

Oracle® Fabric Manager

Command Reference (Beta)



VIRTUAL
NETWORKING

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Contents

Using This Documentation xxiii

1. Oracle Fabric Manager CLI Overview 1

Understanding Oracle Fabric Manager Elements 1

Virtual Resources 2

Oracle Fabric Interconnects 2

I/O Templates 3

I/O Profiles 3

Physical Servers 3

Roles 4

Domains 4

Using the CLI 4

Forming Commands 5

Completing Commands 7

Entering Commands 7

add Command Options 8

show Command Options 8

set Command Options 10

remove Command Options 11

Command Summary 12

Viewing Your Command History	15
Using Wildcards	16
Logging in to Oracle Fabric Manager Using the CLI	17
Initial User Accounts	17
Understanding Authentication in Oracle Fabric Manager	18
▼ Logging In to Oracle Fabric Manager CLI	19
2. Getting Started	21
Managing the Oracle Fabric Interconnect	21
▼ Add Oracle Fabric Interconnects	22
Understanding High Availability (HA) Network and Storage Clouds	23
Creating a Network Cloud	24
Understanding the Default Network Cloud	24
▼ Adding and Configuring a Network Cloud with HA	25
Creating a Storage Cloud	27
Understanding the Default Storage Cloud	27
▼ Adding and Configuring a Storage Cloud with HA	27
Creating an I/O Template	29
▼ Create an I/O Template	29
Creating and Deploying an I/O Profile	31
▼ Create and Deploy an I/O Profile	31
3. Working with Oracle Fabric Interconnects	35
Understanding Oracle Fabric Interconnects	35
Adding Oracle Fabric Interconnects to Oracle Fabric Manager's Environment	36
Displaying Information about Oracle Fabric Interconnects	37
Displaying Summary Information	38
Syntax	38
Example 1	38

Example 2	38
Fields	39
Displaying Director Details	40
Displaying I/O Card Information	41
Syntax	41
Example:	41
Field Definitions	42
Displaying FC Port Information	44
Syntax	45
Example	45
Field Definitions	45
Displaying Ethernet Port Information	46
Syntax	46
Example	47
Field Definitions	48
Managing Oracle Fabric Interconnects	49
Restarting an Oracle Fabric Interconnect	49
Syntax	50
Example	50
Removing an Oracle Fabric Interconnect	50
Syntax	50
Examples	50
Managing User Access Security	50
Understanding How Oracle Fabric Manager Controls User Access	51
User Roles	51
Resource Domains	52
Default Domain	52
Default Domain Users	53

Role and Domain Group Mappings	53
Using the No Access Role	54
Working with User Roles	54
Syntax	55
Example	56
Options	56
Working with Role Group Mappings	57
Syntax	57
Example	58
Working with Domain Group Mappings	58
Syntax	58
Examples	59
Configuring Resource Domains	59
Syntax	60
Example	62
4. Working with Network Clouds	63
Understanding Network Clouds and vNICs	63
vNICs	64
Private vNICs	64
Network QoS Profiles	65
High Availability Network Clouds	65
Ethernet Link Aggregation Groups (LAGs)	66
Virtual Local Area Networks (VLANs)	66
Round Robin Port Allocation Policy for a Network Cloud	67
Creating a Network Cloud	67
Adding a Network Cloud	68
Syntax	68
Examples	68

Options	68
Setting Network Cloud Options	70
Syntax	70
Examples	71
Options	71
Adding Ethernet Ports	72
Syntax	72
Examples	72
Adding Ethernet LAGs	73
Syntax	73
Examples	73
Adding High Availability (HA) to the Network Cloud	73
Syntax	73
Options	74
Examples	74
Displaying Network Cloud Details	74
Displaying Network Cloud Information	74
Syntax	74
Example	75
Field Definitions	75
Displaying Ethernet Port Information	77
Syntax	77
Example	78
Field Definitions	78
Displaying MAC Addresses	79
Syntax	79
Example	80
Removing Network Clouds, Ethernet Ports, and MAC IDs	80

Removing Network Clouds from your Environment	80
Syntax	81
Example	81
Removing Ethernet Ports from a Network Cloud	81
Syntax	81
Example	81
Removing Ethernet LAGs from a Network Cloud	81
Syntax	82
Example	82
Removing MAC IDs from a Network Cloud	82
Syntax	82
Example	82
Creating and Using vNICs	82
Adding vNICs to your Network Cloud	83
Syntax	83
Example—Adding a vNIC	83
Example—Adding an HA vNIC	84
Options	84
Setting vNIC Options	87
Syntax	87
Examples	88
Field Definitions	88
Setting a vNIC in a Network Cloud	88
Setting a vNIC's Termination	88
Displaying vNIC Information	88
Syntax—vNICs on a Physical Server	88
Example—vNICs on a Physical Server	89
Syntax—vNICs on an I/O Template	89

Example—vNICs on an I/O Template	90
Field Definitions	90
Removing vNICs from a Network Cloud	92
Syntax	92
Example	92
Working with Ethernet Link Aggregation Groups (LAGs)	92
Adding a LAG	93
Syntax	93
Example	94
Options	94
Configuring a LAG	94
Syntax	94
Example	95
Options	95
Displaying LAG Information	96
Syntax	96
Example--Ethernet LAG Information	97
Example--Ethernet LAG Port Information	97
Fields	97
Removing LAG	98
Syntax	98
Example	99
Working with Network QoS	99
Displaying Network QoS Information	99
Syntax	99
Example—Display Defined QoS Profiles	100
Example—Display Individual QoS Information	100
Fields	101

Removing a Network QoS Profile	101
Syntax	101
Example	101
Displaying MAC-Based QoS Information	102
Syntax	102
Example	103
Fields	103
Removing a MAC-based QoS Profile	103
Syntax	104
Example	104
Working with Default Gateways	104
Understanding Default Gateways	104
Creating a Default Gateway	105
Syntax	105
Example	105
Fields	105
Configuring a Default Gateway	106
Syntax	106
Example	106
Displaying Default Gateway Information	106
Syntax	106
Example	107
Fields	107
Removing a Default Gateway	108
Syntax	108
Example	108

5. Working With Storage Clouds 109

Understanding Storage Clouds and vHBAs	109
--	-----

Storage Clouds	109
vHBAs	110
Storage Area Network (SAN) QoS Profile	110
High Availability Storage Clouds	111
LUN Masks	111
Round Robin Port Allocation Policy for a Storage Cloud	112
World Wide Names	112
Creating a Storage Cloud	113
Adding a Storage Cloud	113
Syntax	113
Example—Adding a Storage Cloud	114
Example—Adding a Storage Cloud QoS Profile	114
Options	114
Setting Storage Cloud Options	114
Syntax	115
Example	115
Options	115
Adding Fibre Channel Ports	115
Syntax	116
Examples	116
Adding High Availability to the Storage Cloud	116
Syntax	116
Options	116
Examples	117
Displaying Storage Cloud Details	117
Displaying Storage Cloud Information	117
Syntax	117
Example	118

Options	118
Displaying FC Port Information	119
Syntax	119
Example1	120
Example	120
Options	120
Displaying World Wide Names	121
Syntax	121
Examples	122
Removing Storage Clouds and FC Ports	122
Removing Storage Clouds from your Environment	123
Syntax	123
Example	123
Removing FC Ports from a Storage Cloud	123
Syntax	123
Examples	123
Creating and Using vHBAs	124
Adding vHBAs to a Storage Cloud	124
Syntax	124
Example—Adding a vHBA	125
Example—Adding an HA vHBA	125
Options	125
Setting vHBA Options	127
Syntax	127
Examples	128
Options	128
Rescanning a vHBA	128
Setting a vHBA's Storage Cloud	128

Setting a vHBA's Termination	129
Displaying vHBA Information	129
Syntax—vHBAs on a Physical Server	129
Example—vHBAs on a Physical Server	129
Syntax—vHBAs on an I/O Template	130
Example—vHBAs on an I/O Template	130
Example	130
Options	130
Removing vHBAs from a Storage Cloud	131
Syntax	131
Example	131
Working with SAN Quality of Service (QoS)	132
Assigning QoS Profiles	132
Displaying SAN QoS Profiles	132
Syntax	133
Examples	133
Options	133
6. Working with I/O Templates	135
Understanding I/O Templates	135
Stepping Through the Process	136
Providing Connectivity	137
Creating an I/O Template	137
Adding an I/O Template	137
Syntax	138
Example	138
Options	138
Adding Network Resources	139
Syntax	139

Example	139
Options	139
Adding Storage Resources	141
Syntax	142
Example	142
Options	142
Changing I/O Resources	143
Changing vNICs	143
Syntax	144
Example	144
Options	144
Changing vHBAs	144
Syntax	145
Example	145
Options	145
Displaying I/O Resources	145
vNICs	145
Syntax	146
Example	146
Fields	146
vHBAs	147
Syntax	147
Example	148
Options	148
Servers	148
Syntax	149
Example	149
Options	149

Removing I/O Resources	151
vNICs	151
Syntax	151
Example	151
vHBAs	151
Syntax	151
Example	152
I/O Templates	152
Syntax	152
Example	152
7. Working with I/O Profiles	153
Understanding I/O Profiles	153
Creating I/O Profiles	154
Adding I/O Profile	154
Syntax	155
Examples	155
Physical Connectivity	155
Connecting an I/O Profile to a Physical Server	156
Syntax	156
Example	156
Disconnecting an I/O Profile from a Physical Server	156
Syntax	156
Example	157
Updating an I/O Profile	157
Syntax	157
Options	157
Example	158
Displaying I/O Profile Resources	158

vNICs	158
Syntax	158
Example	159
Fields	159
vHBAs	160
Syntax	160
Example	161
Fields	161
I/O Profiles	162
Syntax	162
Examples	163
Fields	164
Removing an I/O Profile	165
Removing I/O Profiles	165
Syntax	165
Examples	165
8. Working with Physical Servers	167
Physical Server Connections	167
Connecting a Physical Server	167
Syntax	168
Example	168
Disconnecting a Physical Server	168
Syntax	169
Example	169
Displaying Physical Server Resource Information	169
General Information	169
Syntax	170
Example	170

Fields	170
vNICs	172
Syntax	173
Example	173
Fields	173
vHBAs	174
Syntax	174
Example	175
Fields	175
Server Groups	176
Statistics	176
Syntax	177
Example	177
Fields	177
Working with Server Groups	178
Creating a Server Group from Selected Servers	178
Syntax	179
Example	179
Displaying Server Groups	179
Syntax	179
Examples	180
Removing Server Groups	180
Syntax	180
Example	181
Removing Virtual I/O Resources from Server Groups	181
Syntax	181
Example	181
Removing Server Groups	181

Syntax 182

Example 182

9. Working with Boot Profiles 183

Understanding and Working with SAN Boot Profiles 183

Creating a SAN Boot Profile 185

Syntax 186

Example 186

Fields 186

Displaying SAN Boot Profile Details 187

Syntax 187

Example 188

Fields 188

Deleting a SAN Boot Profile 189

Syntax 189

Example 190

Understanding and Working with iSCSI Boot Profiles 190

Creating and Changing an iSCSI Boot Profile 192

Syntax 192

Example 193

Fields 193

Displaying an iSCSI Boot Profile 194

Syntax 194

Example 195

Fields 195

Deleting an iSCSI Boot Profile 197

Syntax 197

Example 197

10. Oracle Fabric Manager CLI Quick Reference	199
Role Group Mapping	200
Example Output	202
Domain Group Mapping	202
Example Output	203
PVI Cloud	203
Example Output	205
Applications	205
Example Output	206
Network Clouds	207
Example Output 1	210
Example Output 2	210
Storage Clouds	211
Example Output 1	214
Example Output 2	214
I/O Templates	214
Example Output 1	219
Example Output 2	219
I/O Profiles	220
Example Output 1	223
Example Output 2	223
Physical Servers	223
Example Output	226
Example Output	226
Global Address	226
System Commands for the Oracle Fabric Interconnect or Oracle Fabric Manager	227
System Information and Tech Support	228
Example Output	228

Jobs	228
Example Output	231
Network Connectivity (ping, traceroute)	231
Example Output	232
Example Output	232
Oracle Fabric Interconnects	232
Example Output	234
Example Output	234
vNICs	234
Example Output	237
Example Output	237
vHBAs	238
Example Output	240
Example Output	240
Example Output	240
Server Groups	241
Example Output	242
Ethernet LAGs	242
Example Output	244
Default Gateways	244
Example Output	245
Network Quality of Service (QoS)	245
Example Output	246
Storage Quality of Service (QoS)	246
Example Output	247
MAC-Based Quality of Service	247
Example Output	248
Boot Profiles	248

Example Output	251
Example Output	251
User Role	252
Example Output	253
Resource Domain	253
Example Output	255
CLI Properties	255
World Wide Names and MAC addresses	257
Example Output	258
Example Output	258
LUN Masks	259
Example Output 1	260
Example Output 2	260
Oracle SDN Controllers	261
Plugins	262
A. Installing and Removing Applications	263
Adding an Application	263
Displaying Information About Applications	264
Removing an Application	264
B. Working with Oracle SDN	267
Renaming an Oracle SDN Fabric	267
Syntax	267
Example	267
Display Oracle SDN Fabric Information	268
Syntax	268
Example	268
C. Private Virtual Interface (PVI) Clouds	269

Adding and Configuring a PVI Cloud 269

Displaying a PVI Cloud 270

Removing a PVI Cloud 271

D. System Commands for the Oracle Fabric Interconnect or Oracle Fabric Manager 273

Exiting Oracle Fabric Manager 273

Rescanning 273

E. Network Connectivity 275

Using the PING Command 275

Using the TRACEROUTE Command 275

Index 277

displaying, 119 280

Using This Documentation

This document provides command descriptions, syntax, and examples for some basic functionality available in the Oracle Fabric Manager CLI. For additional documentation, including more robust configuration and administration tasks through the Oracle Fabric Manager GUI, see the *Oracle Fabric Manager User's Guide*.

This document is intended for enterprise network administrators with experience configuring network hardware and software products.

For additional information, see:

- “Product Notes” on page xxiii
- “Related Documentation” on page xxiv
- “Feedback” on page xxv
- “Support and Accessibility” on page xxv

Product Notes

For late-breaking information and known issues about this product, refer to the products notes at:

<http://URL-to-product-library-page>

Related Documentation

Documentation	Link
All Oracle products	http://www.oracle.com/documentation
Oracle Virtual Networking	http://docs.oracle.com/cd/E38500_01/index.html
Oracle Solaris OS and systems software library	http://www.oracle.com/technetwork/indexes/documentation/index.htm#sys_sw

Document	Part Number	Publication Date
<i>Oracle Fabric Manager User Guide</i>	E49557-02	09/2014
<i>Oracle Fabric Interconnect Quick Install Guide</i>	E38476-01	09/2014
<i>Oracle Fabric Interconnect Hardware and Drivers Installation Guide</i>	E50997-02	09/2014
<i>Oracle Fabric Monitor User's Guide</i>	E54892-01	09/2014
<i>Oracle Fabric Manager VMware Integrator User's Guide</i>	E39267-01	01/2013
<i>Oracle SDN Quick Start Guide</i>	E50732-02	09/2014
<i>Oracle SDN Controller User's Guide</i>	E49478-03	02/2014
<i>XgOS User's Guide</i>	E53170-02	09/2014
<i>XgOS Remote Booting Guide</i>	E52520-01	09/2014

Release notes are also available with each major hardware or software release for the Fabric Interconnect, Oracle Fabric Manager and its plugins, and OVN host drivers for the supported host OSes and hypervisors.

Revision Trail

The table shows the revision history for this document.

Document Title	Document Number	Revision Level	Revision Date
<i>Oracle Fabric Manager Command Reference</i>	E49556-02	Beta	09/2014

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Oracle Fabric Manager CLI Overview

This section provides general information about the Oracle Fabric Manager CLI. It describes the Oracle Fabric Manager elements, how to use the CLI commands, and how to log in to the Oracle Fabric Manager CLI, and includes the following sections:

- [“Understanding Oracle Fabric Manager Elements” on page 1](#)
- [“Using the CLI” on page 4](#)
- [“Entering Commands” on page 7](#)
- [“Logging in to Oracle Fabric Manager Using the CLI” on page 17](#)

Understanding Oracle Fabric Manager Elements

The Oracle Fabric Manager Command Line Interface (CLI) enables you to access the following elements:

- [“Virtual Resources” on page 2](#)
- [“Oracle Fabric Interconnects” on page 2](#)
- [“I/O Templates” on page 3](#)
- [“I/O Profiles” on page 3](#)
- [“Physical Servers” on page 3](#)
- [“Roles” on page 4](#)
- [“Domains” on page 4](#)

This section briefly describes each of the above elements. You can find more information about how to use the CLI to manage these elements in the remaining chapters.

Virtual Resources

Oracle Fabric Interconnects contain a set of I/O ports that connect to your data center network and storage. The network and SAN administrators connect these ports to their Ethernet and Fibre Channel switches to provide I/O resources to the servers. The virtual resources that you can configure with the Oracle Fabric Manager CLI include:

- **Virtual network interface cards (vNICs)**—vNICs virtualize network interface connectivity. A vNIC is a virtual NIC that appears to the OS as a physical NIC and enables a server to have an Ethernet network attachment without having a physical NIC present. Instead of the client server using a NIC, an InfiniBand (IB) HCA is used, which virtualizes the NIC allowing for Ethernet connectivity.
- **Virtual host bus adapters (vHBAs)**—vHBAs virtualize storage connectivity. A vHBA appears to the OS as a physical HBA and enables a server to have a Fibre Channel (FC) SAN attachment without having a physical HBA present. Instead of the host server using an HBA, an InfiniBand (IB) HCA is used, which then virtualizes the HBA allowing for SAN connectivity.
- **Private virtual interface (PVI) Clouds**—PVI Clouds are part of the Oracle SDN feature. With this feature, you can use commands to view and configure PVI Clouds your Oracle Fabric Interconnect environment. For more information, see the Oracle SDN User Guide.

For more information about these resources and configuring them in your Oracle Fabric Manager environment, see the following chapters:

- [Chapter 2, Getting Started](#)
- [Chapter 4, Working with Network Clouds](#)
- [Chapter 5, Working with Storage Clouds](#)

Oracle Fabric Interconnects

With the Oracle Fabric Manager CLI, you can retrieve information about the Oracle Fabric Interconnect F1-15 or Fabric Interconnect F1-4 that are managed through Oracle Fabric Manager. You can also display details for a specific chassis by using the `show director` command. For more information about displaying Oracle Fabric Interconnect details, retrieving hardware, firmware, and software information from them, and performing other management tasks, see [Chapter 3, Working with Oracle Fabric Interconnects](#).

I/O Templates

An I/O Template is an Oracle Fabric Manager feature that allows the server administrator to create the shape of the I/O for a set of servers. By setting up an I/O Template, the server administrator builds a way to deploy a set of servers with the desired I/O requirements. You can assign an I/O Template to a server or group of servers and those servers immediately gain access to the network and storage resources without rebooting.

When you create an I/O Template, you use a Network Cloud, a Storage Cloud, or both. See the Getting Started chapter for an example of how to create Network and Storage Clouds and include them in an I/O Template. Your I/O Templates define the resources and specific details about those resources that are required in your environment.

I/O Profiles

Once you define the I/O Template that specifies the virtual connectivity for one or more servers, you then create an I/O Profile based on that I/O Template. You define your vNICs in a Network Cloud and vHBAs in a Storage Cloud. Next, you add the vHBAs and vNICs to an I/O Template to create the shape of the I/O for a set of servers. You then use the I/O Profile object to connect the vNICs and vHBAs in the I/O Template to a physical server. For information about I/O Profiles, see [Chapter 7, Working with I/O Profiles](#).

Physical Servers

Physical servers are the host devices on which your applications run. They connect to the Oracle Fabric Interconnect through high-speed interconnect HCAs that are installed in each server. The Oracle Fabric Interconnect and the Oracle Fabric Manager software support servers and hypervisors such as Oracle Linux, Microsoft Windows, and VMware ESX.

Oracle Fabric Manager manages the servers that are connected through the Oracle Fabric Interconnect and have Oracle OVN host drivers installed on them. You can use the Oracle Fabric Manager CLI to display information for physical servers (either physical or virtual machines) connected to all Oracle Fabric Interconnects.

Roles

Roles associate one or more user accounts with their ability to perform actions. The Oracle Fabric Manager role sets the amount of control that a user has within the Oracle Fabric Manager and Oracle Fabric Interconnect environment. Roles typically are created based on the division of system administration tasks in the data center. For example, some common roles are:

- Network, for managing IP network and routing connectivity.
- Storage, for managing storage capacity, configuration, and connectivity.

You can use the CLI commands to add and remove user roles they have access to your system.

Domains

Domains associate specific roles with their ability to perform actions. For example if your Role belongs to a domain that allows its members to control network settings, then you can create and modify network-related object. The Oracle Fabric Interconnect, Oracle Fabric Manager Server, and physical servers reside in domains, which are logical grouping of resources in the network.

Typically, domains are arranged by a functional group, such as a business unit or department, but domains can be created with virtually any theme—a lab domain, a production domain, a domain of top-quality hardware, a domain of mid-quality hardware, a domain of services or applications, and so on. The Oracle Fabric Manager Domain Manager enables you to create the individual domains within your network, by carving out the resources required and grouping them into a needed domain.

Using the CLI

This section describes how to use the Oracle Fabric Interconnect CLI, including:

- [“Forming Commands” on page 5](#)
- [“Completing Commands” on page 7](#)
- [“Entering Commands” on page 7](#)
- [“Command Summary” on page 12](#)
- [“Viewing Your Command History” on page 15](#)
- [“Using Wildcards” on page 16](#)

- “Logging in to Oracle Fabric Manager Using the CLI” on page 17

Forming Commands

To form a command in the Oracle Fabric Manager CLI, you use an introductory word (typically a verb like *show*, *create*, *remove*, and *set*) followed by the object upon which that the word or verb will act, and then any optional argument(s) needed to refine your command. For example, a basic command looks something like this:

```
show physical-server montana vnic
```

This command returns all of the vNICs defined for the physical server called *montana*.

```
root@FabMgrCLI[ofm] show -list physical-server stills.lab.com vhba
-----
parent.name      stills.lab.com
name             LUN2B
sto-cloud-name   discovered-storage-cloud
termination      arkansas/9/1
state            up/up
wwnn             50:01:39:71:00:01:51:16
wwpn             50:01:39:70:00:01:51:17
is-ha            false
description
-----
parent.name      stills.lab.com
name             LUN1B
sto-cloud-name   discovered-storage-cloud
termination      arkansas/9/1
state            up/up
wwnn             50:01:39:71:00:01:51:18
wwpn             50:01:39:70:00:01:51:19
is-ha            false
description
-----
parent.name      stills.lab.com
name             LUN1
sto-cloud-name   discovered-storage-cloud
termination      texas/9/1
state            up/up
wwnn             50:01:39:71:00:00:F1:24
wwpn             50:01:39:70:00:00:F1:25
is-ha            false
description
```

```

-----
parent.name      stills.lab.com
name             LUN2
sto-cloud-name   discovered-storage-cloud
termination      texas/9/1
state            up/up
wwnn             50:01:39:71:00:00:F1:26
wwpn             50:01:39:70:00:00:F1:27
is-ha            false
description
-----
4 records displayed

```

But you can enter optional keywords or variables to further define the output. For example if you want to display the output in table format rather than a list, you can do that by specifying the `-table` option.

```
show -table physical-server montana vnic
```

This option displays the vNIC information in tabular format rather than in a list as shown below:

```

root@FabMgrCLI[ofm] show -table physical-server montana vhba
parent.name      name sto-cloud-name      termination state ip-address
wwnn             wwpn             is-ha description
-----
montana LUN2B discovered-storage-cloud arkansas/9/1 up/up
50:01:39:71:00:01:51:19 50:01:39:71:00:01:51:19 50:01:39:70:00:01:51:19 false
montana LUN1B discovered-storage-cloud arkansas/9/1 up/up
50:01:39:71:00:01:51:18 50:01:39:71:00:01:51:18 50:01:39:70:00:01:51:18 false
montana LUN1  discovered-storage-cloud texas/9/1  up/up
50:01:39:71:00:00:F1:24 50:01:39:71:00:00:F1:24 50:01:39:70:00:00:F1:24 false
montana LUN2  discovered-storage-cloud texas/9/1  up/up
50:01:39:71:00:00:F1:25 50:01:39:71:00:00:F1:25 50:01:39:70:00:00:F1:25 false
4 records displayed
root@lawrence[ofm]

```

The remaining sections in this chapter describe how to use the various command and options from the Oracle Fabric Manager CLI.

Completing Commands

To form a command in the Oracle Fabric Manager CLI, you use an introductory word (typically a verb) followed by the object that the word/verb acts on and then the option argument(s). The CLI includes a powerful command-completion feature that informs you of possible commands, subcommands, and options at each point on the command line. The following kinds of command completion are available:

- To complete an unambiguous entry, press the Tab key.

If your entry is unambiguous, the CLI completes the command or subcommand that you have begun typing. For example, if you enter the following:

```
add server-Tab
```

the CLI adds profile to your command line as the only legitimate completion. This form of command completion can potentially save you a lot of typing.

- To see valid completions at any point, type ? on the command line.

Typing a question mark causes the CLI to print a list of valid completions, and some short help text for each item, for what is currently on the command line. You can also press the Tab key twice to get this same command completion.

The command-completion facility is context sensitive and always displays what the CLI determines to be valid at the point in the command where you request the completion. You can also configure the CLI to automatically complete the command whenever the space bar is pressed. (Refer to the `set cli space-completion` command) For example, to get command-completion hints and context-sensitive help about adding a vNIC:

```
add vnic ?
Possible completions:
 <name> Virtual NIC name
Repeat '?' for detailed help.
```

Entering Commands

This section describes the commands available in the Oracle Fabric Manager CLI.

Note – When you wish to view the objects available for a command, type that command and press Tab twice. “[add Command Options](#)” on page 8 shows the “help” that appears when you type the command `add` and press Tab twice.

add Command Options

You can add objects to Oracle Fabric Manager using the add command. Press Tab twice after the command to display a list of all objects that you can add to Oracle Fabric Manager.

```
root@lawrence[xms] add Tab Tab
Possible completions:
app                Add an application
default-gateway   Add a Default gateway
director          Add an I/O Director
domain-group-mapping Add a domain group mapping
ethernet-lag      Add a LAG
io-profile        Add an IO Profile
io-template       Add an IOtemplate
iscsi-boot-profile Add a iSCSI boot profile
network-cloud     Add a Network cloud
pvi-cloud         Add a Private Virtual Interconnect cloud
resource domain   Add a Resource domain
role-group-mapping Add a role group mapping
san-boot-profile  Add a SAN boot profile
server-group      Add a Server Group
storage-cloud     Add a Storage cloud
user-role         Add a User role
vhba              Add a vHBA
vnic              Add a vNIC
root@lawrence[xms] add
```

show Command Options

You can display information about objects managed within Oracle Fabric Manager using the show command. The example below displays a list of all objects that you can use to display Oracle Fabric Manager information using the show command.

```
job                Show Job
mac-address-pool   Show MAC address pool
mac-based-qos      Show MAC based QOS
mos                Show no objects given its pkg.classname
network-cloud     Show Network cloud
network-qos        Show Network QOS
object             Show an object given its dn
physical-server    Show Physical servers
```

pvi-cloud	Show a Private Virtual Interconnect cloud
resource-domain	Show Resource domain
role-group-mapping	Show role group mappings
san-boot-profile	Show SAN boot profile
san-qos	Show SAN QOS
server-group	Show Server Group
storage-cloud	Show Storage cloud
system	Show system information
tech-support	Show information useful to technical support personnel
user-role	Show information about the Xms Users
vhba	Show a vHBA
vnic	Show a vNIC
wwn-address-pool	Show WWN address pool
ksf	Show Xsigo Server Fabric

Most show commands offer one or more of the arguments defined in [TABLE 1-1](#).

TABLE 1-1 show Command Options

Show command	Description/Example
-list	Displays the output in list format. Example: <pre>root@FabMgrCLI[ofm] show -list vnic foobar.pubs</pre> <pre>-----</pre> <pre>name foobar.pubs</pre> <pre>state up</pre> <pre>mac-addr 00:13:97:01:80:06</pre> <pre>ipaddr</pre> <pre>descr</pre> <pre>if 6/1</pre> <pre>if-state -</pre> <pre>ha-state</pre> <pre>local-id 0</pre> <pre>type</pre> <pre>vlans none</pre> <pre>qos ie</pre>

TABLE 1-1 show Command Options (Continued)

Show command	Description/Example
-sortby	Indicates the column to sort by. It changes the column upon which the table is sorted. Each time a table is printed, there is a default sort column (or columns) by which it is sorted. This default is the most common.
-table	Displays the output in table format. Table display format is the default.
-xml	Displays the output in XML format. Example: <pre>root@FabMgrCLI[ofm] show -xml vnic foobar.pubs <table> <row number="0"> <cell name="name" value="foobar.pubs"/> <cell name="state" value="up/resourceUnavailable"/> <cell name="mac-addr" value="00:00:00:00:00:00"/> <cell name="ipaddr" value="0.0.0.0/32"/> <cell name="if" value=""/> <cell name="if-state" value="-"/> <cell name="ha-state" value=""/> <cell name="local-id" value="0"/> <cell name="type" value="dhcp"/> <cell name="vlans" value="none"/> <cell name="qos" value="ie"/> </row> </table></pre>

set Command Options

You can define properties and other specifications for objects using the CLI set command. The example below displays a list of all objects for which you can define properties and specification using the set command.

```
root@lawrence[xms] set Tab Tab
Possible completions:
app                Set attributes of an application
cli                Set the properties of the CLI
default-gateway    Set the properties of the Default gateway
director           Set the properties of I/O director
domain-group-mapping Set domain group mapping properties
ethernet-lag       Set the properties of the LAG
globaladdress      Set global address attributes
io-profile         Set Attributes of an IO Profile
io-template        Set the properties of IOtemplate
iscsi-boot-profile Set the properties of the iSCSI boot profile
```

```

network-cloud      Set the properties of Network cloud
object             Set parameter for given object
pvi-cloud         Set Private Virtual Interconnect cloud attributes
resource-domain   Set the properties of the Resource domain
role-group-mapping Set role group mapping properties
san-boot-profile  Set the properties of the SAN Boot Profile
server-group      Set the properties of the Server Group
storage-cloud     Set the properties of the Storage cloud
user-role         Set the properties of the User role
vhba              Set the properties of vHBA
vnic              Set the properties of vNIC
xsf               Update a Xsigo Server Fabric
root@lawrence[xms] set

```

remove Command Options

You can define properties and other specification for objects using the CLI `set` command. The CLI `remove` command provides the `-noconfirm` argument that enables you to skip the confirmation message that displays when you issue that command. For example when you issue the `remove storage-cloud` command, a confirmation message requires that you confirm that deletion.

```

root@FabMgrCLI[ofm] remove storage-cloud Cloud11
Remove storage cloud Cloud11 (y/n)? y

```

To prevent that confirmation message from displaying, include the `-noconfirm` in your command:

```

root@FabMgrCLI[ofm] remove -noconfirm storage-cloud Cloud11

```

The example below displays a list of all objects for which you can define properties and specifications using the `remove` command.

```

root@lawrence[xms] remove Tab Tab
Possible completions:
-noconfirm      Don't ask for confirmation
app             Remove an application
default-gateway Remove a Default gateway
director        Remove an I/O Director
domain-group-mapping Remove a domain group mapping
ethernet-lag    Remove a LAG
io-profile      Remove an IO Profile
io-template     Remove a IOtemplate
iscsi-boot-profile Remove a iSCSI boot profile
mac-based-qos   Remove a MAC based QOS

```

network-cloud	Remove a Network cloud
network-qos	Remove a Network QOS
object	Remove an object given its dn
pvi-cloud	Remove a Private Virtual Interconnect cloud
resource domain	Remove a Resource domain
role-group-mapping	Remove a role group mapping
san-boot-profile	Remove a SAN boot profile
server-group	Remove a server group
storage-cloud	Remove a Storage cloud
user-role	Remove a User role
vhba	Remove a vHBA
vnic	Remove a vNIC
root@lawrence[xms] remove	

Command Summary

[TABLE 1-2](#) lists the possible commands, provides a description of that command and lists the possible objects that you can execute with the command.

TABLE 1-2 Command Summary

Command	Description	Objects	
add	Add an object	app	Add an application
		default-gateway	Add a Default gateway
		director	Add an Oracle Fabric Interconnect
		domain-group-mapping	Add a domain group
		mapping	
		ethernet-lag	Add a LAG
		io-profile	Add an I/O Profile
		io-template	Add an I/O template
		iscsi-boot-profile	Add a iSCSI Boot Profile
		network-cloud	Add a Network cloud
		pvi-cloud	Add a Private Virtual Interconnect cloud
		resource-domain	Add a Resource domain
		role-group-mapping	Add a role group mapping
		san-boot-profile	Add a SAN Boot Profile
		server-group	Add a Server Group
		storage-cloud	Add a Storage cloud
		user-role	Add a User role
vhba	Add a vHBA		
vnic	Add a vNIC		
exit	Exit the CLI	exit	
ping	Ping a host	ping	<i>hostname or host IP address></i>
quit	Quit the CLI	quit	
remove	Remove an object	-noconfirm	Don't ask for confirmation
		app	Remove an application
		default-gateway	Remove a Default gateway
		director	Remove a Fabric Interconnect
		domain-group-mapping	Remove a domain group mapping
		ethernet-lag	Remove a LAG
		io-profile	Remove an IO Profile
		io-template	Remove a IOtemplate
		iscsi-boot-profile	Remove a iSCSI boot profile
		mac-based-qos	Remove a MAC based QOS
		vnic	Remove a vNIC

TABLE 1-2 Command Summary (Continued)

Command	Description	Objects
		network-cloud network-qos object pvi-cloud resource-domain role-group-mapping san-boot-profile server-group storage-cloud user-role vhba
		Remove a Network cloud Remove a Network QOS Remove an object given its dn Remove a Private Virtual Interconnect cloud Remove a Resource domain Remove a role group mapping Remove a SAN boot profile Remove a server group Remove a Storage cloud Remove a User role Remove a vHBA
set	Set the properties of objects	cli object
		Set the properties of the CLI Set parameter for given object
show	Show information	-list -sortby -table -xml -alarm app class cli default-gateway director domain-group-mapping ethernet-lag ethernet-port fc-pory io-profile io-template iscsi-boot-profile job
		Show as list Specify column to sort by Show as table Show as XML Show Alarm Show application Show class information Show CLI settings Show Default gateway Show Oracle Fabric Interconnects Show domain group mappings Show Link Aggregation Group Show Ethernet port Show Fibre channel port Show IO Profile Show IO templates Show iSCSI boot profile Show Job

TABLE 1-2 Command Summary (Continued)

Command	Description	Objects
		mac-address-pool Show pool
		mac-based-qos Show MAC based QOS
		mos Show mo objects given its pkg.classname
		network-cloud Show Network cloud
		network-qos Show Network QOS
		object Show an object given its dn
		physical-server Show Physical servers
		pvi-cloud Show a Private Virtual Interconnect cloud
		resource-domain Show Resource domain
		role-group-mapping Show role group mappings
		san-boot-profile Show SAN boot profile
		san-qos Show SAN QOS
		server-group Show Server Group
		storage-cloud Show Storage cloud
		system Show system information
		tech-support Show information useful to technical support personnel
		user-role Show information about the Oracle Fabric Manager Users
		vhba Show a vHBA
		vnic Show a vNIC
		wwn-address-pool Show WWN address pool
system	Overall system command	download-log Download system log files to the local machine
		rescan Rescan for new servers and remove stale ones
source	Execute a script	<name of script to execute>
tracert	Trace route to host	<hostname> Hostname or IP address

Viewing Your Command History

The CLI maintains a history of the commands that you have entered, during your current session and over multiple sessions.

- For commands issued during your current session, use the up and down arrow key to scroll through the command history and find a specific command you are looking for. When you find the command that you want to re-execute (or edit first and then execute), press the Return/Enter key.
- To view commands entered over multiple sessions, enter `show cli history`. The Fabric Manager CLI displays commands that were submitted over that past several sessions.
- You can also use the `cli repeat <command>` command, which repeats the most recent match in this history.

Using Wildcards

You can use wildcards to control the display of output in most of the CLI show commands to select a set of objects using the asterisk (*) wildcard character. Wildcard instructions are case sensitive, so make sure you enter the wildcard item correctly. For example, vNICs named “vnic1” and “vnic2” are not displayed if you issue `show vnic V*`. If you issue `show vnic v*` the vNICs are displayed.

Note – Not all `show` commands support wildcards (for example, LAGs and VLANs do not support them when selecting the LAG name or VLAN number).

For example, if you enter:

```
admin@system_name[oracle] show vnic v*
```

The wildcard character represents the characters in a name string starting with “v”. The result of this command is a list of all vNIC with “v” as the first letter. If you enter:

```
admin@system_name[oracle] show vhma *.*test*
```

The first wildcard represents an entire name, and the second and third represent individual characters. The result of this command is a list of all vHBAs on all Server Profiles that contains the string “test” in their name. If you enter:

```
show qos network policer */100m*
```

The first wildcard represents a name string for a Network QoS policer, and the second wildcard represents and characters in the policer rate. The result of this command is a list of all Network QoS policers in any set that limit the CIR to 100 Mbps.

Logging in to Oracle Fabric Manager Using the CLI

To log in to the Oracle Fabric Manager CLI, you must provide a valid user name and password. The default user name and password are different on a Windows server versus a Linux server:

- For Linux, the default user name and password are the same as the default user account on the Linux server (root). You can configure additional user accounts for Oracle Fabric Manager, but they must be configured as non-root user accounts on the Linux server.
- For Windows, the default user name and password are the same as the default administrator account on the Windows server (administrator). You can configure additional, non-admin accounts, but they must be configured as non-administrator accounts on the Windows server.

Note – Because some installations do not allow administrator or root access to servers, Oracle also provides the `ofmadmin` account that you can use to log in to the Oracle Fabric Manager Server.

Initial User Accounts

You will use this username and password the first time you access Oracle Fabric Manager. One of these accounts (root, administrator, or `ofmadmin`) is required for configuring features in Oracle Fabric Manager. After logging into Oracle Fabric Manager, you should create specific user accounts (instead of continuing to use the root, administrator, or `ofmadmin` accounts). When you create these specific user accounts, make sure to assign them with the appropriate roles (see [“Working with User Roles”](#) on page 54.)

Note – Keep the root default user name and password kept as securely as possible. After initially logging in to Oracle Fabric Manager, create additional user accounts with specific privileges as documented in [“Managing User Access Security” on page 50](#). When you create the additional non-root user accounts in Oracle Fabric Manager, be aware that these user accounts must also exist in the underlying OS (either a Windows user account or a Linux user account). You cannot log in to Oracle Fabric Manager unless an underlying user account exists at the server’s OS level and that the OS user name and Oracle Fabric Manager are identical. For example, you cannot authenticate to your OS with the user name joey and joe for Oracle Fabric Manager.

Understanding Authentication in Oracle Fabric Manager

Oracle Fabric Manager does no authentication of its own. Instead, it presents a log in screen, then passes the user name and password string to the underlying Windows or Linux OS (pass-through), which allows or denies authentication. Because Oracle Fabric Manager’s login is a pass through, additional authentication methods are supported, such as LDAP AD. Be aware that the additional user accounts on the Active Directory server(s), the Windows server OS, and the Oracle Fabric Manager server must all be congruent.

For more information about authentication methods such as LDAP AD, see [“Working with User Roles” on page 54](#). When the OS and any other authentication methods complete, the appropriate information is sent to Oracle Fabric Manager, which then sets the correct Oracle Fabric Manager-level privileges for the authenticated user. When those privileges are applied, they determine which objects in the Oracle Fabric Manager CLI are available to the authenticated user. The user name can have different rights or privileges at each level, but for Oracle Fabric Manager, only the Oracle Fabric Manager privileges granted to the user are enforced. For example, user joey at the OS level might be a super user with all rights, but user joey at the Oracle Fabric Manager level might be a network administrator user, and therefore, can only use the privileges for a network-admin role, not the super user privileges. In this case, the user joey has different privileges, but only the Oracle Fabric Manager privileges are enforced for managing Oracle Fabric Interconnects and virtual I/O through Oracle Fabric Manager.

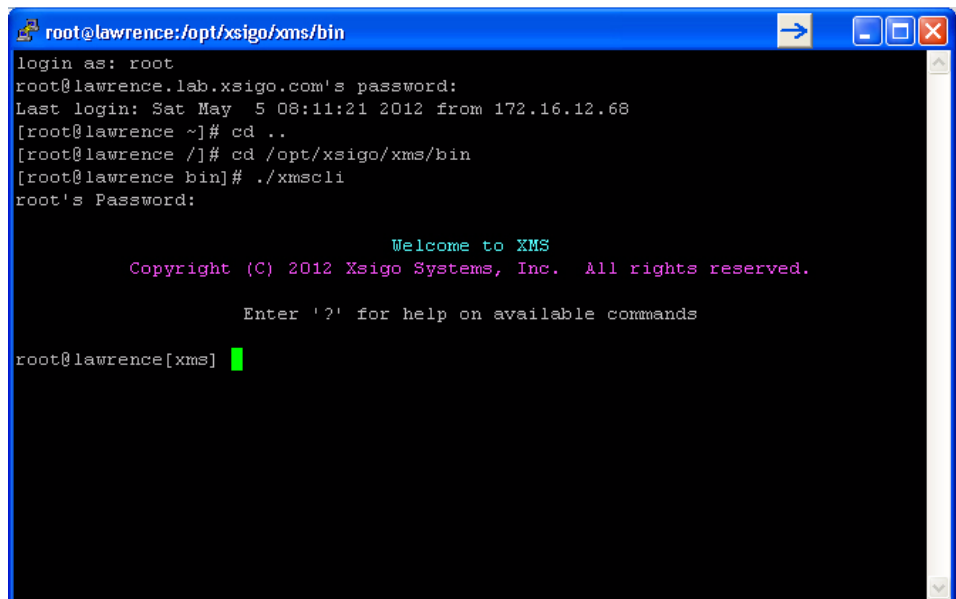
▼ Logging In to Oracle Fabric Manager CLI

You can use the command-line interface to log into Oracle Fabric Manager using a secure shell (SSH) and your own account or the default account. When you are logged in, your session remains active as long as you are actively configuring or managing through Oracle Fabric Manager. Oracle Fabric Manager times your session out after inactivity for 30 minutes. The message “You are being logged out after 60 minutes of idle time” is displayed after the system times out, and you must log back in.

To log in to Oracle Fabric Manager, from an SSH connection to the server (using the Putty tool, for example) on which Oracle Fabric Manager is installed, and perform the following steps:

1. **Log in to your server as root and press Enter.**
2. **Enter the password for root and press Enter.**
3. **Change to the directory where the Oracle Fabric Manager CLI is running by typing `cd /opt/oracle/xms/bin` and pressing Enter.**
4. **Type the root password again and press Enter.**
5. **Type `./xmscli` to start the application.**

FIGURE 1-1 Logging In to the Oracle Fabric Manager CLI



```
root@lawrence:/opt/xsigo/xms/bin
login as: root
root@lawrence.lab.xsigo.com's password:
Last login: Sat May 5 08:11:21 2012 from 172.16.12.68
[root@lawrence ~]# cd ..
[root@lawrence /]# cd /opt/xsigo/xms/bin
[root@lawrence bin]# ./xmscli
root's Password:

                Welcome to XMS
      Copyright (C) 2012 Xsigo Systems, Inc. All rights reserved.

      Enter '?' for help on available commands

root@lawrence[xms] █
```


Getting Started

This chapter presents a use case designed to help you set up an environment using the Oracle Fabric Manager CLI. It covers the Oracle Fabric Manager basics including creating Network and Storage Clouds, creating I/O Templates, and deploying those Templates through I/O Profiles. The use case involves the following steps:

1. [“Managing the Oracle Fabric Interconnect” on page 21](#)
2. [“Creating a Network Cloud” on page 24](#)
3. [“Creating a Storage Cloud” on page 27](#)
4. [“Creating an I/O Template” on page 29](#)
5. [“Creating and Deploying an I/O Profile” on page 31](#)

Managing the Oracle Fabric Interconnect

The Oracle Fabric Interconnects are appliances that contain the components responsible for mapping and connecting virtual Ethernet and virtual Fibre Channel resources to their traditional physical counterparts. Oracle Fabric Interconnects contain a set of I/O ports that are connected to your data center network. The network and SAN administrators connect these ports to their Ethernet switches in order to provide I/O resources to the servers. The server administrator then needs to connect servers to a set of network resources provided by the network administrators.

