** blocks are optional, but at least one of them should be present and only one catch block can be specified.

The control flow begins with execution of the **try** batch. If the **try** batch completes successfully, then the **catch** batch is skipped and the **finally** batch is executed. If the **try** batch fails, for example, **java.io.IOException**, the **try-catch-finally** control flow will terminate immediately, and the **catch** batch if it is available will be executed. The **finally** batch will always execute at the end of the control flow whether the **try** and **catch** batches succeeds or fails to execute.

There are four commands that define the try-catch-finally control flow:

- **try** command starts the **try** batch. The **try** batch continues until one of **catch** or **finally** command is encountered.
- **catch** command marks the end of the **try** batch. The **try** batch is then held back and the **catch** batch is started.
- **finally** command marks the end of the **catch** batch or the **try** batch and starts the **finally** batch.
- **end-try** is the command that ends either the **catch** or **finally** batch and runs the try-catch-finally control flow.

The following example either creates or re-creates a datasource and enables it:

```
try
/subsystem=datasources/data-source=myds:add(connection-url=CONNECTION_URL,jndi-
name=java:/myds,driver-name=h2)

catch
/subsystem=datasources/data-source=myds:remove
/subsystem=datasources/data-source=myds:add(connection-url=CONNECTION_URL,jndi-
name=java:/myds,driver-name=h2)

finally
/subsystem=datasources/data-source=myds:enable
end-try
```

4.12. USE FOR-DONE CONTROL FLOW

The management CLI supports **for-done** control flow, which allows you to iterate over a collection returned from an operation and execute commands on each item in the collection. You can use **for-done** statements with the management CLI in interactive or non-interactive mode. **for-done** statements use the following syntax:

```
for VARIABLE_NAME in OPERATION
  COMMANDS_TO_EXECUTE
done
```

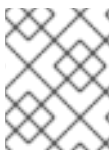
- The **VARIABLE_NAME** can be used in the **COMMANDS_TO_EXECUTE** using the syntax **\$VARIABLE_NAME**.

- The **OPERATION** must return a collection.
- The **COMMANDS_TO_EXECUTE** is a list of commands to execute, with each command on a separate line.

The following example iterates over all deployments and displays whether each is enabled or disabled.

```
for deploymentName in :read-children-names(child-type=deployment)
  if (result == true) of /deployment=$deploymentName:read-attribute(name=enabled)
    echo $deploymentName is enabled.
  else
    echo $deploymentName is disabled.
  end-if
done
```

Enter **done --discard** if you want to discard the current **for** block without executing the commands.



NOTE

The use of **for-done** statements while in batch mode, or nesting them inside other **for-done** statements, is not supported.

4.13. QUERY A RESOURCE

The JBoss EAP management CLI provides the **query** operation to query a resource. You can use the **:read-resource** operation to read all attributes for a resource. If you want to list only selected attributes, you can use the **:query** operation.

For example, to see the list of **name** and **enabled** attributes, use the following command:

```
/deployment=jboss-modules.jar:query(select=["name","enabled"])
```

The following response shows that the operation was successful. The **name** and **enabled** attributes are listed for the **jboss-modules.jar** deployment.

```
{
  "outcome" => "success",
  "result" => {
    "name" => "jboss-modules.jar",
    "enabled" => true
  }
}
```

You can also query across multiple resources, for example, list the **name** and **enabled** attributes of all deployments, using a wildcard:

```
/deployment=*:query(select=["name","enabled"])
```

The following response shows that the operation was successful. The **name** and **enabled** attributes of all deployments are listed.

```
{
  "outcome" => "success",
```

```

"result" => [
  {
    "address" => [{"deployment" => "helloworld.war"}],
    "outcome" => "success",
    "result" => {
      "name" => "helloworld.war",
      "enabled" => true
    }
  },
  {
    "address" => [{"deployment" => "kitchensink.war"}],
    "outcome" => "success",
    "result" => {
      "name" => "kitchensink.war",
      "enabled" => true
    }
  },
  {
    "address" => [{"deployment" => "xyz.jar"}],
    "outcome" => "success",
    "result" => {
      "name" => "xyz.jar",
      "enabled" => false
    }
  }
]
}

```

The **:query** operation also filters relevant objects. For example, to view the **name** and **enabled** attribute values for deployments with **enabled** as **true**.

```
/deployment=*:query(select=["name","enabled"],where=["enabled","true"])
```

The following response shows that the operation was successful. The **name** and **enabled** attribute values for deployments with **enabled** as **true** are listed.

```

{
  "outcome" => "success",
  "result" => [
    {
      "address" => [{"deployment" => "helloworld.war"}],
      "outcome" => "success",
      "result" => {
        "name" => "helloworld.war",
        "enabled" => true
      }
    },
    {
      "address" => [{"deployment" => "kitchensink.war"}],
      "outcome" => "success",
      "result" => {
        "name" => "kitchensink.war",
        "enabled" => true
      }
    }
  ]
}

```

```

| }
| ]
| }

```

4.14. REDIRECT OUTPUT

Instead of printing output from a management CLI operation to the terminal, you can redirect the output to [a file](#) or to [another command](#).

Redirect Output to a File

Use the `>` operator to redirect output from a management CLI operation to a file on the file system.

Example: Write read-resource Output to a File

```
| :read-resource > myfile.txt
```

Use the `>>` operator to redirect output from a management CLI operation and append it to a file on the file system.

Example: Append read-resource Output to a File

```
| :read-resource >> myfile.txt
```

Redirect Output to a Command

Use the `|` operator to redirect output from a management CLI operation to the **grep** command to search output for a regular expression match. Currently, **grep** is the only supported command for the `|` operator.

Example: Search Output from the server.log File

```
| /subsystem=logging/log-file=server.log:read-log-file | grep Deployed
| "2018-03-06 09:48:02,389 INFO [org.jboss.as.server] (management-handler-thread - 5)
| WFLYSRV0010: Deployed \"jboss-helloworld.war\" (runtime-name : \"jboss-helloworld.war\"),
```



NOTE

It is not supported to use the **grep** command more than once in the same command.

CHAPTER 5. USING THE MANAGEMENT CLI WITH A MANAGED DOMAIN

You can use the management CLI to configure and manage both standalone servers and managed domains. The JBoss EAP documentation usually shows examples of management CLI commands for a standalone server configuration. If you are running a managed domain instead, you often need to adjust the command. The following sections describe how to change standalone server management CLI commands for a managed domain configuration.

Specify the Profile for Subsystem Configuration

The management CLI commands for standalone server subsystem configuration begin with **/subsystem=*SUBSYSTEM_NAME***. For managed domain subsystem configuration, you must specify which profile's subsystem to configure by starting the command with **/profile=*PROFILE_NAME*/subsystem=*SUBSYSTEM_NAME***.

Example: Read the Logging Subsystem Configuration (Standalone Server)

```
/subsystem=logging:read-resource
```

This example shows how to read the configuration of the **logging** subsystem for a standalone server.

Example: Read the Logging Subsystem Configuration (Managed Domain)

```
/profile=default/subsystem=logging:read-resource
```

This example shows how to read the configuration of the **logging** subsystem for a the **default** profile in a managed domain.

Specify the Host for Core Management and Runtime Commands

Some core management and runtime commands for a managed domain require you to specify the host that the command applies to by starting the command with **/host=*HOST_NAME***.

