

## Table of Contents

Table of Contents	1
Pivotal Greenplum® Command Center 3.3.0 Release Notes	2

## Pivotal Greenplum® Command Center 3.3.0 Release Notes

Greenplum Command Center version: 3.3.0

Greenplum Workload Manager version: 1.8.2

Published: August, 2017

### About This Release

Pivotal Greenplum Command Center release 3.3.0 contains Greenplum Command Center release 3.3.0 and Greenplum Workload Manager release 1.8.2.

See [Enhancements and Changes in Greenplum Command Center 3.3.0](#) for information about new features and improvements in the Greenplum Command Center 3.3.0 release.

See [Enhancements and Changes in Greenplum Workload Manager 1.8.2](#) for information about new features and improvements in the Workload Manager 1.8.2 release.

### Supported Platforms

Greenplum Command Center may be installed on the following platforms:

- Red Hat Enterprise Linux 5, 6, or 7, 64-bit
- CentOS 5, 6, or 7, 64-bit
- SUSE Linux Enterprise 11SP4, 64-bit

Greenplum Workload Manager may be installed on the following platforms:

- Red Hat Enterprise Linux 5.5+ or 6, 64-bit
- CentOS 5.5+ or 6, 64-bit
- SUSE Linux Enterprise 11SP4, 64-bit

The following table shows Greenplum Command Center and Greenplum Database version compatibility.

Greenplum Database Version	Greenplum Command Center Version
4.3.13.0 and later	3.2.1 and later
4.3.12.0 and earlier	All versions except 3.2.1

### Pivotal Documentation

Pivotal Greenplum Command Center and Pivotal Greenplum Workload Manager documentation is available on the Pivotal Documentation site at <http://gpcc.docs.pivotal.io/>.

### About Pivotal Greenplum Command Center

Pivotal Greenplum Command Center (GPCC) is a management tool for Pivotal Greenplum Database. GPCC monitors query activity and system performance metrics. Pivotal Greenplum Command Center is an interactive graphical web application that can be installed on the master host and used to view and interact with the collected system data from Greenplum Database.

Greenplum Database is a requirement for operating Command Center because Command Center relies on information stored in the Greenplum gpperfmon database. Greenplum Database includes data collection agents that run on the Greenplum Database master host and each segment host. The agents collect data about queries and system utilization and send them to the Greenplum master host at regular intervals. Data stored in the gpperfmon database can be accessed through the Command Center web application or with SQL queries.

## Enhancements and Changes in Greenplum Command Center 3.3.0

Greenplum Command Center 3.3.0 contains the following enhancements:

- Anyone with access to the Command Center web server can sign in anonymously and view the **Query Monitor** page. Anonymous users cannot cancel queries, view the query text or explain plan, or access any other Command Center pages or features.
- Administrators can post a message for all Command Center users to see on the **Query Monitor** page.
- Enabling SSL when creating a new Command Center instance enables WebSocket connections for improved security and performance.
- When the Command Center Console is running on a remote host, Workload Manager views are available if GPCC detects Workload Manager when the Command Center user signs in. If Workload Manager becomes available after a user has signed in to Command Center, the user must sign out and in again to view Workload Manager pages in GPCC.
- Explain plans are no longer generated automatically to reduce system load.
- Users can generate an explain plan by clicking **Run explain with Pivotal Query Optimizer** or **Run explain with legacy optimizer**. The legacy optimizer will generate plans for queries that normally fall back to the legacy optimizer, even when you choose the Pivotal Query Optimizer.
- The Greenplum Command Center version has been added to the header.
- Many usability improvements have been made in the Command Center user interface.
- The Command Center Database reference documentation has been relocated to the *Greenplum Database Reference Guide*. See [The gpperfmon Database Reference](#) for the most recent update to this reference.