Oracle Fabric Manager requires a management IP address to open a communication path for adding the Oracle Fabric Interconnect contents. Do not use a vNIC IP address when adding the Oracle Fabric Interconnect.

▼ Add Oracle Fabric Interconnects

This example creates a high availability environment using two Oracle Fabric Interconnects.

1. **Add two Oracle Fabric Interconnects that you wish to manage in Oracle Fabric Manager using add director command. Example:** add director montana <username> <password>

```
root@FabMgrCLI[ofm] add director montana myusername
Please enter a value for password: mypassword
root@FabMgrCLI[ofm] add director iowa myusername
Please enter a value for password: mypassword
```

2. **Display information about the Oracle Fabric Interconnect you added using the show director command. Example:** show director montana. **The CLI output is as follows:**

```
root@FabMgrCLI[ofm] show director montana
-----
name          montana
ip-addr       102.168.xx.xx
ip-subnet     local
state         up/up
phase         4
fabric        4
modules       4
version       Build 3.8.0-ABCDEF - (root) Tue Apr 10 01:43:37 UTC 2012
-----
1 record displayed
root@FabMgrCLI[ofm] show director iowa
-----
name          iowa
ip-addr       102.168.xx.xx
ip-subnet     local
state         up/up
phase         2
fabric        2
modules       2
version       Build 3.8.0-ABCDEF - (root) Tue Apr 10 01:43:37 UTC 2012
-----
1 record displayed
```

The above output displays the Oracle Fabric Interconnect's name, IP address, IP subnet, its administrative and operation status (either up or down), phase number, number of fabrics, number of I/O modules, the version of XgOS running on the machine, and when it was last updated.

3. Display information about the Ethernet cards and Fibre Channel cards on the Oracle Fabric Interconnects using the `show director <director name> iocards` command:

```
root@FabMgrCLI[ofm] show director montana iocards
name                state                type                description
-----
montana/6           up/up                sanFc2Port4GbCard
montana/10          up/up                sanFc2Port4GbCard
montana/5           up/up                nwEthernet10Port1GbCard
montana/1           up/up                nwEthernet4Port10GbCardEthIb
4 records displayed

root@FabMgrCLI[ofm] show director iowa iocards
name                state                type                description
-----
iowa/7              up/up                nwEthernet10Port1GbCard
iowa/8              up/up                sanFc2Port4GbLrCard
2 records displayed
```

After adding Oracle Fabric Interconnects to Oracle Fabric Manager, you can start to create the elements that control the I/O resources to your network and storage systems.

Understanding High Availability (HA) Network and Storage Clouds

Typical deployments have redundant Oracle Fabric Interconnects so that if one of them becomes disabled for any reason, the second Oracle Fabric Interconnect can assume all the activity being performed by the Oracle Fabric Interconnect that is “down.” You can associate a Network Cloud with two Oracle Fabric Interconnects simultaneously, and also set the connection priority so that one Oracle Fabric Interconnect is considered the primary and the other is considered the secondary. When you initially create a Network Cloud, you must manually connect the HA virtual NIC cards (vNICs) to the Cloud and manually set their primary and secondary status. Once you create the initial Network Cloud, the Oracle Fabric Interconnects’ connection priority is set. Any additional HA pairs that attach to the new Network Cloud set up for HA will first attach to the primary Oracle Fabric Interconnect and then to the secondary Oracle Fabric Interconnect.

Most administrators typically create Network and Storage Clouds around a similar theme for the ports or LAGs that are associated with the clouds. For example, a Network Cloud might have ports or LAGs that provide vNIC connections to a

specific domain or specific upstream Ethernet switch for a specific set of host servers. You create a Network Cloud using the CLI command `add network-cloud` and you create a Storage Cloud using the `add storage-cloud` command.

Note – When you manage a host through Oracle Fabric Manager or one that connects to an Oracle Fabric Interconnect, Oracle Fabric Manager queries the Oracle OVN host drivers on the host to determine if it is capable of supporting HA vNICs. Based on the response from the host driver, Oracle Fabric Manager allows you to, or prevents you from, creating HA vNICs. Some hosts do not support true HA vNICs:

- If the host driver reports that HA vNICs are available on the host, a HA vNIC creates HA vNICs on the server.
- If the host driver reports that HA vNICs are not available, a HA vNIC creates a pair of single vNICs on the server.

Creating a Network Cloud

In the previous section, you added two Oracle Fabric Interconnects to your Oracle Fabric Manager environment and displayed the I/O ports on the Oracle Fabric Interconnects with which you will provide I/O resources to “Cloud.” This section instructs you to create a Network Cloud that provides network resources to engineers who wish to isolate their activity from other departments.

Note – To configure Network Clouds, you must be logged in as an Oracle Fabric Manager Network or Administrator role.

Understanding the Default Network Cloud

Oracle Fabric Manager creates a default Network Cloud that contains all the Ethernet ports available to Oracle Fabric Manager through the managed Oracle Fabric Interconnects. When you create a new Network Cloud, the resources you include in that cloud are removed from the default Network Cloud and placed in your new Network Cloud.

To get a list of Ethernet Ports that are available for you to use in your Network Cloud, use the `show ethernet-port` command. For example:

```
root@FabMgrCLI[ofm] show ethernet-port
name                               type                               state                               vnics                               description
-----
```

montana/5/9	nwEthernet1GbPort	up/up	0
montana/5/1	nwEthernet1GbPort	up/up	0
montana/5/8	nwEthernet1GbPort	up/up	0
montana/5/7	nwEthernet1GbPort	up/up	0
montana/5/6	nwEthernet1GbPort	up/up	0
montana/5/5	nwEthernet1GbPort	up/up	0
montana/5/4	nwEthernet1GbPort	up/up	0
montana/5/3	nwEthernet1GbPort	up/up	6
montana/5/10	nwEthernet1GbPort	up/up	0
montana/5/2	nwEthernet1GbPort	up/up	0
montana/1/1	nwEthernet10GbPort	up/up	0
montana/1/3	nwEthernet10GbPort	up/up	0
montana/1/2	nwEthernet10GbPort	up/up	0
montana/1/4	nwEthernet10GbPort	up/up	0
iowa/7/8	nwEthernet1GbPort	up/up	0
iowa/7/9	nwEthernet1GbPort	up/up	0
iowa/7/10	wEthernet1GbPort	up/up	2
iowa/7/4	wEthernet1GbPort	up/up	1
iowa/7/5	wEthernet1GbPort	up/up	1
iowa/7/6	wEthernet1GbPort	up/up	2
iowa/7/7	wEthernet1GbPort	up/up	0
iowa/7/3	wEthernet1GbPort	up/up	0
iowa/7/2	wEthernet1GbPort	up/up	0
iowa/7/1	wEthernet1GbPort	up/up	2
24 records displayed			

▼ Adding and Configuring a Network Cloud with HA

To add and Network Cloud and configure it for HA, perform the following steps:

1. Using the `add network-cloud` command add a new Network Cloud to your environment and describe its purpose.

```
root@FabMgrCLI[ofm] add network-cloud EngNWcloudA -description="Engineering Network Activity"
```

2. Display your new Network Cloud using the `show network-cloud` command.
Example:

```
root@FabMgrCLI[ofm] show network-cloud EngNWcloudA
-----
name                EngNWcloudA
ports               2
lags                0
trunk-mode          false
```

```

qos
is-private                false
access-vlan-id           1
available-ingress-cir    0
available-egress-cir     0
allocation-policy        roundrobin
description               Engineering Network Activity
-----
1 record displayed

```

3. Using the `set network-cloud` command, add two Ethernet ports (for high availability) to your Network Cloud.

Note – To list the Ethernet ports available, use the `show ethernet-port` command as described in the previous section.

```

root@FabMgrCLI[ofm] set network-cloud EngNWcloudA add ethernet-ports montana/5/6
root@FabMgrCLI[ofm] set network-cloud EngNWcloudA add ethernet-ports iowa/7/8

```

4. Display the new Network Cloud along with its assigned ethernet ports using the `show network-cloud` command. Example:

```

root@FabMgrCLI[ofm] show network-cloud EngNWcloudA ethernet-ports
-----
parent.name              EngNWcloudA
eth-port                 iowa/7/8
state                    up/up
vnic-count               0
type                     nwEthernet1GbPort
available-ingress-cir    1000000
available-egress-cir     1000000
description
-----
parent.name              EngNWcloudA
eth-port                 montana/5/6
state                    up/up
vnic-count               0
type                     nwEthernet1GbPort
available-ingress-cir    1000000
available-egress-cir     1000000
description
-----
2 records displayed

```

You can see that state of the ports are up/up.

Creating a Storage Cloud

In the previous section, you added a Network Cloud with two Oracle Fabric Interconnects so that they provide HA protection in your network environment, and displayed the Ethernet ports that will provide I/O resources to that Network Cloud. This section instructs you to create a Storage Cloud that provides storage resources to engineers who wish to isolate their storage activity from other departments.

Note – In order to configure Storage Clouds, you must be logged as an Oracle Fabric Manager Storage or Administrator role.

Understanding the Default Storage Cloud

Oracle Fabric Manager creates a default Storage Cloud that contains all the Fibre Channel ports available to Oracle Fabric Manager through the managed Oracle Fabric Interconnects. When you create a new Storage Cloud, the resources you include in that cloud are removed from the default Storage Cloud and placed in your new Storage Cloud.

To display a list of Fibre Channel ports that are available for you to use in your Storage Cloud, use the `show fc-port` command. For example:

```
root@FabMgrCLI[ofm] show fc-port
```

name	type	state	vhbas	speed	description
montana/6/2	sanFcPort	up/down	2	4000	
montana/6/1	sanFcPort	up/down	1	4000	
montana/10/2	sanFcPort	up/up	0	4000	
montana/10/1	sanFcPort	up/up	0	4000	
iowa/8/1	sanFcPort	up/up	9	8000	
iowa/8/2	sanFcPort	up/up	8	8000	

6 records displayed

▼ Adding and Configuring a Storage Cloud with HA

To add and Storage Cloud and configure it for HA, perform the following steps:

1. Using the `add storage-cloud` command, add a new Network Cloud to your environment and describe its purpose. Example: `add storage-cloud EngSTcloudA -description="Enginneering Storage Activity"`.

```
root@FabMgrCLI[ofm] add storage-cloud EngSTcloudA -description="Enginneering Storage Activity"
```

2. Display your new Storage Cloud using the `show storage-cloud` command. Example:

```
root@FabMgrCLI[ofm] show storage-cloud EngSTcloudA
-----
name                               EngSTcloudA
ports                               0
qos
lun-mask-reference
allocation-policy                   random
description                           Engineering Storage Activity
-----
1 record displayed
```

3. Using the `set storage-cloud` command, add two FC ports (for high availability) to your Storage Cloud.

```
root@FabMgrCLI[ofm] set storage-cloud EngSTcloudA add fc-ports montana/10/2
root@FabMgrCLI[ofm] set storage-cloud EngSTcloudA add fc-ports iowa/8/1
```

Note – To list the FC cards available, use the `show fc-port` command as described in the previous section.

4. Display the new Storage Cloud along with its assigned FC ports using the `show storage-cloud` command. Example:

```
root@FabMgrCLI[ofm] show storage-cloud EngSTcloudA fc-ports
parent.name  fc-port      state    type        vhba-count  speed  description
-----
EngSTcloudA  iowa/8/1    up/up   sanFcPort   9           8000
EngSTcloudA  montana/10/2 up/up   sanFcPort   0           4000
2 records displayed
```

Creating an I/O Template

An I/O Template is an Oracle Fabric Manager feature that allows the server administrator to create the shape of the I/O for a set of servers. Different servers have different I/O requirements. For example, a server that will be used by the engineering department may require access to a couple of Network Clouds and a Storage Cloud, but a server that is used by Human Resources may only require access to the internet.

Also, rather than creating the physical NICs on each server in your environment, the I/O Template can apply the same NIC characteristics to all vNICs in the environment and all HBA characteristics to all vHBAs in this environment. You create the template with clouds and vNICs and/or vHBAs. Then you create an I/O Profile from the template. It is the I/O Template that gets deployed to the server, and when it does, the vNICs and vHBAs get pushed to the server.

When you create a new I/O Template, you are essentially creating an empty container to which you add building blocks until the I/O Template has the connectivity and virtual resources required for your network.

This section provides instructions for creating an I/O Templates using the Network and Storage Clouds created in the previous sections. This section describes how to build an I/O Template by:

1. Creating an I/O Template
2. Adding HA network resources (vNICs) to the template
3. Adding HA storage resources (vHBAs) to the template
4. Displaying the new I/O Template
5. Displaying the new vNIC and vHBA

To create an I/O Template with information pertinent to your network and storage requirements, use the `add io-template` command. You can also specify a description for your template, a default gateway, a SAN Boot Profile or an iSCSI Boot Profile.

▼ Create an I/O Template

This example instructs you to create an I/O Template and add HA network (vNICs) and HA storage (vHBAs) resources to the template.

1. Using the `add io-template` command, add a new I/O Template to your environment.

```
root@FabMgrCLI[ofm] add io-template EngIOtemplate -description Template for Engineering Resources
```

2. Using the `set io-template` command, add network resources to your Template by creating a high availability vNIC and adding to the Template.

```
root@FabMgrCLI[ofm] set io-template EngIOtemplate add vnic EngVnic -ha-mode=true EngNWcloudA
```

3. Using the `set io-template` command, add storage resources to your Template by creating a high availability vHBA and adding it to the Template.

```
root@FabMgrCLI[ofm] set io-template EngIOtemplate add vhba EngVhba -ha-mode=true EngSTcloudA
```

4. Display the new I/O Template using the `show io-template` command.

```
root@FabMgrCLI[ofm] show io-template EngIOtemplate
-----
name                               EngIOtemplate
iscsiboot-name
sanboot-name
default-gateway
vnics                               1
vhbas                               1
description                        IO Template for Engineering Resources
-----
1 record displayed
```

5. Display the new vNIC and vHBA using the `show io-template` command.
Example:

```
root@FabMgrCLI[ofm] show io-template EngIOtemplate vnics
-----
name                               EngIOtemplate
vnic-name                          EngVnic
net-cloud-name                     EngNWcloudA
qos
ip-type                            hostManaged
is-ha                              true
access-vlan-id                     0
trunk-mode                         false
```



```
description
```

```
-----  
1 record displayed
```

```
root@FabMgrCLI[ofm] show io-template EngIOtemplate vhb
```

```
name          sto-cloud-name      qos      is-ha      description
```

```
-----  
EngVhba      EngSTcloudA              true
```

```
1 record displayed
```

Note – Notice that `is-ha` (HA) is true, since Steps 3 and 4 specified to set HA to true.

Creating and Deploying an I/O Profile

I/O Profiles enable you to connect virtual I/O resources to physical servers by associating them with your I/O Templates. I/O Profiles hold all the virtual I/O information for a particular server managed by Oracle Fabric Manager including vNICs, HA vNICs, vHBAs, HA vHBAs, all server profiles, and all Oracle Fabric Interconnect objects connected to the server.

You first define your I/O Template and its resources, then create an I/O Profile from that template and connect the I/O Profile to a physical server. Once your I/O Profile connects to the server, the vNICs and vHBAs defined in your I/O Template are pushed to that server. This section describes how to build an I/O Profile by:

1. Creating an I/O Profile from the new I/O Template
2. Connecting the I/O Profile to a physical server (thus deploying vNICs and vHBAs on the server)
3. Displaying the job that connects the I/O Profile to the physical server
4. Displaying the resources configured in this chapter

▼ Create and Deploy an I/O Profile

To deploy network and storage requirements from an I/O Template, use the `add io-profile` command.

This example directs you to create an I/O Profile from an I/O Template, then connect your resource to the physical server, which will deploy I/O according to the specifications in the I/O Template.

1. To apply an I/O Template to a server (named `bering`), use the `add io-profile` command. I/O Profiles are normally named after the server to which they apply. This example uses the server named `bering`, and therefore the I/O Profile is named `bering`. Example:

```

root@FabMgrCLI[ofm] add io-profile bering EngIOtemplate
root@FabMgrCLI[ofm] show io-profile bering
-----
name                bering
hostname
template            EngIOtemplate
state               disconnected
description         Fabric Manager-created from template EngIOtemplate
vnics               2
vhbas               2
-----
1 record displayed

```

2. Use the I/O Profile to connect the virtual I/O resources (vNICs and vHBAs) to a server using the `set io-profile` command.

```

root@FabMgrCLI[ofm] set io-profile bering connect bering
A new task was created successfully. Please run "show job ConnectIOProfile_*" to
see more details.

```

3. Run the `show job ConnectIOProfile` command to display the job details.

```

root@FabMgrCLI[ofm] show job ConnectIOProfile_2012-03-28_14:31:26.974
name      ...   ...   user   job-detail   state   detail-status
-----
ConnectIOProfile .root Connect Porphobilinogen' to server bering completed Job
completed successfully
1 record displayed

```

4. Display the new I/O Profile using the `show io-profile` command.

```

root@FabMgrCLI[ofm] show io-profile bering
name      hostname template      state  description                vnics  vhbas
-----
bering    bering   EngIOtemplate  up    FMofm-created template ngIOtemplate  2      2
1 record displayed

```

5. Display the physical server connected to your I/O Profile using the `show physical-server` command.

```
root@FabMgrCLI[ofm] show physical-server bering
name      os      driver-version  vnics  vhbases  bound  state  template-name
chassis-port
-----
bering    Linux/...6  5.1.400/2.1.1  2      2        yes   up     EngIOtemplate
montana:ServerPort17,iowa:ServerPort22,montana:ServerPort22,iowa:ServerPort17
1 record displayed
```

6. Display the vNICs configured on the physical server using the `show physical-server` command. Examples:

```
root@FabMgrCLI[ofm] show physical-server bering vnics
parent.name  ame  net-cloud-name  termination  state  ip-address  mac-address
is-ha  description
-----
bering  EngVnic  EngNWcloudA  iowa-7/8  up/up  0.0.0.0
00:13:97:07:00:AA  true
bering  EngVnic  EngNWcloudA  montana-5/6 up/up  0.0.0.0  00:13:97:07:00:AA
true
2 records displayed
```


Working with Oracle Fabric Interconnects

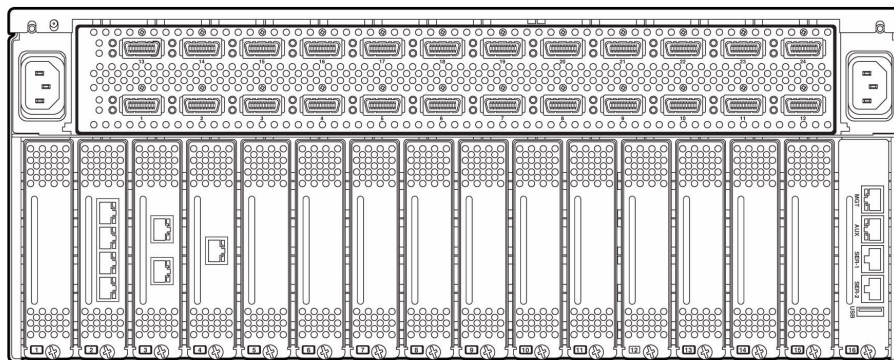
This chapter describes Oracle Fabric Interconnects and how to use the CLI to display Oracle Fabric Interconnect information, manage the Oracle Fabric Interconnects, and manage user access through Oracle Fabric Manager's Identity Management System (IMS). This chapter contains the following topics:

- [“Understanding Oracle Fabric Interconnects” on page 35](#)
 - [“Displaying Information about Oracle Fabric Interconnects” on page 37](#)
 - [“Managing Oracle Fabric Interconnects” on page 49](#)
 - [“Managing User Access Security” on page 50](#)
-

Understanding Oracle Fabric Interconnects

Oracle Fabric Interconnects are appliances that contain the components responsible for mapping and connecting virtual Ethernet and virtual Fibre Channel resources to their traditional physical counterparts. Oracle Fabric Interconnects contain a set of I/O ports that connect to your data center network (see the Oracle Fabric Interconnect's rear view in [FIGURE 3-1](#)). The network and SAN administrators connect these ports to their Ethernet switches to provide I/O resources to your servers. The server administrator connects servers to a set of network resources provided by the network administrators. The server administrator does not care what physical ports on the Oracle Fabric Interconnect are connected as long as the servers have access to the required resources.

FIGURE 3-1 Oracle Fabric Interconnect F1-15



After physically networking the Oracle Fabric Interconnects and prior to creating the elements that you will use to manage your environment through Oracle Fabric Manager, you need to add the Oracle Fabric Interconnects to that environment using the CLI `add director` command. Once you add the Oracle Fabric Interconnect to the environment, you can create and connect the remaining elements that make up your storage and network infrastructure.

Use the Oracle Fabric Interconnect commands to access information about the Oracle Fabric Interconnect chassis managed in your environment. The commands described in this chapter enable you to view detailed information about each managed Oracle Fabric Interconnect, all hardware inventoried in Oracle Fabric Manager, and Oracle Fabric Interconnect-based software and hardware features available on the Oracle Fabric Interconnect. You can use the commands in this chapter to manage the Oracle Fabric Interconnects in your Oracle Fabric Manager environment.

Adding Oracle Fabric Interconnects to Oracle Fabric Manager's Environment

You can use the `add director` command to add Oracle Fabric Interconnects to your environment so that you can manage it using Oracle Fabric Manager.

Note – Before you can add an Oracle Fabric Interconnect to Oracle Fabric Manager, it must first be “discovered” through either its IP address or host name. This activity is explained in more detail in the *Oracle Fabric Manager User's Guide*.

To add an Oracle Fabric Interconnect, at the command prompt, type:

```
add director <director name> <user name> <user password>
```

Example:

```
add director montana joeuser joepassword
```

The user name and password were set up by the administrator when they “discovered” the Oracle Fabric Interconnect. The password is optional, so there may not be a password associated with the Oracle Fabric Interconnect.

Displaying Information about Oracle Fabric Interconnects

The CLI provides several commands for displaying information about managed chassis in your network. To display a list of all Oracle Fabric Interconnects currently being managed in your Oracle Fabric Manager environment, type:

```
show director
```

Then press Tab twice. The CLI displays all of those Oracle Fabric Interconnects, for example:

```
root@FabMgrCLI[ofm] show director Tab Tab
Possible completions:
arkansas Oracle Fabric Interconnect
iowa      Oracle Fabric Interconnect
montana   Oracle Fabric Interconnect
texas     Oracle Fabric Interconnect
```

This section provides instructions for:

- “Displaying Summary Information” on page 38
- “Displaying I/O Card Information” on page 41
- “Displaying FC Port Information” on page 44
- “Displaying Ethernet Port Information” on page 46

Displaying Summary Information

Syntax

To display the summary information for a particular Oracle Fabric Interconnect, type:

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] director <Director name>
```

Example 1

```
show director <Director name>
```

The CLI displays specific information about the specified Oracle Fabric Interconnect:

```
root@FabMgrCLI[ofm] show director arkansas
-----
name          arkansas
ip-addr       192.168.37.6
ip-subnet     local
state         up/up
phase         6
fabric        6
modules       6
version       Build 3.8.0-XGOS-BETA4 - (root) Fri Apr 20 23:11:32 UTC 2012
-----
1 record displayed
```

Example 2

```
show -list director
```

The CLI displays specific information about all Oracle Fabric Interconnects in the Oracle Fabric Manager environment, for example:

```
root@FabMgrCLI[ofm] show director
-----
name          arkansas
ip-addr       192.168.37.6
ip-subnet     local
state         up/up
phase         6
```



```

fabric      6
modules    6
version    Build 3.8.0-XGOS-BETA4 - (root) Fri Apr 20 23:11:32 UTC 2012
-----
name       iowa
ip-addr    192.168.10.85
ip-subnet  local
state      up/up
phase      2
fabric     2
modules    2
version    Build 3.8.0-XGOS-BETA3 - (root) Fri Apr 20 19:56:25 UTC 2012
-----
name       montana
ip-addr    192.168.37.25
ip-subnet  local
state      up/up
phase      4
fabric     4
modules    4
version    Build branch-4.0.0-37909 - (xsmith) Fri Apr 20 14:03:48 PDT 2012
-----
name       texas
ip-addr    192.168.37.9
ip-subnet  local
state      up/up
phase      6
fabric     6
modules    6
version    Build 3.8.0-XGOS-BETA5 - (root) Tue Apr 24 23:05:54 UTC 2012
-----
4 records displayed

```

Fields

[TABLE 3-1](#) describes the fields displayed with the `show director` command.

TABLE 3-1 Fields that Display Using the show director Command

Field	Possible Contents	Description
name		The name of specified Oracle Fabric Interconnect.
ip-addr		The chassis' IP address.
ip-subnet	either a name (for example, "local") or displayed in dotted decimal notation	The IP subnet on which the Oracle Fabric Interconnect is located.
state	<ul style="list-style-type: none"> • Up • Down 	The Oracle Fabric Interconnect's discovery state while the chassis are being discovered and added to the Oracle Fabric Manager framework.
phase		The phase of the discovery process while chassis are being discovered and added to the Oracle Fabric Manager framework.
fabric	If this value is the same as the Oracle Fabric Interconnect name, that Oracle Fabric Interconnect is providing the IB subnet manager. If this value is different than the Oracle Fabric Interconnect's name, the device named in this field provides the IB subnet manager.	Indicates the name or InfiniBand ID of the Oracle Fabric Interconnect that is the master node, which provides the InfiniBand subnet. Note - It is possible that an Oracle Fabric Interconnect named in this field that is not managed by Oracle Fabric Manager is providing subnet manager functionality for an Oracle Fabric Interconnect that is managed by Oracle Fabric Manager.
modules		The number of I/O modules installed in the chassis.
version		The Oracle Fabric Manager version currently installed on the chassis.

Displaying Director Details

```
show director <name> [-detail=Show detailed information]
```

Displaying I/O Card Information

Each Oracle Fabric Interconnect supports Ethernet I/O modules that are the underlying physical connectivity to the IP network and Fiber Channel modules that are the underlying physical connectivity to an FC SAN. These hardware modules support the creation of vNICs for virtual IP connectivity and vHBAs for host servers' SAN connectivity.

Oracle Fabric Interconnects support the following Ethernet I/O modules:

- 10 Gig Ethernet module (10 GE), which supports one physical link at 10 Gbps.
- 4-port 10 Gig Ethernet module (4-Port 10 GE), which support four physical links at 10 Gbps per link.
- 10-port Gig Ethernet module (10-Port GE), which supports 10 individual physical links at 1 Gbps.

Oracle Fabric Interconnects support the following Fibre Channel cards:

- The Line Rate Fibre Channel module (2x4 FC Line Rate card). This module supports two FC port pairs (one transmit port of 4 Gbps and one receive port at 4 Gbps for each port pair) for a total of 8 Gbps per module.
- The 8 Gbps Line Rate Channel module (2x8 FC Line Rate card). This module supports two FC port pairs (one transmit port of 8 Gbps and one receive port at 8 Gbps for each port pair) for a total of 8 Gbps (full line rate) for each port pair.

Syntax

To display the Ethernet and FC card information for a particular Oracle Fabric Interconnect, type:

```
show [-table] [-list] [-xml] [-sortBy=Specify column to sort by] director <Director name> io-cards
```

Example:

```
show -table -sortBy="name" director <Director name> io-cards
```

The CLI displays information about the specified Oracle Fabric Interconnect, for example:

```
root@FabMgrCLI[ofm] show -table -sortBy="name" director montana io-cards
name                state                type                description
-----
montana/5            up/up                nwEthernet10Port1GbCard
```

montana/6	up/up	sanFc2Port4GbCard
montana/9	up/failed	sanFc2Port4GbCard
montana/10	up/up	sanFc2Port4GbCard
4 records displayed		

This example shows two Ethernet cards and two FC cards. The Ethernet card in slot 1 has a missing resource.

Field Definitions

[TABLE 3-2](#) describes the fields displayed using the `show director...io-cards` command.

TABLE 3-2 Fields Displayed Using the `show director` Command

Field	Possible Contents	Description
name		The name of each Ethernet and FC card inventoried in the specified Oracle Fabric Interconnect. Each I/O card is named as chassis/slot, so the card montana/1 is the Ethernet card in slot 1 of the "Montana" chassis and montana/6 is the FC card in slot 6 of the "Montana" chassis.
state	<ul style="list-style-type: none">• Up/Ready• Cold Restart• Warm Restart• Shutting Down• Unmanaged• Upgrading• Up/Initializing• Up/Indeterminate• Up/VersionMismatch• Up/HostControlPathDown• Up/Down• Up/Up	The current state of the Oracle Fabric Interconnect's Ethernet and FC cards. The "state" is displayed as administrative state/operational. Cards in an up/up state are operating correctly.

TABLE 3-2 Fields Displayed Using the `show director` Command (*Continued*)

Field	Possible Contents	Description
<code>type</code>	<p>Ethernet modules supported include:</p> <ul style="list-style-type: none"> • 10 Gig Ethernet module (10 GE), which supports one physical link at 10 Gbps. In the “Type” field, Oracle Fabric Manager displays this module appears as <code>nwEthernet1Port10GBCardEthIb</code> • 4-Port 10 Gig Ethernet module (4-Port 10 GE), which support four physical links at 10 Gbps per link. In the “Type” field, this module appears as <code>nwEthernet4Port10GbCardEthIb</code> • 10-Port Gig Ethernet module (10-Port GE), which supports 10 individual physical links at 1 Gbps. In the “Type” field, this module appears as <code>nwEthernet10Port1GbCardEthIb</code> <p>Fibre Channel modules supported include:</p> <ul style="list-style-type: none"> • The Line Rate Fibre Channel module, which supports two FC port pairs (one transmit port of 4 Gbps and one receive port at 4 Gbps for each port pair) for a total of 8 Gbps per module. In the “Type” field, this module appears as <code>sanFc2Port4GbLrCard</code>. • The 8 Gbps Line Rate Fibre Channel module, which supports 2 FC port pairs (one transmit port of 8 Gbps and one receive port at 8 Gbps for each port pair) for a total of 8 Gbps (full line rate) for each port pair. In the “Type” field, this module appears as <code>sanFc2Port8GbLrCardEthIB</code>. 	The type of Ethernet card installed in the Oracle Fabric Interconnect.
<code>description</code>		An optional description field for the Ethernet or FC card.

Displaying FC Port Information

The `show director fc-ports` command provides a list of all Fibre Channel ports managed by Oracle Fabric Manager, the port type, its status (up or down).

Syntax

To display the FC port information for a specified Oracle Fabric Interconnect in table format, type:

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] director <Director name> fc-ports
```

Example

```
show -table director <Director name> fc-ports
```

```
root@FabMgrCLI[ofm] show director montana fc-ports
name                state                type                vhba-count  speed(-m-b)  description
-----
montana/6/1         up/down              sanFcPort           0             4000
montana/6/2         up/down              sanFcPort           0             4000
montana/9/1         up/indeterminate     sanFcPort           0             4000
montana/9/2         up/indeterminate     sanFcPort           0             4000
montana/10/1        up/up                 sanFcPort           0             4000
montana/10/2        up/up                 sanFcPort           1             4000
6 records displayed
```

This example shows six FC ports with two of them in an “indeterminate” state.

Field Definitions

TABLE 3-3 describes the fields displayed by the `show director...fc-ports` command.

TABLE 3-3 Fields Displayed Using the `show director` Command

Field	Possible Contents	Description
name		The termination ports inventoried in the Oracle Fabric Interconnect that support vHBAs. The Fibre Channel port information is named as chassis/slot/port, so the port montana/1/1 is the FC port 1, on slot 1, of the “Montana” chassis.
state	<ul style="list-style-type: none">• Up/Indeterminate• Up/HostControlPathDown• Up/Down• Up/Up	The current state of the FC port. The state is displayed as administrative state/operational state. FC ports in and “up/up” state are operating correctly.
type	sanFcPort	The FC port displays as <code>sanFcPort</code> .
vhba-count		The number of vHBA resources configured on each port.
speed(-m-b)		The speed that the port supports.
description		An optional description field for the FC port.

Displaying Ethernet Port Information

The `show director ethernet-port` command provides a list of all Ethernet ports managed by Oracle Fabric Manager, the port type, its status (up or down).

Syntax

To display the Ethernet port information for a particular Oracle Fabric Interconnect in list format, type:

```
show [-table] [-list] [-xml] [-sortBy=Specify column to sort by] director <Director name>
ethernet-ports
```


Example

```
show -list director <Director name> ethernet-ports
```

```
root@FabMgrCLI[ofm] show -list director montana ethernet-ports
```

```
-----  
name           montana/5/1  
state          up/down  
type           nwEthernet1GbPort  
vnic-count     0  
speed(-m-b)   1000  
lag-id         0  
description
```

```
-----  
name           montana/5/2  
state          up/down  
type           nwEthernet1GbPort  
vnic-count     0  
speed(-m-b)   1000  
lag-id         2  
description
```

```
-----  
name           montana/5/3  
state          up/up  
type           nwEthernet1GbPort  
vnic-count     0  
speed(-m-b)   1000  
lag-id         0  
description
```

```
-----  
name           montana/5/4  
state          up/up  
type           nwEthernet1GbPort  
vnic-count     0  
speed(-m-b)   1000  
lag-id         0  
description
```

```
-----  
name           montana/5/5  
state          up/down  
type           nwEthernet1GbPort  
vnic-count     0  
speed(-m-b)   1000  
lag-id         0  
description
```

```
-----  
name           montana/5/6  
state          up/up
```

```

type          nwEthernet1GbPort
vnic-count    1
speed(-m-b)  1000
lag-id        0
description
-----
name          montana/5/7
state         up/down
type          nwEthernet1GbPort
vnic-count    0
speed(-m-b)  1000
lag-id        0
description
-----
name          montana/5/8
state         up/down
type          nwEthernet1GbPort
vnic-count    0
speed(-m-b)  1000
lag-id        0
description
-----
name          montana/5/9
state         up/down
type          nwEthernet1GbPort
vnic-count    3
speed(-m-b)  1000
lag-id        0
description
-----
name          montana/5/10
state         up/down
type          nwEthernet1GbPort
vnic-count    0
speed(-m-b)  1000
lag-id        0
description
-----
10 records displayed

```

This example shows 10 Ethernet ports in various “states.”

Field Definitions

TABLE 3-4 describes the fields displayed by the `show director...ethernet-ports` command.

TABLE 3-4 Fields Displayed Using the `show director...ethernet-ports` Command

Field	Possible Contents	Description
name		This module contains a termination port supporting a vNIC, so the configured Ethernet ports' information is shown for any port that is terminating a vNIC. The port is named as chassis/slot/port, so the port montana/1/1 is the Ethernet port 1, on slot 1, of the "montana" chassis.
state	<ul style="list-style-type: none">• Up/Indeterminate• Up/HostControlPathDown• Up/Down• Up/Up	The current state of the Ethernet port. The state is displayed as administrative state/operational state. Ethernet ports in an "up/up" state are operating correctly. Several possible states are displayed in the Possible Contents column.
type	nwEthernet1GbPort	The type of Ethernet port
vnic-count		The number of vNIC resources configured on each port on the Ethernet card.
speed(-m-b)		The speed that the port supports.
lag-id		The link aggregation group ID if one is configured on this port.
description		An optional description field for the Ethernet Card.

Managing Oracle Fabric Interconnects

This section describes additional management functions that you can perform with Oracle Fabric Interconnects using the CLI, including:

- ["Restarting an Oracle Fabric Interconnect" on page 49](#)
- ["Removing an Oracle Fabric Interconnect" on page 50](#)

Restarting an Oracle Fabric Interconnect

The `set director restart` command restarts an Oracle Fabric Interconnect.

Syntax

To restart an Oracle Fabric Interconnect., type:

```
set director <Director name> restart
```

Example

```
set director montana restart
```

Removing an Oracle Fabric Interconnect

The `remove director` command removes an Oracle Fabric Interconnect from Oracle Fabric Manager management.

Syntax

To remove an Oracle Fabric Interconnect from Oracle Fabric Manager management, use the following command syntax.

```
remove [-noconfirm] director <Director name>
```

Examples

```
remove director montana
```

When you execute this command, the CLI displays a message confirming that you wish to remove the Oracle Fabric Interconnect. Type `Y` to continue, or `N` to cancel.

If you do not want a confirmation message to display when you issue this command, use the `-noconfirm` option as shown below:

```
remove -noconfirm director montana
```

Managing User Access Security

This section details:

- “Understanding How Oracle Fabric Manager Controls User Access” on page 51
- “Working with User Roles” on page 54
- “Working with Role Group Mappings” on page 57
- “Working with Domain Group Mappings” on page 58
- “Configuring Resource Domains” on page 59

Understanding How Oracle Fabric Manager Controls User Access

Oracle Fabric Interconnects control user access through its Identity Management System (IMS). IMS has two types:

- Internal IMS, where the user is assigned to a role group (and its associated permissions) within the Oracle Fabric Interconnect itself. The role group has permissions associated with it that determines what system objects the users who are part of the role group can use when logged in to Oracle Fabric Manager. This role assignment is called “internal” because the mapping of a user-to-role as well as the authorization and authentication of that user occurs on the Oracle Fabric Interconnect.
- External IMS, where the authorization and authentication aspects of logging in occur external to the Oracle Fabric Interconnect and the Oracle Fabric Manager Server. Authentication and authorization occur typically on an external device—for example, through a RADIUS server—that is connected to the Oracle Fabric Manager Server through an Oracle Fabric Interconnect.

User Roles

User roles are software constructions associated with one or more user accounts. The roles set the amount of control a user has within the Oracle Fabric Manager and Oracle Fabric Interconnect system. Roles typically are created based on the division of system administration tasks in the data center. For example, some common roles are:

- network, for managing IP networks and routing connectivity
- storage, for managing storage capacity, configuration, and connectivity

Oracle Fabric Manager provides several default roles. Each role has permissions on different hardware, software, and network components. [TABLE 3-5](#) shows the roles with which a user can be associated.

TABLE 3-5 User Roles

This role...	Has privileges for...
operator	read access to Oracle Fabric Interconnect features
network	vNIC configuration and management and network QoS
storage	vHBA configuration and management and SAN QoS
server	compute resource configuration and management
administrator	full admin responsibilities. When a user with this role logs in, Oracle Fabric Manager maps that individual user account to the root account (admin/admin), which grants the user all permissions on the Oracle Fabric Interconnect.
no access	No access. Users with this role cannot use Oracle Fabric Manager and cannot display any information.

To add users to an Oracle Fabric Manager role, see [“Working with User Roles” on page 54](#).

Resource Domains

The Oracle Fabric Interconnect, Oracle Fabric Manager Server, and physical servers reside in domains, which are logical groupings of resources in the network. Typically, domains are arranged by a functional group such as a business unit or department, but domains can be created with any theme—a lab domain, a production domain, a domain of top-quality hardware, a domain of mid-quality hardware, a domain of services or applications, and so on. Oracle Fabric Manager’s Domain Manager enables you to create the individual domains within your network by carving out the resources required, and grouping them into a domain. Domain boundaries are strictly enforced, so the Oracle Fabric Manager Server and the Oracle Fabric Interconnects it manages must be in the same domain.

Default Domain

By default, all resources discovered and managed by Oracle Fabric Manager reside in the default domain. When you create additional domains, you remove resources from the default domain and add them to the domain that you create.

To configure a domain, you must be logged into Oracle Fabric Manager at the administrator-level (either through root or the default domain admin user). The domain admin user (which is used to manage individual domains) cannot create

individual domains. When you log in to Oracle Fabric Manager as root, you can issue the commands required manage the default domain. Use the `add resource-domain` to create individual domains that will be later managed by the admin users.

Once you create a domain, you can add individual resources to it to allow for virtual connectivity to hosts—for example, a domain might contain one or more Oracle Fabric Manager Server(s), Oracle Fabric Interconnects, FC and GE switches, and hosts. When the domain and resources are created, you can create the admin user to manage that domain and its subset of overall resources.

Default Domain Users

In the default domain, users that have administrator role can create, update, or remove non-default domains. These users can also add Oracle Fabric Interconnects and I/O Modules to the non-default domains, as well as delete them from the non-default domains.

In a standard usage model the default domain administrator is a site administrator, and the non-default administrator is the administrator of individual domains. For example, in a data center that sells rack space and services to other companies, the default domain administrator (site administrator) can access and control the Oracle Fabric Interconnects and create the individual domains for each paying company. Within the domain for each company, I/O Modules are available for end-to-connectivity. The default domain administrator adds I/O Modules to the company's domain, then the company's domain (non-default) administrator can manage any further configuration of that domain.

Role and Domain Group Mappings

Oracle Fabric Manager provides an enhanced group mapping functionality that enables you to specify a mapping between a user's group and either a role defined in Oracle Fabric Manager or a domain, or both. With this feature, the user's group is defined on an external Identity Management System (IMS) such as AD or LDAP, and when that user logs into the group, that group is mapped to an Oracle Fabric Manager role (if desired), or a specific domain in Oracle Fabric Manager (if desired) or both. As a result of the group mapping to a role or domain (or both), the user then gets either the corresponding role, or access to only the resources in the mapped domain, or both the corresponding role and resources in the mapped domain.

Groups are identified by a regular expression that is matched against the list of groups to which a user belongs. (Regular expressions are parts of strings that represent a pattern for the overall larger string, and they can contain wildcards for the substitution of the rest of the overall string. For example, `app.*` is a regular expression for "applications"). When a match is found, the role (or domain) is set for that user to that specified in the mapping.

Note – The regular expression must match the whole group name not part of it. For example, abc would not match for the group abcd. However, abc.* would match the group name.

When multiple roles are set for a mapping, the users that are in the affected group are mapped into the corresponding roles. For example, assume the group Oracle_Server_Storage_Admins is created on an AD server. This group is then mapped to the Server and Storage roles in the Oracle Fabric Manager RBAC roles. This mapping is supported, and in this case, users in the Oracle_Server_Storage_Admins group will now have multiple roles.

Using the No Access Role

The “No Access” role prevents access to Oracle Fabric Manager (including read-only access). With the no-access role, you can block certain groups from seeing any of the information within Oracle Fabric Manager. For strictest security, Oracle recommends that you place the Oracle Fabric Manager and Oracle Fabric Interconnect users into their respective domains/groups, and place everyone else into the No Access group.

Note – When mapping external IMS groups, you cannot configure an administrator, network, storage, or compute role in a non-default domain. If you do place these roles in a non-default domain, users will be logged in as operator (read-only). In the default domain, administrator, network, storage, and compute roles can be assigned and function predictably.

Working with User Roles

You define Oracle Fabric Manager users on each Oracle Fabric Interconnect. The user must first be defined in the Oracle Fabric Manager Server’s operating system. You can then associate that user account with an Oracle Fabric Manager role as defined earlier in this chapter. When you create an Oracle Fabric Manager user account, you define the user account name (which should be the same as the operating system’s account name) and specify the role for that account. The user then enters their operating system user name and password when they log into Oracle Fabric Manager.

With the Oracle Fabric Manager CLI, you can:

- Add new users to roles using the `add user-role` command
- Change a user’s account to a different role using the `set user-role` command

- Display a user's role using the `show user-role` command
- Remove a user role from the a user account using the `remove user-role` command

You can assign each user account to only one role; so if the same person needs access to multiple aspects of the Oracle Fabric Interconnect, you can either assign that person to a powerful role (such as server or administrators) or create two different user accounts that provide specific areas of control. For example, if you do not want to give user "timmy" the administrator role, but you want "timmy" to be able to control vNICs and vHBAs, you could create two user accounts:

- one account called "timmy_nic" and assign that user account to the network role
- the other account called "timmy_hba" and assign that user account to the storage role

Timmy would then log on with the account that controls the functions he wishes to manage. There is no need to give him super user privileges to manage both roles.

If you change the role assigned to a user account, the new role (and its associated privileges) take affect the next time that user account logs in. If you change the role for an account that is currently logged in, the old role (and the associated privilege) remain in effect until that user account logs out of the current Oracle Fabric Manager session. For example, if two user accounts with administrator role are logged in, and you set the other user account's role to something other than "administrator" that other account will still have "administrator" role (and its privileges) as long as it remains logged in.