Example: Enable Audit Logging (Standalone Server)

```
/core-service=management/access=audit/logger=audit-log:write-attribute(name=enabled,value=true)
```

This example shows how to enable audit logging for a standalone server.

Example: Enable Audit Logging (Managed Domain)

```
/host=master/core-service=management/access=audit/logger=audit-log:write-attribute(name=enabled,value=true)
```

This example shows how to enable audit logging for the **master** host in a managed domain.



NOTE

Some commands require the host as an argument, for example, **reload --host=*HOST_NAME***. If you do not specify a host for these commands, an error message notifies you that the **--host** argument is required.

Specify the Server for Core Management and Runtime Commands

Some core management and runtime commands for a managed domain require you to specify the host and server that the command applies to by starting the command with **/host=HOST_NAME/server=SERVER_NAME**.

Example: Display Runtime Metrics for a Deployment (Standalone Server)

```
/deployment=test-application.war/subsystem=undertow:read-attribute(name=active-sessions)
```

This example shows how to display runtime metrics for a standalone server deployment.

Example: Display Runtime Metrics for a Deployment (Managed Domain)

```
/host=master/server=server-one/deployment=test-application.war/subsystem=undertow:read-attribute(name=active-sessions)
```

This example shows how to display runtime metrics for a managed domain deployment that is deployed to the **server-one** server on the **master** host.

CHAPTER 6. CONFIGURING THE MANAGEMENT CLI

Certain aspects of the management CLI can be customized in its configuration file, **jboss-cli.xml**. This file must be located either in the **EAP_HOME/bin** directory or in a custom directory specified with the **jboss.cli.config** system property.

The following elements can be configured in the **jboss-cli.xml** file.

default-protocol

The default protocol to use when controller addresses are supplied without one. The default is **remote+http**. If port **9990** is used and no protocol is specified, the protocol will automatically default to **remoting** unless you set the **use-legacy-override** attribute to **false**.

default-controller

Configuration of the controller to which to connect if the **connect** command is executed without any parameters. If the management CLI is started with the argument **--controller=** or **controller=**, then the value specified in the argument overrides the **default-controller** definition from the configuration.

- **protocol** - Protocol name of the controller. If one is not provided, the value of **default-protocol** will be used.
- **host** - Host name of the controller. The default is **localhost**.
- **port** - Port number on which to connect to the controller. The default value is **9990**.

controllers

You can define connection controller aliases in the **jboss-cli.xml** file. For example:

```
<!-- The default controller to connect to when 'connect' command is executed w/o arguments -->
<default-controller>
  <host>localhost</host>
  <port>9990</port>
</default-controller>
<!-- CLI connection controller aliases -->
<controllers>
  <controller name="ServerOne">
    <protocol>remoting</protocol>
    <host>192.168.3.45</host>
    <port>9990</port>
  </controller>
  <controller name="ServerTwo">
    <protocol>http-remoting</protocol>
    <host>192.168.3.46</host>
  </controller>
</controllers>
```

The **name** attribute of controller element should be used as a value to **--controller=** argument. For example, **--controller=ServerTwo**.

validate-operation-requests

Whether to validate the parameter list of operation requests before sending the requests to the controller for execution. The default is **true**.

history

The configuration for the CLI command history log.

- **enabled** - Whether or not the **history** is enabled. The default is **true**.
- **file-name** - The file name in which the history will be stored. The default is **.jboss-cli-history**.
- **file-dir** - The directory in which the history is to be stored. The default is the user's home directory.
- **max-size** - The maximum number of commands stored in the history file. The default is **500**.

resolve-parameter-values

Whether to resolve system properties specified as command argument (or operation parameter) values before sending the operation request to the controller. The default is **false**.

connection-timeout

The time in milliseconds allowed to establish a connection with the controller. The default is **5000**.

ssl

The configuration for the keystores and truststores used for SSL.



WARNING

Red Hat recommends that SSLv2, SSLv3, and TLSv1.0 be explicitly disabled in favor of TLSv1.1 or TLSv1.2 in all affected packages.

- **vault** - The vault configuration. If neither **code** nor **module** is specified, the default implementation will be used. If **code** is specified but not **module**, it will look for the specified class in the Picketbox module. If **module** and **code** are specified, it will look for the class specified by code in the module specified by 'module'.
- **key-store** - The keystore.
- **key-store-password** - The keystore password.
- **alias** - The alias.
- **key-password** - The key password.
- **trust-store** - The truststore.
- **trust-store-password** - The truststore password.
- **modify-trust-store** - If set to **true**, the CLI will prompt the user when unrecognized certificates are received and allow them to be stored in the truststore. The default is **true**.

silent

Whether to write informational and error messages to the terminal. The default is **false**.

access-control

Whether the management-related commands and attributes should be filtered for the current user based on the permissions the user has been granted. For example, if **true**, tab completion will hide commands and attributes that the user is not allowed to access. The default is **true**.

echo-command

Whether to include the prompt and command in the output for commands executed in non-interactive mode. The default is **false**.

command-timeout

The maximum time, in seconds, to wait for a command to complete. A value of **0** means no timeout. By default, there is no timeout.

output-json

Whether to display operation responses in pure JSON format. By default, operation responses are displayed in DMR format.

color-output

Whether to print the CLI log output in color based on the log message output type. The available colors are **black**, **blue**, **cyan**, **green**, **magenta**, **red**, **white**, and **yellow**.

- **enabled** - Whether or not the color output is enabled. The default is **true**.
- **error-color** - Defaults to **red**.
- **warn-color** - Defaults to **yellow**.
- **success-color** - Defaults to **default**, which is the terminal's default foreground color.
- **required-color** - Defaults to **magenta**.
- **workflow-color** - Defaults to **green**.
- **prompt-color** - Defaults to **blue**.

output-paging

Whether the management CLI should pause after a page of output has been displayed, which allows you to browse and search the output. If this option is set to **false**, the entire output is printed immediately. The default is **true**.

6.1. PROPERTY SUBSTITUTION

JBoss EAP supports the use of preset element and property expressions in the management CLI. These expressions will be resolved to their defined values during the execution of the command.

You can substitute expressions for the following properties:

- the operation address part of the operation request (for example, node types or names)
- operation name
- operation parameter names
- header names and values
- command names
- command argument names

By default, the management CLI performs property substitution for every line except for argument or parameter values. Argument and parameter values are resolved in the server at runtime. If you require property substitution for argument or parameter values to occur in the management CLI and have it send the resolved values to the server, complete the following steps.

1. Edit the management CLI configuration file: ***EAP_HOME/bin/jboss-cli.xml***.
2. Set the **resolve-parameter-values** parameter to **true** (the default is **false**).

```
<resolve-parameter-values>true</resolve-parameter-values>
```

This element only affects operation request parameter values and command argument values. It does not impact the rest of the command line. This means system properties present on the command line will be resolved during the parsing of the line regardless of what the value of **resolve-parameter-values** element is, unless it is a parameter/argument value.

System property values used in management CLI commands must have already been defined in order to be resolved. You must either pass in a properties file (**--properties=*path/to/file.properties***) or property value pairs (**-Dkey=value**) when starting your management CLI instance. The properties file uses a standard **KEY=VALUE** syntax.

Property keys are denoted in your management CLI commands using the **`\${MY_VAR}** syntax, for example:

```
/host=${hostname}/server-config=${servername}:add(group=main-server-group)
```

See [Configuring the Management CLI](#) for other **jboss-cli.xml** configuration options.