## Enhancements and Changes in Greenplum Command Center 3.2.2

- Performance enhancements for Segment Health and Alerts.
- Greenplum Command Center 3.2.2 includes **beta** support for viewing and authoring Greenplum Workload Manager rules. If Workload Manager is running on the master host, Greenplum Command Center includes the **Admin>Workload Mgmt** page. Command Center users with Admin permission level can view, add, edit, and delete Workload Manager rules. Users with operator permission level can view, but cannot change, current Workload Manager rules. The GPCC Workload Manager integration is not currently supported on remote Command Center instances.

## Enhancements and Changes in Greenplum Command Center 3.2.0

Greenplum Command Center 3.2.0 contains the following enhancements:

- Hardware Status monitoring for DCA-hosted clusters
- Performance improvements and bug fixes

## Enhancements and Changes in Greenplum Command Center 3.1.1

Greenplum Command Center 3.1.1 contains the following enhancements:

- Fixed a bug introduced in 3.1.0 that refused passwords with special characters
- Fixed a bug introduced in 3.1.0 that prevented long pages from scrolling
- More robust hostname detection for Host Metrics and Storage Status

New Known Issues:

- When multiple queries are submitted as a single statement, cannot run explain because all queries in the statement are included in query text (gpperfmon issue)
- Line breaks in queries are not preserved in query history (gpperfmon issue)

## Enhancements and Changes in Greenplum Command Center 3.1.0

Greenplum Command Center release 3.1.0 contains the following new features and enhancements:

- Manage Command Center user roles in the **Administration > Permissions** view.
- New Command Center permission levels “Basic” and “Operator Self Only”.
- View and edit the Greenplum Database `pg_hba.conf` authentication configuration file in the new **Administration > Authentication** view.

- View recent messages from the Greenplum Database `pg_log` file in the **Alerts** panel on the **Dashboard**.
- On the **Cluster Metrics** view, you can choose metrics to show or hide.
- Clusters on the Multi-cluster page can be protected by adding a list of allowed roles to the clusters' entries in the Multi-cluster configuration file.
- The installer provides an option to install the Command Center software on the standby master.
- OpenSSL libraries are no longer bundled with Greenplum Command Center. The web server continues to support SSL connections and user authentication. However, the `gpccmdr --setup` command no longer provides an option to generate a self-signed certificate. You must install your own server certificate and import it when you create a Command Center instance.
- Experimental support for authenticating Command Center users with Kerberos. If you want to use this feature, please work with Pivotal to ensure that it is correct for your environment.
- Support for Greenplum Command Center with a Greenplum Database 5.x system.

## Enhancements and Changes in Greenplum Command Center 3.0.1

Greenplum Command Center release 3.0.1 addresses the following issues in Greenplum Command Center release 3.0.0:

- Hosts with hostnames changed since the initial Greenplum Database installation not appearing in host and cluster metrics
- Manual 4-digit entry into History time fields
- Temporary display of zero value for cluster metrics when under high load
- Count and sort in History queries grid
- `gpccmdr --restart` not reliably bringing `gpmomws` back up
- `gpccmdr --version`
- History charts can cut off edges of timespan

## Enhancements and Changes in Greenplum Command Center 3.0.0

The Greenplum Command Center software is brand new for this release. A native HTML5 front-end and Go backend replace the previous Flash and Python application.

### New Technology

- Native HTML5 frontend – no Flash, no browser plugin required
- Completely new backend written in [Go](#)
- Same data collection agents, same `gpperfmon` database schema – no corresponding changes in Greenplum Database

### New Upgrade Process

- Preserve your instance configurations with the new `gpccmdr --migrate` command option

### New Console UI

- Reorganized Dashboard view
- More responsive Query Monitor and Query Details views
- Host Metrics view with new skew severity indication
- Cluster Metrics view with synchronized charts
- History browser view featuring user-defined timespan, integrated charts and query list, pan and zoom timeframe
- System monitoring views for Storage and Segment status

## Greenplum Command Center Compatibility

Pivotal Greenplum Command Center is currently certified for the EMC Data Computing Appliance (DCA) and Greenplum Database software-only environments. Command Center monitors the following for each environment:

## Greenplum Data Computing Appliance

- Greenplum Database Module 4.3.x

If you have been using Greenplum’s earlier monitoring tool, Performance Monitor, with an older DCA release, we recommend you upgrade to a supported version of DCA.