Syntax

To add a user to a role, issue the following command:

```
add user-role <Specify a User name (this is a user name that is authenticated by the OS on the Fabric Manager machine)> [-domain-name=Resource domain name] [-role=Specify Security role. Default='operator'] [-description=Specify Description]
```

To rename an Oracle Fabric Manager user or to change a role assigned to a user account without completely deleting and recreating that user name and role, issue the following command:

```
set user-role <User name> [-domain=Resource domain name] [-roles=Specify Security role] [-description=Specify Description]
```

To display a role and domain associated with a user ID, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] user-role <Name of user>
```

To remove a role, issue the following command:

```
remove [-noconfirm] user-role <User name>
```

Example

```
root@FabMgrCLI[ofm] add user-role jkrause -domain=StorageAdmins -role=storage
-description="Storage administrator"
root@FabMgrCLI[ofm] show user-role myuserrole
name                domain                roles                description
-----
jakrause            default                operator             Storage administrator
1 record displayed
```

The above example creates a user named jkrause (who is already defined in the operating system) in the domain StorageAdmins with the Oracle Fabric Manager role storage.

Options

TABLE 3-6 describes the options you specify with the `add user-role` and `set user-role` commands.

TABLE 3-6 Options Entered Using the `add user-role` and `set user-role` Commands

Option	Possible Values	Description
User name	a string between 1 and 128 characters in length	Enter the user name (that already exists in the OS) that you are created and associating with an Oracle Fabric Manager role.
-domain		Specify a domain in which this user and role should be created. By default, all users and their roles are created in the default domain unless you specify a custom domain.
-role	<ul style="list-style-type: none">operatornetworkstorageserveradministratorno access	Specify the role that you want to assign to the user that you are creating. If you do not specify a user, the operator role is assigned by default.
-description		As an option, specify a description string that describes the user account that you are creating.

Working with Role Group Mappings

Role groups provide the permissions for the objects that a user can access, configure, change, or manage. The default role group is “operator,” which is the most restrictive (read-only) group. If there are many roles with similar functions, you can use regular expressions to define that role group.

Syntax

To create a Role Group Mapping, issue the following command:

```
add role-group-mapping <Name of mapping> <Regular expression for the group> <Roles to map>
[-description=Specify Description]
```

To change the role of a role group mapping, issue the following command:

```
set role-group-mapping <Name of mapping> <Regular expression for the group> <Roles to map>
[-description=Specify Description]
```

To display a role group mapping, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] role-group-mapping <Name of
mapping>
```

To delete a role-group-mapping, issue the following command:

```
remove [-noconfirm] role-group-mapping <Name of mapping>
```

Example

```
root@FabMgrCLI[ofm] add role-group-mapping TechnicalSupport Technical*
administrator
root@FabMgrCLI[ofm] show role-group-mapping
-----
displayed-name   HumanResourcesMapping
group-names      HumanResourceGroup
roles            network,storage
description      Access to all human resources networks and storage
-----
1 record displayed
```

The above example creates a new role group mapping called TechnicalSupport using the expression Technical* and assigns that role group the administrator role and displays the defined role group mapping.

Working with Domain Group Mappings

The Group Mapping feature has a separate command for mapping external IMS groups (for example, AD groups) to Oracle Fabric Manager domains. The add domain-group-mapping and set domain-group-mapping commands enable you to create and link one or more groups in an external IMS to one or more specific Oracle Fabric Manager domains. You can display the domain group mappings using the show domain-group-mapping command and delete a domain group mapping using the remove domain-group-mapping command.

Syntax

To work with domain group mappings, issue one of the following commands:

```
add domain-group-mapping <Name of mapping> <Regular expression for group> <Domain-name>
[-Specify Description]
```

```
set domain-group-mapping <Name of mapping> [-group=Regular expression for group] [-domain=
Resource domain name] [-description=Description]
```

```
show [-xml] [-list] [-table] [-sortby=Sort column] domain-group-mapping <Name of
mapping>
```

```
remove [-noconfirm] domain-group-mapping <Name of mapping>
```

Examples

```
root@FabMgrCLI[ofm] add domain-group-mapping StorageAdmin Storage* StorageCloud
```

Configuring Resource Domains

When you create a domain, you carve out a set of resources from the overall default domain. A domain includes the Ethernet ports, FC ports, and physical servers required in the domain. Domains are created by using the `add resource-domain` command one or more of the following commands:

- `set resource-domain...add physical-server` to add physical hosts to your domain. The physical host must be connected to an Oracle Fabric Interconnect being managed by Oracle Fabric Manager. The host cannot already be connected to a Network or Storage Cloud.
- `set resource-domain...add fabric-device` to add a specified Oracle fabric device (either an Oracle Fabric Interconnect or an Oracle SDN Controller) to your domain. If you are adding fabric devices that are already connected to hosts, the hosts (and any associated Network or Storage Clouds) must also be in the same domain as the fabric device(s).
- `set resource-domain...add network-cloud` to add Network Clouds to the domain. The Network Cloud consists of one or more termination GE ports, which cannot be assigned to another cloud.
- `set resource-domain...add storage-cloud` to add an I/O card to a resource domain so that it is available to Network and Storage Clouds.
- `set resource-domain...add io-card` to add Storage Clouds to the domain. The Storage Cloud consists of one or more FC termination ports, which cannot be assigned to another cloud.
- `set resource-domain` also has an option that allows you to set the name for a resource domain.

When you create a domain, you must be logged in as an administrator so that you can configure the resources from the default domain. After configuring the domain, you can log back in with a user account for that domain and continue to configure and manage that individual domain.

You can also remove resources from a domain using one of the following commands

- `set resource-domain...remove physical-server` to remove a physical hosts from your domain.
- `set resource-domain...remove fabric-device` to remove an Oracle fabric device from a resource domain. When removed, the fabric device returns to the default domain, and will be unable to use Network or Storage Clouds, I/O cards, or servers that are in other domains.

- `set resource-domain...remove network-cloud` to remove Network Clouds from the domain.
- `set resource-domain...remove storage-cloud` to remove Storage Clouds from the domain.
- `set resource-domain...remove io-card` to remove an I/O card from a resource domain. When removed, the I/O card returns to the default domain, and will be unavailable for connecting to Network and Storage Clouds, fabric devices, or hosts that are in other domains.

To display the resources that are assigned to a resource domain, use one of the following commands:

- `show resource-domain...physical-server`
- `show resource-domain...network-cloud`
- `show resource-domain...storage-cloud`

To remove a resource domain from the Oracle Fabric Interconnect, use the `remove resource-domain` command.

Syntax

To perform one of the resource domain functions described above, issue one of the following commands:

```
add resource-domain <Specify a Resource domain name> [-description=Specify Description]
```

```
set resource-domain <Specify a Resource domain name> add fabric-device <Specify Oracle fabric device name>
```

```
set resource-domain <Resource domain name> add physical-server <Specify Physical server name>
```

```
set resource-domain <Resource domain name> add network-cloud <Specify Network cloud name>
```

```
set resource-domain <Resource domain name> add storage-cloud <Specify Storage cloud name>
```

```
set resource-domain <Resource domain name> add io-card <Specify I/O card name>
```

```
set resource-domain <Resource domain name> remove fabric-device <Specify Oracle fabric device name> [-no-confirm]
```

```
set resource-domain <Resource domain name> remove physical-server <Specify Physical server name> [-no-confirm]
```

```
set resource-domain <Resource domain name> remove network-cloud <Specify Network cloud name> [-no-confirm]
```

```
set resource-domain <Resource domain name> remove storage-cloud <Specify Storage cloud name> [-no-confirm]
```

```
set resource-domain <Resource domain name> remove io-card <Specify I/O card name> [-no-confirm]
```

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] resource-domain <Resource Domain Name> fabric-device
```

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] resource-domain <Resource Domain Name> physical-server
```

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] resource-domain <Resource Domain Name> network-cloud
```

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] resource-domain <Resource Domain Name> storage-cloud
```

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] resource-domain <Resource Domain Name> io-cards
```

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] resource-domain <Resource Domain Name>
```

```
remove [-noconfirm] resource-domain <Resource Domain name>
```

Example

```
root@FabMgrCLI[ofm] add resource-domain ITresources
root@FabMgrCLI[ofm] set resource-domain ITresources add physical-server bering
root@FabMgrCLI[ofm] set resource-domain ITresources add network-cloud Cloud9
root@FabMgrCLI[ofm] set resource-domain ITresources add storage-cloud S_Cloud0
root@FabMgrCLI[ofm] show resource-domain ITresources
-----
name                ITresources
description
number-of-servers   1
network-cloud-count 1
storage-cloud-count 1
-----
1 record displayed
root@lawrence[ofm]
```

The above example creates the resource domain called ITresources and adds the physical server bering, the Network Cloud Cloud9, and the Storage Cloud S_Cloud0 to the domain. Finally, the example displays the resources in the resource domain bering.

Working with Network Clouds

This chapter describes Network Clouds and vNICs and explains how to create, display, and remove them using the CLI. This chapter also describes how to include Ethernet Link Aggregation Groups (LAGs) and Network QoS Profiles in your Network configurations. This chapter contains the following topics:

- [“Understanding Network Clouds and vNICs” on page 63](#)
- [“Creating a Network Cloud” on page 67](#)
- [“Displaying Network Cloud Details” on page 74](#)
- [“Removing Network Clouds, Ethernet Ports, and MAC IDs” on page 80](#)
- [“Creating and Using vNICs” on page 82](#)
- [“Working with Ethernet Link Aggregation Groups \(LAGs\)” on page 92](#)
- [“Working with Network QoS” on page 99](#)

Understanding Network Clouds and vNICs

Oracle Fabric Interconnects contain a set of I/O ports that are connected to your data center network. The network and SAN administrator connect these ports to their Ethernet switches to provide I/O resources to the servers. Each I/O port on the Oracle Fabric Interconnect provides access to a set of “clouds”. For example, you might have a Network Cloud that provides access to the HR network. As far as the network administrator is concerned, you are connecting wires to the Oracle Fabric Interconnect’s I/O ports for the sole purpose of providing the server administrator access to the resources.

The server administrator then connects servers to a set of network resources provided by the network administrators. The server administrator doesn't care what physical Oracle Fabric Interconnect ports are being connected to as long as the servers have access to the required resources. You can configure and manage Network Clouds using the Oracle Fabric Manager Network and Administrator roles.

vNICs

A virtual Network Interface Card (vNIC) virtualizes NIC connectivity. A vNIC is a virtual NIC that appears to the OS as a physical NIC and enables a server to have an Ethernet network attachment without having a physical NIC present. Instead of the client server using a NIC, it uses an InfiniBand (IB) HCA and then virtualizes the NIC, providing Ethernet connectivity. These commands enable you to configure QoS Profiles, a VLAN, the Ethernet Port to use, and several other parameters when defining your vNIC.

Private vNICs

By default, when two vNICs are terminated on the same I/O module, the Oracle Fabric Interconnect uses a feature called vNIC-to-vNIC Switching, which forwards the traffic between the two vNICs across the I/O module instead of sending them over the midplane. The vNIC-to-vNIC Switching feature provides better performance for network traffic. However, some situations exist where uncontrolled vNIC-to-vNIC Switching might not be desirable due to security reasons.

You can add security to vNIC-to-vNIC switching using Private vNICs. With Private vNICs, you can add isolation for a set of vNICs, and also provide enhancements to existing and new methods of external switching. If a vNIC-to-vNIC Switching configuration does not explicitly have one or more vNICs set as a Private vNIC, then those vNICs are assumed to be Public vNICs, which do not support the isolation and external switching benefits of Private vNICs.

A Private vNIC communicates with the Ethernet network and Public vNICs, but it cannot communicate with other Private vNICs. If a packet's destination is assigned to a Private vNIC, the packet is dropped. Packets originating on a private vNIC and destined for another private vNIC are dropped regardless of whether both vNICs are in the same VLAN.

Public vNICs can communicate without restriction with the exception of traffic isolation enforced by standard VLANs. Packets arriving from private vNICs are dropped or forwarded based on the destination. If the destination is a Public vNIC or the Ethernet network, the packet is forwarded. Otherwise, it is dropped. VLAN restrictions still apply to packets that are forwarded. Broadcast and multicast packets are not special cases. They are also not forwarded between Private VLANs.

You can specify Private vNICs using the `set network-cloud` command (“[Setting Network Cloud Options](#)” on page 70).

Network QoS Profiles

Oracle Fabric Manager provides commonly-used network QoS Profiles that are pre-configured for various network link speeds. These pre-configured Network QoS Profiles use typical CIR and PIR values calculated from the link’s total throughput. When you configure QoS Profiles, make sure that you use a reasonable profile. For example, for a 1 Gigabit Ethernet link, do not select a network QoS profile for a 10 Gigabit Ethernet link (do not choose the Network QoS profile named `7g_10g`, which has throughput values that are in excess of what the 1 Gigabit link can support). You can configure Network QoS for a Network Cloud when you:

- Create the Network Cloud using the `add network-cloud` command (see “[Creating a Network Cloud](#)” on page 67)
- Change the Network Cloud setting using the `set network-cloud` command (see “[Setting Network Cloud Options](#)” on page 70)

You can assign the Network QoS at the Cloud level (see “[Creating a Network Cloud](#)” on page 67) or at the vNIC level (see “[Creating and Using vNICs](#)” on page 82):

- If a Network Cloud has a QoS Profile associated with it, a vNIC terminated in the Network Cloud inherits the Network QoS profile from the Network Cloud. In this case, the vNICs inherit the QoS parameters from their respective clouds (and is true even if the vNIC has its own QoS Profile with which it is associated.)
- If a Network Cloud has no QoS Profile associated with it, and a vNIC has its own QoS profiles, a vNIC terminated in the Network Cloud will have a QoS Profile associated with it. In this case, the Network Cloud has no QoS Profile to apply. This situation does not automatically apply no QoS to the vNICs. Instead, it causes the cloud to defer to the QoS profiles assigned to the individual vNICs (if any). If you do not want QoS applied anywhere for the virtual I/O in a cloud, make sure that no QoS Profile is associated with the Network Cloud, and also that no QoS is associated with the vNIC included in that Cloud.

High Availability Network Clouds

Typical deployments have redundant Oracle Fabric Interconnects so that if one of the Oracle Fabric Interconnects becomes disabled for any reason, the second Oracle Fabric Interconnect can assume all the activity being performed by the Oracle Fabric Interconnect that is “down.” You can associate a Network Cloud with two Oracle Fabric Interconnects simultaneously, and also set the connection priority so that one Oracle Fabric Interconnect is considered the primary and the other is considered the

secondary. When you initially create the Cloud, you must manually connect the HA vNICs to the Cloud and manually set their primary and secondary status. Once you create the initial Network Cloud, the Oracle Fabric Interconnects' connection priority is set. Any additional HA pairs that attach to the new Network Cloud set up for HA will first attach to the primary Oracle Fabric Interconnect and then to the secondary Oracle Fabric Interconnect if the primary Oracle Fabric Interconnect becomes unavailable.

Most administrators typically create Network and Storage Clouds around a similar theme for the ports or LAGs that are associated with it. For example, a Network Cloud might have ports or LAGs that will provide vNIC connections to a specific domain or specific upstream Ethernet switch for a specific set of host servers. You create a Network Cloud using the CLI command `add network-cloud`.

Ethernet Link Aggregation Groups (LAGs)

LAGs function the same as physical Ethernet ports in the Network Cloud. Virtual NICs can be terminated on a LAG just as they would be on a physical port. A LAG typically has all ports in the Network Cloud, but the same Network Cloud can have a LAG and one or more physical ports in it. Multiple LAGs can be assigned to the same Network Cloud as long as each LAG complies with the standard LAG guidelines for the minimum and maximum number of ports. You configure LAGs for a Network Cloud using the `set network-cloud` command.

Virtual Local Area Networks (VLANs)

VLANs are used for traffic isolation and security to prevent some hosts on a network from seeing traffic that is intended for other hosts. When traffic is tagged with a VLAN ID, only the hosts that can transmit or receive packets for that VLAN are able to see and use that traffic.

You can set VLANs for a Network Cloud using the `set network-cloud` command. When a VLAN is set on the Network Cloud, vNICs added to that Cloud inherit the VLAN ID unless additional configuration exists at the port level to enforce different tagging rules.

Round Robin Port Allocation Policy for a Network Cloud

Round robin is a systematic way for ports to be assigned for use in a Network Cloud. You specify multiple ports in a list of available ports for a Network Cloud, and then assign a port as the next available port. Assigning the next available port ranks that port differently than any other port in the available ports list. You can assign ports to Network Clouds or any additional vHBAs that are connected to the Network Cloud by ranking the port. For example, if you create a Network Cloud with Ethernet port 2/1 as the port used to create the cloud then, add ports 2/2, 4/1, and 5/1 to the available ports list, and set port 4/1 as the next available port, when new vNICs connect to the Network Cloud, the first vNIC connect to port 4/1. After that, any additional vNICs are assigned to whichever port has the next lowest rank.

Creating a Network Cloud

When you create a Network Cloud, you include one or more Ethernet ports or LAGs, plus other network characteristics. When you attach the Network Cloud to an I/O Template, it provides a way for hosts to connect to the data network. The Network Cloud provides network access points with specified characteristics—for example, Network QoS Profiles, VLANs, LAGs, and so on.

Oracle Fabric Manager includes a default Network Cloud that contains all the discovered Ethernet ports available through the discovered Oracle Fabric Interconnect(s). When you create a Network Cloud and include resources, those resources are removed from the default Network Cloud and placed in your new Network Cloud(s).

Network Clouds typically are created around some similar theme for the ports or LAGs that are associated with them. For example, a Network Cloud might have ports or LAGs that provide vNIC connections to a specific domain or specific upstream Ethernet switch for a specific set of host servers.

This section describes how to define a Network cloud by:

- [“Adding a Network Cloud” on page 68](#)
- [“Setting Network Cloud Options” on page 70](#)
- [“Adding Ethernet Ports” on page 72](#)
- [“Adding Ethernet LAGs” on page 73](#)
- [“Adding High Availability \(HA\) to the Network Cloud” on page 73](#)
- [“Displaying Network Cloud Details” on page 74](#)

Adding a Network Cloud

You create a Network Cloud using the `add network-cloud` command.

Syntax

To add a Network Cloud to your environment, issue the following command:

```
add network-cloud <Specify Network cloud name> [-description=Specify Network cloud description]
[-qos=Specify Network cloud QOS] [-trunk-mode=Enable trunk-mode?] [-access-vlan-id=Specify
Access VLAN-Id] [-private=Is this private. Default='false']
```

Examples

```
root@FabMgrCLI[ofm] add network-cloud HRnwCloud1 -description="Human Resources
Network Cloud"
```

This example shows a new Human Resources Network Cloud named `HRnwCloud`, and includes a description of that cloud.

```
root@FabMgrCLI[ofm] add network-cloud HRnwCloud1 -qos=100m_1g -trunk-mode=true
-access-vlan-id=1
```

This example assigns a QoS Profile to be applied to the Network Cloud named `HRnwCloud`, to be in trunk mode with an access VLAN ID of 1.

Options

[TABLE 4-1](#) describes the options available with the `add network-cloud` command.

TABLE 4-1 Options for Adding a Network Cloud

Option	Possible Values	Description
Network Cloud name		Specify a name for your new Network Cloud.
-description		An optional description for the Network Cloud you are creating.
-qos	<ul style="list-style-type: none">• 100m_1g• 100m_250m• 10g_10g• 10m_100m• 10m_1g• 10m_50m• 1g_10g• 1m_10m• 250m_500m• 2g_10g• 3g_10g• 4g_10g• 500m_750m• 50m_100m• 5g_10g• 64k_1m• 6g_10g• 750m_1g• 7g_10g• 8g_10g• 9g_10g	<p>Optionally, specify a Network QoS Profile to be applied to the new Network Cloud.</p> <p>You can set Network QoS on a Network Cloud at the cloud level or at the vNIC level. When you apply Network QoS to a Network Cloud, all vNICs associated with the cloud get the specified CIR and PIR values.</p> <p>If you also set Network QoS to a vNIC associated with the Network Cloud, the cloud's Network QoS takes precedence.</p>

TABLE 4-1 Options for Adding a Network Cloud (*Continued*)

Option	Possible Values	Description
-trunk-mode	<ul style="list-style-type: none"> • True • False (default) 	Specify if you want the Network Cloud to be in Trunk Mode by indicating <code>-trunk-mode=true</code> .
-access-vlan-id		<p>If you want all vNICs connected to this Network Cloud to have the same VLAN ID, enter that VLAN number using the <code>-access-vlan-id=</code> option.</p> <p>In addition to VLANs on a Network Cloud, you can control the VLAN IDs that are supported on a specific Oracle Fabric Interconnect through the Allowed VLAN Range feature.</p>
-private	<ul style="list-style-type: none"> • True • False (default) 	<p>Specify if you want all vNICs connected to this Network Cloud to be Private vNICs by indicating <code>-private=true</code>. By default, vNICs are not Private; instead, they are Public.</p> <p>For more information about Private vNICs, see the section entitled “Private vNICs” on page 64.</p> <p>You can configure private vNICs using this command or at the vNIC-level when you deploy the vNIC to the server. Use the <code>set vnic</code> command described in the section entitled “Setting vNIC Options” on page 87.</p>

Setting Network Cloud Options

You can set the following options for Network Clouds

- Description
- QoS Profiles
- Trunk Mode
- VLAN Access
- High Availability

The `set network-cloud` command assigns network characteristics (a QoS Profile, trunk mode, or VLAN ID) to your Network Cloud.

Syntax

To assign network characteristics to a Network Cloud, issue the following command:

```
set network-cloud <Specify Network cloud name> [-description=Specify Network cloud description]
[-qos=Specify Network cloud QOS] [-trunk-mode=Enable trunk-mode?] [-access-vlan-id=Specify
Access VLAN-Id] [-private=Is this private. Default='false']
```


Examples

```
root@FabMgrCLI[ofm] set network-cloud Cloud9 -qos=123
```

```
root@FabMgrCLI[ofm] set network-cloud HRnwCloud1 -qos=100m_1g -trunk-mode=true -access-vlan-id=1
```

This example sets a QoS ID on the Network Cloud called Cloud9.

Options

TABLE 4-2 describes the options you can set using the set network-cloud command.

TABLE 4-2 Network Cloud Options

Option	Possible Values	Description
Network Cloud name		Specify the name of the Network Cloud for which you are specifying options.
-description		Add an optional description for the Network Cloud.
-qos	<ul style="list-style-type: none">• 100m_1g• 100m_250m• 10g_10g• 10m_100m• 10m_1g• 10m_50m• 1g_10g• 1m_10m• 250m_500m• 2g_10g• 3g_10g• 4g_10g• 500m_750m• 50m_100m• 5g_10g• 64k_1m• 6g_10g• 750m_1g• 7g_10g• 8g_10g• 9g_10g	Optionally, specify a Network QoS Profile to be applied to the Network Cloud. You can set Network QoS on a Network Cloud at the cloud level or at the vNIC level. When you apply Network QoS to a Network Cloud, all vNICs associated with the cloud get the specified CIR and PIR values. If you also set Network QoS to a vNIC associated with the Network Cloud, the cloud's Network QoS takes precedence.

TABLE 4-2 Network Cloud Options (*Continued*)

Option	Possible Values	Description
-trunk-mode	<ul style="list-style-type: none"> • true • false (default) 	Specify if you want the Network Cloud to be in Trunk Mode by indicating: -trunk-mode=true.
-access-vlan-id		If you want all vNICs connected to this Network Cloud to have the same VLAN ID, enter that VLAN number using the -access-vlan-id= option.
-alloc-policy	<ul style="list-style-type: none"> • Round robin 	This field specifies that the Network Cloud will be applied to the host server using a “round robin” allocation policy when the cloud gets deployed. (See “Round Robin Port Allocation Policy for a Network Cloud” on page 67 for more information).

Adding Ethernet Ports

The `set network-cloud...add ethernet-port` command adds an Ethernet port to the specified Network Cloud.

Syntax

To add an Ethernet Port to your Network Cloud, issue the following command:

```
set network-cloud <Specify Network cloud name> add ethernet-ports <Specify Ethernet ports or lags>
```

Examples

```
root@FabMgrCLI[ofm] set network-cloud Cloud9 add ethernet-port montana/5/3
```

```
root@FabMgrCLI[ofm] set network-cloud Cloud9 add ethernet-port iowa/4/2
```

These examples add Ethernet ports montana/5/3 and iowa/4/2 to the Network Cloud called Cloud9. Having Ethernet ports from two different Oracle Fabric Interconnects (montana and iowa) enable you to create HA Network Clouds for your environment. You cannot set both of these characteristics using one command.

Adding Ethernet LAGs

A LAG enables you to combine multiple individual physical Ethernet ports into one logical port group. As a result, the ports combined into a LAG can operate in parallel with the benefit of increased link speed and high availability. To create a new LAG, see the section entitled “[Working with Ethernet Link Aggregation Groups \(LAGs\)](#)” on page 92.

Syntax

To add an Ethernet LAG to your Network Cloud, issue the following command:

```
set network-cloud <Specify Network cloud name> add ethernet-lags <Specify Ethernet lag>
```

Examples

```
root@FabMgrCLI[ofm] set network-cloud Cloud9 add ethernet-lag
```

Adding High Availability (HA) to the Network Cloud

To configure HA, you must have a dual-Oracle Fabric Interconnect configuration with Ethernet ports from two different Oracle Fabric Interconnects defined in your Network Cloud. You can then indicate which Oracle Fabric Interconnect is the primary I/O resource provider to your Network Cloud and which Oracle Fabric Interconnect should take over as the secondary Oracle Fabric Interconnect if the primary Oracle Fabric Interconnect becomes unavailable (or “goes down”). Use the `set network-cloud` command to set your HA preference on your Network Cloud.

Syntax

To add an HA preference to your Network Cloud, issue the following command:

```
set network-cloud <Specify Network cloud name> ha-preference <Specify ethernet port or ethernet lag> <Specify the HA preference>
```

Options

You can specify one of the following three options:

- None—No preference
- Primary—Assign primary vNICs to the termination
- Secondary—Assign secondary vNICs to the termination

Examples

```
root@FabMgrCLI[ofm] set network-cloud Cloud9 ha-preference montana/5/3 primary
```

```
root@FabMgrCLI[ofm] set network-cloud Cloud9 ha-preference iowa/4/2 secondary
```

The above example establishes HA preferences for the Network Cloud, Cloud9, with the Primary Ethernet port from Oracle Fabric Interconnect Montana and the secondary port from Iowa.

Displaying Network Cloud Details

You use the `show network-cloud` command to display the detailed information defined for:

- The named Network Cloud
- Ethernet ports defined to the Network Cloud

Displaying Network Cloud Information

Syntax

To display information about a Network Cloud, issue the following command:

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] network-cloud <Network cloud name>
```

Example

```
root@FabMgrCLI[ofm] show network-cloud Cloud9
-----
name                Cloud9
ports               1
lags                0
trunk-mode          false
qos
is-private           false
access-vlan-id      1
available-ingress-cir 0
available-egress-cir 0
allocation-policy    roundrobin
description
-----
1 record displayed
```

This example shows the information defined for the Network Cloud called Cloud9.

Field Definitions

TABLE 4-3 describes the fields displayed by the `show network-cloud` command.

TABLE 4-3 Network Cloud Fields

Field	Possible Contents	Description
name		The name of the Network Cloud to which the subsequent information applies.
ports		The number of Ethernet ports in the Network Cloud. This number is the total of all ports, regardless of whether they are up or down.
lags		The number of link aggregation groups (LAGs) in the Network Cloud. This number is the total of all LAGs configured, not the total number of ports in LAGs.
trunk-mode	<ul style="list-style-type: none">• true• false (default)	Indicates if Trunk Mode is set in this Network Cloud.

TABLE 4-3 Network Cloud Fields (*Continued*)

Field	Possible Contents	Description
qos	<ul style="list-style-type: none"> • 100m_1g • 100m_250m • 10g_10g • 10m_100m • 10m_1g • 10m_50m • 1g_10g • 1m_10m • 250m_500m • 2g_10g • 3g_10g • 4g_10g • 500m_750m • 50m_100m • 5g_10g • 64k_1m • 6g_10g • 750m_1g • 7g_10g • 8g_10g • 9g_10g 	<p>The name of any Network QoS Profiles associated with the Network Cloud. If no Network QoS Profile is configured, this field indicates “none.”</p> <p>If a Network QoS Profile is configured for the Network Cloud, the name indicates the CIR and PIR values. For example, a Network QoS Profile named 5G_10G indicates that 5 Gbps of CIR and 10 Gbps of PIR is configured for the Network Cloud.</p>
is-private	<ul style="list-style-type: none"> • true • false 	Indicates if the Cloud uses a Private vNIC.
access-vlan-id		The number of VLAN IDs configured for this Network Cloud.
available-ingress-cir		The total amount of bandwidth available for ingress traffic. The value displayed also shows the unit of measurement. For example, 1G indicates that 1 Gbps is available for ingress traffic. This value can be affected by the Network QoS Profile (if any) assigned to the Network Cloud.

TABLE 4-3 Network Cloud Fields (*Continued*)

Field	Possible Contents	Description
available-egress-cir		The total amount of bandwidth available for egress traffic. The value displayed also shows the unit of measurement. For example, 1G indicates that 1 Gbps is available for egress traffic. This value displayed can be affected by the Network QoS Profile (if any) assigned to the Network Cloud.
allocation-policy	Roundrobin	This field specifies that the Network Cloud will be applied to the host server using a “round robin” allocation policy when the cloud gets deployed.
description		The Network Cloud description if one was specified.

Displaying Ethernet Port Information

Syntax

To display information about the Ethernet ports defined for use in a Network Cloud, issue the following command:

```
show [-table] [-list] [-xml] [-sortBy=Specify column to sort by] network-cloud <Network cloud name> ethernet-ports-lags
```

Example

```
root@FabMgrCLI[ofm] show network-cloud Cloud9 ethernet-ports-lags
-----
parent.name           Cloud9
eth-port              montana/5/3
state                 up/up
vnic-count            0
type                  nwEthernet1GbPort
available-ingress-cir 1000000
available-egress-cir  1000000
description
-----
1 record displayed
```

This example shows Ethernet port information for the Network Cloud called Cloud9.

Field Definitions

[TABLE 4-4](#) describes the fields displayed by the `display network-cloud...ethernet-ports` command.

TABLE 4-4 Ethernet Port Fields

Field	Possible Contents	Description
parent.name		The name of the Network Cloud being displayed. If you eliminate the name, the command displays all Network Clouds defined in Oracle Fabric Manager.
eth-ports		The name of the Ethernet port designated on the Network Cloud.
state	<ul style="list-style-type: none">• Up• Down	The status of the Ethernet port.
vnic-count		The number of vNICs on the Ethernet port being displayed.
type		The type of Ethernet port.

TABLE 4-4 Ethernet Port Fields (*Continued*)

Field	Possible Contents	Description
available-ingress-cir		The total amount of bandwidth available for ingress traffic. The value displayed also shows the unit of measurement. For example, 1G indicates that 1 Gbps is available for ingress traffic. This value can be affected by the Network QoS Profile (if any) assigned to the Network Cloud.
available-egress-cir		The total amount of bandwidth available for egress traffic. The value displayed also shows the unit of measurement. For example, 1G indicates that 1 Gbps is available for egress traffic. This value displayed can be affected by the Network QoS Profile (if any) assigned to the Network Cloud.
description		A description of the Network Cloud if one was entered for this Network Cloud.

Displaying MAC Addresses

Oracle Fabric Manager keeps a list of all MAC addresses assigned from each Oracle Fabric Interconnect that it has under its management in the MAC Address Pool. The `show mac-address-pool` command enable you to displays this information.

Syntax

To display information about the MAC address pool associated with an Oracle Fabric Interconnect, issue the following command:

```
show [-table] [-list] [-xml] [-sortBy=Specify column to sort by] mac-address-pool  
<Director name>
```

Example

```
root@FabMgrCLI[ofm] show mac-address-pool montana
```

```
-----  
chassis-name      montana  
mac-address       00:13:97:05:70:01  
mac-address-id    001  
is-reserved       false  
is-used           true  
vnic-name  
cloud-name  
-----
```

```
1 record displayed
```

This example shows MAC address information for the Oracle Fabric Interconnect Montana. The `mac-address` field shows the base MAC address pool on each Oracle Fabric Interconnect. To display the MAC address pool information for all chassis being managed by Oracle Fabric Manager, eliminate the Oracle Fabric Interconnect name in the command (`show mac-address-pool`).

Removing Network Clouds, Ethernet Ports, and MAC IDs

This section describes how to remove Network Clouds, Ethernet Ports, and MAC IDs.

Removing Network Clouds from your Environment

The `remove network-cloud` command deletes the named Network Cloud from your environment.

Syntax

To delete a Network Cloud from Oracle Fabric Manager, issue the following command:

```
remove [-noconfirm] network-cloud <Network cloud name>
```

Example

```
root@FabMgrCLI[ofm] remove network-cloud Cloud9
```

This example removes the Network Cloud Cloud9 from the Oracle Fabric Manager environment.

Removing Ethernet Ports from a Network Cloud

The `set network-cloud...remove ethernet-ports` command deletes the named Ethernet ports from a Network Cloud.

Syntax

To remove an Ethernet port from a Network Cloud, issue the following command:

```
set network-cloud <Network cloud name> remove ethernet-ports <Specify Ethernet ports> [-no-confirm]
```

Example

```
root@FabMgrCLI[ofm] set network-cloud Cloud9 remove montana/5/3
```

This example removes Ethernet port `montana/5/3` from the Network Cloud Cloud9.

Removing Ethernet LAGs from a Network Cloud

The `set network-cloud...remove ethernet-lags` command deletes the named Ethernet LAGs from a Network Cloud.

Syntax

To remove an Ethernet LAG from a Network Cloud, issue the following command:

```
set network-cloud <Network cloud name> remove ethernet-lags <Specify Ethernet lags> [-no-confirm]
```

Example

```
root@FabMgrCLI[ofm] set network-cloud Cloud9 remove texas/14/4
```

This example removes Ethernet LAG `texas/14/4` from the Network Cloud `Cloud9`.

Removing MAC IDs from a Network Cloud

The `set network-cloud...remove mac-ids` command deletes the reserved MAC IDs from a Network Cloud.

Syntax

To remove a MAC ID from a Network Cloud, issue the following command:

```
set network-cloud <Network cloud name> remove reserved-mac-ids <Specify the Director>  
<Specify the MAC address> [-no-confirm]
```

Example

```
root@FabMgrCLI[ofm] set network-cloud Cloud9 remove reserved-mac-ids montana  
00:13:97:05:70:00/12
```

This example removes MAC ID `00:13:97:05:70:00/12` located on the Oracle Fabric Interconnect `montana` from the Network Cloud `Cloud9`.

Creating and Using vNICs

This section describes how to use the CLI to work with vNICs, including:

- “Adding vNICs to your Network Cloud” on page 83
- “Setting vNIC Options” on page 87
- “Setting a vNIC’s Termination” on page 88
- “Removing vNICs from a Network Cloud” on page 92

Adding vNICs to your Network Cloud

Use the `add vnic` command to create a new vNIC on a server and terminate it to a Network Cloud. This step does not provide the virtual I/O connection to the host server. It simply creates a vNIC and terminates it on a port in the Network Cloud. The vNIC will not be pushed to the host server until you create an I/O Profile from an I/O Template that uses this Network Cloud, and then that I/O Profile is connected to a physical server.

Syntax

To add a vNIC, issue the following command:

```
add vnic <Specify a vNIC name> <Specify the Physical Server name> <Specify the Network cloud the vnic
points to> [-description=Specify Description] [-qos=Specify QOS profile] [-vlan-id=Set VLAN Id]
[-trunk-mode=Is trunk mode. Default='false'] [-ha-mode=Is this a haVnic. Default='false'] [-ha-mac-
address=MAC Address] [-port=Specify port] [-ha-port=Specify HA Port] [-auto-switchover=
Auto switchover enabled?. Default='false'] [-ip-type=Specify IP address type. Default='HostManaged'] [-
ipaddr=Specify IP address. Default='0.0.0.0'] [-ipmask=Specify IP mask. Default='255.255.255.255'] [-
mac-address=Specify MAC address] [-local-id=Specify Local Id] [-checksum-offload=Checksum
Offload enabled?. Default='false'] [-community-name=Specify Community name] [-iscsi-boot-
capable=Does this vnic do iSCSI Boot? Default='false'] [-pxe-boot-capable=Does this vnic do PXE
Boot? Default='false'] [-tso=Does this vNIC do TSO? Default='false'] [-private=Is it private? Default=
'false']
```

Example—Adding a vNIC

```
root@FabMgrCLI[ofm] add vnic C9vnic1 bering Cloud9 -description="vNIC to provide
resources to Cloud9"
root@FabMgrCLI[ofm] add vnic C9vnic1 bering Cloud9 -qos=100m_250m -vlan-id="1"
```

This example adds a new vnic called C9vnic1 to the physical server “bering” and provides I/O resources to the Network Cloud, Cloud9. The second line adds the QoS configuration 100 Mbps of CIR and 250 Mbps of PIR as well as defines the VLAN for the vNIC as 1.

Example—Adding an HA vNIC

```
root@FabMgrCLI[ofm] add vnic C9vnic2 bering Cloud9 -ha=true" -auto-switchover=true
```

This example adds a new HA vNIC called C9vnic2 to the physical server “bering” and provides high availability I/O resources to the Network Cloud, Cloud9. The Network Cloud, Cloud9, must have resources available from more than one Oracle Fabric Interconnect for this option to be set successfully. This example also specifies that the vNIC should automatically switch over to the vNIC on the Secondary Oracle Fabric Interconnect if the vNIC on the Primary Oracle Fabric Interconnect becomes unavailable. You set the Primary and Secondary Oracle Fabric Interconnects using the `set network-cloud` command as described in the section entitled [“Adding High Availability \(HA\) to the Network Cloud”](#) on page 73 earlier in this chapter. You must specify the type of vNIC you are creating (HA or non-HA) at the time you create the vNIC. You cannot change a vNIC from HA to non-HA or the reverse.

Options

The following table describes the options you can set with the `add vnic` command.

TABLE 4-5 Options for Adding vNICs

Option	Possible Values	Description
-description		You can add a description of the vNIC using this option. Enclose the description in quotation marks.
-qos	<ul style="list-style-type: none">• 100m_1g• 100m_250m• 10g_10g• 10m_100m• 10m_1g• 10m_50m• 1g_10g• 1m_10m• 250m_500m• 2g_10g• 3g_10g• 4g_10g• 500m_750m• 50m_100m• 5g_10g• 64k_1m• 6g_10g• 750m_1g• 7g_10g• 8g_10g• 9g_10g	<p>The name of any Network QoS Profile (if any) associated with the Network Cloud. The default for this option is “none.”</p> <p>If you want to configure a Network QoS Profile for the vNIC, the name indicates the CIR and PIR values. For example, a Network QoS Profile named 5G_10G indicates that 5 Gbps of CIR and 10 Gbps of PIR is configured for the vNIC.</p>
-vlan-id		To configure the vNIC to participate in a VLAN, specify the VLAN number using this option.
-trunk-mode	<ul style="list-style-type: none">• false (default)• true	If you are configuring a vNIC in a VLAN, indicate whether the vNIC will be trunk or access. If you specify true for this option, the vNIC will operate in trunk mode, otherwise, the vNIC will operate in access mode.
-ha-mode	<ul style="list-style-type: none">• false (default)• true	If you are creating an HA vNIC (if the vNIC will be one of an HA vNIC pair), set this option to “true.” Your Network Cloud must have access to Ethernet ports on more than one Oracle Fabric Interconnect, or this setting will not work.
-ha-mac-address		Specify the MAC address of the primary vNIC in the HA vNIC pair.
-port		Specify the port for the vNIC, or the primary port for the HA vNIC if this is an HA vNIC.

TABLE 4-5 Options for Adding vNICs (Continued)

Option	Possible Values	Description
-ha-port		Specify the HA port, which is the secondary port for the vNIC in the HA vNIC pair.
-auto-switchover	<ul style="list-style-type: none"> • false (Default) • true 	If the vNIC will be one of an HA vNIC pair, use this argument if you want the secondary vNIC to return the traffic back to the primary vNIC when the primary comes back online. To enable Auto-switchover, set this option to "true."
-ip-type	<ul style="list-style-type: none"> • hostManager (default) • DHCP 	Specify whether the vNIC's IP address will be assigned by the host server, or by DHCP using this option.
-ipaddr	<ul style="list-style-type: none"> • Default=0.0.0.0 	Specify the vNIC's IP address.
-ipmask	<ul style="list-style-type: none"> • Default=255.255.255.255 	Specify vNIC's IP mask.
-mac-address	<ul style="list-style-type: none"> • the MAC address range 	To configure the port's MAC address to come from the Oracle Fabric Interconnect's MAC address pool for the port supporting the vNIC, use this option to specify the MAC address range for the port.
-local-id		Specify the local ID.
-checksum-offload	<ul style="list-style-type: none"> • false (default) • true 	If the vNIC will support checksum offload, which allows the module to send check-summing tasks to the I/O module instead of the port terminating the vNIC, specify "true" using this option.
-community-name		If the vNIC is to be part of one or more specific SNMP communities, specify the names of the SNMP communities using this option. Separate multiple names using a comma.
-iscsi-boot-capable	<ul style="list-style-type: none"> • false (default) • true 	If the vNIC will support iSCSI Boot for its host server, specify either true or false to enable or disable iSCSI Boot functionality.

TABLE 4-5 Options for Adding vNICs (*Continued*)

Option	Possible Values	Description
-pxe-boot-capable	<ul style="list-style-type: none"> false (default) true 	If the vNIC will support PXE Boot for its host server, specify either true or false to enable or disable iSCSI Boot functionality.
-tso	<ul style="list-style-type: none"> true false (default) 	If the host will be using TCP Segmentation Offload (TSO), specify either true or false to enable or disable the feature.
-private	<ul style="list-style-type: none"> True False (default) 	Specify if you want the vNIC to be a Private vNICs by indicating -private=true. By default, vNICs are not Private; instead, they are Public. For more information about Private vNICs, see the section entitled “Private vNICs” on page 64 . You can configure private vNICs using this command or at the vNIC-level when you deploy the vNIC to the server. Use the set vnic command described in the section entitled “Setting vNIC Options” on page 87 .

Setting vNIC Options

The `set vnic` command enables you to set all of the options described in the previous section as well as to activate and deactivate the vNIC on the Network Cloud.

Syntax

To set operational parameters for the vNIC, issue the following command:

```
set vnic <vNIC name> [-description=Specify Description] [-qos=Specify QOS profile] [-vlan-id=Set VLAN Id] [-auto-switchover=Auto switchover enabled?.Default='false'] [-ip-type=Specify IP address type] [-ip-address=Specify Admin IP address] [-ip-mask=Specify Admin IP mask] [-community-name=Specify Community name] [-boot-capable=Is this boot capable? Default='false'] [-iscsi-boot-capable=Does this vnic do iSCSI Boot? Default='false'] [-pxe-boot-capable=Does this vnic do PXE Boot? Default='false'] [-tso=Does this vNIC do TSO? Default='false'] [-private=Is it private? Default='false']
```

To activate, or bring “up” the vNIC, issue the following command:

```
set vnic <vNIC name> up
```

To deactivate, or shut the vNIC “down,” issue the following command:

```
set vnic <vNIC name> down
```

Examples

```
root@FabMgrCLI[ofm] set vnic Cloud9vnic2.bering up
```

```
root@FabMgrCLI[ofm] set vnic Cloud9vnic2.bering down
```

Field Definitions

See [TABLE 4-5](#) for a description of these options.

Setting a vNIC in a Network Cloud

```
set vnic <vNIC name> network-cloud <The new cloud to terminate on>
```

Setting a vNIC’s Termination

```
set vnic <vNIC name> termination <The new termination port or lag> [-ha-termination=<The new ha termination port or lag>]
```

Displaying vNIC Information

The `show vnic` command enables you to display vNIC information on a physical server and within an I/O Template.

Syntax—vNICs on a Physical Server

To display information configured for the vNICs on a server, issue the following command:

```
show [-table] [-list] [-xml] [-sortby=<Specify column to sort by>] physical-server <Physical server> vnics
```

Example—vNICs on a Physical Server

```
root@FabMgrCLI[ofm] show physical-server bering vnics
```

```
-----  
parent.name      bering  
name             Cloud9vnic  
net-cloud-name   Cloud9  
termination      montana-5/3  
state            up/down  
ip-address       0.0.0.0  
mac-address      00:13:97:05:70:03  
is-ha            false  
description  
-----
```

```
1 record displayed
```

The example above displays the vNICs configured on a physical server.

Syntax—vNICs on an I/O Template

To display the vNICs associated with an I/O Template along with information about those vNICs, issue the following command:

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] io-template <IO profile  
name> vnics
```

Example—vNICs on an I/O Template

```
root@FabMgrCLI[ofm] show io-template cloud9template vnic
-----
name                cloud9template
vnic-name           C19vnic2
net-cloud-name      Cloud9
qos
ip-type             hostManaged
is-ha               false
access-vlan-id      1
trunk-mode          false
description
-----
name                cloud9template
vnic-name           Cloud9vnic
net-cloud-name      Cloud9
qos
ip-type             hostManaged
is-ha               false
access-vlan-id      0
trunk-mode          false
description
-----
2 records displayed
```

The example above displays the vNICs configured on the I/O Template cloud9template.