6.2. CREATING ALIASES

You can define aliases for the CLI commands and operations during a CLI session using the **alias** command.

The following example creates a new CLI command alias named **read_undertow** to read the resources in the **undertow** subsystem using the **alias** command:

```
alias read_undertow='/subsystem=undertow:read-resource'
```



NOTE

Alias names can only contain alphanumeric characters and underscores.

To test the creation of **read_undertow** alias, type the alias name in the management CLI:

```
read_undertow
```

The result will be:

```
{
  "outcome" => "success",
  "result" => {
    "default-security-domain" => "other",
    "default-server" => "default-server",
```

```

"default-servlet-container" => "default",
"default-virtual-host" => "default-host",
"instance-id" => expression "${jboss.node.name}",
"statistics-enabled" => false,
"buffer-cache" => {"default" => undefined},
"configuration" => {
  "filter" => undefined,
  "handler" => undefined
},
"server" => {"default-server" => undefined},
"servlet-container" => {"default" => undefined}
}
}

```

To view a list of all available aliases, use the **alias** command:

```
alias
```

The result will be:

```
alias read_undertow='/subsystem=undertow:read-resource'
```

To remove an alias, use the **unalias** command:

```
unalias read_undertow
```



NOTE

The aliases are stored in the **.aesh_aliases** file within the user's home folder.

6.3. JBOSSCLIRC CONFIGURATION FILE

JBoss EAP contains the runtime configuration **.jbossclirc** file, which helps you to initialize the environment when a new session is launched. This file is located in **EAP_HOME/bin/** directory. The example provided in the file can be used as a template for user-specific environment setup. The **.jbossclirc** file is ideal for storing global CLI variables.

The content of the **.jbossclirc** file is a list of CLI supported commands and operations. This file is executed when a new management CLI session is launched but before the control is given to the user. If there are system properties specified with **--properties** argument, then the **.jbossclirc** file is executed after the properties have been set.

Example .jbossclirc File

```
set console=/subsystem=logging/console-handler=CONSOLE
```



NOTE

When using the **--connect** or **-c** argument, **.jbossclirc** is executed before the client is actually connected to the server.

The following locations will be checked for the presence of the **.jbossclirc** file in the following order:

1. If the system property **jboss.cli.rc** is defined, its value will be considered a path to the file.
2. User's working directory as defined by the **user.dir** system property.
3. The **EAP_HOME/bin** directory.

6.4. USING VARIABLES

Using the Set Command

You can define a certain path of the server model to a variable using the **set** command. For example:

```
set s1=/host=master/server=server-one
```

This is useful in a managed domain as you can include references to host and profiles using variables to easily replicate scripts on different servers. For example:

```
`${s1}/subsystem=datasources/data-source=ExampleDS:test-connection-in-pool
```



NOTE

The variables are referenced using **\$**.

Using the Unset Command

You can remove the variable by using the **unset** command:

```
unset prod_db
```

Using the jbosscli.rc File

To use the variable across CLI session, you can include these variables in the **.jbosscli.rc** file. This file is located in the **EAP_HOME/bin/** directory.

For example:

```
set s1=/host=master/server=server-one  
set s2=/host=master/server=server-two
```

Now, restart the management CLI and issue a **set** command to check the available variables:

```
set
```

The output will be:

```
s1=/host=master/server=server-one  
s2=/host=master/server=server-two
```

The variables may appear in any part of a command line and resolved during the command line parsing phase. In this example, the **prod_db** variable will be resolved to a datasource:

```
`${prod_db}/statistics=jdbc:read-resource
```

Using the Echo Command

Use the **echo** command to check the value of a variable:

```
echo $prod_db
```

The output will be:

```
/subsystem=datasources/data-source=ExampleDS
```

Example

The following general examples show where the variables may appear and that the entire command line may consist of variables:

```
$prod_db:$op($param=$param_value)  
$cmd --$param=$param_value
```



NOTE

The variables help you in CLI scripting.

CHAPTER 7. MANAGEMENT CLI COMMAND HISTORY

The management CLI features a command history functionality that is enabled by default in the application server installation. The history is kept both as a record in the volatile memory of the active CLI session, and appended to a log file that saves automatically in the user's home directory as **.jboss-cli-history**. This history file is configured by default to record up to a maximum of **500** CLI commands. The history file location and maximum history entries can be customized in the **EAP_HOME/bin/jboss-cli.xml** file.

The **history** command by itself will return the history of the current session, or with additional arguments will disable, enable, or clear the history from the session memory. The management CLI also features the ability to use your keyboard's arrow keys to go back and forth in the history of commands and operations.

View the Management CLI Command History

Display the CLI command history stored in memory since the management CLI startup or the history clear command.

```
history
```

Clear the Management CLI Command History

Clear the history of CLI commands from the session memory and from the **.jboss-cli-history** file saved to the user's home directory.

```
history --clear
```

Enable the Management CLI Command History

Record CLI commands in the session memory and in the **.jboss-cli-history** file saved to the user's home directory.

```
history --enable
```

Disable the Management CLI Command History

Do not record CLI commands in the session memory or in the **.jboss-cli-history** file saved to the user's home directory.

```
history --disable
```

CHAPTER 8. MANAGEMENT CLI LOGGING

You can capture output and other management CLI information in a log file. By default, management CLI logging is disabled. You can enable it and configure other logging settings using the **`EAP_HOME/bin/jboss-cli-logging.properties`** file.

Configure Management CLI Logging

1. Edit the **`EAP_HOME/bin/jboss-cli-logging.properties`** file.
2. Uncomment or add the following line to enable logging.

```
# uncomment to enable logging to the file  
logger.handlers=FILE
```

3. Change the log level from **OFF** to the desired level, such as **INFO** or **ALL**.

```
logger.org.jboss.as.cli.level=INFO
```

Once you restart the management CLI, output will be logged to the **`EAP_HOME/bin/jboss-cli.log`** file.

For information on configuring other settings in a logging properties file, see the [Configuring logging.properties](#) section of the JBoss EAP *Development Guide*.

CHAPTER 9. BATCH PROCESSING

Batch processing allows multiple operation requests to be grouped in a sequence and executed together as a unit. If any of the operation requests in the sequence fail, the entire group of operations is rolled back.



NOTE

Batch mode does not support conditional statements.

1. Enter batch mode with the **batch** management CLI command.

```
batch
```

Batch mode is indicated by the hash symbol (**#**) in the prompt.

2. Add operation requests to the batch.

Once in batch mode, enter operation requests as normal. The operation requests are added to the batch in the order they are entered.

You can edit and reorder batch commands. You can also store a batch for processing at a later time. See [Batch Mode Commands](#) for a full list of commands available for working with batches.

3. Run the batch.

Once the entire sequence of operation requests is entered, run the batch with the **run-batch** command.

```
run-batch
```

The entered sequence of operation requests is completed as a batch and prints the result to the terminal: **The batch executed successfully.**

Batch Commands in External Files

Frequently-run batch commands can be stored in an external text file and can be loaded either by passing the full path to the file as an argument to the **batch** command or executed directly by being passed as an argument to the **run-batch** command.

You can create a batch command file by using a text editor and placing each command on its own line.

