



CrossGrid Installation Guide

Task 2.4.1: G-PM

Task 2.4 - Interactive and semiautomatic performance evaluation tools

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Abstract: This is the installation guide for the Grid application performance analysis tool G-PM, developed within the CrossGrid project.



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1 About the software

G-PM (Grid performance monitor) is a run-time tool which allows an on-line performance analysis of parallel / distributed applications executing in a Grid environment based on Globus 2.4, in particular the CrossGrid (and DataGrid) testbeds.

G-PM acquires the performance data via the Grid application monitoring system OCM-G [OCMG].

1.1 Software components

G-PM just consists of an executable, which the user starts either on a UI (user interface) machine or on his/her local computer.

1.2 Dependencies

G-PM is intended to run on RedHat Linux, version 7.3.

In order to use G-PM, the monitoring system OCM-G must be installed on all user interface (UI), computing element (CE), and worker node (WN) machines used by the application to be analyzed. The current version of G-PM (0.7.1) requires version 1.9.3 of the OCM-G to be installed (see the OCM-G installation guide [OCMG]).

In addition, the G-PM package depends on the following software during run-time:

1. `vdt_globus_essentials`, version VDTALT1.1.8-14.edg4 (due to the use of Globus-IO for communication)
2. `gcc3`, version 3.2.2 (shared C++ library)
3. `gtk+`, version 1.2.10 (shared library)
4. `glib`, version 1.2.10 (shared library)
5. `XFree86-libs`, version 4.2.1 (shared libraries)

These packages need to be installed on the same machine as G-PM (i.e. the UI).

2 Installation in the CrossGrid testbed

The CrossGrid testbeds are managed by the LCFG deployment support tool. This tool allows an automatic installation of the software on all the required nodes.

2.1 Rpm lists for LCFG

The following line must be included in the UI's rpmlist (usually inside the file `UserInterface-CG-rpm.h`):

```
cg-wp2.4-gpm-0.7.1-1
```

2.2 Profile modifications for LCFG

None.

2.3 Manual post installation steps

None.

3 Manual Installation

3.1 Download

The RPM of G-PM is available at

- <https://savannah.fzk.de/distribution/crossgrid/autobuilt/i386-rh7.3-gcc3.2.2/wp2/RPMS/cg-wp2.4-gpm-0.7.1-1.rpm>

3.2 Installation from rpm

The package `cg-wp2.4-gpm-0.7.1-1.rpm` must be installed on the user interface (UI).

The software installes under `/opt/cg`.

3.3 Installation from source

1. Make sure that you are using RedHat Linux, version 7.3. OCM-G has been developed for this operating system version. However, other versions of Linux (with at least a 2.4 kernel) should work, too.

2. Make sure that you have the folloing software installed:

- Globus client software, especially Globus-IO. This software is e.g. provided by the package `vdt_globus_essentials`. Any version should be OK (however, only VDTALT1.1.8-14.edg4has been tested).
- `gcc`, version 3.2.2 (package `gcc3-3.2.2`). Using `gcc` version 2.95 should work, too.
- `make`, version 3.79.1 (other versions of `gmake` should be OK, too).
- `bison`, version 1.35 (other versions of `bison` should be OK, too).
- `flex`, version 2.5.4a (other versions of `flex` should be OK, too).
- `gtk+`, version 1.2.10 (higher versions should be OK, too).
- `glib`, version 1.2.10 (higher versions should be OK, too).
- `XFree86-libs`, version 4.2.1 (higher versions should be OK, too).

3. Get the source code of G-PM. It is available

- as SRPM from <https://savannah.fzk.de/distribution/crossgrid/autobuilt/i386-rh7.3-gcc3.2.2/wp2/SRPMS/cg-wp2.4-gpm-0.7.1-1.src.rpm>,
- or as tarball from <https://savannah.fzk.de/distribution/crossgrid/autobuilt/i386-rh7.3-gcc3.2.2/wp2/SOURCES/cg-wp2.4-gpm-0.7.1.tgz>,
- or directly from the CVS repository (use untagged versions at your own risk!):
http://savannah.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp2/wp2.4-perf/wp2.4_1-perfmo

4. Unpack the source code.

5. Go to the top level directory of the souces (`cg-wp2.4-gpm-1.9.3`) and invoke

- (a) `./autogen.sh`
- (b) `./configure`
- (c) `make rpm`

to create the RPM package. The RPM will be stored in the directory `RPMS/i386`.