## Greenplum Database (Software-only Environments)

- Greenplum Database 4.3.x
- Greenplum Database 5.x

## Command Center Installation and Upgrade Instructions

There is now an upgrade path for all 1.x, 2.x, and 3.x versions. See `gpcmdr --migrate` [for details](#).

## DCA and Greenplum Database Software-only

Instructions for installing, configuring, and upgrading your system for Pivotal Greenplum Command Center are provided in the latest [Pivotal Greenplum Command Center Documentation](#).

## Greenplum Command Center Resolved Issues

The following table lists issues that were resolved in Pivotal Greenplum Command Center 3.x.

Issue	Description	Fixed In
148698987	<code>gpcmdr --setup</code> failed with error <code>panic: runtime error: invalid memory address</code> when an inaccessible keytab file was specified. This has been fixed.	3.3.0
ZD-39405	Systems with segment host names that changed since GPDB initialization were not shown in cluster metrics.	3.0.1
CMDR-1999	Failed to start instance without setting of PGHOST and PGPORT.	3.0.0
CMDR-1910	GPCC hangs on “Loading” because request to “/api” does not respond.	3.0.0
CMDR-1996	Orphaned instances after upgrade	3.0.0
PT-87736724	The Command Center installer does not have support to upgrade existing Command Center instances when upgrading to a new release.	3.0.0
CMDR-2008	In GPCC release 3.1.0, the Command Center console does not accept special characters in passwords. Only alphanumeric characters and the tilde (~) and underscore (_) characters are recognized.	3.1.1

## Greenplum Command Center Known Issues

This section lists the known issues in Pivotal Greenplum Command Center 3.x.

Issue	Description
CMDR-297	Heavy workload on the Greenplum Database can affect responsiveness. The refresh rate of the Command Center user interface can be adversely affected by simultaneous heavy workload on the underlying Greenplum Database.
142650749	When multiple queries are submitted as a single statement, cannot run explain because all queries in the statement are included in query text. (gpperfmon issue)

## About Pivotal Greenplum Workload Manager

Greenplum Workload Manager services collect query execution data and real-time system statistics on each segment host. The Workload Manager rules engine allows you to create rules that specify criteria that trigger an action, for example terminating a query that runs longer than a specified time or consumes too many resources on a segment host.

Real-time query performance can be viewed in the Workload Manager `gptop` curses-based GUI.

## Enhancements and Changes in Greenplum Workload Manager 1.8.2

The following are changes in Greenplum Workload Manager 1.8.2.

### Enhanced `gp_wlm_records` view

Three columns have been added to the `gp_wlm_records` table:

Column	Type	Description
<code>rulename</code>	text	The name of the rule that triggered the event.
<code>db_name</code>	text	The name of the database where the query executed.
<code>application_name</code>	text	The name of the client application, for example <code>psql</code> .

The following `gp_wlm_records` columns are renamed:

Old name	New name
<code>ident</code>	<code>id</code>
<code>state</code>	<code>rule_state</code>
<code>username</code>	<code>username</code>
<code>context_args</code>	<code>context</code>

The data type of the `query_start` column is changed from `text` to `timestampz`.

The columns in the table are reordered. See [Querying Workload Manager Record Data](#) for the new order.

When you install Workload Manager 1.8.2, a new external CSV file is created for the `gp-wlm-records` table with a new name. If you later downgrade to an earlier release, you can restore the original CSV files and then start the previous Workload Manager release.

### Enhanced `gp_wlm_events` view

The following `gp_wlm_events` columns are renamed:

Old name	New name
<code>ident</code>	<code>id</code>
<code>sess_id</code>	<code>session_id</code>
<code>username</code>	<code>username</code>
<code>datname</code>	<code>db_name</code>

The columns in the view are reordered. See [Querying Workload Manager Event Data](#) for the new order.