The following command will load the **myscript.txt** file in batch mode. The commands from this file can then be edited or removed. New commands can be inserted. Changes made in this batch session do not persist to the **myscript.txt** file.

```
batch --file=myscript.txt
```

The following will immediately run the batch commands stored in the file **myscript.txt**

```
run-batch --file=myscript.txt
```

The entered sequence of operation requests is completed as a batch.

CHAPTER 10. EMBEDDING A SERVER FOR OFFLINE CONFIGURATION

You can embed a JBoss EAP standalone server or host controller process inside the management CLI process. This allows you to configure the server without it being visible on the network. A common use of this feature is for initial configuration of the server, such as managing security-related settings or avoiding port conflicts, prior to the server being online.

This direct, local administration of a JBoss EAP installation through the management CLI does not require a socket-based connection. You can use the management CLI with the embedded server in a way that is consistent with interacting with a remote JBoss EAP server. All of the standard management CLI commands that you can use to administer a remote server are available.

Start an Embedded Standalone Server

You can launch a standalone server locally using the management CLI to modify standalone configuration without launching an additional process or opening network sockets.

The following procedure launches the management CLI, starts an embedded standalone server, modifies configuration, and then stops the embedded server.

1. Launch the management CLI.

```
$ EAP_HOME/bin/jboss-cli.sh
```

2. Launch the embedded standalone server.

Passing in the **--std-out=echo** parameter prints the standard output to the terminal.

```
embed-server --std-out=echo
```

3. Perform the desired operations.

```
/socket-binding-group=standard-sockets/socket-binding=management-http:write-attribute(name=port,value=9991)
```

4. Stop the embedded server.

```
stop-embedded-server
```

This stops the embedded server and returns you to your management CLI session. If you want to exit the management CLI session as well, you can use the **quit** command.

Specifying the Server Configuration

By default, the embedded server will use the **standalone.xml** configuration file. You can use the **--server-config** parameter to specify a different configuration file to use.

```
embed-server --server-config=standalone-full-ha.xml
```

Starting in Admin-only Mode

By default, the embedded server is started in **admin-only** mode, which will start services related to server administration, but will not start other services or accept end-user requests. This is useful for the initial configuration of the server.

You can start the embedded server in the normal running mode by setting the **--admin-only** parameter to false.

```
embed-server --admin-only=false
```

You can also change the running mode using the **reload** command.

```
reload --start-mode=normal
```

Controlling Standard Output

You can control how to handle standard output from the embedded server. By default, standard output is discarded, but you could find the output in the server log. You can pass in **--std-out=echo** to have server output appear with the management CLI output.

```
embed-server --std-out=echo
```

Boot Timeout

By default, the **embed-server** command blocks indefinitely waiting for the embedded server to fully start. You can specify the time to wait in seconds using the **--timeout** parameter. A value less than **1** will return as soon as the embedded server reaches a point where it can be managed by the CLI.

```
embed-server --timeout=30
```

Starting with a Blank Configuration

When starting an embedded server, you can specify to start with an empty configuration. This is useful if you want to build the entire server configuration using management CLI commands.

```
embed-server --server-config=my-config.xml --empty-config
```

This command will fail if the file already exists, which helps to avoid the accidental deletion of a configuration file. You can specify to remove any existing configuration by passing in the **--remove-existing** parameter.

```
embed-server --server-config=my-config.xml --empty-config --remove-existing
```

Start an Embedded Host Controller

You can launch a host controller locally using the management CLI to modify domain and host controller configuration without launching additional processes or opening network sockets.

An embedded host controller does not start any of its servers. Additionally, you can not use the **--admin-only** parameter when starting an embedded host controller. It will always be launched as if it is in **admin-only** mode.

The following procedure launches the management CLI, starts an embedded host controller, modifies configuration, and then stops the embedded host controller.

1. Launch the management CLI.

```
$ EAP_HOME/bin/jboss-cli.sh
```

2. Launch the embedded host controller.
Passing in the **--std-out=echo** parameter prints the standard output to the terminal.

```
embed-host-controller --std-out=echo
```

3. Perform the desired operations.

```
/host=HOST_NAME:write-attribute(name=name,value=NEW_HOST_NAME)
```

4. Stop the embedded host controller.

```
stop-embedded-host-controller
```

Specifying the Host Controller Configuration

By default, the embedded host controller will use **domain.xml** for domain configuration and **host.xml** for host configuration. You can use the **--domain-config** and **--host-config** parameters to specify different configuration files to use.

```
embed-host-controller --domain-config=other-domain.xml --host-config=host-slave.xml
```



NOTE

Depending on which alternative configuration file you use, you may need to set certain properties when launching the management CLI. For example,

```
$ EAP_HOME/bin/jboss-cli.sh -Djboss.domain.master.address=127.0.0.1
```

Controlling Standard Output

You can control how to handle standard output from the embedded host controller. By default, standard output is discarded, but you could find the output in the host controller's log. You can pass in **--std-out=echo** to have host controller output appear with the management CLI output.

```
embed-host-controller --std-out=echo
```

Boot Timeout

By default, the **embed-host-controller** command blocks indefinitely waiting for the embedded host controller to fully start. You can specify the time to wait in seconds using the **--timeout** parameter. A value less than **1** will return as soon as the embedded host controller reaches a point where it can be managed by the CLI.

```
embed-host-controller --timeout=30
```

Non-Modular Class Loading with the Management CLI

Using the **EAP_HOME/bin/jboss-cli.sh** script to launch the management CLI uses a modular class loading environment. If you use the **EAP_HOME/bin/client/jboss-cli-client.jar** to run the management CLI in a non-modular class loading environment, you will need to specify the root JBoss EAP installation directory.

1. Launch the management CLI.

```
$ java -jar EAP_HOME/bin/client/jboss-cli-client.jar
```

2. Start the embedded server, specifying the root installation directory.

```
embed-server --jboss-home=/path/to/EAP_HOME
```

**NOTE**

To embed a host controller, use the **embed-host-controller** command.

The embedding logic will set up an appropriate modular class loading environment for the server. The module path for the modular class loader will have a single element:

EAP_HOME/modules.

No matter which way you launch the management CLI, the embedded server will run in a modular class loading environment.

CHAPTER 11. HOW TO...

The following CLI commands and operations provide basic examples on how to accomplish certain tasks. For detailed instructions, see the appropriate section of the [Configuration Guide](#), [Configuring Messaging](#), or other [JBoss EAP documentation](#).

Unless specified otherwise, the examples apply when running as a standalone server. Use the **--help** argument on a command to get usage for that command. Use the **read-operation-description** to get information on a particular operation for a resource.

11.1. ADD A DATASOURCE

```
data-source add --name=DATASOURCE_NAME --jndi-name=JNDI_NAME --driver-  
name=DRIVER_NAME --connection-url=CONNECTION_URL
```

11.2. ADD AN EXTENSION

Example: Add a New Extension to a Configuration

```
/extension=EXTENSION_NAME:add
```

11.3. ADD A JMS QUEUE

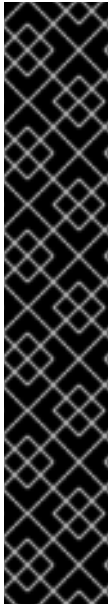
```
jms-queue add --queue-address=QUEUE_NAME --entries=JNDI_NAME
```

11.4. ADD A JMS TOPIC

```
jms-topic add --topic-address=TOPIC_NAME --entries=JNDI_NAME
```

11.5. ADD A MODULE

```
module add --name=MODULE_NAME --resources=PATH_TO_RESOURCE --  
dependencies=DEPENDENCIES
```



IMPORTANT

Using the **module** management CLI command to add and remove modules is provided as Technology Preview only. This command is not appropriate for use in a managed domain or when connecting to the management CLI remotely. Modules should be added and removed manually in a production environment. For more information, see the [Create a Custom Module Manually](#) and [Remove a Custom Module Manually](#) sections of the JBoss EAP *Configuration Guide*.