3.4 Configuration

3.4.1 List of configuration files

None.

3.4.2 Editing the configuration files

N/A

3.4.3 Startup scripts

None.

3.4.4 Other requirements

Environment

None.

Users

No special users are required. G-PM runs under the account of the user invoking it.

Ports

G-PM does not create any ports. However, it connects to a port created by the OCM-G monitoring system. If the OCM-G Main Service Manager is not running on the same host as G-PM, this requires outgoing connectivity from the machine where G-PM is started. See the OCM-G installation manual [OCMG] for details how to configure the range of port numbers used by OCM-G.

Certificates

G-PM uses the credentials of the user invoking the tool for the connection with the monitoring system. No additional certificates are needed.

Folders

G-PM installs under `/opt/cg`. No other directories are required.

4 Running and testing

The following describes a simple procedure to test the successful installation of the G-PM tool. It assumes that the UI, CE, and WN machines used in this procedure have a correct installation of all required OCM-G packages, as outlined in the OCM-G installation manual [OCMG].

1. Install the G-PM package (on a UI machine).
2. Log in as a *normal* user on the UI machine.
3. Get the following files from the CrossGrid CVS repository:

- http://savannah.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp2/wp2_5-integration/src/gpm_tests/ring.c
- http://savannah.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp2/wp2_5-integration/src/gpm_tests/probes.c
- http://savannah.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp2/wp2_5-integration/src/gpm_tests/check_trace.pl

4. Compile the test program with MPICH-G2:

```
cg-ocmg-cc -probes probes.c mpicc --device=g2 -o ring_ocm ring.c -DUSE_OCM
```

This assumes that you are using the CrossGrid mpich-wrappers. Otherwise, you have to replace 'mpicc --device=g2' with '<path_to_mpich_g2>/mpicc'.

5. If necessary, create a Globus proxy certificate using 'grid-proxy-init'.

6. Invoke `cg-ocmg-monitor`. It will print something like

```
Main SM connection string: 8d34a020:4e20
```

7. (In a new shell on the UI machine) start the `ring_ocm` program created in step 4, using `mpirun`. To do so, first create a proper 'machines' file, which lists the CE to use for the job, e.g., the file may contain:

```
ce010.fzk.de
```

Then, invoke

```
mpirun --device=g2 -machinefile machinesCE -np 4 ring_ocm 100 \  
--ocmg-appname app --ocmg-mainism 8d34a020:4e20
```

Again, this assumes that you are using the CrossGrid mpich-wrappers. Otherwise, you have to replace 'mpirun --device=g2' with '<path_to_mpich_g2>/mpirun'.

Of course, you have to replace `8d34a020:4e20` with the proper connection string printed by `cg-ocmg-monitor` in step 6.

8. Invoke the G-PM tool using the following command (in a different shell on the UI machine):

```
cg-gpm app --num-procs 4 --terminate --ocmg-mainism 8d34a020:4e20
```

(Be sure to replace `8d34a020:4e20` with the correct connection string)

9. After a while, the GUI of G-PM should appear. Select 'Start program' from the 'File' menu and exit G-PM by selecting 'Exit' from the 'File' menu.

Verify that both the job and the `cg-ocmg-monitor` started in steps 6 and 7 terminate properly.

Note that the application may print a couple of warnings when it terminates; this is not an error, it is perfectly OK!

Also note that in the window where `cg-ocmg-monitor` has been started, some messages are printed after `cg-ocmg-monitor` has terminated. This may give the impression that the program did not terminate correctly. Just press RETURN to verify that you get a shell prompt and the program really terminated.

If G-PM starts up properly, the installation of G-PM is OK. Other problems indicate problems with the OCM-G package.

4.1 Log files

G-PM does not write any log files.

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Bibliography

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