



# PPC COMPONENT TEST REPORT

## SOFTWARE TEST AND VALIDATION REPORT

### WP4 TASK4 - Verification and Quality Control

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**Abstract:** This report describes the validation performed on the package Performance Prediction Component developed by CrossGrid WP 2 task 3.2. The tests were performed by Dimitris Zilaskos on the behalf of the CrossGrid task 4.4 testbed verification and quality control. The Performance Prediction Component (PPC) is a tool that provides graphical information about the behavior of some important kernels when they are executed in the Grid.

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## 1. CONTEXT

Test and validation of the package Performance Prediction Component developed by CrossGrid WP 4 task 4. The Performance Prediction Component (PPC) is a tool that provides information about the behavior of some important kernels when they are executed in the Grid. The tool consists of two components:

1. The performance model itself, that is an analytical model obtained from multiple executions of the kernels that are correlated with Grid features when they execute. There are two kinds of kernels to be considered, in one hand low level kernels that are useful for any Grid user when programming in parallel using MPICH-G2: they are the communication routines provided by MPICH-G2, in the other hand, high level kernels that are specific of the applications, and that are mainly computational intensive including communications.
2. A visualization tool to show the performance information allowing interactivity. The final product does not need to execute in the Grid, but in the user interface (any personal computer, desktop or laptop).

### 1.1. TEST REQUEST

The test request was performed by Tomas F.Pena of WP2 task 3.2 ([tomas@dec.usc.es](mailto:tomas@dec.usc.es)) at 25 June 2004. The request url is [http://www.lip.pt/computing/projects/crossgrid/task4/softvalidation/10881852004.40030005565895/request\\_form.html](http://www.lip.pt/computing/projects/crossgrid/task4/softvalidation/10881852004.40030005565895/request_form.html).

It was assigned to Dimitris Zilaskos during the wp4 vrvs at 29 June 2004. The test began with version 1.2-0. During the T&V process a few minor bugs were discovered which required system administration intervention in order for the PPC to run. Eventually version 1.2-2 was created that fixed all known issues. Also some unavailable features were removed from the menus. The original rpm in the request is <http://gridportal.fzk.de/distribution/crossgrid/autobuilt/i386-rh7.3-gcc2.95.2/wp2/RPMS/cg-wp2.4.2-perfpred-1.2-0.noarch.rpm>. Newer versions can also be found in the same autobuild directory.

Documentation URLs about usage, installation, requirements and development were correctly provided in the request. All documentation needs were met.

### 1.2. TEST TEAM

The tests were performed by task 4.4 member from AUTH

- Dimitris Zilaskos ( [dzila@physics.auth.gr](mailto:dzila@physics.auth.gr) )

### 1.3. RESOURCES INVOLVED

The tests were performed in the AUTH CrossGrid testbed. They involved the UI ([grid02.physics.auth.gr](http://grid02.physics.auth.gr)), a dual p3 1266 MHz system with 512 Mbytes ram, in which the package was installed. The JIMS servers from which data was pulled were [ce.grid.cesga.es](http://ce.grid.cesga.es) and [zeus24.cyf-kr.edu.pl](http://zeus24.cyf-kr.edu.pl). Topological and meteorological information data was provided by task 1.4.1. JIMS server list was obtained from [www.ac.usc.es](http://www.ac.usc.es).

A linux workstation running KDE under Slackware 10 and a Windows XP centrino 1.4 laptop with Exceed were used for the GUI test part.

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## 2. TEST AND VALIDATION

### 2.1. SOFTWARE INSTALLATION

The installation was made with LCFGng . The rpm used was retrieved from <http://www.ac.usc.es/%7Ecrossgrid/RPMS/cg-wp2.4.2-perfpred-1.2-2.noarch.rpm>, which is the latest version at this moment. The rpm was downloaded in the LCFGng RPM directory. A 'make' was then called for the rpm header to be generated. Then the the local-rpm.h was modified and the following lines were added:

```
#ifdef ISNODE_UI
cg-wp2.4.2-perfpred-1.2-2
#endif
```

Then the /etc/obj/updaterpms run was called in the UI by the system administrator. There were no errors generated and no extra configuration needed.