Technology Preview features are not supported with Red Hat production service level agreements (SLAs), might not be functionally complete, and Red Hat does not recommend to use them for production. These features provide early access to upcoming product features, enabling customers to test functionality and provide feedback during the development process.

See [Technology Preview Features Support Scope](#) on the Red Hat Customer Portal for information about the support scope for Technology Preview features.

11.6. ADD A SERVER

Example: Add a New Server to a Host in a Managed Domain

```
/host=HOST_NAME/server-config=SERVER_NAME:add(group=SERVER_GROUP_NAME)
```

11.7. ADD A SERVER GROUP

Example: Add a New Server Group in a Managed Domain

```
/server-group=SERVER_GROUP_NAME:add(profile=PROFILE_NAME, socket-binding-group=SOCKET_BINDING_GROUP_NAME)
```

11.8. ADD A SYSTEM PROPERTY

```
/system-property=PROPERTY_NAME:add(value=PROPERTY_VALUE)
```

11.9. CLONE A PROFILE

Example: Clone a Profile in a Managed Domain

```
/profile=PROFILE_TO_CLONE:clone(to-profile=NEW_PROFILE_NAME)
```

11.10. CREATE A HIERARCHICAL PROFILE

Example: Create a New Profile That Inherits from Other Profiles

```
/profile=NEW_PROFILE_NAME:add(includes=[PROFILE_1,PROFILE_2])
```

11.11. DEPLOY AN APPLICATION TO A MANAGED DOMAIN

Example: Deploy an Application to All Server Groups

```
deployment deploy-file /path/to/DEPLOYMENT.war --all-server-groups
```

Example: Deploy an Application to One or More Server Groups

```
deployment deploy-file /path/to/DEPLOYMENT.war --server-  
groups=SERVER_GROUP_1,SERVER_GROUP_2
```

11.12. DEPLOY AN APPLICATION TO A STANDALONE SERVER

```
deployment deploy-file /path/to/DEPLOYMENT.war
```

11.13. DISABLE ALL APPLICATIONS

```
deployment disable /path/to/DEPLOYMENT.war
```

You can use the deployment **disable-all** command to disable all the deployments.

```
deployment disable-all
```

11.14. DISPLAY THE ACTIVE USER

Example: Command to Display the Current User

```
:whoami
```

Example: Output for the Current User

```
{  
  "outcome" => "success",  
  "result" => {"identity" => {  
    "username" => "$local",  
    "realm" => "ManagementRealm"  
  }}  
}
```

11.15. DISPLAY THE CONTENTS OF AN ATTACHMENT

You can use the **attachment display** command to display the contents of an attachment returned from a management operation. This applies to any management operation that returns the **attached-streams** response header.

For example, the following operation returns the **server.log** file attached as a stream.

```
/subsystem=logging/log-file=server.log:read-attribute(name=stream)  
{  
  "outcome" => "success",  
  "result" => "f61a27c4-c5a7-43ac-af1f-29e90c9acb3e",
```

```

"response-headers" => {"attached-streams" => [{"uuid" => "f61a27c4-c5a7-43ac-af1f-29e90c9acb3e",
"mime-type" => "text/plain"}]}
}

```

You can use the **attachment display** command to display the contents of the stream returned from this operation to the console.

```
attachment display --operation=/subsystem=logging/log-file=server.log:read-attribute(name=stream)
```

This outputs the contents of the **server.log** file to the console.

```

ATTACHMENT 3480a327-31dd-4412-bdf3-f36c94ac4a09:
2019-10-18 09:19:37,082 INFO [org.jboss.modules] (main) JBoss Modules version 1.8.6.Final-redhat-00001
2019-10-18 09:19:37,366 INFO [org.jboss.msc] (main) JBoss MSC version 1.4.5.Final-redhat-00001
2019-10-18 09:19:37,380 INFO [org.jboss.threads] (main) JBoss Threads version 2.3.2.Final-redhat-1
2019-10-18 09:19:37,510 INFO [org.jboss.as] (MSC service thread 1-1) WFLYSRV0049: JBoss EAP 7.4.0.Beta (WildFly Core 10.0.0.Final-redhat-20190924) starting
...

```

11.16. DISPLAY SCHEMA INFORMATION

To show the schema information for the **:product-info** command:

```
:read-operation-description(name=product-info)
```

To display the schema version, execute an **ls** command at the management CLI root and look for the **management-*-version** values:

```

...
management-major-version=4
management-micro-version=0
management-minor-version=1
...

```

11.17. DISPLAY SYSTEM AND SERVER INFORMATION

Example: Command to Display the System and Server Information

```
:product-info
```

Example: Output for the System and Server Information

```

{
  "outcome" => "success",
  "result" => [{"summary" => {
    "host-name" => "__HOST_NAME__",
    "instance-identifier" => "__INSTANCE_ID__",
    "product-name" => "JBoss EAP",

```



```

"product-version" => "EAP 7.4.0.Beta",
"product-community-identifier" => "Product",
"product-home" => "__EAP_HOME__",
"standalone-or-domain-identifier" => "__OPERATING_MODE__",
"host-operating-system" => "__OS_NAME__",
"host-cpu" => {
  "host-cpu-arch" => "__CPU_ARCH__",
  "host-core-count" => __CORE_COUNT__
},
"jvm" => {
  "name" => "__JAVA_VM_NAME__",
  "java-version" => "__JAVA_VERSION__",
  "jvm-version" => "__JAVA_VM_VERSION__",
  "jvm-vendor" => "__JAVA_VM_VENDOR__",
  "java-home" => "__JAVA_HOME__"
}
}}}
}

```

Similarly, for a managed domain, you can display the information for a particular JBoss EAP host or server:

```
/host=HOST_NAME:product-info
```

```
/host=HOST_NAME/server=SERVER_NAME:product-info
```

11.18. ENABLE ALL DISABLED DEPLOYMENTS

```
deployment enable DEPLOYMENT.war
```

You can use the **deployment enable-all** command to enable all the deployments.

```
deployment enable-all --server-groups=other-server-group
```

11.19. GET THE COMMAND TIMEOUT VALUE

Example: Display the CLI Command Timeout Value

```
command-timeout get
```

The value returned is in seconds. A value of **0** means no timeout.

11.20. RELOAD A HOST CONTROLLER

```
reload --host=HOST_NAME
```

11.21. RELOAD A HOST CONTROLLER IN ADMIN-ONLY MODE

```
reload --host=HOST_NAME --admin-only=true
```

11.22. RELOAD ALL SERVERS IN A SERVER GROUP

Example: Reload All Servers in a Certain Server Group in a Managed Domain

```
/server-group=SERVER_GROUP_NAME:reload-servers
```



NOTE

To reload the servers in a suspended state, pass in the **start-mode=suspend** argument.