Field Definitions

TABLE 4-6 describes the fields that display when you use the `show vnic` command.

TABLE 4-6 Fields Displayed Using the `show vnic` command

Field	Possible Values	Description
Physical Server Fields		
parent.name		The name of the physical server.
name		The name of the vNIC.
net-cloud-name		The name of the Network Cloud in which the vNIC is defined.
termination		The Ethernet port at which the vNIC is terminated.

TABLE 4-6 Fields Displayed Using the `show vnic` command (*Continued*)

Field	Possible Values	Description
state	<ul style="list-style-type: none">• up• down	The current state of the Ethernet port.
ip-address		The physical machine's IP address.
mac-address		The vNIC's MAC address.
is-ha	<ul style="list-style-type: none">• true• false	Indicates if the vNIC is configured for high availability.
description		If a description was entered when the vNIC was created, that description displays in this field.
Template Fields		
name		The name of the template in which the vNIC was assigned.
vnic-name		The name of the vNIC.
net-cloud-name		The Network Cloud name.
qos		The name of a Network QoS Profile associated with the Network Cloud. If no Network QoS Profile is configured, this field indicates "none". If a Network QoS Profile is configured for the Network Cloud, the name indicates the CIR and PIR values. For example, a Network QoS Profile named 5G_10G indicates that 5 Gbps of CIR and 10 Gbps of PIR is configured for the Network Cloud.
ip-type	<ul style="list-style-type: none">• HostManager (default)• DHCP	Indicates whether the vNIC's IP address is assigned by the host server or by DHCP.
is-ha	<ul style="list-style-type: none">• true• false	Indicates if the vNIC is configured for high availability.
access-vlan-id		The ID of the VLANs used for traffic isolation and security (to prevent some hosts on a network from seeing traffic that is intended for other hosts). If a VLAN ID is assigned, only the hosts that can transmit or receive packets for that VLAN are able to see and use that traffic. If you set VLANs for a Network Cloud, all vNICs added to that cloud inherit the VLAN ID unless additional configuration exists at the port level to enforce different tagging rules.
trunk-mode	<ul style="list-style-type: none">• true• false (default)	If the vNIC is configured in a VLAN, this field indicates whether the vNIC is in trunk or access mode. If this option is true, the vNIC operates in trunk mode, otherwise the vNIC operates in access mode.
description		If a description was entered when the vNIC was created, that description displays in this field.

Removing vNICs from a Network Cloud

The `remove vnic` command enables you to remove a vNIC from a Network Cloud.

Syntax

To remove a vNIC from a Network Cloud, issue the following command:

```
remove [-noconfirm] vnic <Vnic name>
```

Example

```
root@FabMgrCLI[ofm] remove -noconfirm vnic Cloud9vnic2.bering
```

The above example removes a vNIC named `Cloud9vnic2` from the server `bering`. This command will not trigger a confirmation message before removing the vNIC because it uses the `-noconfirm` argument.

Working with Ethernet Link Aggregation Groups (LAGs)

A Link Aggregation Group (LAG) enables you to combine multiple individual physical Ethernet ports into one logical port group. As a result, the ports combined into an Ethernet-LAG can operate in parallel with the benefit of increased link speed and high availability.

Oracle Fabric Manager supports LAGs at the I/O module level. When you configure a LAG, you specify a group name for the LAG, then assign ports from the same Ethernet I/O module to the group. Oracle Fabric Manager supports LAGs on the 4-port 10 GE module and the 10-port GE module only (but not the 10 GE module).

You associate a LAG with a Network Cloud and, just like Ethernet ports, you can configure a LAG as the termination point for vNICs. To provision LAGs in your network, you create them first using the `add ethernet-lag` command, then associate a Network Cloud with the LAG using the `set network cloud` command (as described earlier in this chapter). Once you create the LAGs, you can use the `show ethernet-lag` command to list all of the LAGs available in your Oracle Fabric Manager environment.

You can configure each LAG as a static LAG or passive-mode LAG:

- For static LAGs you need to add ports to and delete ports from a LAG.
- For passive-mode LAGs use Link Aggregation Control Protocol (LACP) to dynamically add and remove ports within a LAG.

This section provides instructions for:

- “Adding a LAG” on page 93
- “Configuring a LAG” on page 94
- “Displaying LAG Information” on page 96
- “Removing LAG” on page 98

Adding a LAG

The `add ethernet-lag` command enables you to specify a new LAG within Oracle Fabric Manager. You enter a LAG ID between 1 and 5 to create the LAG profile into which you will put the individual LAG ports. Then specify the Ethernet module on which you will be creating the LAG.

Use the `show ethernet-port` command to display a list of all Ethernet ports defined in your environment. For example:

```
root@FabMgrCLI[ofm] show ethernet-port
```

name	type	state	vnics	description
arkansas/5/1	nwEthernet10GbPort	up/up	11	vMotion Network
arkansas/14/1	nwEthernet1GbPort	up/up	11	Private Network
arkansas/14/2	nwEthernet1GbPort	up/up	0	Private Network
arkansas/14/3	nwEthernet1GbPort	up/up	8	Private Network
arkansas/14/4	nwEthernet1GbPort	up/down	1	

Syntax

To add a LAG, issue the following command:

```
add ethernet-lag <Specify LAG ID> <Specify Ethernet ports (can be comma delimited)>  
[-description=Specify Description] [-lACP=Enable LACP?. Default='false']
```

Example

```
root@FabMgrCLI[ofm] add ethernet-lag 3 arkansas/14/2,arkansas/14/3 -lACP=true
```

The above example creates a new LAG with an ID of 3 using Ethernet modules arkansas/14/2 and arkansas/14/3 to be managed by LACP.

Options

TABLE 4-7 describes the options you can set with the `add ethernet-lag` command.

TABLE 4-7 Options for Adding an Ethernet LAG

Option	Possible Values	Description
<code>-description</code>		This option adds a description of the LAG. Enclose the description string in quotes.
<code>-lACP</code>	<ul style="list-style-type: none">• true• false	By default, LAG ports are not managed by LACP. Enable LACP if the peer network switch for the LAG ports is using LACP. To enable LACP, specify this option as <code>true</code> .

Configuring a LAG

The `set ethernet-lag` command enables you to add an Ethernet port to or remove an Ethernet port from an existing LAG. When you configure a LAG, you can add ports to it as long as ports are available (not already part of another LAG). Ports that are already assigned to another LAG cannot be assigned to another LAG. If you need to take a port from another LAG, you must delete it from its current LAG before assigning it to another LAG.

Syntax

To add an Ethernet port to an existing LAG, issue the following command:

```
set ethernet-lag <LAG name> add <Ethernet ports>
```


To set the properties for a specific LAG, issue the following command:

```
set ethernet-lag <LAG name> [-description=Specify Description] [-admin-rate=Specify Admin rate] [-mtu=Specify MTU] [-access-vlan=Specify Access VLAN Id] [-flow-control=Enable Flow control?. Default='false'] [-lacp-enable=Enable LACP?. Default='false'] [-port-mode=Port Mode] [-tag-native=Tag native?. Default='false'] [-IGMP=IGMP snooping?. Default='true']
```

To remove an Ethernet port from an existing LAG, issue the following command:

```
set ethernet-lag <LAG name> remove <Ethernet ports>
```

Example

```
root@FabMgrCLI[ofm] set ethernet-lag oregon/4.2 add oregon/4/1
```

```
root@FabMgrCLI[ofm] set ethernet-lag oregon/4.2 remove oregon/4/1
```

The above examples add Ethernet port oregon/4/1 to Ethernet LAG oregon/4.2 and removes the same.

Note – You cannot edit an existing LAG to add Ethernet ports to it, and you cannot edit a LAG to change the LAG ports to standard Ethernet ports. You set the port membership for a LAG when you create the LAG. As a result, if you want to add ports to or delete ports from a LAG, you must delete the entire LAG and recreate it after making the port membership changes.

Options

TABLE 4-8 describes the options you can set with the `add ethernet-lag` command.

TABLE 4-8 Options for Adding and Removing Ethernet Ports to/from a LAG

Option	Possible Values	Description
-description		This option adds a description of the LAG. Enclose the description string in quotes.
-admin-rate		The admin rate at which the network traffic is supported. This is typically 10 Gbps or lower, or auto negotiated to the highest value supported on the LAG.
-mtu		The maximum transmission unit, which is the largest data packet supported without fragmentation.
-vlanid		The VLAN ID supported on the port in the LAG.
-flow-control	<ul style="list-style-type: none"> • true • false 	Indicates whether or not flow control is enabled on the port.
-lacp	<ul style="list-style-type: none"> • true • false 	Indicates whether or not LACP is enabled or not on the port.
-port-mode	<ul style="list-style-type: none"> • trunk • access 	The VLAN mode for the port.
-tag-native	<ul style="list-style-type: none"> • true • false 	Indicates whether or not traffic on the port is re-tagged or retains its VLAN ID when the traffic is from the native VLAN.
-IGMP	<ul style="list-style-type: none"> • true • false 	Indicate whether or not IGMP snooping is enabled or not on the port.

Displaying LAG Information

The `show ethernet-lag` command enables you to display information about the port on an Ethernet LAG or information about the Ethernet LAG itself.

Syntax

To display LAG port or LAG information, issue the following commands:

```
show [-table] [-list] [-xml] [-sortBy=Specify column to sort by] ethernet-lag <LAG name>
```

```
show [-table] [-list] [-xml] [-sortBy=Specify column to sort by] ethernet-lag <LAG name>  
ports
```

Example--Ethernet LAG Information

```
root@FabMgrCLI[ofm] show ethernet-lag
-----
name                iowa/7.2
state               up/up
port-count          1
available-ingress-cir 0
available-egress-cir 0
description         IA 7/2 connected to SC 7/2
-----
name                iowa/7.3
state               up/up
port-count          1
available-ingress-cir 0
available-egress-cir 0
description         IA 7/3 connected to SC 7/3
-----
2 records displayed
```

The above example shows the information associated with the LAG iowa/7.3.

Example--Ethernet LAG Port Information

```
root@FabMgrCLI[ofm] show ethernet-lag iowa/7.3 ports
-----
name                iowa/7.3
port                7/3
type                nwEthernet1GbPort
state               up
available-ingress-cir 1000000
available-egress-cir 1000000
description
-----
1 record displayed
```

The above example shows the information associated with the LAG port iowa/7.3 and 7.2.

Fields

TABLE 4-9 describes the fields that display when you issue the `show ethernet-lag ... ports` command.

TABLE 4-9 Fields that Display with the Show Ethernet LAG and LAG Ports Commands

Field	Possible Values	Description
name		The name of the LAG for which the information is displayed.
portcount		The number of individual ports in the LAG.
type		The type of port in the LAG. Typically, ports in the LAG are 1 Gbps Ethernet ports as indicated by the type string <code>nwEthernet1GbPort</code> .
state	<ul style="list-style-type: none"> • up • down 	The admin and operational state of the port in the LAG. The state up/up indicate that the port is online and able to pass traffic in the LAG.
Capacity		The maximum rate of traffic that each port in the LAG can support.
available-ingress-cir		<p>The total amount of bandwidth available for ingress traffic. The value displayed also shows the unit of measurement. For example, 1G indicates that 1 Gbps is available for ingress traffic.</p> <p>The <code>available-ingress-cir</code> value can be affected by the Network QoS Profile (if any) assigned to the Network Cloud.</p>
available-egress-cir		<p>The total amount of bandwidth available for egress traffic. The value displayed also shows the unit of measurement. For example, 1G indicates that 1 Gbps is available for egress traffic.</p> <p>The <code>available-egress-cir</code> value displayed can be affected by the Network QoS Profile (if any) assigned to the Network Cloud.</p>
description		An optional field that contains a description for each port in the LAG.

Removing LAG

The `remove ethernet-lag` command enables you to delete an existing LAG.

Syntax

To remove an Ethernet LAG, issue the following command:

```
remove [-noconfirm] ethernet-lag <LAG name>
```

Example

```
root@FabMgrCLI[ofm] remove -noconfirm ethernet-lag iowa/7.2
```

The above example removes Ethernet LAG iowa/7.2 from the environment.

Working with Network QoS

Network Quality of Service (QoS) feature provides administrators with the ability to treat network packets differently, based on the type of traffic. Network QoS assigns the amount of bandwidth and burst size to a given vNIC. The burst size is the amount of buffering retained for when traffic arrives in bursts during congestion. Oracle Fabric Manager provides several pre-defined Network QoS Profiles that are pre-configured for efficient bandwidth availability and resource usage. You can associate a pre-defined QoS Profile directly with a Network Cloud.

Displaying Network QoS Information

The `show network qos` command enables you to display the pre-configured QoS profiles along with information about those profiles.

Syntax

To display a list of all Network QoS Profiles defined in Oracle Fabric Manager, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] network-qos
```

To display a description of the specified QoS profile including Committed Information Rate (CIR) and Peak Information Rate (PIR) set by that profile, issue the following command.

```
show [-xml] [-list] [-table] [-sortby=Sort column] network-qos <Network QoS profile name>
```

Example—Display Defined QoS Profiles

```
root@FabMgrCLI[ofm] show network-qos
```

name	cir	pir	description
1m_10m	1000	10000	1Mbps CIR, 10Mbps PIR
1g_10g	1000000	9929696	1Gbps CIR, 10Gbps PIR
2g_10g	2000000	9929696	2Gbps CIR, 10Gbps PIR
3g_10g	3002932	9929696	3Gbps CIR, 10Gbps PIR
4g_10g	4000000	9929696	4Gbps CIR, 10Gbps PIR
5g_10g	5001221	9929696	5Gbps CIR, 10Gbps PIR
6g_10g	6005865	9929696	6Gbps CIR, 10Gbps PIR
7g_10g	7001709	9929696	7Gbps CIR, 10Gbps PIR
8g_10g	8000000	9929696	8Gbps CIR, 10Gbps PIR
9g_10g	9002197	9929696	9Gbps CIR, 10Gbps PIR
10m_1g	10000	1000000	10Mbps CIR, 1Gbps PIR
10g_10g	9929696	9929696	10Gbps CIR, 10Gbps PIR
10m_50m	10000	50000	10Mbps CIR, 50Mbps PIR
10m_100m	10000	100000	10Mbps CIR, 100Mbps PIR
50m_100m	50000	100000	50Mbps CIR, 100Mbps PIR
64k_1m	64	1000	64Kbps CIR, 1Mbps PIR
100m_1g	100000	1000000	100Mbps CIR, 1Gbps PIR
100m_250m	100000	250000	100Mbps CIR, 250Mbps PIR
250m_500m	250000	500000	250Mbps CIR, 500Mbps PIR
500m_750m	500000	750000	500Mbps CIR, 750Mbps PIR
750m_1g	750000	1000000	750Mbps CIR, 1Gbps PIR

21 records displayed

The above example describes the information available for all Network QoS Profiles defined in Oracle Fabric Manager.

Example—Display Individual QoS Information

```
root@FabMgrCLI[ofm] show network-qos 100m_1g
```

name	cir	pir	description
100m_1g	100000	1000000	100Mbps CIR, 1Gbps PIR

1 record displayed

The above example describes the information available for Network QoS Profile 100m_1g.

Fields

TABLE 4-10 describes the fields that display when you issue the `show network-qos` command.

TABLE 4-10 Fields that Display with the `show network-qos` Command

Field	Description
name	The name of each configured Network QoS Profile. The name is in the format CIR_PIR, so the "100m_1g" profile sets 100 Mbps of CIR and 1 Gbps of PIR.
CIR	The committed information rate, which is the amount of guaranteed bandwidth for constant traffic.
PIR	The peak information rate, which the amount of peak bandwidth for constant traffic.
Number of vNICs	The total number of vNICs that are associated with each Network QoS Profile.
Description	The description string (if any) that was applied to the Network QoS Profile.

Removing a Network QoS Profile

Syntax

To remove a Network QoS Profile, issue the following command:

```
remove [-noconfirm] network-qos <Network QoS>
```

Example

```
root@FabMgrCLI[ofm] remove -noconfirm network-qos 100m_1g
```

The above example removes the Network QoS profile 100m_1g from the environment.

Displaying MAC-Based QoS Information

When you create a MAC-Based QoS Profile, you create a profile that applies a pre-defined Network QoS Profile to a specific MAC address. This determines the direction on which the Network QoS flow is applied, either ingress, egress, or both. Traffic on a shared vNIC that originates from, or is destined to, the MAC address will be controlled based on the Network QoS profile.

A MAC-Based QoS Profile is composed of the following information elements:

- Q MAC Address, which is the MAC address of a shared vNIC. For example, a vNIC deployed on a virtual machine. If a vNIC is deployed on a physical server, there is no need to configure a MAC-Based QoS Profile because the vNIC has only one MAC address.
- A Network QoS Profile, which controls the amount of bandwidth and traffic that can be used on the shared vNIC.
- The Direction, which determines a traffic flow for the Network QoS Profile.
- An optional description.

MAC-based QoS Profiles are useful on a shared vNIC, where multiple devices are supported on the same vNIC and each device requires a different QoS flow to or from the device (ingress or egress) or both.

The `show mac-based-qos` commands enable you to display the MAC-Based QoS profiles defined in the environment, along with information about those profiles.

Syntax

To display a list of all Network QoS Profiles defined in Oracle Fabric Manager, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] network-qos
```

To display a description of the specified QoS Profile including Committed Information Rate (CIR) and Peak Information Rate (PIR) set by that profile.

```
show [-xml] [-list] [-table] [-sortby=Sort column] mac-based-qos <MAC based QOS profile name>
```


Example

```
root@FabMgrCLI[ofm] show mac-based-qos
name                               conditions qos-profile-name rule-id description
-----
rule-00:11:22:33:44:55-606 1      250m_500m      606      00:11:22:33:44:55
temporary
rule-00:11:22:33:44:55-925 1      250m_500m      925      00:11:22:33:44:55
temporary
2 records displayed
```

The above example describes the information available for all MAC-based QoS Profiles defined in Oracle Fabric Manager.

Fields

TABLE 4-11 describes the fields that display when you issue the `show mac-based-qos` command.

TABLE 4-11 Fields that Display with the `show mac-based-qos` Command

Field	Description
Name	The name of the MAC-based QoS Profile, which is generated from the specified MAC address.
Condition	The specific MAC-Based QoS Profile conditions created. These conditions consist of the MAC address plus either the source (src) or destination (dest) which refers to the traffic direction on which the QoS flow will be applied.
QoS Profile	The name of each configured Network QoS Profile associated with each MAC Based QoS Profile. The name is in the format CIR_PIR, so the “100m_ 1g” profile sets 100 Mbps of CIR and 1 Gbps of PIR.
rule-id	A identifier that enumerates the MAC-Based QoS so that you can easily identify it.
Description	The description string (if any) that was applied to the MAC-based QoS Profile.

Removing a MAC-based QoS Profile

Use the `remove mac-based-qos` command to delete a MAC-based QoS Profile from your environment. When you attempt to delete a MAC-Based QoS Profile, Oracle Fabric Manager prompts you to confirm the deletion. As a result, if you have specified the wrong MAC-Based QoS Profile, you have a chance to correct the error before committing the deletion. If you do not wish to receive the prompt, use the -

noconfirm option when issuing the command. When deleted, the MAC-Based QoS Profile that matches against a specific traffic flow is no longer applied, so the traffic flow is not affected.

Syntax

To remove a MAC-based QoS Profile, issue the following command:

```
remove [-noconfirm] mac-based-qos <MAC based QoS name>
```

Example

```
root@FabMgrCLI[ofm] remove mac-based-qos rule-00:11:22:33:44:55-606
```

The above example removes the MAC-based QoS Profile rule-00:11:22:33:44:55-606 from the environment.

Working with Default Gateways

This section covers the following topics:

- [“Understanding Default Gateways” on page 104](#)
- [“Creating a Default Gateway” on page 105](#)
- [“Configuring a Default Gateway” on page 106](#)
- [“Displaying Default Gateway Information” on page 106](#)
- [“Removing a Default Gateway” on page 108](#)

Understanding Default Gateways

A default gateway allows host servers to forward packets with unknown destination addresses off of the server’s local network. When this feature is configured, the Oracle Fabric Interconnect gets a pool of default gateways for all the servers attached to the Oracle Fabric Interconnect. With this pool of default gateways, the Oracle Fabric Interconnect can support forwarding packets to and from the various networks that hosts use. Each default gateway must be manually specified for it to be added to the Oracle Fabric Manager.

Creating a Default Gateway

You configure a default gateway for each host server network attached to the Oracle Fabric Interconnect. By doing this, you specify the default gateway address for all host servers on that network, so that packets forward to the server networks as needed. You create a new default gateway using the `add default-gateway` command.

Syntax

To add a default gateway, issue the following command:

```
add default-gateway <Specify a Gateway name> <Specify the IP Address> [-dns-server=Specify DNS server] [-domain-name=Resource domain name] [-description=Specify Description]
```

Example

```
root@FabMgrCLI[ofm] add default-gateway def-gw1 444.333.222.111 -dns-server=666.777.888.999 -domain-name=MyCompanyDomain -description="Default Gateway for my company"
```

The example above creates a new default gateway.

Fields

TABLE 4-12 describes the fields you specify when you issue the `add default-gateway` command.

TABLE 4-12 Fields when Using the `add default-gateway` Command

Option	Description
Gateway Name	Enter the name you are assigning to the default gateway.
IP address	Enter the IP address of the default gateway.
-dns-server	Enter either the IP address or the fully qualified name of the DNS server for the default gateway.
-domain-name	Enter the name of the resource domain in which the default gateway is configured.
-description	As an option, enter a short description for the default gateway in quotations.

Configuring a Default Gateway

You configure an existing gateway to be the default gateway using the `set default-gateway` command.

Syntax

To configure an existing gateway as a default gateway, issue the following command:

```
set default-gateway <Specify a Gateway name> [-ip-address=Specify IP address] [-dns-server=Specify DNS server] [-domain-name=Resource domain name] [-description=Specify Description]
```

Example

```
root@FabMgrCLI[ofm] set default-gateway def-gw1 -ip-address=444.333.222.111 -dns-server=666.777.888.999 -domain-name=MyCompanyDomain -description="Default Gateway for my company"
```

The example above configures the existing gateway as the default gateway.

Refer to [TABLE 4-12](#) above for a description of each field you need to enter.

Displaying Default Gateway Information

The `show default-gateway` command enables you to display one or more default gateways, which enables host servers to forward unknown packets to vNICs.

Syntax

To display a list of all default gateways defined in Oracle Fabric Manager, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] default-gateway <Default gateway name>
```

Example

```
root@FabMgrCLI[ofm] show default-gateway
-----
name                Com-iSCSI
discovered-from     arkansas
address             102.168.xx.xx
dns-address         0.0.0.0
domain-name
iotemplates        0
description
-----
name                equallogic
discovered-from     texas
address             102.168.xx.xx
dns-address         0.0.0.0
domain-name
iotemplates        0
description
-----
2 records displayed
```

The above command displays all default gateways defined in Oracle Fabric Manager. If you wish to display information for a specific default gateway, specify the name of that gateway after the command (for example, `show default-gateway equallogic`).

Fields

TABLE 4-13 describes the fields that display when you issue the `show default-gateway` command.

TABLE 4-13 Fields that Display with the `show default-gateway` Command

Field	Description
Name	The Default Gateway's name.
discovered-from	The name or IP address of the Oracle Fabric Interconnect from which the default gateway was discovered.
address	The gateway router's IP address. The default address is 0.0.0.0.
dns-address	The DNS server's IP address. The default address is 0.0.0.0.

TABLE 4-13 Fields that Display with the show default-gateway Command (*Continued*)

Field	Description
domain-name	The resource domain in which the default gateway is configured.
iotemplates	The number of I/O Templates assigned to the hosts that are using the Default Gateway.
Description	The description string (if any) that was applied to the default gateway when it was created.

Removing a Default Gateway

You can delete any default gateway that is configured on an Oracle Fabric Interconnect using the `remove default-gateway` command. Once deleted, the vNICs can no longer forward traffic to destinations on a subnet that is different from the server's.

Syntax

To remove a default gateway, issue the following command:

```
remove [-noconfirm] default-gateway <Gateway name>
```

Example

```
root@FabMgrCLI[ofm] remove default-gateway def-gw1
```

The above example removes the default gateway `def-gw1` from the Oracle Fabric Manager environment.

Working With Storage Clouds

This chapter describes Storage Clouds and vHBAs and explains how to create, display, and remove them using the CLI. This chapter also describes how to include SAN QoS and LUN Mask Profiles in your SAN configurations. This chapter contains the following sections:

- “Understanding Storage Clouds and vHBAs” on page 109
- “Creating a Storage Cloud” on page 113
- “Displaying Storage Cloud Details” on page 117
- “Removing Storage Clouds and FC Ports” on page 122
- “Creating and Using vHBAs” on page 124
- “Working with SAN Quality of Service (QoS)” on page 132

Understanding Storage Clouds and vHBAs

Storage Clouds

Oracle Fabric Interconnects contain a set of I/O ports that are connected to your data center SAN. The SAN administrator connects these ports to their Fibre Channel switches in order to provide I/O resources to the servers. Each I/O port provides access to a set of “clouds.” For example, you might have a Storage Cloud that is zoned to give access to a set of LUNs used by HR. As far as the storage administrator is concerned, you are connecting wires to the Oracle Fabric Interconnect’s I/O ports for the sole purpose of providing the server administrator access to the resources.

The server administrator then needs to connect the servers to a set of storage resources provided by the storage administrators. The server administrator does not care which physical Oracle Fabric Interconnect ports are connect as long as the servers have access to the required resources. You can configure and manage Storage Clouds when logged into Oracle Fabric Manager with the Storage and Administrator roles.

vHBAs

A vHBA virtualizes HBA connectivity. It appears to the OS as a physical HBA and enables a server to have an FC SAN attachment without having a physical HBA present. Instead of the host server using an HBA, it uses an InfiniBand (IB) HCA, which then virtualizes the HBA allowing for SAN connectivity.

Storage Area Network (SAN) QoS Profile

A SAN QoS Profile enables you to place bandwidth usage parameters on a Storage Cloud to control the amount of traffic or throughput available. SAN QoS is enforced by a shaper profile, which controls the allowable traffic by delaying and queuing frames that exceed the Committed Information Rate (CIR) value you set. When you configure a SAN QoS Profile on a Storage Cloud or vHBA, you shape the parameters to the read and write data that affect the host server using that Storage Cloud.

If you want to assign a specific SAN QoS Profile to a Storage Cloud, you must create that Profile first. As an alternative, you can use one of the SAN QoS Profiles that came pre-configured with Oracle Fabric Manager. These Profiles include FC link speeds for efficient bandwidth availability and resource usage and use typical CIR and PIR values calculated from the link's total throughput. If you are using pre-configured SAN QoS Profiles, make sure that you use a reasonable profile. You can configure SAN QoS for a Storage Cloud:

- When you create the Storage Cloud using the `add storage-cloud` command.
- After the Storage Cloud is created using the `set storage-cloud` command.

You can assign SAN QoS to a Storage Cloud or a vHBA. If a Storage Cloud has a QoS Profile associated with it, a vHBA terminated in the Storage Cloud inherits the Storage QoS Profile from the Storage Cloud. In this case, the vHBAs inherit the QoS parameters from their respective Clouds, even if the vHBA has its own QoS Profile associated with it.

If the Storage Cloud is not associated with a QoS Profile, and the vHBAs have their own QoS Profiles, a vHBA terminated in the Storage Cloud is then associated with the QoS profile. In this case, the Storage Cloud has no QoS Profile to apply. This situation does not automatically apply “no QoS” to the vHBAs. Instead, the Cloud defers to the QoS Profiles assigned to the individual vHBAs (if any).

If you do not want QoS applied anywhere for the virtual I/O in a Cloud, make sure that no QoS Profile is associated with the Storage Cloud with the vHBA.

High Availability Storage Clouds

Typical deployments have redundant Oracle Fabric Interconnects so that if one of them becomes disabled, the second Oracle Fabric Interconnect can assume all the activity being performed by the Oracle Fabric Interconnect that is “down.” Just as with Network Clouds, you can associate a Storage Cloud with two Oracle Fabric Interconnects simultaneously, and also set the connection priority so that one Oracle Fabric Interconnect is considered the primary and the other is considered the secondary. When you initially create the Cloud, you must manually connect the HA vHBAs to the Cloud and set their primary and secondary status. However, once you create the initial Storage Cloud, the Oracle Fabric Interconnects’ connection priority is set. Any additional HA pairs that attach to the new Storage Cloud set up for HA will first attach to the primary and then to the secondary Oracle Fabric Interconnect.

Most administrators typically create Storage Clouds around a similar theme for the ports or storage targets that are associated with the clouds. For example, a Storage Cloud might have FC ports that will provide vHBA connections to a specific domain or specific upstream FC Ports for a specific set of storage targets or LUNs. You create a Storage Cloud using the CLI command `add storage-cloud` and you set the HA priority using the `set storage-cloud ha-preference` command.

LUN Masks

LUN masks enable you to zone out specific LUNs or storage targets from servers or initiators. With LUN masks, you can maintain security in the storage network by keeping LUNs that contain sensitive data in a private, restricted section of the Fibre Channel network.

You create LUN Masks and apply them to Storage Clouds through vHBAs or I/O Profiles that use the LUN Masks to determine which hosts can see which storage resources. Before a LUN Mask can control zoning, you must first associate it with an I/O Profile or vHBA. If you create a LUN Mask, but do not associate it with one or more vHBAs (or I/O Profiles), all hosts will be able to see all storage resources.

You create LUN Masts using the `add vhma...-lun-masks-enabled` command (described in this chapter) or the `set io-profile...-lun-masks-enabled` command as described in [Chapter 7, Working with I/O Profiles](#).

Round Robin Port Allocation Policy for a Storage Cloud

An allocation policy determines how ports are assigned from the Storage Cloud to any vHBA that is connected to the cloud. To allocate the port, it must be configured in the Storage Cloud. You can configure multiple ports in a Storage Cloud, ports from different Fibre Channel modules, and different Oracle Fabric Interconnects in the same Storage Cloud with the Round Robin allocation policy.

Round Robin allocates ports in the cloud by rotating through the unallocated FC ports in a systematic way starting from the port you select when you create the Storage Cloud. When using round robin port allocation, you select the a list of the ports available in the round robin queue. Anytime you connect a vHBA to the Storage Cloud, Oracle Fabric Manager steps through the list and allocates the next available port based on the numerical value of the port's slot. For example, port 2 in slot 2, port 1 in slot 4, and port 2 in slot 9 are available in the Storage Cloud, when new vHBAs are connected to the Storage Cloud, the first vHBA will be terminated on port 2 slot 2, the next vHBA will be connected to port 1 in slot 4, and the last vHBA will be terminated on port 2 in slot 9. After that, any additional vHBAs are assigned to whichever port has the next lowest rank.

World Wide Names

Oracle Fabric Manager keeps a list of all the world-wide names (WWNs). The WWNs are embedded in each Oracle Fabric Interconnect. Oracle Fabric Manager tracks them when an Oracle Fabric Interconnect is discovered.

There is a base pool of WWNs that the Oracle Fabric Interconnect uses to assign to vHBAs. Storage administrators can customize the last three hexadecimal digits of the WWN pool, allowing them to assign a specific WWN to a specific storage device. Therefore, when you use the `-reserved-wwn-id` argument, you can tweak the last three digits to assign a specific WWN to a specific device.

Creating a Storage Cloud

When you create a Storage Cloud, you associate one or more FC ports that are assigned to an FC switch with the Cloud. You also associate other SAN characteristics (such as SAN QoS) with the Storage Cloud. When you attach the Storage Cloud to create an I/O Template and I/O Profile (which together provide the connectivity to the host servers), the Storage Cloud provides a way for hosts to attach to the storage network. The Storage Cloud provides the storage access points with characteristics that you define (like SAN QoS).

The Oracle Fabric Manager default Storage Cloud contains all the discovered FC ports available in your environment through the discovered Oracle Fabric Interconnect(s). When you define a Storage Cloud, Oracle Fabric Manager removes the resources you use in your cloud definition from the default Storage Cloud and places them in the Storage Cloud(s) that you create.

Storage Clouds typically are created around some similar theme for the FC ports with which it is associated. For example, a Storage Cloud might have ports that provide vHBA connections to a specific zone or controller for a specific set of host servers.

This section describes how to define a Storage Cloud by:

- [“Adding a Storage Cloud” on page 113](#)
- [“Setting Storage Cloud Options” on page 114](#)
- [“Adding Fibre Channel Ports” on page 115](#)
- [“Adding High Availability to the Storage Cloud” on page 116](#)

Adding a Storage Cloud

You create a Storage Cloud using the `add storage-cloud` command.

Syntax

When you create a Storage Cloud, you can also add a description and define a QoS Profile. To add a Storage Cloud to your environment that will provide storage resources to users, issue the following command:

```
add storage-cloud <Specify Storage Cloud name> [-description=Specify Storage cloud description]
[-qos=Specify Storage Cloud QOS]
```

Example—Adding a Storage Cloud

```
root@FabMgrCLI[ofm] add storage-cloud S_Cloud0
```

This example creates a new Storage Cloud called S_Cloud0.

Example—Adding a Storage Cloud QoS Profile

```
root@FabMgrCLI[ofm] add storage-cloud EngSTcloudB -qos=250m_500m
```

This example defines a new Storage Cloud named EngSTcloudB with a SAN QoS Profile of 250m 500m.

Options

TABLE 5-1 describes the options available with the `add storage-cloud` command.

TABLE 5-1 Options for Adding a Storage Cloud

Option	Possible Values	Description
Storage Cloud Name		Enter a name for the Storage Cloud you are creating.
-description		Enter an optional description for the new Storage Cloud.
-qos	<ul style="list-style-type: none">• 125m_250m• 1g_2g• 250m_500m• 2g_4g• 4g_8g• 500m_1g• 50m_125m	Specify an optional SAN QoS Profile that will be applied to the Storage Cloud.

Setting Storage Cloud Options

You can specify the following options for a Storage Cloud:

- Description
- Storage Cloud QoS

You set Storage Cloud options using the `set storage-cloud` command.

Syntax

To set a Storage Cloud's options, issue the following command:

```
set storage-cloud <Specify Storage cloud name> [-description=Specify Storage cloud description]
[-qos=Specify Storage cloud QOS]
```

Example

```
root@FabMgrCLI[ofm] set storage-cloud EngSTcloudB -description="Engineering
Storage Cloud B" -qos-2g_8g add reserved-wwn-ids Montana wwn-id-count=07 wwn-
ids-list=50:01:39:70:00:04:70:00/12
```

This example adds a description to the Storage Cloud EngSTcloudB, defines a QoS Profile of 2g 8g for that Storage Cloud, and adds reserved WWN IDs to the Oracle Fabric Interconnect Montana including 50:01:39:70:00:04:70:00/12.

Options

TABLE 5-2 describes the options available with the `set storage-cloud` command.

TABLE 5-2 Options using the `set storage-cloud` Command

Option	Possible Values	Description
<code>-description</code>		An optional description of the Storage Cloud for which you are defining options.
<code>-qos</code>	<ul style="list-style-type: none">• 125m_250m• 1g_2g• 250m_500m• 2g_4g• 4g_8g• 500m_1g• 50m_125m	Specify an optional SAN QoS profile that will be applied to the Storage Cloud.

Adding Fibre Channel Ports

To add FC ports to your Storage Cloud, use the `set storage-cloud` command. You can also specify a QoS profile and a Storage Cloud description using this command.

Syntax

To add FC ports to a Storage Cloud, issue the following command:

```
set storage-cloud <Specify Storage cloud name> [-description=Specify Storage cloud description]
[-qos=Specify Storage cloud QOS] add fc-ports <Specify FC port>
```

Examples

```
root@FabMgrCLI[ofm] set storage-cloud S_Cloud0 add fc-ports montana/6/2
```

This example adds the FC port 6/2 to the Oracle Fabric Interconnect, Montana.

Adding High Availability to the Storage Cloud

In order to configure HA, you must have a dual-Oracle Fabric Interconnect configuration with Ethernet ports from two different Oracle Fabric Interconnects defined in your Network Cloud. You can then indicate which Oracle Fabric Interconnect is the primary I/O resource provider to your Network Cloud and which Oracle Fabric Interconnect should take over as the secondary Oracle Fabric Interconnect if the primary Oracle Fabric Interconnect becomes unavailable. Use the `set storage-cloud` command to set your HA preference on your Network Cloud.

Syntax

To specify the HA preference in your Storage Cloud, issue the following command:

```
set storage-cloud <Specify Storage cloud name> ha-preference <Specify the Fibre Channel port>
<Specify the HA preference>
```

Options

You can specify one of the following three options:

- None—No preference
- Primary—Assign primary vNICs to the termination
- Secondary—Assign secondary vNICs to the termination

Examples

```
root@FabMgrCLI[ofm] set storage-cloud S_Cloud0 ha-preference montana/10/1  
primary  
root@FabMgrCLI[ofm] set storage-cloud S_Cloud0 ha-preference iowa/8/2 secondary
```

The above example establishes HA preferences for the Storage Cloud, S_Cloud0, with the Primary Ethernet port from Oracle Fabric Interconnect Montana and the secondary port from Iowa.

Displaying Storage Cloud Details

This section describes how to display information about Storage Clouds defined in Oracle Fabric Manager:

- [“Displaying Storage Cloud Information” on page 117](#)
- [“Displaying FC Port Information” on page 119](#)
- [“Displaying World Wide Names” on page 121](#)

Displaying Storage Cloud Information

You display information about a Storage Cloud using the `show storage-cloud` command.

Syntax

To display all Storage Clouds defined in your Oracle Fabric Manager environment, issue the following command:

```
show [-table] [-list] [-xml] [-sortBy=Specify column to sort by] storage-cloud
```

To display information about a specific Storage Clouds in your Oracle Fabric Manager environment, add the name of that Cloud to the command:

```
show [-table] [-list] [-xml] [-sortBy=Specify column to sort by] storage-cloud <Storage  
cloud name>
```

Example

```
root@FabMgrCLI[ofm] show storage-cloud EngSTcloudA
```

```
-----  
name                EngSTcloudA  
ports               2  
qos-qos=  
lun-mask-reference  
allocation-policy   roundrobin  
description         Engineering Storage  
-----
```

This example shows that EngSTcloudA has two FC ports defined and as an allocation policy of “roundrobin” and a description “Engineering Storage.”

Options

TABLE 5-3 describes the fields that display with the `show storage-cloud` command.

TABLE 5-3 Fields Displayed with the `show storage-cloud` Command

Fields	Possible Values	Description
name		The name of each configured Storage Cloud.
ports		The number of FC ports in the Storage Cloud. This number is the total of all ports, regardless of whether they are up or down.
qos	<ul style="list-style-type: none">• 125m_250m• 1g_2g• 250m_500m• 2g_4g• 4g_8g• 500m_1g• 50m_125m	The name of any SAN QoS Profile associated with the Storage Cloud. If no SAN QoS is configured, this field indicates “none.” If a SAN QoS Profile is configured for the Storage Cloud, the name indicates the CIR and PIR values. For example, a QoS Profile named 125M_250M indicates 125 Mbps of CIR and 250 Mbps of PIR.

TABLE 5-3 Fields Displayed with the `show storage-cloud` Command (*Continued*)

Fields	Possible Values	Description
<code>lun-mask-reference</code>		The name of any LUN Mask Profile associated with the Storage Cloud. If no LUN Mask Profile is configured, this field indicates “none.” If a LUN Mask Profile is configured for the Storage Cloud, this field shows the name that was assigned to the Profile when it was created.
<code>allocation-policy</code>	Round Robin	This field specifies that the Storage Cloud will be applied to the host server using a “round robin” allocation policy when the cloud is deployed.
<code>description</code>		The description string (if any) that was applied to the Storage Cloud. If this field is blank, then it was not specified when the Storage Cloud was created (or deleted).

Displaying FC Port Information

You display information about a Storage Cloud using the `show storage-cloud` command.

Syntax

To display information about a specific Storage Clouds and Fibre Channel ports in your Oracle Fabric Manager environment, add the name of that Cloud to the command:

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] storage-cloud <Storage cloud name> fc-ports
```

```
show [-table] [-list] [-xml] [-sortby=Sort column] fc-port <FC port name> [-detail]
```

Example1

```
root@FabMgrCLI[ofm] show storage-cloud techpubs1 fc-ports
parent.name fc-port state type vhba-count speed description
-----
techpubs1 arkansas/7/2 up/down sanFcPort 0 8000
techpubs1 iowa/8/2 up/up sanFcPort 10 8000
techpubs1 iowa/8/1 up/up sanFcPort 37 8000
3 records displayed
```

The example above shows the Fibre Channel port details available for the Storage Cloud techpubs1.

Example

```
root@FabMgrCLI[ofm] show fc-port arkansas/7/2
name type state vhas speed description
-----
arkansas/7/2 sanFcPort up/down 0 8000
1 record displayed
```

The example above shows information about the Fibre Channel port arkansas/7/2.

Options

TABLE 5-4 describes the fields that display with the `show storage-cloud... fc-ports` command.

TABLE 5-4 Fields Displayed with the `show storage-cloud...fc-ports` command

Fields	Possible Values	Description
parent.name		The name of the parent Storage Cloud on which the FC ports are defined.
fc-ports		The Oracle Fabric Interconnect name and port ID of the FC port.
state	<ul style="list-style-type: none">• up• down	The status of the FC port.
type		The type of FC port being displayed for this Storage Cloud.

TABLE 5-4 Fields Displayed with the `show storage-cloud...fc-ports` command (Continued)

Fields	Possible Values	Description
<code>vhba-count</code>		The number of vHBAs defined for this Storage Cloud.
<code>speed</code>		The speed supported by the FC port displayed using this command.
<code>description</code>		A description of the Storage Cloud if one was entered.

Displaying World Wide Names

Oracle Fabric Manager keeps a list of all the world-wide names (WWNs) assigned from each Oracle Fabric Interconnect it manages in the WWN Address Pool. The `show wwn-address-pool` command enables you to display information about those WWNs.

