

InfiniDB[®] Enterprise Manager Guide

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InfiniDB Enterprise Manager Guide

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1 Introduction

This guide includes information for installing, configuring, maintaining, performance tuning, and troubleshooting InfiniDB through the Enterprise Manager.

The content in this guide is **only** available with InfiniDB Enterprise.

1.1 Audience

This guide is intended for database administrators and IT administrators who are responsible for setting up, maintaining and managing InfiniDB.

1.2 List of Documentation

The InfiniDB Database Platform documentation consists of several guides intended for different audiences. The documentation is described in the following table:

Document	Description
InfiniDB Administrator's Guide	Provides detailed steps for maintaining InfiniDB.
InfiniDB Apache Hadoop™ Configuration Guide	Installation and Administration of an InfiniDB for Apache Hadoop system.
InfiniDB Concepts Guide	Introduction to the InfiniDB analytic database.
InfiniDB Minimum Recommended Technical Specifications	Lists the minimum recommended hardware and software specifications for implementing InfiniDB.
InfiniDB Installation Guide	Contains a summary of steps needed to perform an install of InfiniDB.
InfiniDB Multiple UM Configuration Guide	Provides information for configuring multiple User Modules.
InfiniDB SQL Syntax Guide	Provides syntax native to InfiniDB.
Performance Tuning for the InfiniDB Analytics Database	Provides help for tuning the InfiniDB analytic database for parallelization and scalability.
InfiniDB Windows Installation and Administrator's Guide	Provides information for installing and maintaining InfiniDB for Windows.

1.3 Obtaining documentation

These guides reside on our <http://www.infinidb.co> website. Contact support@infinidb.co for any additional assistance.

1.4 Documentation feedback

We encourage feedback, comments, and suggestions so that we can improve our documentation. Send comments to support@infinidb.co along with the document name, version, comments, and page numbers.

1.5 Additional resources

If you need help installing, tuning, or querying your data with InfiniDB, you can contact support@infinidb.co.

2 InfiniDB Enterprise Manager Overview

2.1 *What is Enterprise Manager*

The Enterprise Manager is a web-based administration and management console that assists in the installation, configuration, administration and monitoring of InfiniDB. It allows a user to easily manage one or more InfiniDB clusters.

2.1.1 Major functional categories

The Enterprise Manager provides the following capabilities for InfiniDB:

- Provisioning of multiple InfiniDB clusters:
 - Installation
- Management of multiple InfiniDB clusters:
 - Status, alarms, locks and configuration
- Monitoring of multiple InfiniDB clusters
 - System memory utilization
 - Query and data import metrics

2.1.2 Components/Roles

- Enterprise Manager Server
 - The server where the Enterprise Manager has been installed and running.
- OAM Server
 - The InfiniDB Cluster server where the components that Enterprise Manager needs in order to interface with the cluster will be installed. This is typically the primary UM server (i.e., UM1) on the InfiniDB Cluster.
- InfiniDB Nodes
 - The servers that make up an InfiniDB Cluster. These are usually referenced as UM servers (UM1, UM2, etc.) or PM servers (PM1, PM2, etc.)

3 Installation of Enterprise Manager

This chapter describes the prerequisites needed and how to install the InfiniDB Enterprise Manager software.

3.1 Prerequisites

3.1.1 General Server Requirements

Before installing Enterprise Manager (EM), the following must exist or be performed:

- If attaching to an existing InfiniDB instance, the cluster must be running InfiniDB 4.5.1 or later. For new installs, InfiniDB 4.6 will be included as part of the Enterprise Manager package. Enterprise Manager will work with either InfiniDB Standard or InfiniDB Enterprise.
- Every InfiniDB server (UM, PM) in the system needs to have these configured or available:
 - Python 2.6 or 2.7
 - passwordless SSH
 - SSH key in the `authorized_keys` for the user specified to perform provisioning from the EM
 - If non-root InfiniDB installation, passwordless SUDO
 - The EM does not have a TTY when it uses SSH to perform provisioning. So `requiretty` needs to be disabled or it will kick it out:

```
vi /etc/sudoers
#Defaults requiretty
```
 - If InfiniDB for Hadoop installation, `pdsh`
 - For more information, please see the “PDSH Setup” section in the InfiniDB Apache Hadoop Configuration Guide.