11.23. RELOAD A SERVER

Example: Reload a Server in a Managed Domain

```
/host=HOST_NAME/server-config=SERVER_NAME:reload
```

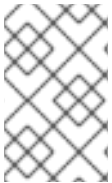


NOTE

To reload the server in a suspended state, pass in the **start-mode=suspend** argument.

11.24. RELOAD A STANDALONE SERVER

```
reload
```



NOTE

To reload the server in admin-only mode, pass in the **--start-mode=admin-only** argument. To reload the server in a suspended state, pass in the **--start-mode=suspend** argument.

11.25. REMOVE AN EXTENSION

Example: Remove an Existing Extension

```
/extension=EXTENSION_NAME:remove
```

11.26. REMOVE A MODULE

```
module remove --name=MODULE_NAME
```



IMPORTANT

Using the **module** management CLI command to add and remove modules is provided as Technology Preview only. This command is not appropriate for use in a managed domain or when connecting to the management CLI remotely. Modules should be added and removed manually in a production environment. For more information, see the [Create a Custom Module Manually](#) and [Remove a Custom Module Manually](#) sections of the *JBoss EAP Configuration Guide*.

Technology Preview features are not supported with Red Hat production service level agreements (SLAs), might not be functionally complete, and Red Hat does not recommend to use them for production. These features provide early access to upcoming product features, enabling customers to test functionality and provide feedback during the development process.

See [Technology Preview Features Support Scope](#) on the Red Hat Customer Portal for information about the support scope for Technology Preview features.

11.27. RESET THE COMMAND TIMEOUT VALUE

Example: Reset the Command Timeout to the Default Value

```
command-timeout reset default
```

Example: Reset the Command Timeout to the Value Provided by the CLI Configuration

```
command-timeout reset config
```



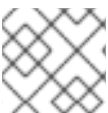
NOTE

The value provided by the CLI configuration can be set in either in the ***EAP_HOME/bin/jboss-cli.xml*** file or passed in with the **--command-timeout** argument when starting the management CLI.

11.28. RESTART ALL SERVERS IN A SERVER GROUP

Example: Restart All Servers in a Certain Server Group in a Managed Domain

```
/server-group=SERVER_GROUP_NAME:restart-servers
```



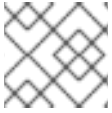
NOTE

To restart the servers in a suspended state, pass in the **start-mode=suspend** argument.

11.29. RESTART A SERVER

Example: Restart a Server in a Managed Domain

```
/host=HOST_NAME/server-config=SERVER_NAME:restart
```

**NOTE**

To restart the server in a suspended state, pass in the **start-mode=suspend** argument.

11.30. SAVE THE CONTENTS OF AN ATTACHMENT

You can use the **attachment save** command to save the contents of an attachment returned from a management operation to a file. This applies to any management operation that returns the **attached-streams** response header.

For example, the following operation returns the **server.log** file attached as a stream.

```
/subsystem=logging/log-file=server.log:read-attribute(name=stream)
{
  "outcome" => "success",
  "result" => "f61a27c4-c5a7-43ac-af1f-29e90c9acb3e",
  "response-headers" => {"attached-streams" => [{"uid" => "f61a27c4-c5a7-43ac-af1f-29e90c9acb3e",
  "mime-type" => "text/plain"}]}
}
```

You can use the **attachment save** command to save the contents of the stream returned from this operation to a file.

```
attachment save --operation=/subsystem=logging/log-file=server.log:read-attribute(name=stream) --
file=log-output.txt
```

This saves the contents of the **server.log** file to **EAP_HOME/bin/log-output.txt**.

11.31. SET THE COMMAND TIMEOUT VALUE

Example: Set the Maximum Time to Wait for a CLI Command to Complete

```
command-timeout set TIMEOUT_VALUE
```

The value is set in seconds. A value of **0** means no timeout.

11.32. SHUT DOWN A HOST CONTROLLER

Example: Shut Down a Host Controller in a Managed Domain

```
shutdown --host=HOST_NAME
```

11.33. SHUT DOWN THE SERVER

Example: Shut Down a Standalone Server

```
shutdown
```

11.34. START ALL SERVERS IN A SERVER GROUP

Example: Start All Servers in a Certain Server Group in a Managed Domain

```
/server-group=SERVER_GROUP_NAME:start-servers
```



NOTE

To start the servers in a suspended state, pass in the **start-mode=suspend** argument.

11.35. START A SERVER

Example: Start a Server in a Managed Domain

```
/host=HOST_NAME/server-config=SERVER_NAME:start
```



NOTE

To start the server in a suspended state, pass in the **start-mode=suspend** argument.

11.36. STOP ALL SERVERS IN A SERVER GROUP

Example: Stop All Servers in a Certain Server Group in a Managed Domain

```
/server-group=SERVER_GROUP_NAME:stop-servers
```

11.37. STOP A SERVER

Example: Stop a Server in a Managed Domain

```
/host=HOST_NAME/server-config=SERVER_NAME:stop
```

11.38. TAKE A CONFIGURATION SNAPSHOT

Example: Take a Snapshot of the Current Configurations

```
:take-snapshot
```

11.39. UNDEPLOY ALL APPLICATIONS

Example: Undeploy All Applications from a Managed Domain

```
deployment undeploy * --all-relevant-server-groups
```

Example: Undeploy All Applications from a Standalone Domain

```
deployment undeploy *
```

11.40. UNDEPLOY AN APPLICATION FROM A MANAGED DOMAIN

Example: Undeploy an Application from All Server Groups with That Deployment

```
deployment undeploy DEPLOYMENT.war --all-relevant-server-groups
```

Example: Undeploy an Application from a Specific Server Group

```
deployment undeploy DEPLOYMENT.war --server-groups=SERVER_GROUP_NAME
```

11.41. UNDEPLOY AN APPLICATION FROM A STANDALONE SERVER

```
deployment undeploy DEPLOYMENT.war
```

11.42. UPDATE A HOST NAME

Example: Update the Name of a Host in a Managed Domain

```
/host=EXISTING_HOST_NAME:write-attribute(name=name,value=NEW_HOST_NAME)  
reload --host=EXISTING_HOST_NAME
```

The host must be reloaded in order for the changes to take effect.

11.43. UPLOAD AN ATTACHMENT

You can upload a local file as an attachment to management operations that accept file streams. For example, the following management CLI command uses the **input-stream-index** option to upload the contents of a local file to an exploded deployment.

```
/deployment=DEPLOYMENT_NAME.war:add-content(content=[{target-  
path=/path/to/FILE_IN_DEPLOYMENT, input-stream-index=/path/to/LOCAL_FILE_TO_UPLOAD}]
```

For more details on uploading files to a deployment, see the [Add Content to an Exploded Deployment](#) section of the *Configuration Guide*.

11.44. VIEW A SERVER LOG

```
/subsystem=logging/log-file=SERVER_LOG_NAME:read-log-file
```

APPENDIX A. REFERENCE MATERIAL

The management CLI supports numerous commands and arguments that help you start and stop servers, deploy and undeploy applications, configure system settings, and perform other administrative tasks.

Use the tables in this section to view descriptions of management CLI commands and arguments.

A.1. MANAGEMENT CLI STARTUP ARGUMENTS

The following table lists the arguments that can be passed into the **jboss-cli** script to launch the management CLI.