Syntax

To display information about WWNs assigned from an Oracle Fabric Interconnect, issue the following command:

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] wwn-address-pool <Director name>
```

Examples

```
root@FabMgrCLI[ofm] show wwn-address-pool montana
```

```
-----  
chassis-name    montana  
wwn             50:01:39:70:00:04:71:02  
wwn-id         102  
is-reserved     false  
is-used        true  
vhba-name      vhba5  
cloud-name  
-----
```

```
chassis-name    montana  
wwn             50:01:39:70:00:04:71:00  
wwn-id         100  
is-reserved     false  
is-used        true  
vhba-name      s_Cloud0vhba  
cloud-name  
-----
```

```
chassis-name    montana  
wwn             50:01:39:70:00:04:71:01  
wwn-id         101  
is-reserved     false  
is-used        true  
vhba-name      s_Cloud0vhba  
cloud-name  
-----
```

```
3 records displayed
```

This example shows the world wide names, vHBA, and Network Clouds associated with the specified Oracle Fabric Interconnect.

Removing Storage Clouds and FC Ports

This section describes how to remove Storage Clouds and FC ports.

Removing Storage Clouds from your Environment

The `remove storage-cloud` command deletes the named Storage Cloud from your environment.

Syntax

To delete a Storage Cloud from Oracle Fabric Manager, issue the following command:

```
remove [-noconfirm] storage-cloud <Storage cloud name>
```

Example

```
root@FabMgrCLI[ofm] remove storage-cloud S_Cloud0
```

This example removes Storage Cloud `S_Cloud0` from the environment.

Removing FC Ports from a Storage Cloud

The `set storage-cloud...remove fc-ports` command deletes the named Fibre Channel ports from a Storage Cloud.

Syntax

To remove a Fibre Channel port from a Storage Cloud, issue the following command:

```
set storage-cloud <Storage cloud name> remove fc-ports <Specify Fibre Channel ports> [-noconfirm]
```

Examples

```
root@FabMgrCLI[ofm] set storage-cloud S_Cloud0 remove fc-ports montana/6/2
```

This example removes FC port `Montana/6/2` from Storage Cloud `S_Cloud0`.

Creating and Using vHBAs

This section describes how to work with vHBAs, including:

- “Adding vHBAs to a Storage Cloud” on page 124
- “Setting vHBA Options” on page 127
- “Rescanning a vHBA” on page 128
- “Setting a vHBA’s Storage Cloud” on page 128
- “Setting a vHBA’s Termination” on page 129
- “Displaying vHBA Information” on page 129
- “Removing vHBAs from a Storage Cloud” on page 131

Adding vHBAs to a Storage Cloud

Use the `add vhma` command to create a new vHBA on a server and terminate it to a Storage Cloud. This step does not provide the virtual I/O connection to the host server. It simply creates a vHBA and terminates it on a port in the Storage Cloud. The vHBA will not be pushed to the host server until after you create an I/O Profile from an I/O Template that uses this Storage Cloud, and then connect that I/O Profile to a physical server.

Syntax

To add a vHBA to your environment, issue the following command:

```
add vhma <Specify a vHBA name> <Specify the Physical Server name> <Specify the Storage cloud the vhma points to> [-description=Specify Description] [-qos=Specify QOS profile] [-lun-masks-enabled=LUN Mask enabled?. Default='false'] [-ha-mode=Is this a haVhma] [-local-id=Specify Local Id] [-wwnn=Specify WWN Id] [-mtu=Specify MTU] [-lun-mask=LUN Mask] [-lun-mask-profile=Specify LUN Mask Profile] [-wwnn-ha=Specify WWN ha Id] [-san-boot-capable=Does this vHBA do SAN Boot? Default='false'] [-port=Specify port] [-ha-port=Specify HA Port]
```

Example—Adding a vHBA

```
root@FabMgrCLI[ofm] add vhma C10vhba2 bering S_Cloud0 -description="vHBA to  
provide resources to S_Cloud0"  
root@FabMgrCLI[ofm] add vhma C9vnic1 bering Cloud9 -qos=125m_250m
```

This example creates a new vHBA called C10vhba2 on physical server “bering”. The second line adds SAN QoS configuration 125 Mbps of CIR and 250 Mbps of PIR.

Example—Adding an HA vHBA

```
root@FabMgrCLI[ofm] add vhma C10vhba2 bering S_Cloud0 -ha-mode=true
```

This example adds a new HA vHBA called C10vhba2 to the physical server “bering” and provides high availability I/O resources to the Storage Cloud, S_Cloud0. The Storage Cloud, S_Cloud0, must have resources available from more than one Oracle Fabric Interconnect for this option to be set successfully. This example also specifies that the vHBA should automatically switch over to the vHBA on the secondary Oracle Fabric Interconnect if the vHBA on the primary Oracle Fabric Interconnect becomes unavailable. You set the primary and secondary Oracle Fabric Interconnects using the `set storage-cloud` command as described in the section entitled “Adding High Availability to the Storage Cloud” on page 116.

Options

TABLE 5-5 describes the options available with the `add vhma` command.

TABLE 5-5 Options for adding a vHBA to a server

Options	Possible Values	Description
-description		Add an alphanumeric string that describes the vHBA that you are adding.
-qos	<ul style="list-style-type: none"> • 125m_250m • 1g_2g • 250m_500m • 2g_4g • 4g_8g • 500m_1g • 50m_125m 	Specify an optional SAN QoS Profile that will be applied to the vHBA.
-ha-mode	<ul style="list-style-type: none"> • true • false 	Indicate True if you are creating a HA vHBA.
-lun-masks-enabled		Specify an existing LUN Mast Profile for the vHBA.
-wwnn		If the vHBA must be assigned from a specific range of WWNs, enter the WWN range using this option (separate by a dash or a colon).
-mtu		The maximum transmission unit, which is the largest size data packet supported without fragmentation.
-lun-mask		If the Storage Cloud will use LUN Masking to control the access to storage targets, specify the name of the LUN Mask, which must already exist.
-lun-mask-profile		If the Storage Cloud will use LUN Masking to control the access to storage targets, specify the name of the LUN Mask Profile which contains the LUN Mask(s).
-wwn-ha		If the Storage Cloud will be using HA WWNs, specify the HA WWN ID.
-san-boot-capable	<ul style="list-style-type: none"> • true • false (default) 	If the vHBA will be SAN Booting it host server, specify true or false to enable or disable SAN Booting over the vHBA.
-port		Specify the Fibre Channel port on which the vHBA is being configured, or if this is an HA vHBA, specify the primary port.
-ha-port		For HA vHBAs, specify the secondary Fibre Channel port for the vHBA.

Setting vHBA Options

With the `set vHBA` command you can set the following options:

- Bring the vHBA “up” or “down”
- Set the Storage Cloud on which to terminate the vHBA
- Set a new termination port for the vHBA (and as an option, indicate an HA termination port)
- Specify a LUN Mask for the vHBA
- Specify the Quality of Services (QoS) profile for the vHBA

The `set vHBA` command enables you to set the options described in the previous section as well as to activate and deactivate the vHBA on the Storage Cloud.

Syntax

To activate, or bring “up” the vHBA, issue the following command:

```
set vHBA <vHBA name> [-description=Specify Description] [-qos=Specify QOS profile]
[-lun-mask=Specify LUN mask] [-storage-cloud=Update the vHBA to terminated at another Storage
cloud'] [-termination=Update the vHBA to change its termination to a different port] up
```

To deactivate, or shut “down” the vHBA, issue the following command:

```
set vHBA <vHBA name> [-description=Specify Description] [-qos=Specify QOS profile]
[-lun-mask=Specify LUN mask] [-storage-cloud=Update the vHBA to terminated at another Storage
cloud'] [-termination=Update the vHBA to change its termination to a different port] down
```

To set the Storage Cloud on which to terminate the vHBA, issue the following command:

```
set vHBA <vHBA name> storage-cloud <The new cloud to terminate on>
```

To set a new termination port or HA termination port, issue the following command:

```
set vHBA <vHBA name> termination <The new termination port> [-ha-termination=The new ha
termination port or lag]
```

Examples

```
root@FabMgrCLI[ofm] set vhma C10vhba2.bering up
```

```
root@FabMgrCLI[ofm] set vhma C10vhba2.bering down
```

The above two examples activate then deactivate the vHBA C10vhba2.

```
root@FabMgrCLI[ofm] set vhma C10vhba2.bering storage-cloud techpubs1
```

The above example sets the vHBA C10vhba2 to terminate at Storage Cloud techpubs1.

Options

TABLE 5-6 describes the options available with the `set vhma` command.

TABLE 5-6 Fields for the vHBA Command

Fields	Possible Values	Description
-qos	<ul style="list-style-type: none">• 125m_250m• 1g_2g• 250m_500m• 2g_4g• 4g_8g• 500m_1g• 50m_125m	Specify an optional SAN QoS Profile that will be applied to the vNIC.

Rescanning a vHBA

```
set vhma <vHBA name> rescan
```

Setting a vHBA's Storage Cloud

```
set vhma <vHBA name> storage-cloud <The new cloud to terminate on>
```

Setting a vHBA's Termination

```
set vhma <vHBA name> termination <The new termination port> [-ha-termination=<The new ha termination port>]
```

Displaying vHBA Information

The `show vhma` command enables you to display vHBA information on a physical server and within an I/O Template.

Syntax—vHBAs on a Physical Server

To display information configured for the vHBAs on a server, issue the following command:

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] physical-server <Physical server> vmbas
```

Example—vHBAs on a Physical Server

```
root@FabMgrCLI[ofm] show physical-server bering vmbas
```

```
-----  
parent.name      bering  
name             C10vhba2  
sto-cloud-name   techpubs1  
termination      unknown:  
state            null/null  
ip-address       null  
wwnn             null  
wwpn             null  
is-ha            false  
description  
-----
```

```
1 record displayed
```

This example above displays the vHBAs configured on the physical server bering.

Syntax—vHBAs on an I/O Template

To display the vNICs in an I/O Template along with information about them, issue the following command:

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] io-template <IO profile name> vnbas
```

Example—vHBAs on an I/O Template

```
root@FabMgrCLI[ofm] show io-template cloud9template vnbas
name                sto-cloud-name      qos      is-ha      description
-----
Cl0vhba2            S_Cloud0              false
s_Cloud0vhba        S_Cloud0              false
2 records displayed
```

The example above displays the vHBAs configured on the I/O Template cloud9template.

Example

```
root@FabMgrCLI[ofm] show vhma vhbaiii.III targets
vhma name wwnn wwpn lun-ids
-----
vhbaiii.III 2F:9F:00:06:2B:10:C3:BA 2F:9F:00:06:2B:10:C3:BA 3,2,1,0
vhbaiii.III 2F:BF:00:06:2B:10:C3:BA 2F:BF:00:06:2B:10:C3:BA 3,2,1,0
vhbaiii.III 2F:DF:00:06:2B:10:C3:BA 2F:DF:00:06:2B:10:C3:BA 3,2,1,0
vhbaiii.III 2F:FF:00:06:2B:10:C3:BA 2F:FF:00:06:2B:10:C3:BA 3,2,1,0
4 records displayed
```

This example shows all the FC storage targets and LUNs available through vHBA named “vhbaiii” in server Profile “III.”

Options

TABLE 5-7 describes the options available with the show vhma command.

TABLE 5-7 Fields displayed with the `show vhma` command

Fields	Possible Values	Description
<code>parent.name</code>		The name of the physical server or template.
<code>name</code>		The name of the vHBA.
<code>sto-cloud-name</code>		The name of the Storage Cloud in which the vHBA is defined.
<code>termination</code>		The FC port at which the vHBA is terminated.
<code>state</code>		The current state of the FC port.
<code>ip-address</code>		The physical machine's IP address.
<code>wwn</code>		The vNIC's World Wide Node Name address.
<code>wwpn</code>		The vNIC's World Wide Port Name address.
<code>is-ha</code>	<ul style="list-style-type: none">• true• false	Indicates if the vHBA is configured for high availability.
<code>description</code>		If a description was entered when the vHBA was created, that description displays in this field.
<code>qos</code>		The QoS Profile, if defined.

Removing vHBAs from a Storage Cloud

The `remove vhma` command enables you to remove a vHBA from a Storage Cloud.

Syntax

To remove a vHBA from a Storage Cloud, issue the following command:

```
remove [-noconfirm] vhma <vhba name> [-no-confirm]
```

Example

```
root@FabMgrCLI[ofm] remove -noconfirm vhma Cloud9vhba2.bering
```

The above example removes the vHBA named `Cloud9vhba2` from the server `bering`. This command will not trigger a confirmation message before removing the vNIC.

Working with SAN Quality of Service (QoS)

The SAN QoS Profile uses Committed Information Rate (CIR) to guarantee bandwidth. You can assign one SAN QoS Profile to a Storage Cloud or a vHBA, and you can assign the same SAN QoS Profile to multiple, different Storage Clouds or vHBAs.

Oracle Fabric Manager provides two SAN QoS Profiles that are preconfigured for application to Storage Clouds or vHBAs:

- 125M_250m (125 Mbps CIR and 250 Mbps PIR).
- 50M_125M (50 Mbps CIR and 125 Mbps PIR).

Assigning QoS Profiles

You can assign a SAN QoS Profile to a Storage Cloud or to a vHBA.

- If you assign the QoS Profile to a Storage Cloud, any vHBA terminated in the Storage Cloud inherits that Storage QoS Profile. This is true even if the vHBA has its own associated QoS Profile.
- If a Storage Cloud has no associated QoS Profile, but one of its vHBAs does have an associated QoS Profile, that QoS Profile is applied to the vHBA. Thus, when a Storage Cloud has no QoS Profile to apply, it causes the cloud to defer to the QoS Profiles assigned to the individual vHBAs (if any).

If you do not want a QoS Profile to be applied anywhere for the virtual I/O in a cloud, make sure that no QoS Profile is associated with the Storage Cloud or any of the vHBAs terminated in that Cloud.

Displaying SAN QoS Profiles

The `show san-qos` command displays a description of the specified QoS Profile including Committed Information Rate (CIR) and Peak Informants Rate (PIR) set by that Profile. You can display all of the SAN QoS Profiles saved in your environment or the information for one specific Profile.

Syntax

To display the SAN QoS Profiles defined in your environment, issue the following command:

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] san-qos <San QOS profile name>
```

Examples

```
root@FabMgrCLI[ofm] show san-qos
```

name	cir	pir	description
1g_2g	1000000	2000000	1-2Gbps
2g_4g	2000000	4000000	2-4Gbps
4g_8g	4000000	8000000	4-8Gbps
50m_125m	50000	125000	50Mbps
125m_250m	125000	250000	125Mbps
250m_500m	250000	500000	250-500Mbps
500m_1g	500000	1000000	500Mbps-1Gbps

7 records displayed

This example shows all of the SAN QoS Profiles saved in Oracle Fabric Manager environment.

```
root@FabMgrCLI[ofm] show san-qos 125m_250m
```

name	cir	pir	description
125m_250m	125000	250000	125Mbps

1 record displayed

Options

TABLE 5-8 describes the options available with the `show san-qos` command.

TABLE 5-8 Fields Displayed with the `show san-qos` Command

Fields	Description
<code>name</code>	The name of each configured SAN QoS Profile.
<code>cir</code>	The Committed Information Rate, which is the amount of guaranteed bandwidth for constant traffic.
<code>pir</code>	The Peak Information Rate, which is guaranteed bandwidth by controlling traffic through dropping packets that exceed this rate.
<code>description</code>	The description string (if any) that was applied to the SAN QoS Profile.

Working with I/O Templates

This chapter describes how to define I/O requirements for a set of servers that require the same resources to an Oracle Fabric Manager I/O Template using the CLI. It explains how to create the building blocks by defining connectivity and virtual resources for your network and storage requirements. This chapter contains the following topics:

- “Understanding I/O Templates” on page 135
- “Creating an I/O Template” on page 137
- “Changing I/O Resources” on page 143
- “Displaying I/O Resources” on page 145
- “Removing I/O Resources” on page 151

Understanding I/O Templates

I/O Templates enable server administrators to define I/O requirements for a set of servers. Once the access requirements are defined, they can be applied to any new servers that are brought online that require the same I/O resource needs. For example, a server that will be used by the Engineering department may require access to a couple of Network Clouds and a Storage Cloud, but a server that is used by Finance may only require access to the internet.

Once you build an I/O Template you can then save those settings to an I/O Profile. That I/O Profile applies your settings to a server or group of servers and those servers immediately gain access to the network and storage resources without rebooting.

To build an I/O Template, you need a Network Cloud, a Storage Cloud, or both. You will find it helpful if your Network and Storage Clouds are created before you begin building I/O Templates.

Note – Even though you can use I/O Templates to configure a single physical server, Templates are most useful when deploying virtual connectivity to multiple servers that require a consistent configuration. Be aware that configuring the I/O Template to define the virtual connectivity for one or more servers is only the first half of the connectivity process. Next, you must create the I/O Profile from your I/O Template to actually connect the vNICs and vHBAs in the template to the physical server. For information about I/O Profiles, see [Chapter 7](#).

Stepping Through the Process

When you create an I/O Template, you create an empty container to which you add building blocks that define the connectivity and virtual resources for your network and storage. For example, to create an I/O Template using the CLI might consist of the following steps:

1. Creating and naming the I/O Template using the `add io-template` command.
2. Creating a Network Cloud and a Storage Cloud (building blocks) using the `add network-cloud` and `add storage-cloud` commands.
3. Editing the Network and Storage Clouds to support specific features (for example, Network and SAN QoS Profiles) using the `set network-cloud` and `set storage-cloud` commands.
4. Adding one or more vNICs and vHBAs (more building blocks) to the Template and connecting them to the Network Cloud and Storage Cloud using the `add vnic` and `add vhma` commands and specifying the template through the `-apply-template-name` option.
5. Editing the vNICs and vHBAs with specific Ethernet and Fibre Channel properties using the `set io-template...update vnic` and `set io-template...update vhma` commands.
6. Creating an I/O Profile from the I/O Template using the `add io-profile` command.
7. Connecting the I/O Profile to the physical resources using the `set io-profile...connect` command.

Providing Connectivity

I/O Templates alone do not provide virtual connectivity to hosts. You must create an I/O Profile based on the I/O Template. The I/O Profile provides virtual connectivity to the hosts. Steps 6 and 7 above demonstrate how to provide this connectivity. When performing those last two steps, make sure that the correct I/O Profile is deployed on the correct host server. This chapter describes steps 1, 4, and 5. Steps 2 and 3 are described in earlier chapters ([Chapter 4, Working with Network Clouds](#), and [Chapter 5, Working With Storage Clouds](#)), and Steps 6 and 7 are described in the next chapter ([Chapter 7, Working with I/O Profiles](#)).

Creating an I/O Template

This section describes how to create an I/O Template, including:

- [“Adding an I/O Template” on page 137](#)
- [“Adding Network Resources” on page 139](#)
- [“Adding Storage Resources” on page 141](#)

Note – You will find it helpful if the following elements are already created before building I/O Templates.

- * Server boot profiles (SAN Boot Profiles or iSCSI Boot Profiles)
 - * Default gateways
 - * Network QoS Profiles
 - * Storage QoS Profiles
-

Adding an I/O Template

You create a new I/O Template using the `add io-template` command.

Syntax

When you create an I/O Template, you can also add a description, a default gateway, a SAN Boot Profile, and an iSCSI Boot Profile. To add an I/O Template that will provide standard I/O resources to your environment, issue the following command:

```
add io-template <Specify IO template name> [-description=Specify Description] [-default-gateway=Specify Default gateway] [-san-boot-profile=Specify SAN boot profile] [-iscsi-boot-profile=Specify iSCSI boot profile] [-apply-template-name=When applying to a server name use the template name or the server name]
```

Example

```
root@FabMgrCLI[ofm] add io-template cloud9template -description="Template for engineering resources"
```

The example above creates a new I/O Template called cloud9template with an associated description.

Options

TABLE 6-1 describes the options available with the `add io-template` command.

TABLE 6-1 Options for Adding I/O Templates

Option	Description
<code>-description</code>	Enter an optional alphanumeric string that describes the I/O Template that you are creating.
<code>-default-gateway</code>	Specify the default gateway for the I/O Template. The default gateway must already be created in Oracle Fabric Manager (using the <code>add default gateway</code> command) before you can specify it here.
<code>-san-boot-profile</code>	If the hosts using this I/O Template will boot using SAN boot, specify that SAN Boot Profile using this option. The SAN Boot Profile must already be created in Oracle Fabric Manager (using the <code>add san-boot-profile</code> command) before you can specify it here.
<code>-iscsi-boot-profile</code>	If the hosts using this I/O Template will boot using iSCSI boot, specify that iSCSI Boot Profile using this option. The iSCSI Boot Profile must already be created in Oracle Fabric Manager (using the <code>add iscsi-boot-profile</code> command) before you can specify it here.
<code>-apply-template-name</code>	If the host will be using an I/O Template, when applying an I/O Template to a server, use the template name or the server name.

Adding Network Resources

You add network resources to your I/O Template using the `set io-template` command.

Syntax

To add network resources to your I/O Template, specify the I/O Template name, a name for your new vNIC (use a maximum of 10 characters), and the Network Cloud to which the vNIC points. The other specifications in the syntax below are optional. You can specify multiple Network Clouds and vNICs to the same I/O Template.

To add one or more vNICs to the I/O Template, issue the following command.

```
set io-template <IO-profile name> add vnic <vnic name> <Network Cloud the vnic points to>
[-description=Specify description] [-iscsi-boot-capable=Does this vnic do an iSCSI Boot?
Default='false'] [-pxe-boot-capable=Does this vnic do an PXE Boot? Default='false'] [-qos=Specify
qos profile] [-trunk-mode=Is it trunk mode? Default='false'] [-ip-type=IP address type. Default=
'hostmanaged'] [-vlan-id=Specify Access VLAN Id] [-checksum-offload=Specify Checksum offload]
[-community-name=Specify Community name] [-ha-mode=Is this an HA vNIC? Default='false']
[-auto-switchover=Auto Switchover?. Default='false'] [-user-mac=Specify User defined] [-apply-
template-name=When applying to a server name use the template name or the server name] [-tso=Does this
vNIC do TSO? Default='false'] [-private=Is it private? Default='false'] [-no-confirm]
```

Example

```
root@FabMgrCLI[ofm] set io-template Cloud0template add vnic Cloud9vnic Cloud9
```

The above example adds the vNIC named `Cloud9vnic`, which now belongs to the Network Cloud `Cloud9`, to the template called `Cloud0template`. This means that both the Network Cloud and the vNICs are part of the Template.

Options

TABLE 6-1 describes the options available with the `set io-template...add vnic` command.

TABLE 6-2 Options for Adding or Changing a vNIC

Option	Possible Values	Description
-description		Specify an optional description for the vNIC you are creating.
-qos	<ul style="list-style-type: none"> • 100m_1g • 100m_250m • 10g_10g • 10m_100m • 10m_1g • 10m_50m • 1g_10g • 1m_10m • 250m_500m • 2g_10g • 3g_10g • 4g_10g • 500m_750m • 50m_100m • 5g_10g • 64k_1m • 6g_10g • 750m_1g • 7g_10g • 8g_10g • 9g_10g 	Specify the Network QoS Profile if one is to be applied to the vNIC you are creating for this template.
-trunk-mode	<ul style="list-style-type: none"> • true • false (default) 	If the vNIC will be configured in a VLAN, indicate <code>Trunk Mode=true</code> . If you do not specify <code>true</code> for this option, the vNIC will operate in access mode.
-ip-type	<ul style="list-style-type: none"> • hostmanaged (default) • DHCP 	Indicate whether the vNIC's IP address will be assigned by the host server, or by DHCP.
-vlan-id		If the vNIC will be required to participate in a VLAN, enter the VLAN number using this command.
-checksum-offload	<ul style="list-style-type: none"> • true • false (default) 	If the vNIC will support checksum offload, which allows the module to send checksumming tasks to the I/O Module instead of the port terminating the vNIC, indicate <code>-checksum-offload=true</code> as part of this command.
-community-name		If the vNIC needs to be part of specific SNMP communities, specify the names of the SNMP communities using this option.

TABLE 6-2 Options for Adding or Changing a vNIC (*Continued*)

Option	Possible Values	Description
-ha-mode	<ul style="list-style-type: none">• true• false (default)	If the vNIC will be one of an HA vNIC pair, indicate <code>-ha-mode=true</code> in the command.
-auto-switchover	<ul style="list-style-type: none">• true• false (default)	If the vNIC will be one of an HA vNIC pair, and you want the secondary vNIC to give traffic back to the primary vNIC when the primary comes back online, indicate <code>-auto-switchover=true</code> in this command.
-user-mac		If the vNIC's MAC ID must be assigned from a specific range of MAC addresses, specify the user-defined MAC IDs to have the Oracle Fabric Interconnect bypass automatically assigning the vNIC's MAC Address from the Oracle Fabric Interconnect's pool.
-apply-template-name	<ul style="list-style-type: none">• server name• template name	If the host will be using an I/O Template, when applying an I/O Template to a server, use the template name or the server name.
-tso	<ul style="list-style-type: none">• true• false (default)	If the host will be using TCP Segmentation Offload (TSO), specify either true or false to enable or disable the feature.
-private	<ul style="list-style-type: none">• true• false (default)	If the host will be a private vNIC, specify true or false to enable or disable the feature. If the vNIC is not private, it will be accessible as a standard vNIC on the network. If private, the vNIC will be accessible in a private network not accessible by all resources.

Adding Storage Resources

You add storage resources to your I/O Template using the `set io-template` command. You can add as many vHBAs to a template as you need. This step does not provide the virtual I/O connection to the host server. It simply creates a vHBA and terminates it on a port in the Storage Cloud. The vHBA will not be pushed to the host server until you create an I/O Profile from the Template and connected the I/O Profile to a server.

Syntax

To add storage resources to your I/O Template, specify the I/O Template name, the name for your new vHBA, and the Storage Cloud to which the vHBA will terminate. The other specifications in the command below are optional.

```
set io-template <IO profile name> add vhma <Specify vhma name> <Specify the storage cloud the vhma points to> [-description=Specify description] [-san-boot-capable=Does this vhma do a SAN Boot? Default='false'] [-qos=Specify qos profile] [-ha-mode=Is this a haVhma. Default='false'] [-user-wwn=Specify User defined WWN Id] [-apply-template-name=When applying to a server name use the template name or the server name] [-lun-mask-profile=Specify LUN Mask Profile] [-no-confirm]
```

Example

```
root@FabMgrCLI[ofm] set io-template cloud9template add vhma s_Cloud0vhba S_Cloud0 -description="This vHBA is used for engineering network traffic only"
```

The above example adds storage resources to your template. It adds a vHBA called s_Cloud0vhba, which points to the Storage Cloud S_Cloud0, to the I/O Template Cloud9template.

Options

TABLE 6-3 describes the options available with the `set io-template...add vhma` command.

TABLE 6-3 Options for Adding a vHBA to an I/O Template

Option	Possible Values	Description
-description		Specify an optional description for the vHBA you are adding to the I/O Template.
-qos	<ul style="list-style-type: none">125m_250m1g_2g250m_500m2g_4g4g_8g500m_1g50m_125m	Specify a SAN QoS Profile for the vHBA you are adding, if applicable.
-ha-mode	<ul style="list-style-type: none">truefalse (default)	If the vHBA will be part of an HA vHBA, indicate <code>-ha-mode=true</code> in your command.

TABLE 6-3 Options for Adding a vHBA to an I/O Template (*Continued*)

Option	Possible Values	Description
-user-wwn		If the vHBA's WWN ID must be assigned from a specific range of WWNs, specify the user-defined WWN ID to have the Oracle Fabric Interconnect bypass automatically assigning the vHBA's WWN from the Oracle Fabric Interconnect's pool. Use this option if you, or a SAN device, will be assigning WWNs. Enter the WWN range as a starting WWN ID, then either a dash (-) or colon, then the ending WWN ID.
-apply-template-name	<ul style="list-style-type: none">• server name• template name	If the host will be using an I/O Template, when applying an I/O Template to a server, use the template name or the server name.
-lun-mask-profile		If the host will be using LUN Masks to control what storage targets are accessible, specify the name of the LUN Mask which must already exist.

Note – At this point, the I/O Template is created, but not yet deployed. You will need to create an I/O Profile from the I/O Template, and connect that I/O Profile to a physical server in order to push the vHBAs in the template to the server. See [Chapter 7](#) for instructions on working with I/O Profiles.

Changing I/O Resources

This section describes how to change vNICs and vHBAs.

Changing vNICs

To change one of the vNIC specifications in an I/O Template, you use the `set io-template...update vnic` command.

Syntax

When you change an I/O Template's vNIC, you specify the I/O Template and vNIC names, the Network Cloud it points to (if applicable), and the change you wish to make. Issue the following command:

```
set io-template <IO profile name> update vnic <Specify vnic name> [-network-cloud-name=Specify the network cloud the vnic points to] [-description=Specify description] [-iscsi-boot-capable=Does this vnic do an ISCSI Boot? Default='false'] [-qos=Specify qos profile] [-pxe-boot-capable=Does this vnic do an PXE Boot? Default='false'] [-qos=Specify qos profile] [-trunk-mode=Is it trunk mode? Default='false'] [-ip-type=IP address type. Default='hostmanaged'] [-vlan-id=Specify Access VLAN Id] [-checksum-offload=Specify Checksum offload] [-community-name=Specify Community name] [-ha-mode=Is this a haVnic. Default='false'] [-auto-switchover=Auto Switchover? Default='false'] [-user-mac=Specify User defined] [-apply-template-name=When applying to a server name use the template name or the server name] [-no-confirm]
```

Example

```
root@FabMgrCLI[ofm] set io-template cloud9template update vnic s_Cloud9vnic -trunk-mode=true
```

The above example changes (updates) the vNIC s_Cloud9vnic in the I/O Template cloud9template to use trunk mode.

Options

TABLE 6-2 describes the options available with the `set io-template...update vnic` command.

Changing vHBAs

To change one of the vHBA specifications in a Template, you use the `set io-template...update vhma` command.

Syntax

When you change an I/O Template's vHBA, you specify the I/O Template and vHBA names, the Storage Cloud it points to (if applicable) and the change you wish to make. Issue the following command:

```
set io-template <IO profile name> update vhma <Specify vhma name> [-storage-cloud-name=  
Specify the storage cloud the vhma points to] [-description=Specify description] [-san-boot-capable=  
Does this vhma do a SAN Boot? Default='false'] [-qos=Specify qos profile] [-ha-mode=Is this a haVhma.  
Default='false'] [-user-wwn=Specify User defined WWN Id] [-apply-template-name=When applying  
to a server name use the template name or the server name]
```

Example

```
root@FabMgrCLI[ofm] set io-template cloud9template update vhma s_Cloud0vhba
```

The above example changes (updates) the vHBA in the vHBA named s_Cloud0vhba, which is part of the I/O Template cloud9template.

Options

TABLE 6-2 describes the options available with the `set io-template...update vhma` command.

Displaying I/O Resources

This section describes how to display “vNICs” on page 145, “vHBAs” on page 147, and “Servers” on page 148.

vNICs

You display information about the vNICs configured for an I/O Template using the `show io-template...vnics` command.

Syntax

When you display vNIC information for an I/O Template, you specify the name of the template by issuing the following command:

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] io-template <IO profile name> vnics
```

Example

```
root@FabMgrCLI[ofm] show io-template cloud9template vnics
name      vnic-name  net-cloud-name qos ip-type  is-ha access-vlan-id trunk-mode
description
-----
cloud9template Cloud9vnic  Cloud9  hostManaged false  0          false
1 record displayed
```

The above example displays the vNICs in the I/O Template cloud9template.

Fields

TABLE 6-4 describes the fields displayed with the `show io-template...vnics` command.

TABLE 6-4 Fields Displayed Using the `show io-template...vnics` Command

Field	Possible Values	Description
name		The template name in which the vNIC is defined.
vnic-name		The name of the vNIC for which the following information is displayed.
net-cloud-name		The name of the Network Cloud with which the vNIC is associated.
qos		The bandwidth usage parameters for the vNIC in the format CIR_PIR, in megabits per second.

TABLE 6-4 Fields Displayed Using the `show io-template...vnic` Command (Continued)

Field	Possible Values	Description
<code>ip-type</code>	<ul style="list-style-type: none"> • Static, for a statically assigned IP address. • DHCP, for an address that was assigned through DHCP. • Host managed, for an address that was assigned by the host instead of through the Oracle Fabric Interconnect. 	The method by which the IP address for the vNIC was assigned.
<code>is-ha</code>	<ul style="list-style-type: none"> • true • false (default) 	Indicates if the vNIC was configured for HA.
<code>access-vlan-id</code>		Indicates the VLAN ID if the vNIC is configured in a VLAN.
<code>trunk-mode</code>	<ul style="list-style-type: none"> • true • false (default) 	Indicates if the vNIC is in “trunk” or “access.” If the vNIC was configured for Trunk Mode, this field displays true. False indicates that it was configured for Access Mode.
<code>description</code>		A description for the vNIC if one was entered when the vNIC was created.

vHBAs

You display information about the vHBAs configured for an I/O Template using the `show io-template...vhas` command.

Syntax

When you display vHBA information for an I/O Template, you specify the name of the template by issuing the following command:

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] io-template <IO profile name> vhas
```

Example

```
show [root@FabMgrCLI[ofm] show io-template cloud9template vhbases
name                sto-cloud-name        qos            is-ha          description
-----
s_Cloud0vhba       S_Cloud0                                false
1 record displayed
```

The above example displays the vHBA in the I/O template cloud9template.

Options

TABLE 6-5 describes the fields available with the `show io-template...vhbases` command.

TABLE 6-5 Fields Displayed Using the `show io-template...vhbases` Command

Fields	Possible Values	Description
name		The name of the vHBA for which the following fields are displayed.
sto-cloud-name		The name of the Storage Cloud with which the vHBA is associated.
qos		The SAN QoS Profile configured for the vHBA.
is-ha	<ul style="list-style-type: none">• true• false (default)	Indicates if the vHBA was configured for HA.
description		A description of the vHBA if one was entered when the vHBA was created.

Servers

You display information about the servers configured for an I/O Template using the `show io-template...servers` command.

Syntax

When you display server information for an I/O Template, you specify the name of the template by issuing the following command:

```
show [-table] [-list] [-xml] [-sortBy=Specify column to sort by] io-template <IO template name> servers
```

Example

```
root@hawk[ofm] show io-template test servers
-----
name                COLEMAN
os                  Windows/6.1.7600/x64-3.0.0.26
driver-version      5.3.0/2.1.1
vnics               0
vhbas               0
bound               no
state               up
template-name       test
chassis-ports       oregon:ServerPort11,oregon:ServerPort11
-----
```

The above example displays the information about the server providing resources to the I/O Template `cloud9template`.

Options

[TABLE 6-6](#) describes the fields displayed with the `show io-template...servers` command.

TABLE 6-6 Fields Displayed with the `show io-template...servers` command

Field	Possible Values	Description
name		The name of the server being displayed.
OS		The name of the OS running on the server with which the I/O Template is associated.
driver-version		The driver version running on the server.
vnics		The number of vNICs configured on the server.
vhbas		The number of vHBAs configured on the server.

TABLE 6-6 Fields Displayed with the `show io-template...servers` command (Continued)

Field	Possible Values	Description
bound	<ul style="list-style-type: none"> • yes • no 	Indicates whether or not the server is bound to an I/O Profile.
state	<ul style="list-style-type: none"> • up • down 	The state of the physical server.
template-name		The name of the template associated with the server.
chassis-ports		<p>The port string for the InfiniBand port on which the physical server is connected to the Oracle Fabric Interconnect. The port string consists of the Oracle Fabric Interconnect name, and the Server Port number separated by a colon (:). For example, <code>iowa:ServerPort18</code> indicates that the host server is connected to the Oracle Fabric Interconnect named “iowa” through port 18 on iowa’s InfiniBand fabric board.</p> <p>If the host server is connected to multiple Oracle Fabric Interconnects, a port string is displayed for each connection, and the individual port strings are separated by a comma. For example, <code>rhode-island:ServerPort6,alabama:ServerPort10</code> indicates two individual connections—one connection to the Oracle Fabric Interconnect name “rhode-island” and the other connection to the Oracle Fabric Interconnect named “alabama.”</p> <p>If the host server is connected through an intervening InfiniBand switch, the switch’s GUID is listed in this field. For example, the value <code>ExtSw-2c90200419858-Port20</code> indicates a connection to an intervening IB switch between the host server and the Oracle Fabric Interconnect.</p>

```

Example output:
root@FabMgrCLI[ofm] add io-template cloud9template
root@FabMgrCLI[ofm] set io-template cloud9template add vnic Cloud9vnic Cloud9
root@FabMgrCLI[ofm] set io-template cloud9template add vhba s_Cloud0vhba
S_Cloud0
root@FabMgrCLI[ofm] show io-template cloud9template
-----
name                cloud9template
iscsiboot-name
sanboot-name
default-gateway
apply-templatename true
vnics                1
vhbas                0
description
-----
1 record displayed

```

Removing I/O Resources

vNICs

You remove a vNIC from an I/O Template using the `set io-template...remove vnic` command.

Syntax

When you remove a vNIC from an I/O Template, you specify the name of the I/O Template from which you wish to remove the vNIC as well as the name of that vNIC. Issue the following command:

```
set io-template <IO profile name> remove vnic <Specify a vNIC name> [-no-confirm]
```

Example

```
root@FabMgrCLI[ofm] set io-template cloud9template remove vnic s_Cloud9vnic
```

The above example removes the vNIC called `s_Cloud9vnic` from your I/O Template `cloud9template`.

vHBAs

You remove a vHBA from an I/O Template using the `set io-template...remove vhma` command.

Syntax

When you remove a vHBA from an I/O Template, you specify the name of the I/O Template from which you wish to remove the vHBA as well as the name of that vHBA. Issue the following command:

```
set io-template <IO profile name> remove vhma <Specify a vHBA name> [-no-confirm]
```

Example

```
root@FabMgrCLI[ofm] set io-template cloud9template remove vhb s_Cloud0vhba
```

The above example removes the vHBA called Cloud0vhba from the I/O Template cloud9template.

I/O Templates

You remove an I/O Template using the `remove io-template` command.

Syntax

When you delete the I/O Template, it is no longer available to any servers that use it. Any servers that are running with vNICs and vHBAs provided through the I/O Template will continue to run with the vNICs and vHBAs. But the next time the I/O Template is used, the server will no longer be connected to the network and storage attached to the vNIC(s) and vHBA(s) that were in the deleted Template. To delete an I/O Template, issue the following command:

```
remove [-noconfirm] io-template <IO template name> [-no-confirm]
```

Example

```
root@FabMgrCLI[ofm] remove io-template HRtemplate
```

The above example deletes the I/O Template HRtemplate from your system.

Working with I/O Profiles

This chapter describes how to provide the connection policy that specifies the number of vNICs and /or vHBAs required for a specific server by using the CLI to define I/O Profiles. This chapter contains the following topics:

- “Understanding I/O Profiles” on page 153
- “Creating I/O Profiles” on page 154
- “Physical Connectivity” on page 155
- “Displaying I/O Profile Resources” on page 158
- “Removing an I/O Profile” on page 165

Understanding I/O Profiles

I/O Profiles provide a connection policy that specifies the number of vNICs and/or vHBAs that are required for a specific server. I/O Profiles define the virtual I/O resources for a particular server that is managed by Oracle Fabric Manager. The virtual resources that you can define in an I/O Profile include vNICs, HA vNICs, vHBAs, HA vHBAs, server profiles, and Oracle Fabric Interconnect objects.

An I/O Profile is derived from an I/O Template. The I/O Template provides the server’s basic scope and connection type and is used to create one or more I/O Profiles for a server. It is the I/O Profile—not the I/O Template—that actually connects to a server. When you connect an I/O Profile to a server, the vNICs and vHBAs in the Template are pushed to the server.

The workflow for deploying connectivity through an I/O Template is to:

1. Create an I/O Template (including vNIC and/or vHBA resource specifications).
2. Create one or more I/O Profiles from the I/O Template.

3. Connect the I/O Profile to a physical server, deploying the vNICs or vHBAs to the server.

You can also use I/O Profiles to create vNICs and vHBAs directly on a physical server (without an I/O Template). In this case, the I/O Profile is created automatically with the server name.

Creating I/O Profiles

When you create an I/O Profile, you specify the individual vNIC and vHBA connections for each server. The I/O Profile provides the policy and the connectivity for the vNIC network and vHBA storage resource.

You can create up to 20 I/O Profiles from one I/O Template. For example, if six servers require the same connectivity, you can use the template to create six different I/O Profiles—one for each physical server requiring connectivity. You can then connect each I/O Profile to its corresponding server as needed. This allows you provide consistent server resources and connectivity for all six servers, rather than creating six different sets of vNICs and vHBAs. You make these specifications once through the I/O Template, and connect the servers when you need them.

When you create multiple I/O Profiles from the same Template, you give them a name, and Oracle Fabric Manager adds an enumerated suffix in the form of `_x`. For example, if you created six I/O Profiles for your security auditing servers with the name "AuditServers," then the I/O Profiles would be named "AuditServer_1" through "AuditServer_6". Because of the suffix, each I/O Profile is a unique object in Oracle Fabric Manager, and as a result, can be used and managed independent of the other five I/O Profiles.

Before using the commands in this section to create I/O Profiles, make sure you already have your I/O Template(s) created. See [Chapter 6](#) for the commands used to create I/O Templates.

Adding I/O Profile

Use the `add io-profile` command to create a new I/O Profile from an I/O Template.

Syntax

To add an I/O Profile based on an I/O Template, name the I/O Profile so that you can associate it with a server. For example, “montana” in the following example is the name of a server, and now it is the name of the I/O Profile being defined. Issue the following command:

```
add io-profile <Name of IO Profile> <Name of IO Template>
```

Examples

```
root@FabMgrCLI[ofm] add io-profile montana cloud9template
```

The above example creates a new I/O Profile called montana from the template cloud9template.

Physical Connectivity

As part of configuring an I/O Profile, you can select the individual Oracle Fabric Interconnects that connect the I/O Profile to a server. For example, assume you have a dual-Oracle Fabric Interconnect environment, but you want only one of the Oracle Fabric Interconnects to connect the I/O Profile to the server. Through the New I/O Profile commands, you can specify which Oracle Fabric Interconnects support one or more I/O Profiles. By default, any Oracle Fabric Interconnect managed by Oracle Fabric Manager can support the connection.

An I/O Profile contains the definition of your vNICs and vHBAs, but it does not actually provide any connectivity until you connect that I/O Profile to a server. Once connected, the vNICs and vHBAs contained in the I/O Profile are pushed to the host. An I/O Profile must be in the “disconnected” state to be applied to a server. If you want to connect an I/O Profile that is already connected to a server, you must explicitly disconnect that I/O Profile first. You can also connect an I/O Profile to a server that is in any state, but only when the server is fully up and online will the I/O Profile support traffic.

You can remove an I/O Profile from a physical server that is in the “connected” state. If you want to remove the vNICs and vHBAs from a server without deleting the I/O Profile, you can simply disconnect the I/O Profile. All the connectivity in the I/O Profile remains intact and can be used again on the same server or on another server. By disconnecting the I/O Profile, you remove the server’s network and storage connections, which causes a service interruption, but does not affect the admin or operational state of the server itself.

Connecting an I/O Profile to a Physical Server

To connect an I/O Profile to a physical server, issue the `set io-profile...connect` command.

Syntax

To connect an I/O Profile to a physical server, issue the following command:

```
set io-profile <Name of IO Profile> connect <Physical server> [-lun=iSCSI/SAN Bootable LUN]
[-iqn=iSCSI IQN target] [-iqn-ha=iSCSI IQN Target for the Secondary termination (only use for HA
VNICs)] [-wwpn=SAN WWPN Target] [-wwpn-ha=SAN WWPN Target for the Secondary termination (only
use for HA VHBAs)]
```

Example

```
root@FabMgrCLI[ofm] set io-profile montana connect montana
```

The above example connects the I/O Profile `montana` to the physical server `montana`.

Disconnecting an I/O Profile from a Physical Server

Before you can completely delete an I/O Profile, you must first disconnect the I/O Profile from the physical server using the `set io-profile...disconnect` command.

Syntax

To disconnect an I/O Profile from a physical server, issue the following command:

```
set io-profile <Name of IO Profile> disconnect
```

Example

```
root@FabMgrCLI[ofm] set io-profile montana disconnect
```

The above command disconnects the physical server montana from the I/O Profile montana.

Updating an I/O Profile

For I/O Profiles that are already created, you can make changes to them (and in turn, the host's connectivity) without having to delete and recreate the I/O Profile. Use the `set io-profile...update` command to make real-time updates for a configured I/O Profile.

Syntax

To update an I/O Profile connected to a physical server, issue the following command:

```
set io-profile <Name of IO Profile> update io-profile [-description=  
Specify description] [-default-gateway=Specify Default gateway] [-san-boot-  
profile=Specify SAN Boot Profile] [-iscsi-boot-profile=Specify iSCSI Boot  
Profile] [-tso=Does this vNIC do TSO?Default='false'] [-private=Is it Private?Default=  
'false'] [-lun-mask-profile=Specify LUN Mask Profile]
```

Options

TABLE 7-1 Options for Updating an I/O Profile

Option	Possible Values	Description
I/O Profile name		Specify a name for the I/O Profile that you are updating.
-description		An optional description for the I/O Profile you are updating.
-default-gateway		Sets or changes the default gateway for the server that is using the I/O Profile
-san-boot-profile		Sets or changes the SAN Boot Profile for the I/O Profile. The named SAN Boot Profile must already exist.
-iscsi-boot-profile		Sets or changes the iSCSI Boot Profile for the I/O Profile. The named iSCSI Boot Profile must already exist.

TABLE 7-1 Options for Updating an I/O Profile (*Continued*)

Option	Possible Values	Description
-tso	<ul style="list-style-type: none"> • true • false (default) 	If the host will be using TCP Segmentation Offload (TSO), specify either true or false to enable or disable the feature.
-private	<ul style="list-style-type: none"> • True • False (default) 	Sets or changes the state of the Private vNIC feature for all vNICs using the I/O Profile. If you want all vNICs connected to this I/O Profile to be Private vNICs by indicating -private=true. By default, vNICs are not Private; instead, they are Public.
-lun-mask-profile		Sets or changes the LUN Mask Profile for the I/O Profile. The named LUN Mask Profile must already exist.