When you install Workload Manager 1.8.2, new external CSV files are created for the `gp_wlm_events` view with a new name. If you later downgrade to an earlier release, you can restore the original CSV files and then start the previous Workload Manager release.

### Improved Installation Process

The Workload Manager installer `--dbname-records` command line option is changed to `--dbname`.

The Workload Manager installer now creates the `gp_wlm_events` view and the external files it references. The view is created in the same database where the `gp_wlm_records` table is created — the database specified with the `--dbname` command line option.

The upgrade process has been completely automated for both `gp_wlm_events` and `gp_wlm_records`. Upon upgrade or uninstall, the `gp_wlm_events` and

`gp_wlm_records` tables and views are automatically dropped from the database in which they were previously installed.

## Configuration default changed for idle process and session tracking

The Workload Manager configuration parameters `gpdb_stats:publish_idle_sessions` and `systemdata:publish_idle_processes` are now set to 'false' by default. Upgrading Workload Manager does not change the current values of these parameters.

The effect of this is two-fold. First, only the actual query processes are tracked. Second, the additional load caused by the extra processing is no longer incurred. If you would like to track inactive sessions, you can set these parameters to 'true' or query [session\\_state.session\\_level\\_memory\\_consumption.idle\\_start](#). (Querying `idle_start` is not a Workload Manager feature.)

## Enhancements and Changes in Greenplum Workload Manager 1.8.0

### Compatibility with Greenplum Database 4.3.13

The view created using the SQL script file `gp_session_state.sql` that ships with Greenplum Database 4.3.13.0 is not compatible with Greenplum Workload Manager 1.7.2 and earlier. This version provides the compatibility.

### `gp_segment_configuration` used for WLM Installation

Previously, multiple methods were used to access a server's hostname during installation. Customers that had inconsistent hostname configurations were experiencing installation issues. To eliminate any potential source of hostname error, GP-WLM now uses `gp_segment_configuration` as the source of truth for hostnames. In this release, the most consequential occurrences of hostname have been consolidated; the remaining ones will be removed in upcoming releases.

### `gp_wlm_records` can now be sorted and filtered by time and displayed in user's timezone

The `time` column of the `gp_wlm_records` table is now a timestamp with timezone (timestampz) type. As a result, users can now sort and filter rows using time functions and operators. In addition, users can view time in the timezone set in their sessions. For example, you can set the timezone in a psql session with a command such as `SET TIME ZONE 'PST8PDT'` to view the time column in PDT timezone.

### Removed repeated data from `gp_wlm_records` context column

The context column of the `gp_wlm_records` table contained information that was already available in other columns. These data are now removed from the context column, making it easier for users to see data they have added using the `including` clause of their rules.

### Enhanced installation error messages

Some of the error messages shown during installation have been improved to help the user identify the cause of the error and accordingly take action to resolve the issue. For example, if a user attempts to install Workload Manager on a segment, instead of the master host, they will receive the following message: "WLM must be installed on the GPDB master host. Please retry installing on GPDB master host." Another example is if the Greenplum cluster is not running at the time of WLM installation. The user will then be presented the message: "Greenplum cluster is not started. Please start the cluster and try installing WLM again."

### Terminology change

In this Greenplum Workload Manager release the term *datum* is replaced by the term *metric*.

## Enhancements and Changes in Greenplum Workload Manager 1.7.3

The following are changes in Greenplum Workload Manager 1.7.3.

## Compatibility with Greenplum Database 4.3.13

The view created using the SQL script file `gp_session_state.sql` that ships with Greenplum Database 4.3.13.0 is not compatible with Greenplum Workload Manager 1.7.2 and earlier. This version provides the compatibility.