Table A.1. Management CLI Arguments

Argument	Description
<code>--bind</code>	Specifies to which address the CLI is going to be bound to. If none is provided then the CLI will choose one automatically as needed.
<code>--command</code>	Specifies a single command or an operation that should be executed in the CLI session. The CLI will terminate the session immediately after the command or the operation has been executed.
<code>--command-timeout</code>	The maximum time, in seconds, to wait for a command to complete. A value of 0 means no timeout. By default, there is no timeout.
<code>--commands</code>	Specifies a comma-separated list (must not contain whitespace) of commands and operations that should be executed in the CLI session. The CLI session will terminate after the last command has been executed or if a command fails.
<code>--connect, -c</code>	Instructs the CLI to connect to the controller on start-up. This avoid having to issue a separate connect command later.
<code>--controller</code>	The default controller host, port, and protocol to connect to when the --connect option is specified upon startup or when the connect command is issued in the management CLI without arguments. The default host is localhost , the default port is 9990 , and the default protocol is remote+http . Alternatively, a controller alias containing the host, port, and protocol information can be supplied.
<code>--echo-command</code>	Include the prompt and command in the output for commands executed in non-interactive mode.
<code>--error-on-interact</code>	Disables prompts for security-related input in non-interactive mode. If an input is required to proceed, the CLI process will terminate abruptly with an error.

Argument	Description
--file	Specifies the path to a file which contains commands and operations (one per line) that should be executed non-interactively. The CLI will terminate after the last command has been executed or if a command or operation fails.
--gui	Launches a GUI that is built on top of the command-line interface. This GUI is not a supported way to interact with the JBoss EAP management CLI and should only be used to view configuration and help build CLI commands.
--help, -h	Displays the help message.
--no-color-output	Disable CLI output and prompt colors.
--no-local-auth	Disables the local authentication mechanism which allows the CLI to demonstrate that it is being executed locally to the server being managed through an exchange of tokens using the file system.
--no-output-paging	Disables output paging, which is when the management CLI pauses after a page of output has been displayed, allowing you to browse and search the output. When this option is specified, the entire output is printed immediately.
--output-json	Displays operation responses in pure JSON format. By default, operation responses are displayed in DMR format.
--password, -p	Specifies the password for authentication while connecting to the controller. If the argument is not specified and authentication is required, then the user will be prompted to enter the password when the connect command is issued.
--properties	Specifies a path to a properties file that contains property value pairs to define system properties. The properties file uses a standard KEY=VALUE syntax.
--resolve-parameter-values	Resolve system properties specified as command argument values or operation parameter values before sending the operation request to the controller.
--timeout	Specifies the time, in milliseconds, to wait for a connection to succeed. The default is 5000 .
--user, -u	Specifies the user name if the controller requires user authentication. If the argument is not specified and authentication is required, then the user will be prompted to enter the user name when the connect command is issued. Local authentication is automatically disabled if a user is specified.

Argument	Description
--version	Displays the application server version and environment information.

A.2. MANAGEMENT CLI BATCH MODE COMMANDS

This table provides a list of commands that can be used with the management CLI to work with batches.

Table A.2. Management CLI Batch Mode Commands

Command Name	Description
clear-batch	Removes all the existing command lines from the currently active batch.
discard-batch	Discards the currently active batch and exits batch mode.
edit-batch-line	Edit a line in the current batch by providing the line number to edit and the edited command. For example: edit-batch-line 2 data-source disable --name=ExampleDS .
holdback-batch	Postpone or store a current batch. Using this command without arguments creates an unnamed heldback batch. To return to this heldback batch, simply type batch again at the CLI command line. There can be only one unnamed heldback batch. You can optionally provide a name under which to store the batch by using the holdback_name argument. To return to the named batch, pass the heldback_name to the batch command. Use the batch -l command to see a list of all heldback batches.
list-batch	Lists all commands in the currently active batch.
move-batch-line	Re-order the lines in the batch by specifying the line number you want to move as the first argument and its new position as the second argument. For example: move-batch-line 3 1 .
remove-batch-line	Removes the batch command at the specified line. For example: remove-batch-line 3 .
run-batch	Runs the currently active batch. If the batch executed successfully, the batch will be discarded and the CLI will exit batch mode.

A.3. MANAGEMENT CLI COMMANDS

The following table lists management CLI commands and their purposes. For more usage and argument details, use the **--help** argument on a specific command.

Table A.3. Management CLI Commands

Command	Description
alias	Define an alias with the format NAME=VALUE . When no arguments are specified, the list of aliases are displayed.
batch	Starts batch mode by creating a new batch. If there is an unnamed held back batch, it will be reactivated. If there are named held back batches, reactivate by specifying the heldback_name .
cd	Changes to the specified path.
clear	Clears the screen.
command	Allows you to add, remove, and list existing generic type commands. A generic type command is a command that is assigned to a specific node type and which allows you to perform any operation available for an instance of that type. It can also modify any of the properties exposed by the type on any existing instance.
connect	Connects to the controller on the specified host and port using the specified protocol when the management CLI was launched. If not specified, the default host is localhost , the default port is 9990 , and the default protocol is http .
connection-factory	Manages connection factories in the messaging-activemq subsystem.
connection-info	Displays information about the current connection to the server.
data-source	Manages datasource configuration in the datasources subsystem.
deployment deploy-file	Deploys an application. Use wildcard (*) to deploy all the applications.
deployment disable	Disables a pre-existing deployment.
deployment enable	Enables a pre-existing deployment.
deployment info	Displays information about an individual deployment or about multiple deployments.
deployment undeploy	Undeploys an application with the specified name.
deployment-overlay	Manage deployment overlays. If no arguments are specified, all existing deployment overlays are listed.
echo	Outputs the specified text to the console.
echo-dmr	Builds a DMR request for the command or operation passed in as the argument and echos in its toString() format.

Command	Description
help	Displays the help message. Can be used with an argument to display help information for a particular command or operation. Use the --commands argument to display a list of available commands.
history	Displays the CLI command history in memory and displays a status of whether the history expansion is enabled or disabled. Can be used with arguments to clear, disable and enable the history as required.
if	Starts if-else control flow.
jdbc-driver-info	Displays information about the installed JDBC drivers.
jms-queue	Manage JMS queues in the messaging-activemq subsystem.
jms-topic	Manage JMS topics in the messaging-activemq subsystem.
ls	Lists the contents of the node path. Use the -l switch to print the result one per line.
module	Add and remove modules. Note that this command is provided as Technology Preview only.
patch	Apply or roll back a patch to the server.
pwd	Prints the full node path of the current working node.
quit	Terminates the command line interface.
read-attribute	Prints the value and, depending on the arguments, the description of the attribute of a managed resource.
read-operation	Displays the description of a specified operation, or lists all available operations if none is specified.
reload	Sends the :reload operation request to the server/domain controller and waits for the controller to close the connection and then it returns the control back to the client.
rollout-plan	Manage stored rollout plans.
run-batch	Runs the currently active batch while in batch mode. While not in batch mode, can use with the --file argument to execute the contents of the file as a batch.
set	Initializes variables with the given names with the specified values.

Command	Description
shutdown	Sends the :shutdown operation request to the server/domain controller and waits for the controller to close the connection.
try	Starts a try-catch-finally control flow.
unalias	Remove the specified alias.
unset	Removes an existing variable with the specified name.
version	Prints the application server version and environment information.
xa-data-source	Manages XA datasource configuration in the datasources subsystem.