Example

```
root@FabMgrCLI[ofm] set io-profile montana update io-profile -san-  
boot-profile=SB14 -lun-mask-profile=Compellent10
```

The above command updates the I/O Profile on the server montana by adding a SAN Boot Profile named SB14 and a LUN Mask named Compellent10.

Displaying I/O Profile Resources

vNICs

Use the `show io-profile...vnic` command to display information about the vNICs configured for an I/O Profile.

Syntax

To display vNIC information for an I/O Profile, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] io-profile <Name of IO Profile> vnic
```


Example

```
root@FabMgrCLI[ofm] show io-profile scissors vnics
-----
parent.name      scissors-4c4c454400434e108059c3c04f4b4d31
name             eth6
net-cloud-name   discovered-network-cloud
termination      arkansas/14/5
state            up/resourceUnavailable
ip-address       0.0.0.0
mac-address      00:13:97:02:50:69
is-ha            false
description
-----
parent.name      scissors-44454c4c4300104e8059c3c04f4b4d31
name             bug20568
net-cloud-name   discovered-network-cloud
termination      texas/14/7
state            up/up
ip-address       0.0.0.0
mac-address      00:13:97:01:F0:28
is-ha            false
description
-----
parent.name      scissors-44454c4c4300104e8059c3c04f4b4d31
name             eth5
net-cloud-name   discovered-network-cloud
termination      texas/14/7
state            up/up
ip-address       192.168.15.205
mac-address      00:13:97:01:F0:25
is-ha            false
description
-----
3 records displayed
```

This example displays all vNICs associated with the I/O Profile named scissors.

Fields

TABLE 7-2 describes the fields available with the `show io-profile...vnics` command.

TABLE 7-2 Fields Displayed Using the `show io-profile... vnic` Command

Fields	Possible Values	Description
<code>parent.name</code>		The name of the I/O Profile and its parent server.
<code>name</code>		The name of the Ethernet port to which the vNIC is connected.
<code>net-cloud-name</code>		The name of the Network Cloud with which the vNIC is associated.
<code>termination</code>		The termination point for the vNIC. The termination point is either a port, which is displayed in slot/port notation, or a LAG, which is displayed in slot.port notation.
<code>state</code>		The vNIC's administrative and operational state. A state of "up/up" indicates that the vNIC is operating correctly.
<code>ip-address</code>		The vNIC's IP address.
<code>mac-address</code>		The vNIC's MAC address. This can either be statically assigned, or automatically assigned from the Oracle Fabric Interconnect's pool.
<code>is-ha</code>	<ul style="list-style-type: none"> • true • false 	Indicates if the vNIC is configured for HA.
<code>description</code>		A description of the vNIC if one was entered when the vNIC was created.

vHBAs

Use the `show io-profile... vhbas` command to display information about the vHBAs configured for an I/O Profile.

Syntax

To display an I/O Profile's vHBA information, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] io-profile <Name of IO Profile> vhbas
```

Example

```
root@FabMgrCLI[ofm] show io-profile moe vhbases
-----
parent.name      moe-534d4349000200259013002590138cd8
name             vh1B
sto-cloud-name   discovered-storage-cloud
termination      arkansas/9/1
state            up/up
wwnn             50:01:39:71:00:01:51:1E
wwpn             50:01:39:70:00:01:51:1E
is-ha           false
description
-----
parent.name      moe-534d4349000200259013002590138cd8
name             vh1
sto-cloud-name   discovered-storage-cloud
termination      texas/9/1
state            up/up
wwnn             50:01:39:71:00:00:F1:2B
wwpn             50:01:39:70:00:00:F1:2B
is-ha           false
description
-----
2 records displayed
```

The above example displays all vHBAs associated with the I/O Profile named moe.

Fields

TABLE 7-3 describes the fields displayed with the `show io-profile...vhabases` command.

TABLE 7-3 Fields Displayed Using the `show io-profile...vhabases` Command

Fields	Possible Values	Description
parent.name		The name of the I/O Profile and its parent server.
name		The name of the vHBA for which the following information is displayed.
sto-cloud-name		The name of the Storage Cloud with which the vHBA is associated.
termination		The termination point (FC port) for the vHBA.
state		The administrative state of the vHBA. A state of “up/up” indicates that the vHBA is operating correctly.

TABLE 7-3 Fields Displayed Using the `show io-profile...vshbas` Command (Continued)

Fields	Possible Values	Description
<code>wwnn</code>		The vHBA's world wide network name.
<code>wwpn</code>		The vHBA's world wide port name.
<code>is-ha</code>	<ul style="list-style-type: none">• true• false (default)	Indicates if the vHBA was configured for HA.
<code>description</code>		A description of the vHBA if one was entered when it was created.

I/O Profiles

Syntax

To display information about the I/O Profiles defined in your Oracle Fabric Manager environment and the physical server to which each is connected, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] io-profile <Name of IO Profile>  
server-profile
```

Examples

```
root@FabMgrCLI[ofm] show io-profile
name                daisy-texas
hostname
template
state              disconnected
description
vnics              4
vhbas              3
-----
name                dellblade10-arkansas
hostname            dellblade10.lab.com
template
state              up
description
vnics              8
vhbas              6
-----
name                dellblade13-arkansas
hostname            dellblade13.lab.com
template
state              up
description
vnics              6
vhbas              4
-----
name                dghruij_30-3148344fc0b154801044320044454c4c
hostname
template
state              disconnected
description
vnics              0
vhbas              0
-----
The example above shows the information displayed for all I/O Profiles being
managed by Fabric Manager.
root@FabMgrCLI[ofm] show io-profile vmcto11_12 server-profile
parent.name name                state                chassis-name busy  description
-----
vmcto11_12  vmcto11_12  up/unassigned      arkansas           false  FM-created from
template vmcto
1 record displayed
```

The example above shows the information displayed for an individual I/O Profile's physical server.

Fields

TABLE 7-4 describes the fields displayed with the `show io-profile` command.

TABLE 7-4 Fields Displayed Using the `show io-profile` Command

Fields	Possible Values	Description
name		The name of each configured I/O Profile.
hostname		The name of the server on which the I/O Profile is deployed. If no server name is displayed, the I/O Profile is not connected to any server.
template		The name of the I/O Template (if any) that is linked to the I/O Profile. Note - It is possible to create an I/O Profile and connect it to a server without creating an I/O Template. If no Template name is displayed, then the I/O Profile is not linked to an I/O Template.
state	<ul style="list-style-type: none">• Up, when the I/O Profile is successfully connected to a server or server group.• Connected, when the I/O Profile is connected to a server.• Disconnected (default), when the I/O Profile is not connected to a server.• Partial, when the I/O Profile is not completely connected to a server. This state requires your attention because it usually means that an error has occurred.	Indicates the current state of the listed I/O Profiles.
description		A description of the I/O Profile if one was entered when the profile was created.
vnics		The number of vNICs that are controlled by the I/O Profile.
vhbas		The number of vHBAs that are controlled by the I/O Profile.
Boot Profile		The name of the Boot Profile(s) that are controlled by the I/O Profile.
Default Gateway		The default gateway that is controlled by the I/O Profile.

Removing an I/O Profile

You can remove an I/O Profile from your Oracle Fabric Manager environment at any time as long as it not connected to a physical server. If the I/O Profile is connected to a server, use the `set io-profile...disconnect` command to disconnect it and then use the `remove io-profile` command to delete it from your Oracle Fabric Manager environment.

Removing I/O Profiles

When you delete an I/O Profile, you are completely removing the I/O Profile, its vNICs, and its vHBAs from your environment. Deleting an I/O Profile has no effect on the state of the server itself, so an online server remains up and online running any virtual network or virtual storage connections until another I/O Profile is connected.

Syntax

To delete and I/O Profiles from your Oracle Fabric Manager environment, issue the following command:

```
remove [-noconfirm] io-profile <Name of IO Profile> [-no-confirm]
```

Examples

```
root@FabMgrCLI[ofm] remove io-profile montana
```

The above command deletes the I/O Profile montana from Oracle Fabric Manager.

Working with Physical Servers

This chapter describes how to use the Oracle Fabric Manager CLI (CLI) to configure physical server connections and how to work with server groups using CLI commands. This chapter has the following topics:

- “Physical Server Connections” on page 167s
- “Displaying Physical Server Resource Information” on page 169
- “Displaying Physical Server Resource Information” on page 169
- “Working with Server Groups” on page 178

Physical Server Connections

You can connect physical servers to, or disconnect them from I/O Profiles using the `set physical-server` command as described below.

Connecting a Physical Server

An I/O Profile is contains the definition of your vNICs and vHBAs, but it does not actually provide connectivity until you connect that I/O Profile to a server. If a server is not already connected to an I/O Profile, you can connect it to any I/O Profile in a “disconnected” state. When the I/O Profile is connected to a server, it takes a short time to push the network and storage connectivity to the host. Once established, the I/O Profile transitions from a “disconnected” state to the “up” state. In this state, traffic can flow to and from the server. If the I/O Profile transitions from “disconnected” state to “partial” state, an error has prevented the I/O Profile from completely connecting to the server. This state requires your attention to fix it.

Once connected, the vNICs and vHBAs contained in the I/O Profile are pushed to the host. The `set physical-server...connect` command connects a physical server to an I/O Profile. For more information about creating and working with I/O Profiles, see [Chapter 7](#).

Syntax

To connect a physical server to an I/O Profile, issue the following command:

```
set physical-server <Physical server name> connect <IO Profile name> [-lun=ISCSI/SAN bootable lun] [-iqn=ISCSI IQN Target] [-iqn-ha=ISCSI IQN Target for the Secondary termination (only use for HA VNICs)] [-wwpn=SAN WWPN Target] [-wwpn-ha=SAN WWPN Target for the Secondary termination (only use for HA VHBAs)]
```

Specify the physical server name and I/O Profile name you wish to connect.

Example

```
root@FabMgrCLI[ofm] set physical-server bering connect bering
```

The above example connects the physical server `bering` to the I/O Profile `bering`.

Disconnecting a Physical Server

You can remove an I/O Profile that is already bound to a physical server. When you unbind an I/O Profile, all vNICs and vHBAs that are assigned to the server are completely removed. As a result, traffic no longer moves between the server, the data, and the storage networks to which it is connected. When the I/O Profile is disconnected from a server, that I/O Profile is in the “up/down” state. The server itself remains online, but it is no longer connected to the Oracle Fabric Interconnect at the network level. The server is still physically connected to the Oracle Fabric Interconnect through the cable between server’s HCA and the Oracle Fabric Interconnect.

The `set physical-server...disconnect` command disconnects a physical server from an I/O Profile. For more information on creating and working with I/O Profiles, see [Chapter 7](#).

Syntax

To disconnect a physical server from an I/O Profile, issue the following command:

```
set physical-server <Physical server name> disconnect
```

Specify the physical server name and I/O Profile name you wish to disconnect from each other.

Example

```
root@FabMgrCLI[ofm] set physical-server bering disconnect bering
```

The above example removes the connection between the physical server `bering` and the I/O Profile `bering`.

Displaying Physical Server Resource Information

Physical servers are the host devices on which your applications run. They connect to the Oracle Fabric Interconnect through high-speed interconnect HCAs that are installed in each server. The Oracle Fabric Interconnect and Oracle Fabric Manager support commonly used hypervisors and server types including Oracle Linux, Microsoft Windows, and VMware ESXi. For information about specific operating systems and hypervisors supported, see the Compatibility Matrix.

You can display the following information about a physical server:

- [“General Information” on page 169](#)
- [“vNICs” on page 172](#)
- [“vHBAs” on page 174](#)
- [“Server Groups” on page 176](#)
- [“Statistics” on page 176](#)

General Information

Use the `show physical-server` command to display general information about a specific physical server being managed by Oracle Fabric Manager.

Syntax

To display general information about one or all physical servers, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] physical-server <physical server name> [-detail]
```

Example

```
root@FabMgrCLI[ofm] show physical-server bering
-----
name           bering
os             Linux/2.6.18-238.el5:xg-3.7.1.LX1/x86_64
driver-version 5.3.0/3.0.0
vnics          0
vhbas          0
bound          no
state
template-name
chassis-ports  montana:ServerPort20
-----
1 record displayed
```

The example above displays general information about the physical server `bering`. You can also generate a list of all physical servers being managed by Oracle Fabric Manager by eliminating the server name from the command. The command `show physical-server` provides the same information above for each server in your Oracle Fabric Manager environment.

Fields

[TABLE 8-1](#) describes the fields available with the `show physical-server` command.

TABLE 8-1 Fields Displayed Using the `show physical-server` Command

Fields	Possible Values	Description
<code>name</code>		Indicates the name of the server.
<code>os</code>	<ul style="list-style-type: none">• Linux• Windows• Citrix• VMware	Indicates the hypervisor or host operating system and version currently running on that server.
<code>driver-version</code>		The version of Oracle OVN host driver currently in use on the host server.
<code>vnic</code> s		The number of vNICs that are configured on the physical server.
<code>vhba</code> s		The number of vHBAs that are configured on the physical server.

TABLE 8-1 Fields Displayed Using the `show physical-server` Command (Continued)

Fields	Possible Values	Description
state	<ul style="list-style-type: none"> • Up • Down • Unbound • Initializing • Partial 	The current administrative state of the I/O Profile that is deployed on the physical server.
template-name		The name of the I/O Template bound (if any) to the physical server.
chassis-ports		<p>The port string for the InfiniBand port on which the physical server is connected to the Oracle Fabric Interconnect. The port string consists of the Oracle Fabric Interconnect name, and the Server Port number separated by a colon (:). For example, <code>iowa:ServerPort18</code> indicates that the host server is connected to the Oracle Fabric Interconnect named "iowa" through port 18 on iowa's InfiniBand fabric board.</p> <p>If the host server is connected to multiple Oracle Fabric Interconnects, a port string is displayed for each connection, and the individual port strings are separated by a comma. For example, <code>rhode-island:ServerPort6,alabama:ServerPort10</code> indicates two individual connections—one connection to the Oracle Fabric Interconnect name "rhode-island" and the other connection to the Oracle Fabric Interconnect named "alabama."</p> <p>If the host server is connected through an intervening InfiniBand switch, the switch's GUID is listed in this field. For example, the value <code>ExtSw-2c90200419858-Port20</code> indicates a connection to an intervening IB switch between the host server and the Oracle Fabric Interconnect.</p>

vNICs

When a physical server is bound to an I/O Template, it has virtual connectivity through vNICs, vHBAs, or both. Use the `show physical-server...vnics` command to display information about each vNIC configured for a physical server.

Syntax

To display information about the vNICs configured on a physical server, issue the following command:

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] physical-server <Physical server> vnics
```

Example

```
root@FabMgrCLI[ofm] show physical-server scissors vnics
```

```
-----  
parent.name      scissors  
name             bug20568  
net-cloud-name   discovered-network-cloud  
termination      texas/14/7  
state            up/up  
ip-address       0.0.0.0  
mac-address      00:13:97:01:F0:28  
is-ha            false  
description
```

```
-----  
parent.name      scissors  
name             eth5  
net-cloud-name   discovered-network-cloud  
termination      texas/14/7  
state            up/up  
ip-address       192.168.15.205  
mac-address      00:13:97:01:F0:25  
is-ha            false  
description
```

```
-----  
2 records displayed
```

The example above displays all vNICs associated with the Physical Server named scissors.

Fields

TABLE 8-2 describes the fields available with the `show physical-server... vnics` command.

TABLE 8-2 Fields Displayed Using the `show physical-server ... vnics` Command

Fields	Possible Values	Description
parent.name		Indicates the name of the server for which the vNICs are included.
name		The name of the Ethernet port to which the vNIC is connected.
net-cloud-name		The name of the Network Cloud with which the vNIC is associated.
discovered-network-cloud		The total number of Network Cloud ports known to Oracle Fabric Manager.
termination		The termination point for the vNIC. The termination point is either a port, which is displayed in slot/port notation, or a LAG, which is displayed in slot.port notation.
state		The vNIC's administrative and operational state. A state of "up/up" indicates that the vNIC is operating correctly.
ip-address		The vNIC's IP address.
mac-address		The vNIC's MAC address. This can either be statically assigned, or automatically assigned from the Oracle Fabric Interconnect's pool.
is-ha	<ul style="list-style-type: none">• true• false	Indicates if the vNIC is configured for HA.
description		A description of the vNIC if one was entered when the vNIC was created.

vHBAs

When a physical server is bound to an I/O Template, it has virtual connectivity through vNICs, vHBAs, or both. Use the `show physical-server ... vhbases` command to display information about each vHBA configured for a physical server.

Syntax

To display information about the vHBAs configured on a physical server, issue the following command:

```
show [-table] [-list] [-xml] [-sortBy=Specify column to sort by] physical-server <Physical server> vhbases
```


Example

```
root@FabMgrCLI[ofm] show physical-server scissors vhbases
```

```
-----  
parent.name      shaker35  
name             lun2B  
sto-cloud-name   discovered-storage-cloud  
termination      arkansas/9/1  
state            up/up  
ip-address       50:01:39:71:00:01:51:14  
wwnn             50:01:39:71:00:01:51:14  
wwpn             50:01:39:70:00:01:51:14  
is-ha            false  
description
```

```
-----  
parent.name      bug-shaker35  
name             lun1B  
sto-cloud-name   discovered-storage-cloud  
termination      arkansas/9/1  
state            up/up  
ip-address       50:01:39:71:00:01:51:13  
wwnn             50:01:39:71:00:01:51:13  
wwpn             50:01:39:70:00:01:51:13  
is-ha            false  
description
```

```
-----  
2 records displayed
```

The example above displays all vHBAs associated with the physical server named scissors.

Fields

[TABLE 8-3](#) describes the fields available with the `show physical-server ... vhbases` command.

TABLE 8-3 Fields Displayed Using the `show physical-server ... vhbases` Command

Fields	Possible Values	Description
<code>parent.name</code>		Indicates the name of the server for which the vHBAs are included.
<code>name</code>		The name of the FC port to which the vHBA is connected.
<code>sto-cloud-name</code>		The name of the Storage Cloud with which the vHBA is associated.
<code>termination</code>		The termination point for the vHBA. The termination point is either a port, which is displayed in slot/port notation.
<code>state</code>		The vHBA's administrative and operational state. A state of "up/up" indicates that the vHBA is operating correctly.
<code>wwn-address</code>		The vHBA's world wide network name address.
<code>wwpn-address</code>		The vHBA's world wide port name address. This address can either be statically assigned, or automatically assigned from the Oracle Fabric Interconnect's pool.
<code>is-ha</code>	<ul style="list-style-type: none">• true• false	Indicates if the vHBA is configured for high availability.
<code>description</code>		A description of the vHBA if one was entered when the vNIC was created.

Server Groups

```
show physical-server <Name of Physical Server> server-groups
```

Statistics

You can display the I/O statistics on a physical server using the `physical-server...stats` command. The values displayed also show the unit of measurement. For example, 1G indicates that 1 Gbps is currently in use for inbound (ingress) or outbound (egress) traffic. The Ingress and Egress values can be affected by Network and Storage QoS Profile (if any) assigned to the server.

Syntax

To display information about the server profiles configured for a physical server, issue the following command:

```
show [-table] [-list] [-xml] [-sortby=Specify column to sort by] physical-server <Physical server> stats
```

Example

```
root@FabMgrCLI[ofm] show physical-server jed stats
-----
name                jed
network-ingress    18632.872000
network-egress     984417.184000
storage-ingress    0.000000
storage-egress     0.000000
total-ingress      18632.872000
total-egress       984417.184000
-----
1 record displayed
```

The example above displays real-time statistic information about the physical server named jed.

Fields

[TABLE 8-4](#) describes the fields available with the `show physical-server...stats` command.

TABLE 8-4 Fields Displayed Using the `show physical-server ... stats` Command

Fields	Description
name	The name of the server for which the real-time statistics are being displayed.
network-ingress	The amount of inbound network traffic currently in use on the server.
network-egress	The amount of outbound network traffic currently in use on the server.
storage-ingress	The amount of inbound storage traffic currently in use on the server.

TABLE 8-4 Fields Displayed Using the `show physical-server ... stats` Command (Continued)

Fields	Description
<code>storage-egress</code>	The amount of outbound storage traffic currently in use on the server.
<code>total-ingress</code>	The total amount of inbound (network and storage) traffic currently in use on the server.
<code>total-egress</code>	The total amount of outbound (network and storage) traffic currently in use on the server.

Working with Server Groups

Server groups enable you to use some of Oracle Fabric Manager's features to manage multiple servers at once, instead of managing individual servers. For example, with a server group of three servers you can perform one failover on the entire server group instead of having to failover each server on its own (a total of three failovers).

When you create server groups, you are gathering individual servers in the network and putting them together in a logical construction that acts like a container. All servers in the group are treated as one entity for many configuration and management tasks. For example, assume a server group has 10 servers in it. You can migrate the servers by migrating the server group as a whole, instead of performing 10 migrations, one for each server. Or, you can assign the same I/O Template to all servers within the group so that all servers have an identical configuration.

You can group servers as needed for your network, but it is common to have a unifying theme for the server group. For example, grouping servers by department or business unit, by application type, or by hardware configuration is common.

This section describes:

- [“Creating a Server Group from Selected Servers” on page 178](#)
- [“Displaying Server Groups” on page 179](#)
- [“Removing Server Groups” on page 180](#)

Creating a Server Group from Selected Servers

To create a new server group, you first add it to Oracle Fabric Manager using the `add server-group` command and then you add physical servers to that group using the `set server-group...add` command.

Syntax

To create a new server group and add physical servers to that group, issue the following commands:

```
add server-group <Specify Server Group name> [-description=Specify Description]
```

```
set server-group <Server Group name> add <Physical server>
```

Example

```
root@FabMgrCLI[ofm] add server-group HRserverGroup
root@FabMgrCLI[ofm] set server-group HRserverGroup add bering
root@FabMgrCLI[ofm] set server-group HRserverGroup add scissors
root@FabMgrCLI[ofm] show server-group
name                servers                description
-----
HRserverGroup       scissors,bering
1 record displayed
```

The example above creates the server group called HRserverGroup, adds two servers (bering and scissors) to that group and displays all of the server groups defined to Oracle Fabric Manager.

Displaying Server Groups

With the `show server-group` command you can:

- Display the server groups in which a physical server is a member
- Display the physical servers that are part of a server group

Syntax

To display the server groups in which a physical server is a member, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] physical-server <physical server name> server-group
```

To display the physical servers that are part of a server group, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] server-group <Server Group name>
```

Examples

```
root@FabMgrCLI[ofm] show physical-server bering server-group
parent.name          name          servers      description
-----
bering               HRserverGroup  2
1 record displayed
```

The example above displays the server group (HRserverGroup) to which the physical server bering belongs.

```
root@FabMgrCLI[ofm] show server-group HRserverGroup
name          servers      description
-----
HRserverGroup  scissors,bering
1 record displayed
```

The above example displays the physical servers that are part of the server group HRserverGroup.

Removing Server Groups

To remove a physical server from server group, use the `set server-group . . . remove` command.

Syntax

To remove a physical server from a server group, issue the following commands:

```
set server-group <Server Group name> remove <Physical server>
```

Example

```
root@FabMgrCLI[ofm] set server-group HRserverGroup remove scissors
```

The example above removes the physical server scissors from the server group HRserverGroup.

Removing Virtual I/O Resources from Server Groups

You can remove all virtual I/O resources from server group using the `set server-group...unbind` command.

Syntax

To remove all virtual I/O resources from a server group, issue the following commands:

```
set server-group <Server Group name> unbind <Physical server>
```

Example

```
root@FabMgrCLI[ofm] set server-group HRserverGroup unbind
```

The example above removes the virtual resources from the server group HRserverGroup.

Removing Server Groups

You can remove a server group from Oracle Fabric Manager using the `remove server-group` command.

Syntax

To remove all virtual I/O resources from a server group, issue the following commands:

```
remove [-noconfirm] server-group <Server Group name>
```

Example

```
root@FabMgrCLI[ofm] remove server-group HRserverGroup
```

The example above removes the server group HRserverGroup.

Working with Boot Profiles

This chapter provides instructions for defining SAN and iSCSI Boot Profiles using the CLI. This chapter has the following topics:

- “Understanding and Working with SAN Boot Profiles” on page 183
- “Understanding and Working with iSCSI Boot Profiles” on page 190

Understanding and Working with SAN Boot Profiles

SAN Boot enables you to boot a server or virtual machine from a SAN disk accessed through a vHBA. The disk is identified by a target World Wide Port Name (WWPN) and Logical Unit Number (LUN) ID on a storage disk array as shown in [FIGURE 9-1](#).

FIGURE 9-1 SAN Boot Topology

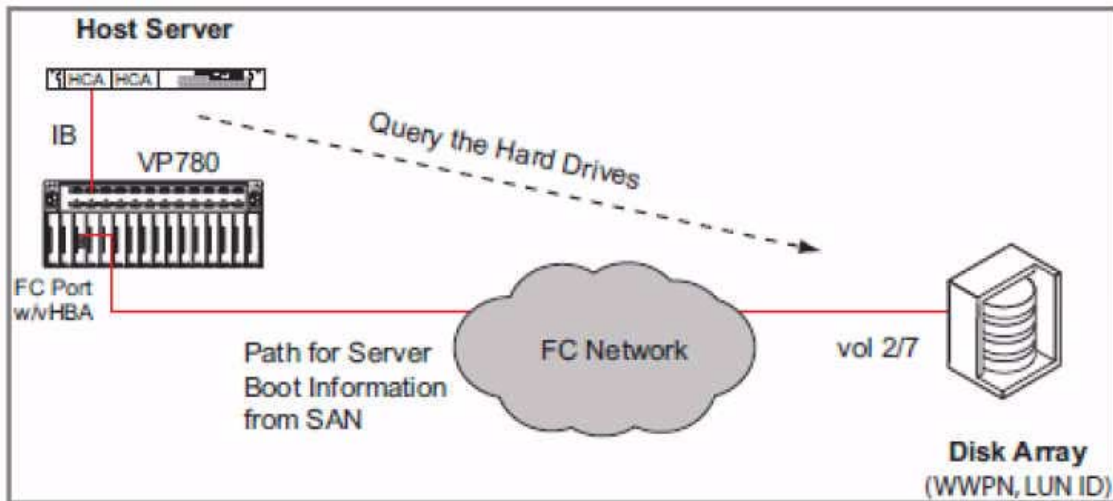


Figure 1 SAN Boot Topology

All computers boot from local boot devices. However to boot from a “remote” device, you need to make the device appear to be local. Oracle’s ROM BIOS extensions for HCA cards perform the following boot-sequence:

1. On power up, the server’s BIOS initializes the necessary hardware.
2. The host server establishes a connection to the Oracle Fabric Interconnect, where the system determines which vHBA to use and how to set up the communication path from the host server to the hard disk in the storage array.
3. The BIOS reads the boot sequence, where the Oracle HCA is the first boot device (highest priority) in the list.

Note – Ensure that the Oracle HCA is moved up from the “Excluded from boot order” list into the “Boot priority order” list. The HCA card appears as a generic “PCI SCSI” device.

1. The OS Loader is installed, which is specific to each OS:

For Linux, the loader is GRand Unified Bootloader (GRUB). This loader resides in the boot sector of a bootable disk. The software responsible for loading the GRUB loader is held in the Option ROM of the HCA and runs in the context of the BIOS.

When the loader runs, it typically reads a configuration file from the disk and allows the user to boot the operating system in a number of configurations. For GRUB, this file is called `grub.conf`.

For Linux, GRUB will load the kernel and `initrd` into memory and begin running the kernel. The root file system (`rootfs`) given to the kernel will be the `initrd`. An initial RAM disk (`initrd`) is a compressed CPIO image (or compressed ext2 image for older kernels).

The kernel runs a program in the `initrd` in the location `/init`. Typically this program is a shell script that loads the kernel modules and mounts the real root file system.

2. BIOS interrogates the hard disk to determine if it is present and if the disk is bootable (or not). If the hard disk is bootable, the Oracle HCA functions as a hard-disk controller. BIOS begins to treat the Oracle HCA as the local ID controller for the local hard disk.
3. The data (Linux kernel) is sent from the hard disk and loaded into memory. The kernel begins to work and loads all the necessary drivers into the host server. Additional information about preparing the host server for SAN Booting over an Oracle vHBA is available through the Remote Booting Guide.

Creating a SAN Boot Profile

When the physical server has been installed with an Oracle HCA with the SAN Boot Option ROM, SAN Boot requires a vHBA and a SAN Boot Profile to support server boot up from SAN disk. In addition, through Oracle Fabric Manager you will need to create a Preboot Server Profile if the server has never been booted up with Oracle's OVN host drivers installed and connected to the Oracle Fabric Interconnect—for example, a bare metal install.

As part of creating a SAN Boot Profile, you specify the root file system through a LUN on a target. The SAN Boot Profile supports different ways of mounting the root file system:

- **direct**, which allows you to specify a device name for the LUN that contains the boot image and the root file system, and always use that device name. Otherwise, when devices are discovered you cannot guarantee that the SAN boot device is used consistently.
- **static**, which allows you to manually specify the location of the SAN boot information and configure SAN booting on the host server.
- **logical volume manager**, which allows you to specify a group and volume that contain the root file system.

Be aware that the boot image must be entirely contained within one LUN. The boot image file cannot be striped across multiple LUNs. The root file system must also be entirely contained within one LUN.

Syntax

When you configure a SAN Boot vHBA, the vHBA supports both the SAN Boot and the vHBA functionality. To create a SAN Boot Profile, issue the following command.

```
add san-boot-profile <Specify a SAN profile> [-description=Specify Description]
[-mount-type=Specify Mount type] [-mount-device=Specify Device name] [-group-name=Specify
Group name] [-volume-name=Specify Volume name]
```

To change the properties of a SAN Boot Profile, you can issue the following command:

```
set san-boot-profile <SAN profile name> [-description=Specify Description] [-mount-type=
Specify Mount type] [-mount-device=Specify Device name] [-group-name=Specify Group name]
[-volume-name=Specify Volume name]
```

Example

```
root@FabMgrCLI[ofm] add san-boot-profile sanboot_2 -mount-type=lvm -group-name=
VolGroup00 -volume-name=LogVol100
```

The example above creates a new logical volume manager SAN Boot Profile named `sanboot_2`. The name of the server's boot device that will receive the SAN boot information (kernel and `initrd`) off the SAN is `VolGroup00` and `LogVol100` is the name of the volume on which the SAN Boot information will be located.

Fields

TABLE 9-1 describes the fields available with the `add` and `create san-host-profile` commands.

TABLE 9-1 Fields Specified Using the `add` and `create san-host-profile` Commands

Fields	Possible Values	Description
<code>name</code>		Specify the name of the new SAN Boot Profile or existing SAN Boot Profile that you are adding or changing. The name can be an alphanumeric character string, and typically relates to the server(s) that use the SAN Boot Profile—for example, LinuxFinance for all the Linux servers in the Finance server group.
<code>-description</code>		Specify a description of the SAN Boot Profile.
<code>-mount-type</code>	<ul style="list-style-type: none">• <code>static</code>• <code>lvm</code>• <code>direct</code>	Specify the mount type, which can be static, logical volume manager, or direct attached.
<code>-mount device</code>		If the mount type is direct, enter the name of the server’s boot device that will receive the SAN Boot information (kernel and initrd) from the SAN.
<code>-group-name</code>		If you are creating a logical volume manager SAN Boot Profile, specify the name of the server’s boot device that will receive the SAN boot information (kernel and initrd) off the SAN.
<code>-volume-name</code>		If you are creating a logical volume manager SAN Boot Profile, specify the name of the volume on which the SAN Boot information is located.

Displaying SAN Boot Profile Details

You can display information about all of the SAN Boot Profiles defined in your Oracle Fabric Manager environment, or for a single profile using the `show san-boot-profile` command.

Syntax

To display SAN Boot Profile information, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] san-boot-profile <SAN boot profile name>
```

Example

```
root@FabMgrCLI[ofm] show san-boot-profile
-----
name                sanboot_1
mount-type          lvm
group-name          VolGrop00
volume-name         LogVol100
mount-device
iocloud-reference
iotemplates         0
description
-----
name                sanboot_2
mount-type          lvm
group-name          VolGroup00
volume-name         LogVol100
mount-device
iocloud-reference
iotemplates         0
description
-----
name                sanboot_3
mount-type          static
group-name
volume-name
mount-device
iocloud-reference
iotemplates         0
description
-----
3 records displayed
```

The above example lists information for all SAN Profile defined in the environment. To display information for only one profile, specify the profile name in the command (for example, `show san-boot-profile sanboot_3`).

Fields

[TABLE 9-2](#) describes the fields displayed with the `show san-boot-profile` command.

TABLE 9-2 Fields Displayed Using the `show san-boot-profile` Command

Fields	Possible Values	Description
<code>name</code>		The name of the SAN Boot Profile for which the information is being displayed.
<code>mount-type</code>	<ul style="list-style-type: none">• <code>static</code>• <code>lvm</code>• <code>direct</code>	The SAN Boot Profile's mount type, which can be static, logical volume manager, or direct attached.
<code>group-name</code>		For a logical volume manager SAN Boot Profile, this is the name of the server's boot device that receives the SAN boot information (kernel and initrd) off the SAN.
<code>volume-name</code>		For a logical volume manager SAN Boot Profile, this is the name of the volume on which the SAN Boot information is located.
<code>mount-device</code>		If the mount type is direct, this is the name of the server's boot device that receives the SAN Boot information (kernel and initrd) from the SAN.
<code>iocloud-reference</code>		If this is a dual path bootable I/O Template (provides two paths to the same LUN so that a single point of failure through the Oracle Fabric Interconnect's fabric is eliminated), this is the name of the Storage Cloud that terminates the vHBA on a FC port.
<code>iotemplates</code>		The number of associated I/O Templates providing the vHBA that connects to the LUN in the SAN where the server's boot information resides (kernel, boot image, and so on).
<code>description</code>		A description of the SAN Boot Profile if one was entered when the profile was created.

Deleting a SAN Boot Profile

You can delete a SAN Boot Profile from your Oracle Fabric Manager environment using the `remove san-boot-profile` command.

Syntax

To remove a SAN Boot Profile, issue the following command:

```
remove [-noconfirm] san-boot-profile <SAN boot profile name>
```

Example

```
root@FabMgrCLI[ofm] remove san-boot-profile sanboot_1
```

The example above removes the SAN Boot Profile `sanboot_1` from the Oracle Fabric Manager environment.

Understanding and Working with iSCSI Boot Profiles

The Oracle Fabric Interconnect supports booting a Linux server over a vNIC using an iSCSI connection. [FIGURE 9-2](#) illustrates the topology used to achieve iSCSI booting.

FIGURE 9-2 Linux Server iSCSI Boot Topology

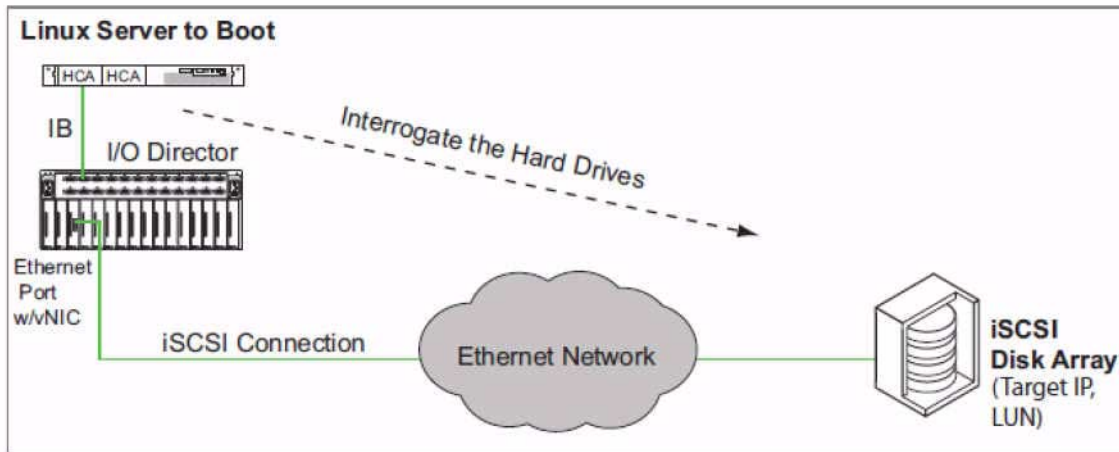


Figure 3 Linux Server iSCSI Boot Topology

[TABLE 9-3](#) lists some terminology specific to iSCSI booting.

TABLE 9-3 iSCSI Boot Terms

Term	Definition
initiator	The host server that is booting over an iSCSI connection
target	The iSCSI array
IQN	An iSCSI qualified name of an initiator or target
target IP	The IP address of the target filer or array

When configuring iSCSI boot, you perform the same general steps as for any remote booting setup:

1. Install the SAN volume with the necessary bits.

Note – iSCSI boot uses the same initrd that Linux SAN Boot uses. You cannot use the supported Linux installers over iSCSI. You can find additional affirmation about patching the Anaconda installer and installing the boot disk in the Remote Booting Guide’s “iSCSI Booting” chapter.

Alternatively, you can install over FC to the disk and then have your server boot over iSCSI. The iSCSI install options require a temporary FC or Ethernet connection to the volume.

-
2. Configure the Oracle Fabric Interconnect with the required virtual I/O resources. Create a vNIC and server profile, using either DHCP or static addressing.
 3. Configure the host server with drivers and firmware to enable remote boot to occur.

To configure iSCSI booting, you will need:

- the Server GUID.
- the LUN from which the server will be booting. This is the LUN where the server’s boot information is located on the iSCSI storage array. The Oracle vNIC must be connected to this LUN to provide a path for the boot information to reach the server on which the vNIC is deployed.
- the target IQN (T-IQN), which you can get by logging into the storage.
- the initiator IQN (I-IQN), which you can get by displaying the vNIC properties. On the Oracle Fabric Interconnect, you can get this information by issuing the `show server-profile <profile-name> iscsi-boot -detail` command. The `-detail` qualifier is required to display the I-IQN.

Creating and Changing an iSCSI Boot Profile

Creating an iSCSI Boot Profile enables the host server to access its boot information over a boot capable vNIC that connects the server to its boot information. The iSCSI boot information is supported on the server through an Oracle HCA and option ROM, which must be present in the host server that will boot over an iSCSI connection. If the Oracle HCA and option ROM are not yet installed, you should install them now.

When you create an iSCSI Boot Profile, you enter the necessary information for booting the server over a vNIC that connects to its boot information on storage. However, the bootable vNIC that connects the server to the network is not configured as part of creating an iSCSI Boot Profile. The profile must be connected to an I/O Template that contains a valid bootable vNIC for iSCSI booting. For information about creating an I/O Template, see [Chapter 6](#).

As part of creating an iSCSI Boot Profile, you specify the root file system through a LUN on a target. The iSCSI Boot Profile three ways of mounting the root file system:

- **direct**, which allows you to specify a device name for the LUN that contains the boot image and the root file system, and always uses that device name. Otherwise, when devices are discovered you cannot guarantee that the SAN boot device is used consistently.
- **static**, which allows you to manually specify the location of the SAN boot information and configure SAN booting on the host server.
- **logical volume manager**, which allows you to specify a group and volume that contain the root file system.

Be aware that the boot image must be entirely contained within one LUN. The boot image file cannot be striped across multiple LUNs. The root file system must also be entirely contained within one LUN. You also must specify the target IP Address Group, which is the IP address of the target filer or array.

When you configure an iSCSI Boot vNIC, the vNIC supports both iSCSI Boot and standard virtual I/O functionality.

Syntax

To create an iSCSI Boot Profile, issue the following command:

```
add iscsi-boot-profile <Specify a iSCSI boot profile> <Specify Target address> [-target-portal-group=Specify Target portal group] [-protocol=Specify Protocol Id. Default='6'] [-port=Specify Port Id. Default='3260'] [-description=Specify Description] [-mount-type=Specify Mount type] [-mount-device=Specify Device name] [-group-name=Specify Group name] [-volume-name=Specify Volume name]
```

To change the properties of an iSCSI Boot Profile, you can issue the following command:

```
set iscsi-boot-profile <iSCSI boot profile name> [-description=Specify Description]
[-target-address=Specify Target address] [-target-portal-group=Specify Target portal group]
[-protocol=Specify Protocol Id. Default='6'] [-port=Specify Port Id. Default='3260'] [-mount-type=
Specify Mount type] [-mount-device=Specify Device name] [-group-name=Specify Group name]
[-volume-name=Specify Volume name]
```

Example

```
root@FabMgrCLI[ofm] set iscsi-boot-profile iscsiboot_3 -target-address=
172.16.1.2 mount-type=direct
```

The above example sets IP address of the iSCSI Boot Profile `iscsiboot_3` and defines its mount type as `direct`.

Fields

TABLE 9-4 describes the fields you specify with the `add` and `set iscsi-boot-profile` commands.

TABLE 9-4 Fields Displayed Using the `add` and `set iscsi-boot-profile` Commands

Fields	Possible Values	Description
<code>name</code>		Specify an alphanumeric character string that will name the iSCSI Boot Profile that you are creating.
<code>-target-address</code>		Specify the IP Address group for the filer or array that contains the server's iSCSI Boot information.
<code>-target-portal-group</code>		Specify the IP address for the iSCSI Portal Group. Depending on your iSCSI storage array, this field might not be required.
<code>-protocol</code>	Default=6	Specify the number of the protocol that will support the iSCSI communication. This field is populated with the default value 6, but you can change the communication protocol number if you need to.
<code>-port</code>	Default=3260	Specify the port number that will support the iSCSI communication between the server and the location of the server's iSCSI Boot information. This field is populated with the default value 3260, but you can change the communication port number if you need to.

TABLE 9-4 Fields Displayed Using the `add` and `set iscsi-boot-profile` Commands (Continued)

Fields	Possible Values	Description
<code>-description</code>		As an option, you can enter an alphanumeric character string that describes the iSCSI Boot Profile that you are creating or changing.
<code>-mount-type</code>	<ul style="list-style-type: none">• <code>static</code>• <code>lvm</code>• <code>direct</code>	Specify the mount type, which can be static, logical volume manager, or direct attached.
<code>-mount-device</code>		If you are creating or changing a direct attached iSCSI Boot Profile, specify the name of the server's boot device that will receive the iSCSI boot information.
<code>-group-name</code>		If you are creating or changing a logical volume manager iSCSI Boot Profile, specify the name of the Volume Group that contains the volume where the server's iSCSI Boot information is located.
<code>-volume-name</code>		If you are creating or changing a logical volume manager iSCSI Boot Profile, specify the name of the volume on which the server's iSCSI Boot information is located.

Displaying an iSCSI Boot Profile

You can display information about all of the iSCSI Boot Profiles defined in your Oracle Fabric Manager environment, or for a single profile using the `show iscsi-boot-profile` command.