3.1.2 EM Server Requirements

In addition to the general requirements, these capabilities need to be present on the node where the Enterprise Manager is installed. The Enterprise Manager can be installed on any node whether or not it is also a PM or UM in the InfiniDB cluster. In most installations it is appropriate to deploy the EM on the primary UM node (UM1).

- Centos 6, Ubuntu 12.04, Ubuntu 14.04, Debian 6, Debian 7
- Python 2.6 or Python 2.7
- Python libraries
 - `python-setuptools`
 - `pip` version 1.5 or later
 - `virtualenv` version 1.11 or later
- Java 7

Example commands for use on a CentOS system:

- YUM commands to get a node up to the levels needed:

```
sudo yum install python-setuptools
sudo yum install java-1.7.0-openjdk
```

```
sudo easy_install pip
sudo pip install virtualenv
```

Note: There will be the capability to designate a non-InfiniDB node for the Enterprise Manager in the future.

3.2 Enterprise Manager Installation

Enterprise Manager comes in various packages to allow different types of installs:

- RPM Install for Single/Multiple Server
- DEB Install for Single/Multiple Server
- Binary Install for Single/Multiple Server

3.2.1 RPM Installation

Download and install the RPM for the InfiniDB Enterprise Manager:

```
rpm -ivh infinidb-entmgr-release#.el6.x86_64.rpm
```

After the installation of the RPM, a service named infinidb-em will be made and started.

3.2.2 DEB Installation

Download and install the DEB for the InfiniDB Enterprise Manager:

```
dpkg -i infinidb-entmgr-release#.el6.amd64.deb
```

After the installation of the DEB, a service named infinidb-em will be made and started.

3.2.3 Binary Installation

Download and unpack the tarball for InfiniDB Enterprise Manager, which will create the `/opt/infinidb/em` directory.

```
# tar -zxvf infinidb-em-release#.tar.gz
```

From the `/opt/infinidb/em` directory, run the install script `install.sh`. After the installation, a service named infinidb-em will be made and started.

3.2.4 Accessing Enterprise Manager

In order to access the Enterprise Manager, the Enterprise Manager server should be addressable from the browser. You may need to modify the `hosts` file on the user machine to add something similar to the following information:

```
10.100.1.167   EMServerName
```

In addition, you may need to allow the following ports to any firewall software running on the user machine:

- EM Server - 9090

- OAM Server - 8180

Once set up, Enterprise Manager can be accessed in a browser using the hostname or ipaddress. Example based on the above `hosts` information:

<http://EMServerName:9090> or <http://10.100.1.167:9090>

4 Upgrading Enterprise Manager

The recommendation is to remove the existing installation (See “Removal of Enterprise Manager”) and perform a new installation (See “Enterprise Manager Installation”).

You can remove only the EM components on the node the EM was installed on and the installation will work. The components on the remote nodes did not change in the build and are compatible.

The upgrade procedure is being worked on currently to alleviate the manual steps described above of removal and re-installation.

5 Provisioning

The Enterprise Manager has the ability to perform new cluster installations or attach to existing installations of InfiniDB. The following sections describe each case of installation. These steps may be performed for each cluster that you want Enterprise Manager to manage and monitor.

Note: Alarms will not be enabled when performing an install with the Enterprise Manager.

5.1 New Cluster Installation

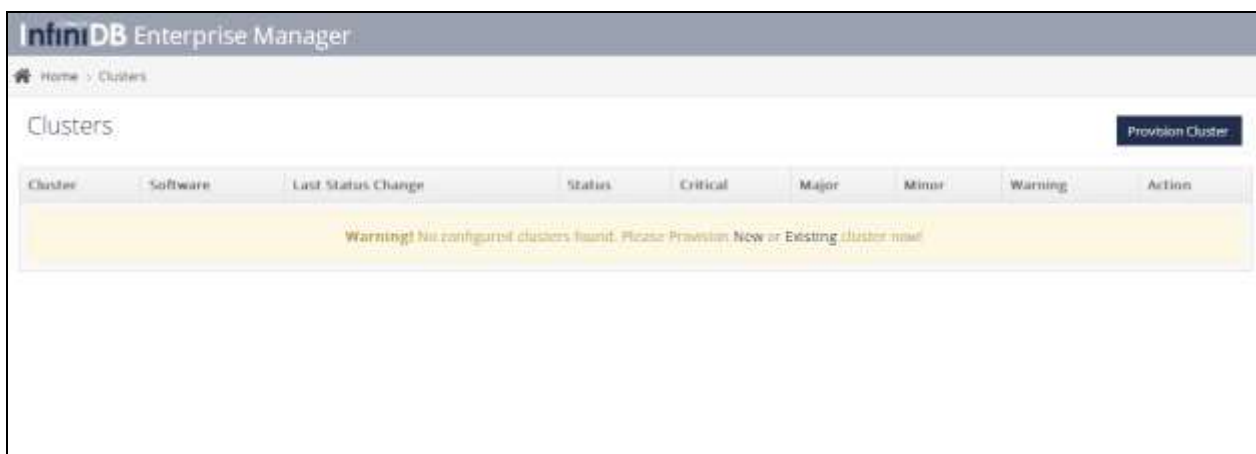
Follow these steps for creating a new InfiniDB cluster through Enterprise Manager:

5.1.1 Preparation

- Please note that all servers intending to be provisioned as an InfiniDB cluster must have previously been set up. Please see the “Prerequisites” section above.
- Additional items to consider. For more detailed information, see the “Preparing for Installation” section in the InfiniDB Installation Guide.
 - The EM can be installed to any installed on servers that meet the required supported platform:
 - RedHat®/CentOS v6
 - Debian v6, v7
 - Ubuntu 12.04, 14.04
 - Storage requirements
 - Local Disk
 - HDFS (root only)

5.1.2 Install

On the Home/Clusters page, Select the Provision Cluster button and select “New” (if there are no clusters listed, you may also choose the “New” link in the list):



The Provisioning Cluster page is displayed to enter information about the new cluster:

Provisioning Cluster

Cluster

Cluster Name

test_infinidb_cluster

Cluster Hosts (separated by comma)

10.100.6.179, 10.100.6.178, 10.100.6.180

SSH

User

root

Key

EM_id_rsa.txt

Continue

Inputs:

- Cluster Name - Name to use for the cluster. This is the name the EM will display and refer to. Must be a unique name within EM (example above – *test_infinidb_cluster*).
- Cluster Hosts – A list of all the nodes to be used for the cluster. Hosts entries may go on separate lines
- User - The user to perform the provisioning as. Must have passwordless SSH for any user. If non-root, must have passwordless sudo. Can use the root user.
- Key - The SSH Key that has been setup for the nodes for passwordless SSH.

Once the Continue button is selected, EM gathers information about the cluster and presents the following page:

Provisioning Cluster - Host Report

Cluster

Configuration

Software Version

4.6-0

Storage Type

local

OS Version

CentOS

Deployment Type

Separate UM/PM

Node Count (UM/PM)

1/2

Primary UM

qavmEMum1

Primary PM

qavmEMpm1

Secondary PM

qavmEMpm2

OAM Server

qavmEMpm1

Hostname	IP	UM	PM	Status	Message
qavmEMpm1	10.100.6.178		PM1	Online	
qavmEMum1	10.100.6.179	UM1		Online	
qavmEMpm2	10.100.6.180		PM2	Online	

Back

Install

The specifics about the cluster and hosts can be configured here. Information on the Cluster tab:

- Software Version – allows the user to select which version of InfiniDB to install. Currently only 4.6 is allowed.
- Storage Type – allows the user to select local vs. hdfs.
- OAM Server – allows the selection of the host tagged as the OAM Server.
- Local PM Query – This provides the ability to query data from a single PM and for the query results to remain on the PM without having to use the network bandwidth between UM and PM. For more information, see the “Local PM Query” section in the InfiniDB Multiple UM Configuration Guide.
- Host List – allows the user to designate the hosts as UMs or PMs or UM/PM combination. If only one host exists in the list, it will be designated as a single server UM/PM.

Information on the Configuration tab. Currently this information is defaulted based on the host information and may be changed for specific tuning.