### `host:pg_cancel_backend()` now acts on subsequent queries in the same session

The rule action `host:pg_cancel_backend` now cancels queries that start after it has canceled a query that was running in the same session. Previously, this action only acted on the first offending query in a session and not on the subsequent queries in that same session. For example, the following rule would cancel only the first query that has exceeded 10 seconds and not the other queries that follow it.

```
rule add cancel_long_query host:pg_cancel_backend() when session_id:host:pid:runtime > 10
```

### `host:pg_cancel_backend()` no longer tries to cancel queries on idle session processes

`host:pg_cancel_backend()` now checks if a session process has a query running and attempts to cancel only if the process is active with processing a query. Previously, `host:pg_cancel_backend()` attempted to cancel queries on sessions that did not have queries running. Consequently, `gp_wlm_events` should no longer have entries for `host:pg_cancel_backend` action if matching pids are idle and not running a query.

## Enhancements and Changes in Greenplum Workload Manager 1.7.2

The following are changes in Greenplum Workload Manager 1.7.2.

### Timezone aware dates and times

The timestamps in the `gp_wlm_events` table now display using the timezone set in the database session. Previously, they displayed in UTC regardless of the timezone setting. In psql, use the `SHOW TIME ZONE;` and `SET TIME ZONE '<your_timezone>';` commands to see and set the timezone.

### Reduced frequency of transaction ID (XID) creation

Workload Manager frequently queries the Greenplum database to collect statistics from the catalog tables. To reduce the need for frequent VACUUM execution and to avoid transaction ID wraparound, certain Workload Manager queries now execute within explicit BEGIN/END transactions.

## Enhancements and Changes in Greenplum Workload Manager 1.7.0

The following are enhancements and changes in Greenplum Workload Manager 1.7.0.

### SUSE Linux 11

Support is added for running Greenplum Workload Manager on SUSE Linux 11.

The Greenplum Command Center installer now includes separate installers for RHEL and SUSE platforms. The installer files have names in the format `gp-wlm-<version>-<platform>.bin`, where `<version>` is the Workload Manager release number and `<platform>` is the identifier for the Linux distribution and architecture.

### Changes to `gp_wlm_events` View

The `gp_wlm_events` view is changed to include additional fields so that a base set of datums is available in each event row. Additional datums referenced in the rule expression are added to the view's `context` column.

See [Querying Workload Manager Event Data](#) for the new `gp_wlm_events` structure and examples.

After you upgrade Workload Manager, you must run the `manage-event-tables.sh` script to recreate the external tables and `gp_wlm_events` view with the new structure. See [Recreate the `gp\_wlm\_events` External Tables and View](#) for instructions.



## Enhancements and Changes in Greenplum Workload Manager 1.6.0

The following are enhancements and changes in Greenplum Workload Manager 1.6.0.

### Improved Hostname Handling

During startup, the runtime framework detects and ignores duplicate hostnames. Duplicate hostnames are hostnames that resolve to the same machine.

### Improved Response to Cancel Query

The amount of time Workload Manager takes to respond to a query cancellation request has been reduced to a minimum so that the request is delivered to Greenplum Database without delay.

## Enhancements and Changes in Greenplum Workload Manager 1.5.0

The following are enhancements and changes in Greenplum Workload Manager 1.5.0.

### Removed Option to Install Workload Manager with gpcmdr Command

The Greenplum Command Center 2.4.0 `gpcmdr --setup` utility no longer offers to install Greenplum Workload Manager. Workload Manager must be installed using its installer, `gp-wlm-<version>-<platform>.bin`, which is located in the Command Center installation directory. See [Installing Greenplum Workload Manager](#) for installation instructions.

### Publishing Connections and Sessions

By default, Workload Manager now publishes information about idle Greenplum Database sessions. An idle session represents a client connection without an active or queued query.

To create a rule that is triggered by idle transactions, `session_id:host:pid:current_query = "<IDLE>"` in the when clause. For example, the following message records a message when an idle `psql` session is detected.

```
gpdb_record(message="Idle PSQL session")
when host:pid:current_query = "<IDLE>" and host:pid:name = "psql"
```

In Workload Manager 1.0 through 1.4, information about idle sessions was never published, so they could not be detected with a rule. With 1.5.0, idle sessions are published by default.