Syntax

To display iSCSI Boot Profile information, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] iscsi-boot-profile <SAN boot profile name>
```

Example

```
root@FabMgrCLI[ofm] show iscsi-boot-profile
```

```
-----  
name                iscsiboot_1  
target-address      192.168.8.108  
target-portal-group  
port                3260  
protocol            6  
mount-type          direct  
group-name  
volume-name  
mount-device  
iocloud-reference  
iotemplates        0  
description  
-----
```

```
name                iscsiboot_2  
target-address      1.1.2.4  
target-portal-group  
port                3260  
protocol            6  
mount-type          direct  
group-name  
volume-name  
mount-device  
iocloud-reference  
iotemplates        0  
description  
-----
```

```
name                iscsiboot_3  
target-address      172.16.1.2  
target-portal-group  
port                3260  
protocol            6  
mount-type          direct  
group-name  
volume-name  
mount-device  
iocloud-reference  
iotemplates        0  
description  
-----
```

```
3 records displayed
```

Fields

TABLE 9-5 describes the fields displayed with the `add` and `set iscsi-boot-profile` commands.

TABLE 9-5 Fields Displayed Using the `add` and `set iscsi-boot-profile` Commands

Fields	Possible Values	Description
<code>name</code>		The name of the iSCSI Boot Profile.
<code>-target-address</code>		The IP Address of the filer or array that contains the server's iSCSI Boot information.
<code>-target-portal-group</code>		Specify the IP address for the iSCSI Portal Group. Depending on your iSCSI storage array, this field might not be required.
<code>-port</code>	Default=3260	The port number that supports the iSCSI communication between the server and the location of the server's iSCSI Boot information. The default value is 3260.
<code>-protocol</code>	Default=6	The protocol number used for communication between the server and the target containing its iSCSI boot information. The default value is 6.
<code>-mount-type</code>	<ul style="list-style-type: none"> • static • lvm • direct 	The type of mount configured on the iSCSI Boot vNIC.
<code>-group-name</code>		The logical volume manager (LVM) group name. If the mount type is LVM, this field displays the group name.
<code>-volume-name</code>		The name of the logical volume that LVM uses for the root file system mount point.
<code>-mount-device</code>		The name of the device that contains the root file system mount point for the iSCSI Boot Profile.
<code>iocloud-reference</code>		If this is a dual path bootable I/O Template (provides two paths to the same LUN so that a single point of failure through the Oracle Fabric Interconnect's fabric is eliminated), this is the name of the Network Cloud that terminates the vNIC on an Ethernet port.
<code>iotemplates</code>		The number of associated I/O Templates providing the vHBA that connects the LUN in the SAN where the server's boot information (kernel, boot image, and so on).
<code>-description</code>		As an option, you can enter an alphanumeric character string that describes the iSCSI Boot Profile that you are creating or changing.

Deleting an iSCSI Boot Profile

You can delete an iSCSI Boot Profile from your Oracle Fabric Manager environment using the `remove iscsi-profile` command.

Syntax

To remove a iSCSI Boot Profile, issue the following command:

```
remove [-noconfirm] iscsi-boot-profile <iSCSI boot profile name>
```

Example

```
root@FabMgrCLI[ofm] remove iscsi-boot-profile iscsiboot_3
```

The example above removes the iSCSI Boot Profile `iscsiboot_3` from the Oracle Fabric Manager environment.

Oracle Fabric Manager CLI Quick Reference

This chapter is a quick reference of all the commands in the Oracle Fabric Manager CLI. Click the link below to display a table of commands related to the topic:

- [“Role Group Mapping” on page 200](#)
- [“Domain Group Mapping” on page 202](#)
- [“PVI Cloud” on page 203](#)
- [“Applications” on page 205](#)
- [“Network Clouds” on page 207](#)
- [“Storage Clouds” on page 211](#)
- [“I/O Templates” on page 214](#)
- [“I/O Profiles” on page 220](#)
- [“Physical Servers” on page 223](#)
- [“Global Address” on page 226](#)
- [“System Commands for the Oracle Fabric Interconnect or Oracle Fabric Manager” on page 227](#)
- [“System Information and Tech Support” on page 228](#)
- [“Jobs” on page 228](#)
- [“Network Connectivity \(ping, traceroute\)” on page 231](#)
- [“Oracle Fabric Interconnects” on page 232](#)
- [“vNICs” on page 234](#)
- [“vHBAs” on page 238](#)
- [“Server Groups” on page 241](#)
- [“Ethernet LAGs” on page 242](#)
- [“Default Gateways” on page 244](#)
- [“Network Quality of Service \(QoS\)” on page 245](#)

- “Storage Quality of Service (QoS)” on page 246
 - “MAC-Based Quality of Service” on page 247
 - “Boot Profiles” on page 248
 - “User Role” on page 252
 - “Resource Domain” on page 253
 - “CLI Properties” on page 255
 - “World Wide Names and MAC addresses” on page 257
 - “LUN Masks” on page 259
 - “Oracle SDN Controllers” on page 261
 - “Plugins” on page 262
-

Role Group Mapping

Role groups provide the permissions for the objects to which a user can access—configure, change, or manage. The default role group is “operator,” which is the most restrictive (read-only). If there are many roles with similar functions, you can use regular expressions to define that role group

Command	Arguments	Description
add role-group-mapping	<Name of mapping> <Regular expression for group> <Roles to map>	Create a role group mapping on the Oracle Fabric Interconnect Example: add role-group-mapping TechnicalSupport Technical* administrator
remove role-group-mapping	<Name of mapping>	Remove a role group mapping from the Oracle Fabric Interconnect Example: remove role-group-mapping TechnicalSupport
set role-group-mapping	<Name of mapping> [-group=Regular expression for group] [-roles=Roles to map] [-description=Description]	Assign the group mapping and its role Example: set role-group-mapping TechnicalSupport -group= technical* -role= administrator -description= Support users requiring admin access
show role-group-mapping	[-xml] [-list] [-table] [-sortby=Sort column] <Name of mapping>	Display the role group mapping to verify that you added it correctly Example: show role-group-mapping - list -sort='Security Role' Technical*
set role-group-record	<Name of record> <-group=Regular expression for group> <-roles=Roles to map> <-description=string>	Sets roles and/or an optional description for a named role group.

Example Output

```
root@FabMgrCLI[ofm] show role-group-mapping
-----
displayed-name HumanResourcesMapping
group-names    HumanResourceGroup
roles          network,storage
description    Access to all human resources networks and storage
-----
1 record displayed
```

See also: [Chapter 3](#)

Domain Group Mapping

Domain groups define which Oracle Fabric Manager domains a user is able to access, ultimately enabling them access to the resources mapped to that domain. The Domain Group Mapping command supports linking one or more groups in an external IMS to one or more specific Oracle Fabric Manager domains. If there are many domains to which a user should have access, you can use regular expressions to define that domain group.

Command	Arguments	Description
add domain-group-mapping	<i><Name of mapping></i> <i><Regular expression for group></i> <i><Resource domain name></i>	Create a domain group mapping on the Oracle Fabric Interconnect Example: add domain-group-mapping StorageAdmin Storage* StorageCloud

Command	Arguments	Description
remove domain-group-mapping	<Name of mapping>	Remove a domain group mapping from the Oracle Fabric Interconnect Example: remove domain-group-mapping StorageAdmin
set domain-group-mapping	<Name of mapping> [-group= <i>Regular expression for group</i>] [-domain= <i>Resource domain name</i>] [-description= <i>Description</i>]	Assign the group mapping and its role Example: set domain-group-mapping StorageAdmin Storage* StorageCloud
show domain-group-mapping	[-xml] [-list] [-table] [-sortby= <i>Sort column</i>] <Name of mapping>	Display the domain group mapping to verify that you added it correctly Example: show domain-group-mapping

Example Output

```

root@FabMgrCLI[ofm] show domain-group-mapping
displayed-name  group-names  domain  description
-----
MedicalData    Medical      default  domain for all medical information
1 record displayed

```

See also: [Chapter 3](#)

PVI Cloud

A PVI requires a Fabric name. You create a Fabric when you connect an Oracle Fabric Interconnect to switches and/or servers with InfiniBand cables. If you connect two Oracle Fabric Interconnects using InfiniBand cables, the two subnets become one subnet, or one fabric. When you make a PVI cloud on that Fabric, any communication on that cloud between the two servers connected through InfiniBand occurs at InfiniBand speeds (such as 20-40GB/s).

This command enables you to add, remove, manage, and list Private Virtual Interconnect (PVI) clouds.

Command	Arguments	Description
add pvi-cloud	<pvi-cloud name> <Fabric name> [-mtu=Private Virtual Interconnect mtu]	Create a private virtual interconnect for a maximum transmission unit (MTU) within the specified fabric. Example: add pvi-cloud pviCloud9
remove pvi-cloud	<pvi-cloud name>	Removes a PVI from your fabric Example: remove pvi-cloud pviCloud9
set pvi-cloud	<pvi-cloud name> up [or] down	Enables a new PVI Cloud or disables an existing one Example: set pvi-cloud pviCloud9 up
set pvi-cloud	<PVI name> [-mtu=Private Virtual Interconnect MTU] [-description=Private Virtual Interconnect Description]	Specifies an MTU, a new name, or a description for a PVI Cloud Example: set pvi-cloud pviCloud9 -mtu=9000 -description=PrivateCloud9
show pvi-cloud vnics	<PVI name> vnics [-xml] [-list] [-table] [-sortby=Sort column]	Lists the vNICs available to the PVI Cloud Example: show pvi-cloud pviCloud9 vnics

Example Output

```
root@FabMgrCLI[ofm] show pvi-cloud
-----
name          pviCloud9
state         up/up
network-id    64896
mtu           9000
fabric        fabric_5514059420008609
description   PrivateCloud9
vnics         0
-----
name          XSF1
state         up/up
network-id    39852
mtu           9000
fabric        fabric_5514059420008609
description
vnics         0
-----
2 records displayed
```

See also: [Appendix C](#)

Applications

These command enable you to add applications to, and remove them from, Oracle Fabric Manager management.

Command	Arguments	Description
add app	<Name of app> [-zipfile=App ZIP file name] [-location=Location of ZIP file]	Adds an application to Oracle Fabric Manager Example: add app Fabric Monitor - zipfile=perfman.zip -location=/ofm/apps
remove app	<Name of app>	Removes an application from Oracle Fabric Manager control Example: remove app Fabric Monitor
set app	<Name of app> [-description=Description]	Enables an application within Oracle Fabric Manager Example: set app -description=This application shows the performance of your Oracle Fabric Manager environment.
show app	[-xml] [-list] [-table] [-sortby=Sort column] <Name of app>	Displays the applications managed by Oracle Fabric Manager. Example: show app

Example Output

```

root@FabMgrCLI[ofm] show app ofmperfmgr
-----
displayed-name      ofmperfmgr
version             1.0
index-url           pm.jsf
plugin-loader-class
rest-base           ofmperfmgr
plugin-state        active
contact-info        support@oracle.com
description
-----
1 record displayed

```

See also: [Appendix A](#)

Network Clouds

Oracle Fabric Interconnects contain a set of I/O ports that are connected to your data center network. The network and SAN administrator connect these ports to their Ethernet switches in order to provide I/O resources to the servers. Each I/O port on the Oracle Fabric Interconnect system provides access to a set of “clouds”. For example, you might have a Network Cloud that provides access to the HR network. As far as the network administrator is concerned, you are connecting wires to the Oracle Fabric Interconnect’s I/O ports for the sole purpose of providing the server administrator access to the resources.

The server administrator then connects servers to a set of network resources provided by the network administrators. The server administrator doesn’t care what physical Oracle Fabric Interconnect ports are being connected to as long as the servers have access to the required resources. Network Clouds can be configured and managed by Network and Administrator roles in Oracle Fabric Manager.

The commands in this section enable you to add, remove, configure, and display Network Clouds.

Command	Arguments	Description
add network-cloud	<Specify Network cloud name> [-description=Specify Network cloud description] [-qos=Specify Network cloud QOS] [-trunk-mode=Enable trunk-mode?] [-access-vlan-id=Specify Access VLAN-Id] [-private=Is this private. Default='false']	Add a network cloud to your environment that will provide network resources to users. Oracle Fabric Interconnects contain a set of I/O ports that are connected to your data center network. The network and SAN administrator connect these ports to their Ethernet switches. You assign network resources to an Oracle Fabric Manager Network Cloud. Example: add network-cloud Cloud9
remove network-cloud	<Network cloud name>	Deletes the named Network Cloud from your environment Example: remove network-cloud Cloud9
set network-cloud	<Specify Network cloud name> [-description=Specify Network cloud description] [-qos=Specify Network cloud QOS] [-trunk-mode=Enable trunk-mode?] [-access-vlan-id=Specify Access VLAN-Id] [-private=Is this private. Default='false'] add ethernet-ports <Specify Ethernet ports or lags>	Assign network characteristics (a QoS Profile, trunk mode, VLAN ID, or Ethernet Port) to your Network Cloud Example: set network-cloud Cloud9 -qos=123 or set network-cloud Cloud9 add ethernet-port montana/5/3

Command	Arguments	Description
set network-cloud	<Specify Network cloud name> [-description=Specify Network cloud description] [-qos=Specify Network cloud QOS] [-trunk-mode=Enable trunk-mode?] [-access-vlan-id=Specify Access VLAN-Id] [-private=Is this private. Default='false'] remove ethernet-ports <Specify Ethernet ports or lags>	Removes an Ethernet port from a Network Cloud Example: set network-cloud Cloud9 remove montana/5/3
set network-cloud	<Specify Network cloud name> [-description=Specify Network cloud description] [-qos=Specify Network cloud QOS] [-trunk-mode=Enable trunk-mode?] [-access-vlan-id=Specify Access VLAN-Id] [-private=Is this private. Default='false'] remove reserved-mac-ids <Specify the Director> <Specify the MAC address>	Removes a MAC ID from a Network Cloud Example: set network-cloud Cloud9 remove reserved-mac-ids montana 00:13:97:05:70:00/12
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] network-cloud <Network cloud name> ethernet-ports	Displays the Ethernet ports on a Network Cloud Example: show network-cloud Cloud9 ethernet-ports

Example Output 1

```
root@FabMgrCLI[ofm] add network-cloud Cloud9
root@FabMgrCLI[ofm] set network-cloud Cloud9 add ethernet-ports montana/5/3
root@FabMgrCLI[ofm] show network-cloud Cloud9
-----
name                Cloud9
ports               1
lags                0
trunk-mode          false
qos
is-private          false
access-vlan-id      1
available-ingress-cir 0
available-egress-cir 0
allocation-policy   random
description
-----
1 record displayed
```

Example Output 2

```
root@FabMgrCLI[ofm] show network-cloud Cloud9 ethernet-ports-lags
-----
parent.name         Cloud9
eth-port            montana/5/3
state               up/up
vnic-count          0
type                nwEthernet1GbPort
available-ingress-cir 1000000
available-egress-cir 1000000
description
-----
1 record displayed
```

See also: [Chapter 4](#)

Storage Clouds

Oracle Fabric Interconnects contain a set of I/O ports that are connected to your data center SAN. The SAN administrator connects these ports to their Fibre Channel switches in order to provide I/O resources to the servers. Each I/O port on the Oracle Fabric Interconnect can be thought of as providing access to a set of “clouds”. For example, you might have a Storage Cloud that is zoned to give access to a set of LUNs used by HR. As far as the storage administrator is concerned, you are connecting wires to the Oracle Fabric Interconnect’s I/O ports for the sole purpose of providing the server administrator access to the resources.

The server administrator then connects the servers to a set of storage resources provided by the storage administrators. The server administrator doesn’t care what physical ports are being connected to as long as the servers have access to the required resources. Storage Clouds can be configured and managed by Storage and Administrator roles.

The commands in this section enable you to add, remove, configure, and display Storage Clouds.

Command	Arguments	Description
add storage-cloud	<Specify Storage cloud name> [-description=Specify Storage cloud description] [-qos=Specify Storage cloud QOS]	Add a Storage Cloud to your environment that will provide storage resources to users. Oracle Fabric Interconnects contain a set of I/O ports that are connected to your data center network. The network and SAN administrator connect these ports to their Fibre Channel switches. You assign storage resources to an Oracle Fabric Manager Storage Cloud. Example: add storage-cloud S_Cloud0
set storage-cloud	<Specify Storage cloud name> [-description=Specify Storage cloud description] [-qos=Specify Storage cloud QOS] [-lun-mask=Specify Storage cloud profile] add fc-ports <Specify FC port>	Adds Fibre Channel ports to a Storage Cloud Example: set storage-cloud S_Cloud0 add fc-ports montana/6/2
set storage-cloud	<Specify Storage cloud name> [-description=Specify Storage cloud description] [-qos=Specify Storage cloud QOS] [-lun-mask=Specify Storage cloud profile] add reserved-wwn-ids <Specify a Director> [-wwn-id-count=Enter Number of WWN IDs you want to reserve (1 to 4095). Also use the option 'start-index' to specify start WWN ID to reserve.] [-start-index=Enter the Start index of WWN IDs that you want to reserve (MAC ID is 3 hex digits). Also use the option 'wwn-id-count' to mention the number of WWN IDs to reserve] [-wwn-ids-list=Enter multiple WWN IDs separated by commas]	Reserves World Wide Names for your Storage Cloud Example: set storage-cloud S_Cloud0 wwn-ids-list=50:01:39:70:00:04:70:00/12
set storage-cloud	<Specify Storage cloud name> [-description=Specify Storage cloud description] [-qos=Specify Storage cloud QOS] [-lun-mask=Specify Storage cloud profile] remove fc-ports <Specify FC port>	Removes a Fibre Channel port from the named Storage Cloud. Example: set storage-cloud S_Cloud0 remove fc-ports montana/6/2

Command	Arguments	Description
set storage-cloud	<Specify Storage cloud name> [-description=Specify Storage cloud description] [-qos=Specify Storage cloud QOS] [-lun-mask=Specify Storage cloud profile] remove reserved-wwn-ids <Specify the Director> <Specify the WWN address>	Removes a reserved world wide name(s) from the named Storage Cloud. Example: set storage-cloud S_Cloud0 remove reserved-wwn-ids list=50:01:39:70:00:04:70:00/12
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] storage-cloud <Storage cloud name> fc-ports	Display the Fibre Channel ports associated with the named Storage Cloud. Example: show storage-cloud S_Cloud0 fc-ports
remove storage-cloud	<Storage cloud name>	Removes a Storage Cloud from the environment. Example: remove storage-cloud S_Cloud0
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] lun-mask <name> target-luns	Displays the target LUNs that are included in the named Storage Cloud Example: show lun-mask3 target-luns

Example Output 1

```
root@FabMgrCLI[ofm] add storage-cloud S_Cloud0
root@FabMgrCLI[ofm] set storage-cloud S_Cloud0 add fc-ports montana/6/2
root@FabMgrCLI[ofm] show storage-cloud S_Cloud0
name      ports      qos      lun-mask-reference  allocation-policy  description
-----
S_Cloud0  1
1 record displayed
```

Example Output 2

```
root@FabMgrCLI[ofm] show storage-cloud S_Cloud0 fc-ports
parent.name  fc-port      state  type      vhba-count  speed  description
-----
S_Cloud0    montana/6/2  up/down  sanFcPort  0  4000
1 record displayed
```

See also: [Chapter 5](#)

I/O Templates

An I/O Template is an Oracle Fabric Manager feature that allows the server administrator to create the shape of the I/O for a set of servers. Different servers have different I/O requirements. For example, a server that will be used by the engineering department may require access to a couple of Network Clouds and a Storage Cloud, but a server that is used by Finance may only require access to the internet. The commands in this section enable you to use the CLI to create and deploy I/O templates that define access to your network and storage resources.

Command	Arguments	Description
add io-template	<Specify IO template name> [-description=Specify Description] [-default-gateway=Specify Default gateway] [-san-boot-profile=Specify SAN boot profile] [-iscsi-boot-profile=Specify iSCSI boot profile]	Creates a new I/O template with information pertinent to your network and storage requirements. Example: add io-template cloud9template
remove io-template	<IO template name> [-no-confirm]	Deletes an existing IO template from your system. Example: remove io-template HRtemplate
set io-template	<IO profile name> [-description=Specify Description] [-default-gateway=Specify Default gateway] [-san-boot-profile=Specify SAN boot profile] [-iscsi-boot-profile=Specify iSCSI boot profile] [-use-template-name=Use Template-name? Default='true'] add vnic <Specify vnic name> <Specify the network cloud the vnic points to> [-description=Specify description] [-qos=Specify qos profile] [-trunkmode=Is it trunk mode? Default='false'] [-iptype=IP address type. Default='hostmanaged'] [-vlanId=Specify Access VLAN Id] [-checksum=Specify Checksum offload] [-community-name=Specify Community name] [-ha-mode=Is this a haVnic. Default='false'] [-auto-switchover=Auto Switchover?. Default='false'] [-user-mac=Specify User defined MAC address]	Adds a network resources to your template Example: set io-template Cloud0template add vnic Cloud9vnic Cloud9

Command	Arguments	Description
set io-template	<p><IO profile name> [-description=Specify Description] [-default-gateway=Specify Default gateway] [-san-boot-profile=Specify SAN boot profile] [-iscsi-boot-profile=Specify iSCSI boot profile] [-use-template-name=Use Template-name? Default='true'] add vhba <Specify vhba name> <Specify the storage cloud the vhba points to> [-description=Specify description] [-qos=Specify qos profile] [-lunmask=set profile] [-lunmask-enable=Enabled Lunmask?. Default='false'] [-ha-mode=Is this a haVhba. Default='false'] [-user-wwn=Specify User defined WWN Id]</p>	<p>Adds storage resources to your template Example: <pre>set io-template cloud9template add vhba s_Cloud0vhba S_Cloud0</pre></p>
set io-template	<p><IO profile name> [-description=Specify Description] [-default-gateway=Specify Default gateway] [-san-boot-profile=Specify SAN boot profile] [-iscsi-boot-profile=Specify iSCSI boot profile] [-use-template-name=Use Template-name? Default='true'] remove vnic <Specify a vNIC name> [-no-confirm]</p>	<p>Removes a vNIC from your I/O template. Example: <pre>set io-template cloud9template remove vnic s_Cloud9vnic</pre></p>
set io-template	<p><IO profile name> [-description=Specify Description] [-default-gateway=Specify Default gateway] [-san-boot-profile=Specify SAN boot profile] [-iscsi-boot-profile=Specify iSCSI boot profile] [-use-template-name=Use Template-name? Default='true'] remove vhba <Specify a vHBA name></p>	<p>Removes a vHBA from your I/O template. Example: <pre>set io-template cloud9template remove vhba s_Cloud0vhba</pre></p>
set io-template	<p><IO Profile Name> update io-template <-description=string> <-default-gateway=Default Gateway Address> <-san-boot-profile=SAN Boot Profile Name> <-iscsi-boot-profile=iSCSI Boot Profile Name></p>	<p>Changes (updates) properties in your I/O Template</p>

Command	Arguments	Description
set io-template	<p><IO profile name> [-description=Specify Description] [-default-gateway=Specify Default gateway] [-san-boot-profile=Specify SAN boot profile] [-iscsi-boot-profile=Specify iSCSI boot profile] [-use-template-name=Use Template-name? Default='true'] update vnic <Specify vnic name> [-net-cloud=Specify the network cloud the vnic points to] [-description=Specify description] [-qos=Specify qos profile] [-trunkmode=Is it trunk mode? Default='false'] [-iptype=IP address type. Default='hostmanaged'] [-vlanId=Specify Access VLAN Id] [-checksum=Specify Checksum offload] [-community-name=Specify Community name] [-ha-mode=Is this a haVnic. Default='false'] [-auto-switchover=Auto Switchover?. Default='false'] [-user-mac=Specify User defined MAC address]</p>	<p>Changes (updates) the vNIC in your I/O template</p> <p>Example: set io-template cloud9template update vnic s_Cloud9vnic</p>
set io-template	<p><IO profile name> [-description=Specify Description] [-default-gateway=Specify Default gateway] [-san-boot-profile=Specify SAN boot profile] [-iscsi-boot-profile=Specify iSCSI boot profile] [-use-template-name=Use Template-name? Default='true'] update vhba <Specify vhba name> [-sto-cloud=Specify the storage cloud the vhba points to] [-description=Specify description] [-qos=Specify qos profile] [-lunmask=set profile] [-lunmask-enable=Enabled Lunmask?. Default='false'] [-ha-mode=Is this a haVhba. Default='false'] [-user-wwn=Specify User defined WWN Id]</p>	<p>Changes (updates) the vHBA in your I/O template</p> <p>Example: set io-template cloud9template update vhba s_Cloud0vhba</p>

Command	Arguments	Description
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] io- template < <i>IO profile name</i> > vnics	Displays the vNICS in your I/O template Example: show io-template cloud9template vnics
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] io- template < <i>IO profile name</i> > vhbases	Displays the vHBAs in your I/O template Example: show io-template cloud9template vhbases
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] io- template < <i>IO profile name</i> > servers	Displays the servers in your I/O template Example: show io-template cloud9template servers

Example Output 1

```
root@FabMgrCLI[ofm] add io-template cloud9template
root@FabMgrCLI[ofm] set io-template cloud9template add vnic Cloud9vnic Cloud9
root@FabMgrCLI[ofm] set io-template cloud9template add vhma s_Cloud0vhba
S_Cloud0
root@FabMgrCLI[ofm] show io-template cloud9template
-----
name                cloud9template
iscsiboot-name
sanboot-name
default-gateway
apply-templatename true
vnics                1
vhbas                0
description
-----
1 record displayed
```

Example Output 2

```
root@FabMgrCLI[ofm] show io-template cloud9template vnics
name      vnic-name  net-cloud-name  qos  ip-type  is-ha  access-vlan-id  trunk-mode
description
-----
cloud9template  Cloud9vnic  Cloud9  hostManaged  false  0          false
1 record displayed

root@FabMgrCLI[ofm] show io-template cloud9template vmbas
name                sto-cloud-name      qos          is-ha          description
-----
s_Cloud0vhba       S_Cloud0            false
1 record displayed
```

See also: [Chapter 6](#)

I/O Profiles

I/O Profiles enable you to connect virtual I/O resources to physical servers by associating them with your I/O Templates. I/O Profiles hold all the virtual I/O information for a particular server managed by Oracle Fabric Manager including vNICs, HA vNICs, vHBAs, HA vHBAs, all server profiles, and all Oracle Fabric Interconnect objects connected to the server.

You first define your I/O Template and its resources, then create an I/O Profile from that template and connect the I/O Profile to a physical server. Once your I/O Profile connects to the server, the vNICs and vHBAs defined in your I/O Template are pushed to that server.

The commands in this section enable you to use the CLI to create and deploy I/O Profiles, connecting your virtual I/O resource definitions (vNICs and vHBAs) to physical servers, deploying those resources defined in your I/O Template. The commands in this section also show how to display I/O Profile information and remove I/O Profiles.

TABLE 10-1 Commands to Create and Deploy I/O Profiles

Command	Arguments	Description
<code>add io-profile</code>	<code><Name of IO Profile> <name of I/O Template></code>	Create an I/O Profile based on an I/O Template. Name the I/O Profile so that you can associate it with a server. For example, "montana" in the following example is the name of a server, and now it is the name of the I/O Profile being defined. Example: <pre>add io-profile montana cloud9template</pre>
<code>remove io-profile</code>	<code><Name of IO Profile></code>	Delete an I/O Profile from an Oracle Fabric Interconnect. Example: <pre>remove io-profile cloud9template</pre>
<code>set io-profile</code>	<code><Name of IO Profile></code> <code>[-description=Description] connect</code> <code><Physical server></code>	Connect an I/O Profile to a physical server managed by Oracle Fabric Manager Example: <pre>set io-profile montana connect montana</pre>

TABLE 10-1 Commands to Create and Deploy I/O Profiles (Continued)

Command	Arguments	Description
set io-profile	<p><Name of IO Profile> add vnic <Specify a vNIC name> <Specify the Network cloud the vnic points to> [-description=Specify Description] [-qos=Specify QOS profile] [-vlan-id=Set VLAN Id] [-trunk-mode=Is trunk mode. Default='false'] [-ha-mode=Is this a haVnic. Default='false'] [-auto-switchover=Auto switchover enabled?. Default='false'] [-ip-type=Specify IP address type. Default='HostManaged'] [-ipaddr=Specify IP address. Default='0.0.0.0'] [-ipmask=Specify IP mask. Default='255.255.255.255'] [-mac-address=Specify MAC address] [-local-id=Specify Local Id] [-checksum-offload=Checksum Offload enabled?. Default='false'] [-community-name=Specify Community name]</p>	<p>Adds a new vNIC to an I/O Profile with the network characteristics required.</p> <p>Example: <pre>set io-profile montana -add vnic NewMonVnic -ha-mode=true -auto-switchover=true</pre></p>
set io-profile	<p><Name of IO Profile> add vhma <Specify a vHBA name> <Specify the Storage cloud the vhma points to> [-description=Specify Description] [-qos=Specify QOS profile] [-ha-mode=Is this a haVhma] [-lun-masks-enabled=LUN Mask enabled?. Default='false'] [-local-id=Specify Local Id] [-wwnn=Specify WWN Id] [-mtu=Specify MTU]</p>	<p>Adds a new vHBA to an I/O Profile with the storage characteristics required.</p> <p>Example: <pre>set io-profile montana add vhma NewMonVhma -ha-mode=true -lun-masks-enabled=true</pre></p>
set io-profile	<p><Name of IO Profile> [-description=Description] disconnect</p>	<p>Disconnect a physical server from an I/O Profile</p> <p>Example: <pre>set io-profile montana disconnect montana</pre></p>
set io-profile	<p><IO Profile Name> server-profile <server-profile-name> down</p>	<p>Sets an I/O Profile connected to a server to “down” state without disconnecting the profile from the server. vNICs and vHBAs remain connected, but not able to support traffic</p>
set io-profile	<p><IO Profile Name> server-profile <server-profile-name> up</p>	<p>Sets an I/O Profile connected but in “down” state back to “up” state. vNICs and vHBAs can support traffic when the I/O Profile is brought successfully “up.”</p>

TABLE 10-1 Commands to Create and Deploy I/O Profiles (*Continued*)

Command	Arguments	Description
set io-profile	<IO Profile Name> server-profile <server-profile-name> reset	Resets an I/O Profile that is connected to a server. This command sequentially sets the I/O Profile “down” then “up”
show	[-xml] [-list] [-table] [-sortby=Sort column] io-profile <Name of IO Profile> vnics	Displays all vNICs associated with the named I/O Profile Example: show io-profile montana vnics
show	[-xml] [-list] [-table] [-sortby=Sort column] io-profile <Name of IO Profile> vhbases	Displays all vHBAs associated with the named I/O Profile Example: show io-profile montana vhbases
show	[-xml] [-list] [-table] [-sortby=Sort column] io-profile <Name of IO Profile> server-profiles	Displays all server profiles associated with the named I/O Profile Example: show io-profile montana server-profiles

Example Output 1

```
root@FabMgrCLI[ofm] add io-profile montana cloud9template
root@FabMgrCLI[ofm] set io-profile montana connect bering
root@FabMgrCLI[ofm] show io-profile montana
name      hostname  template  state  description          vnics  vhbases
-----
montana   bering    cloud9template  up    FM-created from template cloud9template  1
1
1 record displayed
```

Example Output 2

```
root@FabMgrCLI[ofm] show io-profile montana server-profiles
-----
parent.name  montana
name         montana
state        up/up
chassis-name montana
busy         false
description  FM-created from template cloud9template
-----
1 record displayed
```

See also: [Chapter 7](#)

Physical Servers

This chapter describes how to upgrade the physical servers, connect a physical server to an I/O Profile, save a physical server as a New I/O Template, display a physical server's resource information, and work with server groups. These commands apply to a physical server attached to an Oracle Fabric Interconnect.

Command	Arguments	Description
set physical-server	<Physical server name> apply-io-template <I/O Template name>	Connects the first instance of an I/O Template to a server, or re-applies an I/O Template that was already connected.
set physical-server	<Physical server name> [-description=Specify Description] upgrade-hca firmware	Upgrades the firmware that the HCA uses on the host server connected to the Oracle Fabric Interconnect (no server reboot required). Example: set physical-server bering upgrade-hca firmware
set physical-server	<Physical server name> [-description=Specify Description] upgrade-hca optionrom	Upgrades the Option ROM version that the HCA uses on the host server connected to the Oracle Fabric Interconnect (requires server reboot). Example: set physical-server bering upgrade-hca optionrom
set physical-server	<Physical server name> [-description=Specify Description] upgrade-hca all	Upgrades both the firmware and the Option ROM used by the HCA on the host server connected to the Oracle Fabric Interconnect (requires server reboot). Example: set physical-server bering upgrade-hca all
set physical-server	<Physical server name> [-description=Physical server name] upgrade-hca remove-optionrom	While upgrading the HCA on the host server, this command causes the currently loaded Option ROM to be removed from the HCA. This command does not remove images. Example: set physical-server bering upgrade-hca remove-optionrom
set physical-server	<Physical server name> [-description=Specify Description] upgrade-hca reset	If errors occur, or if the upgrade hangs, you can use this command to reset the upgrade session or to clear a semaphore lock on the HCA. Example: set physical-server bering upgrade-hca reset

Command	Arguments	Description
set physical-server	<Physical server name> [-description=Specify Description] disconnect	Disconnects the named physical server from the Oracle Fabric Interconnect. Example: set physical-server bering disconnect
set physical-server	<Physical server name> [-description=Specify Description] connect <IO Profile to connect>	Associates, or connects a physical server to an I/O Profile. Example: set physical-server bering connect bering
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] physical-server <Physical server> vnics	Displays a list of all vNICs associated with the named physical server Example: show physical-server bering vnics
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] physical-server <Physical server> vhas	Displays the vHBAs associated with the named physical server Example: show physical-server bering vhas
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] physical-server <Physical server> server-groups	Displays all physical servers included in the named server group Example: show physical-server server-groups
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] physical-server <Physical server> stats	Displays the real-time statistics that are available for the named physical server Example: show physical-server jed stats

Example Output

```
root@FabMgrCLI[ofm] show physical-server jed stats
```

```
-----  
name                jed  
network-ingress    0.000000  
network-egress     0.000000  
storage-ingress    0.000000  
storage-egress     0.000000  
total-ingress      0.000000  
total-egress       0.000000  
-----
```

```
1 record displayed
```

Example Output

```
root@FabMgrCLI[ofm] show physical-server bering vnics
```

```
-----  
parent.name        bering  
name               Cloud9vnic  
net-cloud-name     Cloud9  
termination        montana-5/3  
state              up/down  
ip-address         0.0.0.0  
mac-address        00:13:97:05:70:03  
is-ha              false  
description  
-----
```

```
1 record displayed
```

See also: [Chapter 10](#)

Global Address

This command resets the Oracle Fabric Manager's global address.

Command	Arguments	Description
set globaladdress reset		Reset the Oracle Fabric Manager's global address Example: set globaladdress reset

System Commands for the Oracle Fabric Interconnect or Oracle Fabric Manager

These commands control various system attributes as described below.

Command	Arguments	Description
system rescan		Removes any stale servers and scans for new ones. Example: system rescan
system clean-offline	name of offline server	Cleans up and removes any servers that are in <i>offline</i> state but are still displayed in the Oracle Fabric Manager CLI or GUI. Example: system clean-offline montana
quit		Exit the Oracle Fabric Manager CLI Example: quit
exit		Exits the command prompt and closes the window. Example: exit

System Information and Tech Support

These commands display information about your system.

Command	Arguments	Description
show	<code>[-xml] [-list] [-table]</code> <code>[-sortby=Sort column] system version</code>	Displays the Fabric Manager version currently installed. Example: <code>show system version</code>
show	<code>[-xml] [-list] [-table]</code> <code>[-sortby=Sort column] system credits</code>	Displays the names of the Oracle employees who developed Oracle Fabric Manager. Example: <code>show system credits</code>

Example Output

```
root@FabMgrCLI[ofm] show system credits
The Fabric Manager system was developed by the following people:

Richard Wu
David Allison
```

Jobs

The commands in [TABLE 10-2](#) show information about jobs running on the Oracle Fabric Manager server. Various levels of granularity are supported.

TABLE 10-2 Commands to Display Information About Oracle Fabric Manager Jobs

Command	Arguments	Description
system cleanup-jobs		Cleans up jobs that might have stalled or been incomplete.
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] job <Job name>	Displays and describes the jobs (or sub-jobs) that have run on the Oracle Fabric Manager server, when the job was run and updated, and the state and status of that job. Example: show job ManageDirectors
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] job <Job name> sub-jobs	Displays and describes the jobs (or sub-jobs) that have run on the Oracle Fabric Manager server, when the job was run and updated, and the state and status of that job. Example: show job ManageDirectors sub-jobs
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] job <Job name> steps	Displays and describes the individual steps in a named job that has run on the Oracle Fabric Manager server, Example: show job ManageDirectors steps

Displays information in the log specified on the screen or in a named file.

Command	Arguments	Description
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] alarm <Alarm name> history	Displays and describes system events and network management alarms, how severe the event was, and when that alarm occurred. Example: show alarm phys-con* history
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] job <Job name> sub-jobs	Displays and describes the jobs (or sub-jobs) that have run on the Oracle Fabric Manager server, when the job was run and updated, and the state and status of that job. Example: show job ManageDirectors sub-jobs
system download-logs	<Name of file to put the result in> [-recent]	Writes the system download logs to a named file. Example: system download-logs ofm-logs

Example Output

```
root@FabMgrCLI[ofm] show alarm phys-con*
```

```
-----  
name           phys-con-2c9030005f63b  
director       texas  
severity       major  
type           resource  
cause          unavailable  
time-created   2012.03.22.09.26.19.614  
description    Server connection down. Check connection to Server.  
-----
```

```
name           phys-con-2c903004a8601  
director       texas  
severity       major  
type           resource  
cause          unavailable  
time-created   2012.03.22.09.26.19.382  
description    Server connection down. Check connection to Server.  
-----
```

```
----  
name           phys-con-2c903000aa8bf  
director       texas  
severity       major  
type           resource  
...  
5 records displayed
```

Network Connectivity (ping, traceroute)

These commands enable you to obtain network information about servers in your environment.

Command	Arguments	Description
ping	<Hostname or IP address>	Displays the IP address and name of the specified host. Example: ping montana
tracert	<Hostname or IP address>	Displays the path to the specified host Example: tracert montana

Example Output

```

root@FabMgrCLI[ofm] ping montana
PING montana.lab.com (102.168.xx.xx) 56(84) bytes of data.
64 bytes from montana.lab.com (102.168.xx.xx): icmp_seq=1 ttl=64 time=0.171 ms

--- montana.lab.com ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.171/0.171/0.171/0.000 ms

```

Example Output

```

root@FabMgrCLI[ofm] tracert montana
tracert to montana (102.168.xx.xx), 30 hops max, 40 byte packets
 1 montana.lab.com (102.168.xx.xx) 0.150 ms 0.119 ms 0.094 ms

```

Oracle Fabric Interconnects

These commands provide access to the Oracle Fabric Interconnect chassis, the IP subnet in which it is installed, and where the Oracle Fabric Interconnect can be discovered. You can use these commands to view detailed information about each managed Oracle Fabric Interconnect, all hardware inventoried in Oracle Fabric Manager, and Oracle Fabric Interconnect-based software and hardware features that are available on the Oracle Fabric Interconnect.

Command	Arguments	Description
add director	<Director name> <Specify user name> <Password (Optional). You will be prompted for Password.>	Creates an Oracle Fabric Interconnect to be managed by Oracle Fabric Manager. Enter the user name and password that was set up for that Oracle Fabric Interconnect. Example: add director montana joeuser joepassword
remove director	<Director name>	Removes an Oracle Fabric Interconnect from Oracle Fabric Manager. Example: remove montana
set director	<Director name> restart	Restarts the Oracle Fabric Interconnect. Example: set director montana restart
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] director <Director name> io-cards	Displays the I/O cards on the Oracle Fabric Interconnect. Example: show director montana io-cards
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] director <Director name> fc-ports	Provides a list of all Fibre Channel ports managed by Oracle Fabric Manager, the port type, its status (up or down) Example: show director montana fc-ports
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] director <Director name> ethernet-ports	Provides a list of all Ethernet ports on an Oracle Fabric Interconnect. Example: show director montana ethernet-ports

Example Output

```
root@FabMgrCLI[ofm] show director montana io-cards
name          state          type          description
-----
montana/1     up/resourceMissing  nwEthernet4Port10GbCardEthIb
montana/6     up/up          sanFc2Port4GbCard
montana/10    up/up          sanFc2Port4GbCard
montana/5     up/up          nwEthernet10Port1GbCard
4 records displayed
```

Example Output

```
root@FabMgrCLI[ofm] show director montana ethernet-ports
-----
name          montana/1/4
state         up/down
type          nwEthernet10GbPort
vnic-count   0
speed(-m-b)  10000
lag-id        0
description
-----
name          montana/1/3
state         up/down
type          nwEthernet10GbPort
vnic-count   0
speed(-m-b)  10000
lag-id        0
description
-----
name          montana/1/2
state         up/down
```

See also: [Chapter 10](#)

vNICs

A virtual Network Interface Card (vNIC) virtualizes NIC connectivity. A vNIC is a virtual NIC that appears to the OS as a physical NIC and enables a server to have a Ethernet network attachment without having a physical NIC present. Instead of the

client server using a NIC, an InfiniBand (IB) HCA is used and then virtualizes the NIC allowing for Ethernet connectivity. These commands enable you to configure QoS Profiles, a VLAN, the Ethernet Port to use, and several other parameters when defining your vNIC.

Command	Arguments	Description
add vnic	<p><Specify a vNIC name, <vnicname>.<servername>> <Specify the Network Cloud the vnic points to></p> <p>[-description=Specify Description]</p> <p>[-qos=Specify QOS profile]</p> <p>[-vlan-id=Set VLAN Id]</p> <p>[-trunk-mode=Is trunk mode. Default='false']</p> <p>[-ha-mode=Is this a haVnic. Default='false']</p> <p>[-auto-switchover=Auto switchover enabled?. Default='false']</p> <p>[-iptype=Specify IP address type. Default='HostManaged']</p> <p>[-ipaddr=Specify IP address. Default='0.0.0.0']</p> <p>[-ipmask=Specify IP mask. Default='255.255.255.255'] [-macaddr=Specify MAC address]</p> <p>[-localId=Specify Local Id]</p> <p>[-checksum-offload=Checksum Offload enabled?. Default='false']</p> <p>[-community-name=specify Community name]</p>	<p>Creates a new virtual network interface card (vNIC) for a Network Cloud</p> <p>Example:</p> <pre>root@FabMgrCLI[ofm] add vnic Cloud0vnic2 bering Cloud9</pre>
remove vnic	<p><Vnic name> [-no-confirm]</p>	<p>Removes a vNIC from the Network Cloud.</p> <p>Example:</p> <pre>remove vnic Cloud9vnic2.bering</pre>
set vnic	<p><vNIC name> [-description=Specify Description] [-qos=Specify QOS profile] [-vlan-id=Set VLAN Id]</p> <p>[-auto-switchover=Auto switchover enabled?.Default='false']</p> <p>[-iptype=Specify IP address type. Default='HostManaged'] [-admin-ip-address=Specify Admin IP address]</p> <p>[-admin-mask=Specify Admin IP mask] [-community-name=Specify Community name]</p> <p>[-boot-capable=Is this boot capable? Default='false'] [-network-cloud=Update the vNIC to terminated at another Network cloud']</p> <p>[-termination=Update the vNIC to change its termination to a different port or lag] up</p>	<p>Activates the vNIC on the Network Cloud.</p> <p>Example:</p> <pre>set vnic Cloud9vnic2.bering up</pre>

Command	Arguments	Description
set vnic	<p><vNIC name> [-description=Specify Description] [-qos=Specify QOS profile] [-vlan-id=Set VLAN Id] [-auto-switchover=Auto switchover enabled?. Default='false'] [-iptype=Specify IP address type. Default='HostManaged'] [-admin-ip-address=Specify Admin IP address] [-admin-mask=Specify Admin IP mask] [-community-name=Specify Community name] [-boot-capable=Is this boot capable? Default='false'] [-network-cloud=Update the vNIC to terminated at another Network cloud'] [-termination=Update the vNIC to change its termination to a different port or lag] down</p>	<p>Disables the named vNIC. Example: set vnic cCl9vnic2.bering down</p>
show	<p>[-table] [-list] [-xml] [-sortby=Specify column to sort by] physical-server <Physical server> vnics</p>	<p>Displays the vNICs configured on a physical server. Example: show physical-server bering vnic</p>
show	<p>[-table] [-list] [-xml] [-sortby=Specify column to sort by] io-template <IO profile name> vnics</p>	<p>Displays the vNIC configured within a template. Example: show io-template cloud9template vnic</p>
show vhba	<p><vHBA name> <-detail=Show detailed information></p>	<p>Displays detailed information about the named vHBA</p>

Example Output

```
root@FabMgrCLI[ofm] show physical-server bering vnic
```

```
-----  
parent.name      bering  
name             Cloud9vnic  
net-cloud-name   Cloud9  
termination      montana-5/3  
state            up/down  
ip-address       0.0.0.0  
mac-address      00:13:97:05:70:03  
is-ha            false  
description  
-----
```

```
1 record displayed
```

Example Output

```
root@FabMgrCLI[ofm] show io-template cloud9template vnic
```

```
-----  
name             cloud9template  
vnic-name        Cl9vnic2  
net-cloud-name   Cloud9  
qos  
ip-type          hostManaged  
is-ha            false  
access-vlan-id   1  
trunk-mode       false  
description  
-----
```

```
name             cloud9template  
vnic-name        Cloud9vnic  
net-cloud-name   Cloud9  
qos  
ip-type          hostManaged  
is-ha            false  
access-vlan-id   0  
trunk-mode       false  
description  
-----
```