Provisioning Cluster - Host Report

Cluster

Configuration

TotalUmMemory

2G

LocalQuery

☒ NO

DBRootsPerPm

1

NumBlocksPct

20

PmMaxMemorySmallSide

64M

VersionBufferFileSize

1G

CoreFileFlag

☒ NO

Back

Attach





- **TotalUmMemory** – Constrains the maximum amount of memory available for managing intermediate results for join, aggregations and select operations on the User Module. This setting is shared across all queries active on a User Module. Expressed as 1-100% or expressed in bytes such as 1G.
- **LocalQuery** – Defines whether the local query interface for PMs will be enabled. This allows queries to be limited to the local PM instead of querying all PMs in the cluster.
- **DBRootsPerPm** – Defines how many DB Roots per PM will be allocated. Setting the value to 1 with 4 PMs defined will result in 4 DB Roots.
- **NumBlocksPct** – Defines the amount of memory dedicated to the data buffer cache within each Performance Module. The setting is expressed as a percentage of a Performance Module's total memory. Valid values are 1 through 100.
- **PmMaxMemorySmallSide** - Defines the maximum size of a small side join result set for a PM join. If the size of the data set is smaller than the PmMaxMemorySmallSide, the data will be sent to the PM(s) to allow creation of a distributed hash map. Otherwise, it will be created on the UM. The setting is individual to each small side result set. Expressed as 1-100% or expressed in bytes such as 64M.
- **VersionBufferFileSize** - This setting defines the amount of disk per DBRoot dedicated to the version buffer. The version buffer is used for rollbacks of DML statements. Valid value is 1G for 1 GB, 2G for 2GB, etc. Minimum value is 1G.
- **CoreFileFlag** - Determines whether core files will be produced upon abnormal termination of InfiniDB processes. Valid value is y or n.

Once the Attach button is selecting, EM will proceed with the provisioning of the configuration. Once completed, the cluster will appear in the Cluster list:



Cluster	Software	Last Status Change	Status	Critical	Major	Minor	Warning	Action
test_infinidb_cluster	4.6-0	Fri, Jun 27, 2014 16:05:12.000	ACTIVE	0	0	0	0	   

On this page the following options are available:

- Start, Stop, Restart the cluster – These are icons (  ) listed under the Actions column.
- Detach the cluster from EM – Also an icon () under the Actions column. This will not delete the installed InfiniDB cluster and will only remove it from being managed within EM
- Selecting the cluster name will navigate to the Cluster Details page for a detailed look at the cluster summary, configuration and monitoring. See the “

Management” below for more information.

5.2 Attach Existing Cluster

Follow these steps for attaching an existing InfiniDB cluster to Enterprise Manager:

The EM can attach to any installed InfiniDB instance version 4.5.1 or later as long as it's on a supported platform:

- RedHat®/CentOS v6
- Debian v6, v7
- Ubuntu 12.04, 14.04

Click Add -> Existing

Provisioning Existing Cluster screen is displayed:

Provisioning Existing Cluster

Cluster	SSH
Cluster Name <input type="text"/>	User <input type="text"/>
Cluster Host <input type="text"/>	Key <div>Drop files here or click to choose </div>

Continue

Inputs:

- Cluster Name - Name to use for the cluster. This is the name the EM will display and refer to it as. It does not have to match the system name in Calpont.xml.
- Cluster Host - One of the nodes of the cluster, it can be UM1, PM1, just has to be one of the nodes, we will discover the database from there.
- User - The user to perform the provisioning as. Must have passwordless SSH for any user. If non-root, must have passwordless sudo. Can use the root user.
- Key - The SSH Key that has been setup for the nodes for passwordless SSH.

Example fields entered:

Provisioning Existing Cluster

Cluster

SSH

Cluster Name

test_infinidb_cluster

Cluster Host

10.100.6.179

User

root

Key

EM_id_rsa.txt

Continue

Click continue and the server will connect to the node and discover the cluster. A report of the cluster will come back:

Provisioning Existing Cluster

Cluster Information

Software Version	4.6-0	Primary UM	qavmEMum1
Storage Type	internal	Primary PM	qavmEMpm1
OS Version	CentOS	Secondary PM	qavmEMpm2
Deployment Type	Separate UM/PM	OAM Server	qavmEMpm1 ▾
Node Count (UM/PM)	0/0		

Nodes

Hostname	IP	Role	Status	Message
qavmEMpm1	10.100.6.178	PM1	Online	
qavmEMum1	10.100.6.179	UM1	Online	
qavmEMpm2	10.100.6.180	PM2	Online	