You can revert to the previous behavior by configuring the following settings to 'false'.

Module	Setting	Description
gpdb_stats	publish_idle_sessions	Publish information about idle Greenplum Database sessions
systemdata	publish_idle_processes	Publish information about idle GPDB processes

In addition to the new `publish_idle_sessions` settings in the table above, the following new configuration setting is available in the `gp-wlm` CLI.

Module	Setting	Description
systemdata	logging:log_level	Configure logging verbosity for the systemdata plugin

See [Configuring Workload Manager Components](#) in the *Greenplum Workload Manager User Guide* for information about setting configuration values.

### Including Additional Datums in Action Scope

Rules can now be created or modified to include datums in the action scope in addition to the datums that trigger the rule action. Previously, only values of datums present in the conditional expression that triggered the rule were captured when the rule was triggered.

In Workload Manager 1.5.0, additional datums specified using the `including` keyword are also captured. The context columns in the `gp_wlm_record` table or `gp_wlm_events` view will contain values for datums that triggered the rules as well as values for datums specified using the `including` keyword.

See [Adding Rules](#) in the *Greenplum Workload Manager User Guide* for information about this new feature.

## Application Name Field is Set for Workload Manager GPDB Sessions

Greenplum Database sessions initiated by Workload Manager components are now configured to set the `application_name` field to 'gp-wlm'. This field is available in the `pg_stat_activity` table.

## Enhancements in Greenplum Workload Manager 1.4.0

The following are enhancements and changes in Greenplum Workload Manager release 1.4.0:

### New Features and Improvements

- A `host:pg_cancel_backend` action is added. This action calls the PostgreSQL `pg_cancel_backend()` function, which sends a SIGINT signal to the backend process, cancelling the current query. This differs from the `pg_terminate_backend()` function, which sends a SIGTERM signal and terminates the session. `host:pg_cancel_backend` events are logged to the `wlm_event_log`.
- A new set of datums is added to provide Greenplum segment virtual memory (vmem) statics.
- The timing values that determine how frequently agents publish datums and rules are evaluated have been changed from integer to float values, allowing sub-second times to be specified.
- A new configuration manager allows viewing, describing, and modifying user-settable configuration values for Workload Manager components. In release 1.4.0, the configuration manager supports viewing, describing, and setting various configuration values for Workload Manager.

### Fixes

- Fixed a rare bug where some queries cannot be ruled upon if the session id of the query is not present in the `list_backend_priorities()` recordset.
- In certain environments, environment variables were not being set correctly.

## Greenplum Workload Manager Installation and Upgrade

To install or upgrade Greenplum Workload Manager, run the Workload Manager installer found in the Greenplum Command Center installation directory. See [Installing Greenplum Workload Manager](#) in the Greenplum Workload Manager documentation for command syntax and usage.

## Greenplum Workload Manager Known Issues

This section lists the known issues in Pivotal Greenplum Workload Manager. A work-around is provided where applicable.

### Install failure at cluster-health-check stage

In rare cases it is possible for installations or upgrades to fail at the `cluster-health-check` stage. In the event that the cluster is not healthy, re-run the Workload Manager installer with the `--force` option. See "Installing Greenplum Workload Manager" in the Pivotal Greenplum Workload Manager User Guide for instructions to run the installer at the command line.

### Install failure due to temporary directory

A failed Greenplum Workload Manager installation can leave a temporary directory on the file system, which causes subsequent installation attempts to fail. An example of an error when this happens is:

```
getopt: unrecognized option 'func-file=<INSTALL_DIR>/gp-wlm-data/.scratch/installer/installer.functions'
```

The workaround is to manually remove the temporary directory `<INSTALL_DIR>/gp-wlm-data/.scratch`.