A.4. MANAGEMENT CLI OPERATIONS

The following table lists management CLI operations that are available at the root level (*/*). The actual available operations for a particular resource will vary per resource and also depend on the operating mode (standalone server or managed domain).

Operations are invoked using a colon (:). The available operations for a resource can be exposed by using the **read-operation-names** operation or by using tab completion after a colon. Operation descriptions can be displayed by using the **read-operation-description** operation. For example:

```
:read-operation-description(name=write-attribute)
```

Table A.4. Management CLI Operations

Operation Name	Description
add-namespace	Adds a namespace prefix mapping to the namespaces attribute's map.
add-schema-location	Adds a schema location mapping to the schema-locations attribute's map.
clean-obsolete-content	Clean contents that are no longer referenced from the content repository.
delete-snapshot	Deletes a snapshot of the server configuration from the snapshots directory.
full-replace-deployment	Adds previously uploaded deployment content to the list of content available for use, replace existing content of the same name in the runtime, and remove the replaced content from the list of content available for use.
list-add	Add an entry to a list attribute.

Operation Name	Description
list-clear	Clear all entries from a list attribute.
list-get	Get an entry from a list attribute.
list-remove	Remove an entry from a list attribute.
list-snapshots	Lists the snapshots of server configurations saved in the snapshots directory.
map-clear	Clear all entries from a map attribute.
map-get	Get an entry from a map attribute.
map-put	Add an entry to a map attribute.
map-remove	Remove an entry from a map attribute.
product-info	Returns a summary of the current server installation.
query	Query a resource.
read-attribute	Displays the value of an attribute for the selected resource.
read-attribute-group	Displays the value of attributes for the selected group.
read-attribute-group-names	Displays the names of all the attribute groups under the selected resource.
read-children-names	Displays the names of all children under the selected resource with the given type.
read-children-resources	Displays information about all of a resource's children that are of a given type.
read-children-types	Displays the type names of all the children under the selected resource.
read-config-as-xml	Displays the current configuration in XML format.
read-operation-description	Displays the details of an operation for the given resource.
read-operation-names	Displays the names of all available operations for the given resource.
read-resource	Displays a resource's attribute values along with either basic or complete information about any child resources.

Operation Name	Description
read-resource-description	Displays the description of a resource's attributes, types of children and operations.
reload	Reloads the server by shutting all services down and restarting.
reload-servers	Reloads all servers currently running in the domain.
remove-namespace	Removes a namespace prefix mapping from the namespaces attribute map.
remove-schema-location	Removes a schema location mapping from the schema-locations attribute map.
replace-deployment	Replace existing content in the runtime with new content. The new content must have been previously uploaded to the deployment content repository.
resolve-expression	Accepts an expression as input (or a string that can be parsed into an expression), and resolves it against the local system properties and environment variables.
resolve-expression-on-domain	Accepts an expression as input (or a string that can be parsed into an expression) and resolves it against the local system properties and environment variables on all servers in the domain.
resolve-internet-address	Takes a set of interface resolution criteria and finds an IP address on the local machine that matches the criteria, or fails if no matching IP address can be found.
restart-servers	Restarts all servers currently running in the domain.
resume	Resumes normal operations in a suspended server.
resume-servers	Resumes processing on all servers in the domain.
shutdown	Shuts down the server with a call to System.exit(0) .
start-servers	Starts all configured servers in the managed domain that are not currently running.
stop-servers	Stops all servers currently running in the managed domain.
suspend	Suspends server operations gracefully. All current requests will complete normally, however no new requests will be accepted.

Operation Name	Description
suspend-servers	Suspends all servers in the domain. All current operations will finish and no new operations will be allowed.
take-snapshot	Takes a snapshot of the server configuration and saves it to the snapshots directory.
undefine-attribute	Sets the value of an attribute of the selected resource to undefined .
upload-deployment-bytes	Indicates that the deployment content in the included byte array should be added to the deployment content repository. Note that this operation does not indicate the content should be deployed into the runtime.
upload-deployment-stream	Indicates that the deployment content available at the included input stream index should be added to the deployment content repository. Note that this operation does not indicate the content should be deployed into the runtime.
upload-deployment-url	Indicates that the deployment content available at the included URL should be added to the deployment content repository. Note that this operation does not indicate the content should be deployed into the runtime.
validate-address	Checks whether a resource with the specified address exists.
validate-operation	Validates that an operation is valid according to its description. Any errors present will be shown in the operation's failure-description .
whoami	Returns the identity of the currently authenticated user.
write-attribute	Sets the value of an attribute for the selected resource.

A.5. RESOURCE ATTRIBUTE DETAILS

The **read-resource-description** operation displays a resource's attributes and the details about the attribute. The following table lists the possible fields that might be returned, depending on whether it is relevant for the attribute.

Table A.5. Resource Attribute Details

Field	Description
access-type	Whether an attribute can only be read, can be read and written, or is a metric. Valid values are read-only , read-write , and metric . A metric is a read-only attribute, where the value is not stored in the persistent configuration and can change due to activity on the server.

Field	Description
allowed	The list of valid values.
alternatives	Defines an exclusive relationship between attributes. If this attribute's value is set, the attributes listed in the alternatives field should be undefined, even if those attributes state that they are required.
capability-reference	Indicates that this attribute's value specifies the dynamic portion of the name of the specified capability provided by another resource. This indicates the attribute is a reference to another area of the management model.
default	The default value to use for the attribute if a value is not provided.
description	The text description of the attribute.
deprecated	Whether this attribute is deprecated. It also provides the version that it was deprecated in and reason for the deprecation.
expressions-allowed	Whether the attribute's value can be an expression.
max	The maximum value of a numeric attribute.
max-length	The maximum length of an attribute of type STRING , LIST , or BYTES .
min	The minimum value of a numeric attribute.
min-length	The minimum length of an attribute of type STRING , LIST , or BYTES .
nillable	Whether it is allowed for the attribute to not have a defined value. An attribute can be undefined either because it is not required or because it is required but has alternatives and an alternative is defined. This field helps users easily understand whether they need to account for the possibility of an undefined value.
required	Whether the attribute must have a defined value. If true , a value must be defined or an alternative must be defined. If false , the value may be undefined.
requires	Indicates that, if this attribute has a defined value, the attributes defined in this list must also have a value.

Field	Description
restart-required	<p>Defines which services must be restarted upon execution of a write-attribute operation. This field allows the following values.</p> <ul style="list-style-type: none"> ● no-services - No services must be restarted. ● all-services - All services must be restarted. ● resource-services - Some services associated with the resource must be restarted. ● jvm - The entire JVM must be restarted.
storage	<p>Whether the attribute's value is stored in the persistent configuration file or only exists as long as the resource is running. The value can be either configuration or runtime.</p>
type	<p>The type of the attribute's value. The allowed values are BIG_DECIMAL, BIG_INTEGER, BOOLEAN, BYTES, DOUBLE, INT, LIST, LONG, OBJECT, PROPERTY, and STRING.</p>
value-type	<p>Defines additional type information for attributes of type LIST or OBJECT. A value-type of INT for a LIST attribute is analogous to a Java List<Integer>. A value-type of STRING for an OBJECT attribute is analogous to a Java Map<String, String>. If all elements in an OBJECT attribute are not of the same type, the value-type represents a fully-defined complex object that defines that object's fields and values.</p>
unit	<p>The unit of the attribute's value, if appropriate.</p>

Revised on 2021-03-25 10:37:33 UTC