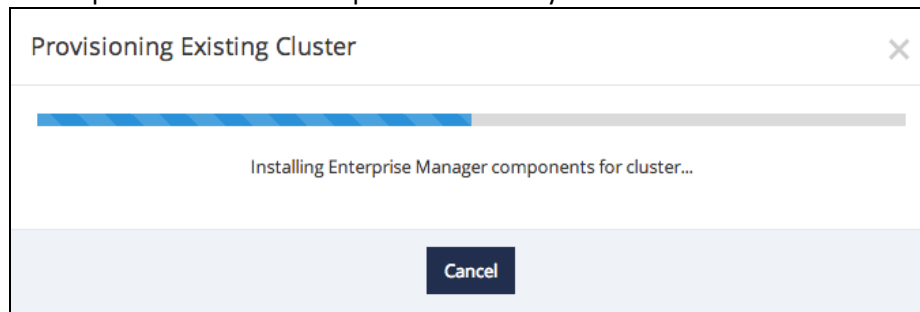
Back

Attach

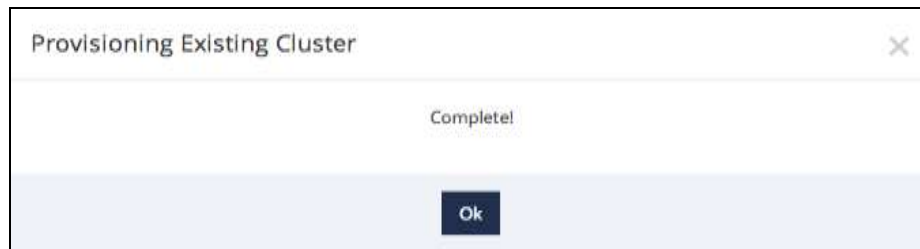
For attaching to a cluster, the OAM Server will need to be designated. This can be any node of the system. Recommendation is to use UM1 as the OAM Server. Here in the future we will support a separate node to be in the cluster that can be the EM / OAM Server node only and not affect the UM / PM nodes for database operations.

Should a node have an issue, such as passwordless SUDO missing, there will be a message on the node and the status of the node will be Offline. Fix the issue on the node and hit back and continue to refresh the report.

Click Attach to provision the EM components to the system:



Installation Successful:



The Cluster should appear in the cluster list now.

5.3 Detach Cluster

Select the cluster to detach and click the delete icon (🗑️). This will remove the cluster from being managed by the EM. Detaching a cluster will have the telemetry removed for that cluster, but the installed components will remain. Follow the uninstallation steps to remove software changes.

5.4 Management

The Enterprise Manager has the capability to manage several key areas for InfiniDB Cluster. Selecting the cluster name navigates to the Cluster Details page:

The screenshot shows the InfiniDB Enterprise Manager interface. The top navigation bar includes 'Home' and 'Clusters'. The main header shows 'Clusters' with a dropdown menu displaying 'test_infinidb_cluster'. Below this, there are three tabs: 'Summary' (selected), 'Configure', and 'Monitoring'. The 'Modules' section contains a table with the following data:

Module	Status	Last Status Update
UM1	ACTIVE	Thu, Jul 3, 2014 19:14:11.000
PM1	ACTIVE	Thu, Jul 3, 2014 19:13:57.000
PM2	ACTIVE	Thu, Jul 3, 2014 19:13:53.000

Below the modules table, there is an 'Alarms' section with a table that currently shows 'No Active Alarms'. The 'Locks' section also shows 'No Active Locks'.

5.4.1 Cluster Summary

Information about the cluster is collected on a 10 second poll by the EM to retrieve the status of the system along with a list of any alarms and locks present.

5.4.1.1 Status

Status is shown on a per module basis along with System. This is the same information that can be seen by calling `calpontConsole getsystemstatus`.

- Module - Name of the module
- Status - The status being reported
- Last Status Update - The last time the status was changed

5.4.1.2 Alarms

List of the active alarms on the system. This is the same information that can be seen by calling `calpontConsole getactivealarms`.

5.4.1.3 Locks

List of active table locks on the system. This is the same information that can be seen by calling `calpontConsole.getTablelocks`.

5.4.2 Cluster Configuration

The Enterprise Manager can manage certain key configuration parameters for each type of InfiniDB node.



The screenshot shows the InfiniDB Enterprise Manager web interface. The breadcrumb navigation is 'Home > Clusters'. The cluster name is 'test_infinidb_cluster'. There are three tabs: 'Summary', 'Configure' (which is selected), and 'Monitoring'. Below the tabs is a search bar labeled 'Search properties'. On the left, there is a tree view with 'PM' and 'UM' nodes. The main area displays configuration parameters for the 'PM' node type. The parameters and their values are: 'PmMaxMemorySmallSide' with value '500', 'NumBlocksPct' with value '20', 'VersionBufferFileSize' with value '1G', and 'CoreFileFlag' with value 'false'. A 'Save' button is located in the top right corner of the configuration area.