```
2 records displayed
```

See also: [“Creating and Using vNICs” on page 82](#)

vHBAs

Each Oracle Fabric Interconnect supports Fibre Channel (FC) modules that are the underlying physical connectivity to an FC SAN. You can then create virtual HBAs for host servers' SAN connectivity. These commands allow you to create, change, remove, and display information about vHBAs.

Command	Arguments	Description
add vhma	<i><Specify a vHBA name, <vhbaname>.<servername>></i> <i><Specify the Storage cloud the vhma points to></i> [-description= <i>Specify Description</i>] [-qos= <i>Specify QOS profile</i>] [-lun-mask= <i>Specify</i>] [-ha-mode= <i>Is this a haVhma</i>] [-lunmask-enabled= <i>enabled?. Default='false'</i>] [-local-id= <i>specify Local Id</i>] [-wwn-id= <i>specify WWN Id</i>] [-mtu= <i>specify MTU</i>]	Creates a new vHBA on the server. Example: add vhma C10vhba2 bering S_Cloud0
remove vhma	<i><Vhma name></i>	Deletes a vHBA from the server Example: remove vhma C10vhba2.bering
set vhma	<i><vHBA name></i> [-description= <i>Specify Description</i>] [-qos= <i>Specify QOS profile</i>] [-lun-mask= <i>Specify</i>] [-storage-cloud= <i>Update the vHBA to terminated at another Storage cloud'</i>] [-termination= <i>Update the vHBA to change its termination to a different port</i>] up	Activates the vHBA Example: set vhma C10vhba2.bering up
set vhma	<i><vHBA name></i> [-description= <i>Specify Description</i>] [-qos= <i>Specify QOS profile</i>] [-lun-mask= <i>Specify</i>] [-storage-cloud= <i>Update the vHBA to terminated at another Storage cloud'</i>] [-termination= <i>Update the vHBA to change its termination to a different port</i>] down	Disables the specified vHBA. Example: set vhma down

Command	Arguments	Description
set vhma	<i><vHBA name></i> [-description= <i>Specify Description</i>] [-qos= <i>Specify QOS profile</i>] [-lun-mask= <i>Specify</i>] [-storage-cloud= <i>Update the vHBA to terminated at another Storage cloud'</i>] [-termination= <i>Update the vHBA to change its termination to a different port</i>] rescan	Discovers the available target and LUN information on the network without requiring a host server to be bound to the Oracle Fabric Interconnect. Use this feature to determine if the list of targets and LUNs are satisfactory, or require any removals or additions, before committing them (binding) to a host-server profile. Example: set vhma vhbaiii.III targets
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] vhma <i><vHBA name></i>	Displays information about the specified vHBA. Example: show vhma C10vhba2 stats
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] physical-server <i><Physical server></i> vmbas	Displays the vHBAs configured for a physical server. Example: show physical-server bering vmbas
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] io-template <i><IO profile name></i> vmbas	Displays the vHBAs associated with an I/O Template. Example: show io-template cloud9template vmbas
show vhma	<i><vHBA name></i> [-detail= <i>Show detailed information</i>]	Displays detailed information about the named vHBA

Example Output

```
root@FabMgrCLI[ofm] show physical-server bering vhba
```

```
-----  
parent.name      bering  
name             s_Cloud0vhba  
sto-cloud-name   S_Cloud0  
termination      montana-6/2  
state            up/up  
ip-address       50:01:39:71:00:04:71:01  
wwnn             50:01:39:71:00:04:71:01  
wwpn             50:01:39:70:00:04:71:01  
is-ha            false  
description  
-----
```

```
1 record displayed
```

Example Output

```
root@FabMgrCLI[ofm] show io-template cloud9template vhba
```

```
-----  
name                sto-cloud-name      qos      is-ha      description  
-----  
Cl0vhba2           S_Cloud0               
s_Cloud0vhba       S_Cloud0             false  
-----
```

```
2 records displayed
```

Example Output

```
root@FabMgrCLI[ofm] show vhba vhbaiii.III targets
```

```
vhba name wwnn wwpn lun-ids  
-----
```

```
vhbajii.III 2F:9F:00:06:2B:10:C3:BA 2F:9F:00:06:2B:10:C3:BA 3,2,1,0  
vhbajii.III 2F:BF:00:06:2B:10:C3:BA 2F:BF:00:06:2B:10:C3:BA 3,2,1,0  
vhbajii.III 2F:DF:00:06:2B:10:C3:BA 2F:DF:00:06:2B:10:C3:BA 3,2,1,0  
vhbajii.III 2F:FF:00:06:2B:10:C3:BA 2F:FF:00:06:2B:10:C3:BA 3,2,1,0  
-----
```

```
4 records displayed
```

See also: [“Creating and Using vHBAs” on page 124](#)

Server Groups

A Server Group enables you to select one or more physical servers and treat them as one logical unit for the purpose of certain management functions. For example, with a Server Group of three servers you can perform one failover on the entire Server Group instead of having to failover each server on its own (a total of three failovers). These commands enable you to add, remove, change and display server group functions.

Command	Arguments	Description
add server-group	<Specify ServerGroup name> [-description=Specify Description]	Adds a server group to Oracle Fabric Manager. Example: add server-group HRserverGroup
set server-group	<Server Group name> [-description=Specify Description] add <Physical server>	Adds a physical server to your Server Group Example: set server-group HRserverGroup add bering
set server-group	<Server Group name> [-description=Specify Description] remove <Physical server>	Removes a physical server from a Server Group. Example: set server-group HRserverGroup remove bering
remove server-group	<Server Group name>	Removes a Server Group from Oracle Fabric Manager. Example: remove server-group HRserverGroup
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] physical-server <Physical server> server-groups	Displays the Server Group(s) in which a physical server is a member. Example: show physical-server bering server-group
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] server-group <Server group name>	Displays the physical server(s) that are part of the Server Group. Example: show server-group HRserverGroup

Example Output

```
root@FabMgrCLI[ofm] add server-group HRserverGroup
root@FabMgrCLI[ofm] set server-group HRserverGroup add bering
root@FabMgrCLI[ofm] show physical-server bering server-group
parent.name          name          servers      description
-----
bering               HRserverGroup 1
1 record displayed
```

See also: [Chapter 8](#)

Ethernet LAGs

A Link Aggregation Group (LAG) enables you to combine multiple individual physical Ethernet ports into one logical port group. As a result, the ports combined into an Ethernet LAGs can operate in parallel with the benefit of increased link speed and high availability.

Command	Arguments	Description
add ethernet-lag	<Specify LAG Id. LAG Id can be between 1 and 5, inclusive> <Specify Ethernet ports> [-description=Specify Description] [-lACP=Enable LACP?. Default='false']	Configures an Ethernet-LAG in Oracle Fabric Manager. Example: add ethernet-lag 3 montana/5/3
set ethernet-lag	<LAG name> [-description=Specify Description] [-admin-rate=Specify Admin rate] [-mtu=Specify MTU] [-vlanid=Specify Access VLAN Id] [-flow-control=Enable Flow control?. Default='false'] [-lACP=Enable LACP?. Default='false'] [-port-mode=Port Mode] [-tag-native=Tag native?. Default='false'] [-IGMP=IGMP snooping?. Default='true'] add <Ethernet ports>	Adds an Ethernet port to an existing LAG Example: set ethernet-lag oregon/4.2 add oregon/4/1
set ethernet-lag	<LAG name> [-description=Specify Description] [-admin-rate=Specify Admin rate] [-mtu=Specify MTU] [-vlanid=Specify Access VLAN Id] [-flow-control=Enable Flow control?. Default='false'] [-lACP=Enable LACP?. Default='false'] [-port-mode=Port Mode] [-tag-native=Tag native?. Default='false'] [-IGMP=IGMP snooping?. Default='true'] remove <Ethernet ports>	Removes an Ethernet port from an Ethernet LAG. Example: set ethernet-lag oregon/4.2 remove oregon/4/1
show	[-table] [-list] [-xml] [-sortBy=Specify column to sort by] ethernet-lag <LAG name> ports	Displays the Ethernet LAGs configured in Oracle Fabric Manager. Example: show ethernet-lag
remove ethernet-lag	<LAG name>	Removes an Ethernet LAG from Oracle Fabric Manager. Example: remove ethernet-lag

Example Output

```
root@FabMgrCLI[ofm] add ethernet-lag 3 montana/5.3
root@FabMgrCLI[ofm] show ethernet-lag
-----
name                montana/5.3
state               up/up
port-count          1
available-ingress-cir 0
available-egress-cir 0
description          Test LAG
-----
1 record displayed
```

See also: [“Working with Ethernet Link Aggregation Groups \(LAGs\)”](#) on page 92

Default Gateways

You can define a default gateway on a server profile to enable IP communication with hosts on different IP subnets. This allows you to centralize IP address administration from the Oracle Fabric Interconnect so that you do not have to configure a default gateway directly on a host.

Command	Arguments	Description
add default-gateway	<i><Specify a Gateway name></i> <i><Specify the IP Address></i> [-dns-server= <i>Specify DNS server</i>] [-domain-name= <i>Resource domain name</i>] [-description= <i>Specify Description</i>]	Adds a default gateway Oracle Fabric Manager. Example: add default-gateway test 10.1.1.112

Command	Arguments	Description
set default-gateway	<Gateway name> [-ip-address=Specify IP address] [-dns-server=Specify DNS server] [-domain-name=Resource domain name] [-description=Specify Description]	Change the default gateway to a different gateway Example: set default-gateway def-gw1
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] default-gateway <Default gateway name> [-detail]	Displays information about the specified default gateway. Example: show default-gateway test
remove default-gateway	<Gateway name>	Removes a default gateway from the environment. Example: remove default-gateway test

Example Output

```

root@FabMgrCLI[ofm] show default-gateway test
-----
name                test
discovered-from    texas
address            192.168.1.1
dns-address        0.0.0.0
domain-name
iotemplates       0
description
-----
1 record displayed

```

See also: [“Working with Default Gateways” on page 104](#)

Network Quality of Service (QoS)

Network Quality of Service (QoS) provides administrators the ability to treat packets differently, based on the type of traffic. Network QoS assigns the amount of bandwidth and burst size to a given vNIC. The burst size is the amount of buffering retained for when traffic arrives in bursts during congestion.

Command	Arguments	Description
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] network-qos <Network QOS profile name> [-detail]	Displays a description of the specified QoS profile including Committed Information Rate (CIR) and Peak Information Rate (PIR) set by that profile. Example: show network-qos 100m_1g

Example Output

```

root@FabMgrCLI[ofm] show network-qos 100m_1g
name          cir          pir          description
-----
100m_1g      100000      1000000     100Mbps CIR, 1Gbps PIR
1 record displayed

```

See also: [“Working with Network QoS” on page 99](#)

Storage Quality of Service (QoS)

A vHBA supports QoS where the bandwidth is rate limited with shaping (not dropped). There are no queues or policers associated with FC traffic—only shapers.

Command	Arguments	Description
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] san- qos <San QOS profile name> [-detail]	Displays a description of the specified QoS profile including Committed Information Rate (CIR) and Peak Information Rate (PIR) set by that profile. Example: show san-qos 125m_250m

Example Output

```
root@FabMgrCLI[ofm] show san-qos 125m_250m
name                cir                pir                description
-----
125m_250m           125000            250000            125Mbps
1 record displayed
```

See also: [“Working with SAN Quality of Service \(QoS\)”](#) on page 132

MAC-Based Quality of Service

In addition to network QoS, which governs the amount of bandwidth used on vNICs, Oracle Fabric Manager supports MAC-Based QoS. MAC-Based QoS controls which devices on a vNIC can use specific bandwidth amounts. Through MAC-Based QoS, you assign a usage condition to traffic sent or received by a specific network device identified by its MAC address. The usage conditions are enforced by QoS application flows.

Command	Arguments	Description
show	<code>[-table] [-list] [-xml]</code> <code>[-sortBy=<i>Specify column to sort by</i>]</code> <code>mac-based-qos <MAC based QOS profile name> [-detail]</code>	Displays the conditions and QoS Profile name in the specified MAC-based QoS profile. The MAC-Based QoS Profile that matches against a specific traffic flow is no longer applied Example: <code>show mac-based-qos rule-00:11:22:33:44:55-606</code>
remove mac-based-qos	<code><MAC based QOS name></code>	Removes a MAC based QoS profile from the Network Cloud Example:

Example Output

```
root@FabMgrCLI[ofm] show mac-based-qos rule-00:11:22:33:44:55-606
-----
name                rule-00:11:22:33:44:55-606
conditions          1
qos-profile-name    250m_500m
rule-id             606
description         00:11:22:33:44:55 temporary
-----
1 record displayed
```

Boot Profiles

SAN Boot allows you to boot a server or virtual machine from a SAN disk accessed through a vHBA. The disk is identified by a target World Wide Port Name (WWPN) and Logical Unit Number (LUN) ID on a storage disk array.

Host servers can be booted remotely (not from their local hard drive) through either SAN Boot or iSCSI Boot. The boot profile is a software construction that contains all the information a host need to boot through either SAN Boot or iSCSI boot.

The Oracle Fabric Interconnect supports booting a Linux server over a vNIC using an iSCSI connection.

These commands enabled you to create, modify, remove, and displays both SAN and iSCSI Boot Profiles.

Command	Arguments	Description
add iscsi-boot-profile	<p><Specify a iSCSI boot profile> <Specify Target address> [-target-portal-group=Specify Target portal group] [-protocol-id=Specify Protocol Id. Default='6'] [-port-id=Specify Port Id. Default='3260'] [-description=Specify Description] [-mount-type=Specify Mount type]</p> <p>[-dev-name=Specify Device name]</p> <p>[-grp-name=Specify Group name]</p> <p>[-vol-name=Specify Volume name]</p>	<p>This command enables you to boot a Linux server over a vNIC using an iSCSI connection</p> <p>Example:</p> <pre>add iscsi-boot-profile iscsiboot_3 192.168.46.3</pre>
add san-boot-profile	<p><Specify a SAN profile></p> <p>[-description=Specify Description] [-mount-type=Specify Mount type]</p> <p>[-dev-name=Specify Device name]</p> <p>[-grp-name=Specify Group name]</p> <p>[-vol-name=Specify Volume name]</p>	<p>Enables you to boot from a SAN Boot Profile. SAN Boot allows you to boot a server or virtual machine from a SAN disk accessed through a vHBA. The disk is identified by a target World Wide Port Name (WWPN) and Logical Unit Number (LUN) ID on a storage disk array.</p> <p>Example:</p> <pre>add san-boot-profile sanboot_3</pre>
remove iscsi-boot-profile		<p>Removes the specified iSCSI Boot Profile.</p> <p>Example:</p> <pre>remove iscsi-boot-profile iscsiboot_3</pre>
remove san-boot-profile		<p>Deletes a SAN Boot Profile.</p> <p>Example:</p> <pre>add san-boot-profile sanboot_3</pre>
set iscsi-boot-profile	<p>[-target-address=Specify Target address]</p> <p>[-target-portal-group=Specify Target portal group] [-protocol-id=Specify Protocol Id. Default='6'] [-port-id=Specify Port Id. Default='3260'] [-description=Specify Description] [-mount-type=Specify Mount type]</p> <p>[-dev-name=Specify Device name]</p> <p>[-grp-name=Specify Group name]</p> <p>[-vol-name=Specify Volume name]</p>	<p>Specifies a description, Target Portal Group, Protocol ID, Port ID, Mount Type, Device Name Group Name, and/or Volume Name, for the iSCSi Boot Profile</p> <p>Example:</p> <pre>set iscsi-boot-profile mount-type=Static</pre>

Command	Arguments	Description
set san-boot-profile	<SAN boot profile name> [-description= <i>Specify Description</i>] [-mount-type= <i>Specify Mount type</i>] [-mount-device= <i>Specify Device name</i>] [-group-name= <i>Specify Group name</i>] [-volume-name= <i>Specify Volume name</i>]	Specifies a description, mount type, device name, group name, and/or volume for the SAN Boot Profile Example: set san-boot-profile mount-type=Static
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] san-boot-profile <SAN boot profile name> [-detail]	Displays information about a defined SAN Boot Profile Example: show san-boot-profile sanboot_3
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] iscsi-boot-profile <iSCSI boot profile name> [-detail]	Displays information about a defined iSCSI Boot Profile Example: show iscsi-boot-profile iscsiboot_3

Example Output

```
root@FabMgrCLI[ofm] add iscsi-boot-profile iscsiboot_3 192.168.46.3
root@FabMgrCLI[ofm] show iscsi-boot-profile iscsiboot_3
-----
name                iscsiboot_3
target-address      192.168.46.3
target-portal-group
port                3260
protocol            6
mount-type          direct
group-name
volume-name
mount-device
iocloud-reference
iotemplates         0
description
-----
1 record displayed
```

Example Output

```
root@FabMgrCLI[ofm] show san-boot-profile sanboot_3
-----
name                sanboot_3
mount-type          lvm
group-name          VolGrop00
volume-name         LogVol100
mount-device
iocloud-reference
iotemplates         0
description
-----
1 record displayed
```

See also: [Chapter 9](#)

User Role

Roles associate one or more user accounts with their ability to perform actions. The Oracle Fabric Manager role sets the amount of control that a user has within the Oracle Fabric Manager and Oracle Fabric Interconnect system. Roles typically are created based on the division of system administration tasks in the data center. For example, some common roles are:

- network, for managing IP network and routing connectivity.
- storage, for managing storage capacity, configuration, and connectivity.

To provide access to Oracle Fabric Manager, you first provide access to your system (i.e., LDAP), and then add a user-role for them. Oracle Fabric Manager then authenticates them to the system and obtains their permissions using the user-role assigned.

These commands enable you to create, remove, set, and display roles in Oracle Fabric Manager.

Command	Arguments	Description
add user-role	<i><Specify a User name></i> [-domain= <i>Specify Domain</i>] [-role= <i>Specify Security role. Default='operator'</i>] [-description= <i>Specify Description</i>]	Adds a new user role to Oracle Fabric Manager Example: add user-role myuserrole
remove user-role		Deletes a user role from Oracle Fabric Manager Example: remove user-role myuserrole
set user-role	[-domain= <i>Specify Domain</i>] [-role= <i>Specify Security role</i>] [-description= <i>Specify Description</i>]	Assigns an Oracle Fabric Manager security role to a specified user role Example: set user-role myuserrole -role=operator
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] user-role <i><User name></i>	Displays the security role and domain associated with a user role Example: show user-role myuserrole

Example Output

```
root@FabMgrCLI[ofm] add user-role myuserrole
root@FabMgrCLI[ofm] set user-role myuserrole -role=operator
root@FabMgrCLI[ofm] show user-role myuserrole
name                domain                roles                description
-----
myuserrole          default              operator
1 record displayed
```

See also: [“Working with User Roles” on page 54](#)

Resource Domain

The Oracle Fabric Interconnect, Oracle Fabric Manager Server, and physical servers reside in domains, which are logical groupings of resources in the network. Typically, domains are arranged by a functional group, such as a business unit or department, but you can create domains with virtually any theme—a lab domain, a production domain, a domain of top-quality hardware, a domain of mid-quality hardware, a domain of services or applications, and so on. When you create domains, you remove resources from the default domain and add them to the specific domain that you are creating.

Command	Arguments	Description
add resource-domain	<Specify a Resource domain name> [-description=Specify Description]	Adds a resource domain to your environment Example: add resource-domain ITresources
remove resource-domain	<Resource domain name>	Removes a resource domain from your environment Example: remove resource-domain ITresources
set resource-domain	<Resource domain name> <-description=string>	Sets an optional description for a named resource domain

Command	Arguments	Description
set resource-domain	<Resource domain name> [-description=Specify Description] add physical-server <Specify Physical server name>	Specifies a physical server as one of the available resources in the resource domain Example: set resource-domain ITresources add physical-server bering
set resource-domain	<Resource domain name> [-description=Specify Description] add network-cloud <Specify Network cloud name>	Specifies a Network Cloud as one of the available resources in the resource domain Example: set resource-domain ITresources add network-cloud Cloud9
set resource-domain	<Resource domain name> [-description=Specify Description] add storage-cloud <Specify Storage cloud name>	Specifies a Storage Cloud as one of the available resources in the resource domain Example: set resource-domain ITresources add storage-cloud S_Cloud0
set resource-domain	<Resource domain name> [-description=Specify Description] remove physical-server <Specify Physical server name>	Removes a physical server from the resource domain Example: set resource-domain ITresources remove physical-server bering
set resource-domain	<Resource domain name> [-description=Specify Description] remove network-cloud <Specify Network cloud name>	Removes a Network Cloud from the resource domain Example: set resource-domain ITresources remove network-cloud Cloud9
set resource-domain	<Resource domain name> [-description=Specify Description] remove storage-cloud <Specify Storage cloud name>	Removes a Storage Cloud from the resource domain Example: set resource-domain ITresources remove storage-cloud S_Cloud0

Command	Arguments	Description
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] resource-domain < <i>Resource domain name</i> > physical-server	Displays the physical servers that are part of the specified resource domain Example: show resource-domain ITresources physical-server
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] resource-domain < <i>Resource domain name</i> > network-cloud	Displays the Network Clouds that are part of the specified resource domain Example: show resource-domain ITresources network-cloud
show	[-table] [-list] [-xml] [-sortby= <i>Specify column to sort by</i>] resource-domain < <i>Resource domain name</i> > storage-cloud	Displays the Storage Clouds that are part of the specified resource domain Example: show resource-domain ITresources storage-cloud

Example Output

```

root@FabMgrCLI[ofm] add resource-domain ITresources
root@FabMgrCLI[ofm] set resource-domain ITresources add physical-server bering
root@FabMgrCLI[ofm] set resource-domain ITresources add network-cloud Cloud9
root@FabMgrCLI[ofm] set resource-domain ITresources add storage-cloud S_Cloud0
root@FabMgrCLI[ofm] show resource-domain ITresources
-----
name                ITresources
description
number-of-servers   1
network-cloud-count 1
storage-cloud-count 1
-----
1 record displayed
root@lawrence[ofm]

```

See also: “Configuring Resource Domains” on page 59

CLI Properties

These commands configure the CLI itself including how the CLI displays on the screen.

Command	Arguments	Description
set	cli mode core	Enables standard CLI operating mode.
set	cli mode sdn	Enables the progressive CLI to add commands for the Oracle SDN Controller feature.
set	cli fail-on-error <Enabled or Disabled?>	Enables or disables the CLI's ability to close on an error.
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] cli history	Displays the history of issued commands. You can search the history log using the up or down arrow keys and Ctrl-R command sequence. Example: show -list cli history
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] cli paging	Indicates if the CLI is configured to stop the data display once the screen is full Example: show -table cli paging
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] cli color	Indicates if the CLI is set to display colors for command output during the current session Example: show cli color
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] cli space-completion	Indicates if CLI space-completion is on or off Example: show -list cli space-completion
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] cli confirmation-msg	Indicates if the CLI is configured to request confirmation to execute dangerous command Example: show cli confirmation-msg
show	[-table] [-list] [-xml] [-sortby=Specify column to sort by] cli idle-timeout	Indicates the setting, if any, at which your CLI is configured to time out if left unattended Example: show cli idle-timeout

World Wide Names and MAC addresses

Oracle Fabric Manager keeps a list of all the World Wide Names (WWNs) and MAC addresses assigned from each Oracle Fabric Interconnect that it has under management in the WWN Address Pool and the MAC Address Pool. These commands enable you to display this information.

Command	Arguments	Description
show	<code>[-table] [-list] [-xml]</code> <code>[-sortby=Specify column to sort by]</code> <code>mac-address-pool <Director name></code>	Displays the MAC addresses, vNIC, and cloud name of the specified Oracle Fabric Interconnect Example: <code>show mac-address-pool montana</code>
show	<code>[-table] [-list] [-xml]</code> <code>[-sortby=Specify column to sort by]</code> <code>wn-address-pool <Director name></code>	Displays the world wide names, vHBA, and Network Cloud associated with the specified Oracle Fabric Interconnect Example: <code>show wwn-address-pool montana</code>

Example Output

```
root@FabMgrCLI[ofm] show mac-address-pool montana
-----
chassis-name    montana
mac-address     00:13:97:05:70:02
mac-address-id  002
is-reserved     false
is-used         true
vnic-name       Cloud9vnic
cloud-name
-----
chassis-name    montana
mac-address     00:13:97:05:70:03
mac-address-id  003
is-reserved     false
is-used         true
vnic-name       Cloud9vnic
cloud-name
-----
chassis-name    montana
mac-address     00:13:97:05:70:04
mac-address-id  004
is-reserved     false
is-used         true
vnic-name
cloud-name
-----
3 records displayed
```

Example Output

```
root@FabMgrCLI[ofm] show wwn-address-pool montana
-----
chassis-name    montana
wwn             50:01:39:70:00:04:71:02
wwn-id          102
is-reserved     false
is-used         true
vhba-name       mlathe
cloud-name
-----
chassis-name    montana
wwn             50:01:39:70:00:04:71:00
wwn-id          100
is-reserved     false
```

```

is-used      true
vhba-name    s_Cloud0vhba
cloud-name
-----
chassis-name montana
wwn          50:01:39:70:00:04:71:01
wwn-id       101
is-reserved  false
is-used      true
vhba-name    s_Cloud0vhba
cloud-name
-----
3 records displayed

```

LUN Masks

These commands enable the configuration and management of the LUN Masks presented to storage and vHBAs.

Command	Arguments	Description
add lun-mask	<LUN Mask Name> <-description=string>	Adds an optional description to a LUN Mask
set lun-mask	<LUN Mask Profile Name> add <WWPN> <List of LUN IDs>	Adds a LUN Mask and list of LUNs.
set lun-mask	<LUN Mask Profile Name> add-lun <WWPN> <List of LUN IDs>	Adds one or more LUNs to an existing LUN Mask.
set lun-mask	<LUN Mask Profile Name> remove-lun <WWPN> <List of LUN IDs>	Removes one or more LUNs from an existing LUN Mask.
set lun-mask	<LUN Mask Profile Name> remove <WWPN>	Removes an target from a LUN Mask
show lun-mask	<LUN Mask Profile Name>	Displays a named LUN Mask
show lun-mask	<LUN Mask Profile Name> targets	Displays the storage targets
remove lun-mask	<LUN Mask Profile Name>	Removes a named LUN Mask
show	[-table] [-list] [-xml] [-sortBy=Specify column to sort by] wwn-address-pool <Director name>	Displays the world wide names, vHBA, and Network Cloud associated with the specified Oracle Fabric Interconnect Example: show wwn-address-pool montana

Example Output 1

```
root@FabMgrCLI[ofm] show mac-address-pool montana
```

```
-----  
chassis-name    montana  
mac-address     00:13:97:05:70:02  
mac-address-id  002  
is-reserved     false  
is-used         true  
vnic-name       Cloud9vnic  
cloud-name
```

```
-----  
chassis-name    montana  
mac-address     00:13:97:05:70:03  
mac-address-id  003  
is-reserved     false  
is-used         true  
vnic-name       Cloud9vnic  
cloud-name
```

```
-----  
chassis-name    montana  
mac-address     00:13:97:05:70:04  
mac-address-id  004  
is-reserved     false  
is-used         true  
vnic-name  
cloud-name
```

```
-----  
3 records displayed
```

Example Output 2

```
root@FabMgrCLI[ofm] show wwn-address-pool montana
```

```
-----  
chassis-name    montana  
wwn             50:01:39:70:00:04:71:02  
wwn-id          102  
is-reserved     false  
is-used         true  
vhba-name       mlathe  
cloud-name
```

```
-----  
chassis-name    montana  
wwn             50:01:39:70:00:04:71:00  
wwn-id          100  
is-reserved     false
```

```

is-used      true
vhba-name    s_Cloud0vhba
cloud-name
-----
chassis-name montana
wwn          50:01:39:70:00:04:71:01
wwn-id       101
is-reserved  false
is-used      true
vhba-name    s_Cloud0vhba
cloud-name
-----
3 records displayed

```

Oracle SDN Controllers

These commands allow configuration and management of Oracle SDN Controllers. For information about the Oracle SDN Controller feature, see the Oracle Software Defined Network Controller User Guide.

Command	Arguments	Description
add controller	<Controller DNS name or IP address> <user-name> <-password=Password. You will be prompted for Password.>	Adds a primary Oracle SDN Controller to Oracle Fabric Manager, and configures the controller's password.
set controller	<Controller DNS name or IP address> add-backup <Backup Controller DNS name or IP address> <user-name> <-password=Password>	Adds a backup Oracle SDN Controller to Oracle Fabric Manager, and configures the controller's password.
set controller	<Controller DNS name or IP address> remove-backup <Backup Controller DNS name or IP address>	Removes a backup Oracle SDN Controller to Oracle Fabric Manager.
set controller	<Controller DNS name or IP address> set <Backup Controller DNS name or IP address> activate	Enables a backup Oracle SDN Controller that was administratively set to "down" state.
set controller	<Controller DNS name or IP address> set <Backup Controller DNS name or IP address> deactivate	Disables a backup Oracle SDN Controller that was administratively set to "down" state.

Command	Arguments	Description
show controller	<Controller DNS name or IP address> <-detail=Show detailed information>	Displays detailed information about a user-defined Oracle SDN Controller.
show controller backup	<Controller DNS name or IP address> backup	Displays the backup Oracle SDN Controller in an HA controller deployment.
remove controller	<Controller DNS name or IP address>	Removes a user-defined Oracle SDN Controller

Plugins

This command enables you to display information about the plugins installed in Oracle Fabric Manager.

Command	Arguments	Description
show plugin	<Name of Plugin>	Displays information about the named plug-in.

Installing and Removing Applications

You can use the CLI to install, display, and remove add-on applications such as Oracle Fabric Monitor using the CLI.

Adding an Application

To add an application to Oracle Fabric Manager, issue the following command:

```
add app <Name of app> [-zipfile=App ZIP file name] [-location=Location of ZIP file]
```

You should then add a description of the application, by issuing the following command:

```
set app <Name of app> [-description=Description]
```

For example:

```
root@FabMgrCLI[ofm] add app PerformanceManager -zipfile=perfman.zip -location=/xms/apps
```

```
root@FabMgrCLI[ofm] set app perfmgr -description="Performance Manager Version 1.0.1 installed September, 2012"
```

Displaying Information About Applications

You can display information about a particular application or about all applications installed on Oracle Fabric Manager using the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] app <Name of app>
```

For example:

```
root@FabMgrCLI[ofm] show app
-----
displayed-name      perfmgr
version             1.0.1
index-url           perfmgr.jsf
plugin-loader-class
rest-base           perfmgr
plugin-state        active
contact-info        support@oracle.com
description
-----
displayed-name      riskanalyzer
version             1.0
index-url           riskanalyzer.jsf
plugin-loader-class
rest-base           riskanalyzer
plugin-state        active
contact-info        support@oracle.com
description
-----
2 records displayed
```

Removing an Application

To remove an application from Oracle Fabric Manager issue the following command:

```
remove [-noconfirm] app <Name of app>
```

For example:

```
root@FabMgrCLI [ofm] remove app PerformanceManager
```


Working with Oracle SDN

Unique Oracle SDN fabrics are part of the Oracle SDN feature. With Oracle SDN, you can use the commands in this section to rename and display existing Oracle SDN fabrics. Servers in the Oracle SDN deployment support “east-west” traffic—for example, vMotion traffic. For additional information, see the *Oracle SDN Quick Start Guide* or the *Oracle SDN Controller User’s Guide*.

Renaming an Oracle SDN Fabric

Oracle Fabric Manager automatically “discovers” fabrics when they are cabled and configured in an Oracle Fabric Manager environment. The `set xsf` command enables you to rename the discovered fabric to a name other than the automatically-assigned name (by Oracle Fabric Manager).

Syntax

To rename an Oracle SDN fabric, issue the following command:

```
set xsf <XSF name> [-new-name=The new fabric name]
```

Example

```
set xsf fabric_5514059420008481 [-new-name=MyCompanyFabric]
```

The above example changes the auto-generated fabric name to “MyCompanyFabric,” which makes more sense than the group of numbers combined with the word fabric.

Display Oracle SDN Fabric Information

You can also display a list of all Oracle SDN Fabrics in your environment using the `show xsf` command.

Syntax

To display the Oracle SDN Fabrics in your environment, issue the following command:

```
show [-xml] [-list] [-table] [-sortby=Sort column] xsf <Name of XSF>
```

Example

```
root@FabMgrCLI[ofm] show xsf
fabric-name                subnet-name      fabric interconnects  pvi-clouds
-----
fabric_5514059420008481   texas           texas,arkansas       0
fabric_5514059420008973   montana         montana              0
2 records displayed
```

Private Virtual Interface (PVI) Clouds

PVI Clouds are part of the Oracle SDN feature. With this feature, you can use the commands described in this section to add, configure, display and remove PVI Clouds. For more information, see the Oracle SDN Controller for Networking User Guide.

A PVI requires a Fabric name. You create a Fabric when you connect an Oracle Fabric Interconnect to switches and/or servers with InfiniBand cables. If you connect two Oracle Fabric Interconnects using InfiniBand cables, the two subnets become one subnet, or one fabric. When you make a PVI cloud on that Fabric, any communication on that cloud between the two servers connected through InfiniBand occurs at InfiniBand speeds (for example, 20 - 40 Gbps).

This command enables you to add, remove, manage, and list Private Virtual Interconnect (PVI) clouds.

Adding and Configuring a PVI Cloud

To create a private virtual interconnect Cloud for a maximum transmission unit (MTU) within the specified fabric, issue the following command.

```
add pvi-cloud <PVI name> <Fabric name> [-mtu=Private Virtual Interconnect mtu]
```

For example:

```
root@FabMgrCLI[ofm] add pvi-cloud pviCloud9
```

To bring the PVI Cloud “up” or “down,” issue one of the following commands:

```
set pvi-cloud <pvi-cloud name> up
```

```
set pvi-cloud <pvi-cloud name> down
```

For example:

```
root@FabMgrCLI[ofm] set pvi-cloud pviCloud9 -mtu=9000 -description=
PrivateCloud9
```

To specify an MTU, a new name, or a description for a PVI Cloud, issue the following command:

```
set pvi-cloud <PVI name> [-mtu=Private Virtual Interconnect MTU] [-description=Private
Virtual Interconnect Description]
```

For example:

```
root@FabMgrCLI[ofm] set pvi-cloud pviCloud9 up
```

Displaying a PVI Cloud

To display a list of PVI Clouds configured in your environment, issue the following command:

```
show pvi-cloud vnics [-xml] [-list] [-table] [-sortby=Sort column] [<PVI name>]
```

Example:

```
root@FabMgrCLI[ofm] show pvi-cloud
```

name	state	network-id	mtu	fabric	description	vnics
HAXSF1	up/up	3390	9000	_unintialized_		0
HAXSF2	up/up	38791	1500	_unintialized_		0
HAXSF3	up/up	47760	65504	_unintialized_		0
XSF1	up/up	52742	9000	_unintialized_		0
XSF2	up/up	15884	1500	_unintialized_		0
XSF3	up/up	25083	65504	_unintialized_		0
XSF4	up/up	59793	9000	_unintialized_		0
XSF5	up/up	44624	1500	_unintialized_		0
XSF6	up/up	7437	65504	_unintialized_		0


```
aaaa      up/up    3099      9000      _unintialized_      0
backup    up/up    21196     9000      _unintialized_      0
11 records displayed
```

Removing a PVI Cloud

To remove a PVI from your fabric, issue the following command:

```
remove [-noconfirm] pvi-cloud <PVI name>
```

For example:

```
root@FabMgrCLI [ofm] remove pvi-cloud pviCloud9
```


System Commands for the Oracle Fabric Interconnect or Oracle Fabric Manager

This section describes the system commands available in the Oracle Fabric Manager CLI.

Exiting Oracle Fabric Manager

To exit the Oracle Fabric Manager CLI, issue the `quit` command.

Rescanning

Use the `system rescan` command to removes any stale servers and scans for new ones.

Network Connectivity

The ping and traceroute commands enable you to obtain network information about servers in your environment.

Using the PING Command

Use the ping command to display the IP address and name of the specified host.

```
ping <Hostname or IP address>
```

For example:

```
root@FabMgrCLI[ofm] ping montana
PING montana.lab.com (102.168.xx.xx) 56(84) bytes of data.
64 bytes from montana.lab.com (102.168.xx.xx): icmp_seq=1 ttl=64 time=0.171 ms

--- montana.lab.com ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.171/0.171/0.171/0.000 ms
```

Using the TRACEROUTE Command

Use the traceroute command to display the path to the specified host.

```
traceroute <Hostname or IP address>
```

For example:

```
root@FabMgrCLI[ofm] traceroute montana  
traceroute to montana (102.168.xx.xx), 30 hops max, 40 byte packets  
 1 montana.lab.com (102.168.xx.xx) 0.150 ms 0.119 ms 0.094 ms
```

Index

A

- Add Command, 8
- add default-gateway Command, 105
- add ethernet-lag command, 93
- add iscsi-boot-profile commands, 193, 196
- add san-host-profile commands, 187
- add user-role command, 56
- Adding a Storage Cloud, 114
- adding a vHBA, 125
- Adding HA vHBAs, 125
- Adding I/O Templates, 138
- Adding vNICs, 85
- Applications, adding and removing, 205
- Authentication, 18

B

- Backup and Restore, 231
- Boot Profiles, 248
- Boot Profiles, working with, 183

C

- CLI Overview, 1
- CLI Properties, 255
- Command History, 15
- Command Summary, all commands, 12
- create san-host-profile commands, 187

D

- Default Domain, 52
- Default Domain Users, 53

Default Gateway

- configuring, 106
- creating, 105
- displaying information, 106
- removing, 108
- working with, 104

Default Gateways, 244

Domain Group Mapping, 202

Domain Group Mappings, 53, 58

E

Ethernet LAG

- adding, 73, 94

Ethernet LAG Information, 97

Ethernet Link Aggregation Groups (LAGs), 66

Ethernet modules supported, 44

Ethernet Port

- adding, 72
- displaying Information, 77
- fields, 78
- Information on, 46
- removing, 80

Ethernet-LAGs, 242

F

FC Port

- displaying information, 119
- removing, 122

FC Port Information, 44

Fibre Channel modules supported, 44

Fibre Channel Ports, adding, 115

- G**
Global Address, 226
- H**
HA vNIC, adding, 84
Help with commands, 7
High Availability (HA) Network and Storage Clouds, 23
High Availability Network Clouds, 65
High Availability Storage Clouds, 111
- I**
I/O Card, displaying information, 41
I/O Profile
 connecting to a physical server, 156
 creating and deploying, 31
 disconnecting from a physical server, 156
 removing resources from, 165
I/O Profile Resources
 displaying, 158
I/O Profiles, 220
 creating, 154
 removing, 165
 working with, 153
I/O Resources
 changing, 143
 displaying, 145
 removing, 151
I/O Templates, 3, 214
 connectivity, 137
 creating, 29, 137
 removing, 152
 working with, 135
iSCSI Boot Profile
 creating and changing, 192
 deleting, 197
 displaying, 194
iSCSI Boot Profiles, working with, 190
- L**
LAG
 adding, 93
 configuring, 94
 displaying information, 96
 removing, 98
LAG Ports Command, 98
LAGs, 92
Link Aggregation Groups, working with, 92
Linux login, 17
Linux Server iSCSI Boot Topology, 190
Logging In, 19
Logs, 228
LUN Masks, 111
- M**
MAC addresses, 257
MAC Addresses, displaying, 79
MAC IDs
 removing, 80
MAC-based QoS Profile, removing, 103
MAC-Based QoS, displaying information, 102
MAC-Based Quality of Service, 247
- N**
Network Cloud, 207
 adding, 68
 adding HA to, 73
 configuring HA, 25
 creating, 24, 67
 displaying information for, 74
 fields, 77
 options, 69, 70, 72, 157
 removing, 80
 working with, 63
Network Connectivity, 231
Network QoS
 displaying, 99
 working with, 99
Network QoS Profile, removing, 101
Network QoS Profiles, 65
Network Quality of Service (QoS), 245
Network Resources, adding, 139
No Access Role, 54
- O**
Oracle Fabric Interconnect, 232
 displaying information about, 37
 managing, 21
 removing, 50
 restarting, 49
 understanding, 35
Oracle Fabric Interconnects, 21

- managing, 49
- Oracle Fabric Manager, adding Oracle Fabric Interconnects, 36

P

- Physical Connectivity, 155
- Physical Server
 - connecting to I/O Profiles, 167
 - disconnect from I/O Profiles, 168
 - displaying resources, 169
- Physical server connections, 167
- Physical Servers, 223
- Physical Servers, working with, 167
- ping, 231
- Port Allocation Policy, 112
- Private virtual interface (PVI) Clouds, 2
- Private vNICs, 64
- PVI Cloud, 203

Q

- QoS Profiles, assigning, 132
- Question mark, using for help, 7

R

- Redirecting Output, 16
- Remove Command, 11
- remove ethernet-lag command, 98
- Removing Ethernet LAGs, 81
- Removing Ethernet Ports, 81
- Removing FC Ports, 123
- Removing I/O Profiles, 165
- Removing MAC IDs, 82
- Removing Network Clouds, 80
- Removing Storage Clouds, 123
- Removing WWNs, 124
- Resource Domain, 253
- Resource Domains, 52
 - configuring, 59
- Revision Trail, xxv
- Role Group Mapping, 200
- Role Group Mappings, 53, 57
- root default user name, 18

S

- SAN Boot Profile
 - creating, 185
 - deleting, 189
 - details, 187
- SAN Boot Profiles
 - working with, 183
- SAN Boot Topology, 184
- SAN QoS Profiles, displaying, 132
- SAN Quality of Service, 132
- Server Group
 - removing, 180
- Server Groups, 241
 - creating, 178
 - displaying, 179
 - removing, 181
 - removing virtual resources from, 181
 - working with, 178
- Server Profiles, displaying, 176
- Set Command, 10
 - set ethernet-lag command, 94
 - set io-template...add vnic command, 139
 - set iscsi-boot-profile commands, 193, 196
 - set storage-cloud Command, 115
 - set user-role Commands, 56
- Show Command, 8
 - show default-gateway Command, 107
 - show director Command, 46
 - show director command
 - fields, 39, 43
 - show director...ethernet-port Command, 49
 - show ethernet-lag command, 96
 - show ethernet-lag Port command, 97
 - show ethernet-port, 93
 - show io-profile ..vhbas command, 161
 - show io-profile ..vnics command, 160
 - show io-profile command, 164
 - show io-template...servers command, 149
 - show io-template...vhbas command, 148
 - show mac-based-qos commands, 102
 - show network-qos command, 101
 - show physical-server ..stats command, 177
 - show physical-server ..vhbas command, 176
 - show physical-server ..vnics command, 174

- show physical-server command, 171
- show san-boot-profile command, 189
- show san-qos Command, 134
- show storage-cloud command, 118
- show storage-cloud...fc-ports command, 120
- show vhba command, 131
- show vnic command, 90
- Storage Area Network (SAN) QoS Profile, 110
- Storage Cloud
 - adding, 113
 - adding HA to, 116
 - creating, 27, 113
 - creating with HA, 27
- Storage Cloud Options, 114
- Storage Clouds, 109, 211
 - removing, 122
 - working with, 109
- Storage Quality of Service (QoS), 246
- Storage resources, adding to Templates, 141
- System Commands, 227
- System Information, 228

T

- Tab key, 7
- Tech Support, 228
- Templates, 3
- traceroute, 231

U

- User Access Security, managing, 50
- User Role, 252
- User Roles, 51, 54

V

- vHBA
 - displaying, 129
 - setting options, 127
- vHBA Command options, 128
- vHBAs, 110, 238
 - adding to I/O Templates, 147
 - creating and using, 124
 - displaying physical server information, 174
 - in I/O Profiles, 160
 - removing from I/O Templates, 151
 - removing from Storage Clouds, 131

- vHBAs, defined, 2
- Virtual Local Area Networks (VLANs), 66
- Virtual Resources, 2
- vNIC
 - displaying information, 88
 - setting options, 87
- vNICs, 63, 234
 - adding to I/O Templates, 145
 - adding to Network Clouds, 83
 - creating, 82
 - displaying physical server, 172
 - in I/O Profiles, 158
 - removing from I/O Templates, 151
 - removing from Network Cloud, 92
- vNICs on an I/O Template, 89
- vNICs, defined, 2

W

- Wildcards, 16
- Windows login, 17
- World Wide Names, 112, 257
 - displaying, 121

displaying, 119