5.4.2.1 PM

PmMaxMemorySmallSide

This setting defines the maximum size of a small side join result set for a PM join. If the size of the data set is smaller than the `PmMaxMemorySmallSide`, the data will be sent to the PM(s) to allow creation of a distributed hash map. Otherwise, it will be created on the UM. The setting is individual to each small side result set. Expressed as 1-100% or expressed in bytes such as 64M.

NumBlocksPct

This setting defines the amount of memory dedicated to the data buffer cache within each Performance Module. The setting is expressed as a percentage of a Performance Module's total memory. Valid values are 1 through 100.

VersionBufferFileSize

This setting defines the amount of disk per DBRoot dedicated to the version buffer. The version buffer is used for rollbacks of DML statements. Valid value is 1G for 1 GB, 2G for 2GB, etc. Minimum value is 1G.

CoreFileFlag

This setting determines whether core files will be produced upon abnormal termination of InfiniDB processes. Valid value is y or n.

5.4.2.2 UM

TotalUmMemory

This setting constrains the maximum amount of memory available for managing intermediate results

for joins, aggregations, and set operations on the User Module. This setting is shared across all queries active on a User Module. Expressed as 1-100% or expressed in bytes such as 1G.

5.4.3 Monitoring

The Enterprise Manage can monitor key memory and statistical elements of an InfiniDB cluster.



5.4.3.1 System Utilization

Each node of the cluster will be displayed at the same time for the metric chosen. The metrics available are:

Category	Metric
CPU	User System Idle
Memory	Free Used Buffered Cached
Network	Bytes Packets Errors
Storage	Free Used Reserved
Disk	Bytes OPS Merged

	Time
Swap	Free Used Cached IO

In cases where there are multiple instances of a metric, such as CPU with a multi core, the metric has been aggregated to the system.

- CPU - All cores are aggregated (SUM)
- Network - All interfaces are aggregated (SUM)
- Disk - All devices are aggregated (SUM)

The metrics have been normalized to a 0-100 scale when possible to provide similar scale across nodes for viewing. Network and Disk will be displayed as absolute values as it cannot be determined what the range of values could be.

The type of graph being shown is a horizon graph. The range of values for the metric is divided into 4 bands and as the value reaches the top of the graph, it will cycle back at the bottom and use a darker intensity of the coloring. This allows seeing the groups of nodes as a heat map like graph as you can quickly identify the intensity levels based on coloring. In the cases of the normalized metrics, the coloring will always be based on the 0-100 range, while for the absolute metrics, the range will be dynamically determined based on the data returned for the time range.

The difference granularity selections are:

- 10s
- 30s
- 1m
- 1h

By adjusting the granularity you can change the time range of the window seen (how far back in time from real time).

e.g. Changing from 10s to 30s when having a resolution of 1440 pixels would change the time range window from 4 hours to 12 hours.

By default it is 10s, which is the same value as the granularity that is stored server side (no aggregations are needed).

In order to aggregate the metrics to the granularity selected, the following aggregates are applied to the metrics:

Category	Metric	Aggregation
CPU	User	AVG
	System	AVG
	Idle	AVG
Memory	Free	AVG

	Used	AVG
	Buffered	AVG
	Cached	AVG
Network	Bytes	SUM
	Packets	SUM
	Errors	SUM
Storage	Free	AVG
	Used	AVG
	Reserved	AVG
Disk	Bytes	SUM
	OPS	SUM
	Merged	SUM
	Time	SUM
Swap	Free	AVG
	Used	AVG
	Cached	AVG
	IO	SUM

5.4.3.2 Jobs

The telemetry data for queries and loads can be seen under the Job tab. This data originates from InfiniDB and is sent to the EM as they occur.

Each type can be seen in a similar manner of a summary table that provides sorting, filtering, and paging capabilities. You may select the Details link at the right to drill down into the details of the telemetry.

The screenshot shows the InfiniDB Enterprise Manager web interface. The top navigation bar includes 'Home' and 'Clusters'. The main content area is titled 'Clusters > test_infinidb_cluster'. On the left sidebar, the 'Jobs' tab is selected, showing a list of 'Queries' and 'Loads'. The 'Queries' section is active, displaying a table of query telemetry data. The table has columns: Start Time, End Time, State, Duration, Schema, Module, Progress, and Note. A single query is listed with a state of 'complete' and a duration of '965ms'. A 'Details' link is available for this query. The interface also includes a search bar, a 'Filter by Time Range' dropdown, and a 'Items per Page' selector set to 10.

Start Time	End Time	State	Duration	Schema	Module	Progress	Note
Thu, Jul 3, 2014 18:17:55.333	Thu, Jul 3, 2014 18:18:00.304	complete	965ms	mytest	um1	100	insert into testTable values ('1', 'hello')

5.4.3.3 Paging

The number of items per page can be changed by the Item Per Page on the bottom right, the available options are 10, 25 and 50.

As multiple pages of data occur, the page navigation on the bottom left will be available.

5.4.3.4 Sorting

Query Telemetry supports sorting by all columns except Note. Import Telemetry supports sorting by all columns.

With the explicit sorting defined by the user a secondary implicit sort of StartTime and ID is applied to give deterministic ordering of the result set. This occurs when multiple objects have the same value, the secondary sort will guarantee the same result ordering each time the query is ran.

e.g. Sorting by Progress will typically result in multiple items having the same value (such as 100), the items will then be sorted by Start Time and then by ID.

5.4.3.5 Filtering

By Status

Can toggle by All or Active for filtering. Objects which have no End Time are considered Active.

By Search

Performs a substring filter by search term of designated fields for the Telemetry object:

- Query Telemetry will search ID and Note (SQL statement)
- Import Telemetry will search ID and Tables

By Date

Performs a date range filter of objects.

- Today
- Yesterday
- Last 7 Days
- Last 30 Days

Context filters for date range are available to provide easy selection of time range

5.4.3.6 Query Telemetry

Queries are shown at the summary and can be drilled into for details. In the details of a query, you can see the telemetry information for the query along with the steps of the query.

In addition to the common filtering options, the queries can be filtered by their statement type to allow filtering to only SELECT or similar types. The types can be toggled on and off in combination with each other.

5.4.3.7 Import Telemetry

Imports can be seen at the summary level and the number of rows that have been imported so far as part of the import. Import telemetry is aggregated for all modules. The rows imported is updated periodically during the active import.

6 Removal of Enterprise Manager

If you have an existing build of the Enterprise Manager and wish to uninstall it, here are the procedures. Some of these may overlap as a node could be acting as multiple roles.

6.1 Saving off configuration/data files

If you would like to keep the configuration and telemetry files before removing Enterprise Manager in order to use them when re-installing/upgrading Enterprise Manager, the following directories should be copied to a backup location and restored once EM has been re-installed:

```
/opt/infinidb/em/conf  
/opt/infinidb/em/data
```

6.2 EM Removal

6.2.1 General

Every node in the cluster has components installed on it during the attach process.

```
service infinidb-em-collectd stop  
chkconfig --del infinidb-em-collectd  
userdel -r infinidb-em  
rm -rf /opt/infinidb/em
```

6.2.2 EM Host

The EM was installed via a RPM which then installed the components needed for the EM host. It also has the components installed (collectd) on all nodes as part of the EM attach. Currently the RPM does not contain a full uninstall script, so we will do it manually and then remove the entry from the RPM DB.

```
service infinidb-em stop  
chkconfig --del infinidb-em  
userdel -r infinidb-em  
rm -rf /opt/infinidb/em  
rpm -e --justdb infinidb-entmgr
```

6.2.3 OAM Host

The OAM Server contains the graphite installation which has two processes, graphite and carbon, to be removed.

```
service infinidb-em-graphite stop  
service infinidb-em-carbon stop  
chkconfig --del infinidb-em-graphite  
chkconfig --del infinidb-em-carbon  
userdel -r infinidb-em  
rm -rf /opt/infinidb/em
```

7 Appendix A

7.1.1 Logging

The Enterprise Manager server has two logs being generated. These are configurable in the YAML file in the server directory.

- Request log
 - The HTTP access logs to the EM
 - Rolled up daily and archived for 5 days
 - WARN and higher are sent to STDOUT also
 - `/opt/infinidb/em/server-access.log`
- Server log
 - The application logs of the EM
 - Rolled up daily and archived for 5 days
 - WARN and higher are sent to STDOUT also
 - `/opt/infinidb/em/server.log`

Collectd, if it is present on the machine (after attach of cluster), will generate a log:

- Collectd log
 - The log for the collectd agent running on the machine
 - `/opt/infinidb/em/log/collectd`