The package depends on:

- Migrating Desktop (X# WP3.1, <http://ras.man.poznan.pl/crossgrid/plugins/tool/ToolPlugin.html>), libraries ToolPlugin.jar, cog-jglobus.jar
- JIMS (X# WP3.3, [http://gridportal.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp3/wp3\\_3-moninfr/wp3\\_3\\_3-jims/lib](http://gridportal.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp3/wp3_3-moninfr/wp3_3_3-jims/lib) and [http://gridportal.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp3/wp3\\_3-moninfr/wp3\\_3\\_3-jims/share/java](http://gridportal.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp3/wp3_3-moninfr/wp3_3_3-jims/share/java)) libraries SoapGateway.jar, axis.jar, commons-discovery.jar, commons-logging.jar, jaxrpc.jar, saaj.jar
- JFreeChart v0.9.18 (<http://www.jfree.org/jfreechart/>) libraries jfreechart-0.9.18.jar, jcommon-0.9.3.jar, log4j-1.2.8.jar
- SGT Graphics Package v3.0 (<http://www.epic.noaa.gov/java/sgt/index.html>) library sgt\_v30.jar
- JavaHelp System (<http://java.sun.com/products/javahelp/>) library jh.jar

All dependencies are present in the current CrossGrid tag. The installed files went to the appropriate places with correct permissions. The package needs no special privileges to run. When update to a newer versions was required, the procedure was download of the new rpm, modifying local-rpm.h and then calling updaterpms.

### 2.2. ADDITIONAL TESTBED MODIFICATIONS

No additional testbed modifications were required.

### 2.3. TEST DEVELOPMENTS

No special software was needed. A default Linux with X-windows and ssh was sufficient

### 2.4. USABILITY

Installation was straightforward with no errors produced and the software worked instantly by following the steps in the manual. The software was used under both old slow systems and more modern ones. Interactivity with the user was in both cases sufficient.

### 2.5. FUNCTIONALITY

The software operates by pulling data from the JIMS server. The data was pulled correctly and the information was found to be accurate. The graphs represented actual cluster conditions. The information can be used to estimate the performance certain tasks will have under certain cluster conditions as obtained by JIMS or as specified by the user.

#### 2.5.1. Unit tests

The software standalone consists of a GUI. The GUI uses the classic point and click menus scheme. The use of this established interface makes the use comfortable. Data was successfully obtained from the JIMS servers, and the graphically represented. Performance predictions were then made based on that DATA.

#### 2.5.2. System tests

The tests performed were:

- Retrieving data from JIMS servers
- Showing this data
- Making predictions based on the available data from JIMS and from meteo

#### 2.5.3. Stress tests

During repeated usage of the software no problems were observed. Continued menu interaction and commands worked flawless at all times. However in some cases it has been observed that leaving the software idle for a long time somehow freezes it and it needs restart. More about this in following sections.

### 2.6. COMPATIBILITY

The software has no compatibility issues. Itself and all of its dependencies interact in an expected manner.

### 2.7. SECURITY AND NETWORKING

The software runs without privileges and it is purely client. There no listening ports opened in the UI. No special privileged are required. As it is now it obtains via http a list of JIMS

servers , then connects to the JIMS server selected by the user via tcp and receives the data.

## 2.8. PREVIOUSLY REPORTED ISSUES

No previously reported issues were known.

### 3. ISSUES FOUND

#### 3.1. ISSUES FOUND IN THE SOFTWARE

All bugs found during the T&V procedure were fixed by the developer.

In the original version the list of JIMS servers was hard coded in the code, which was not flexible at all. It was proposed that the user could specify a list of JIMS servers from a config file. However, that contradicts with the need to run PPC from within MD without any extra installation. At this moment JIMS is not widely deployed and during the T&V period the JIMS server were operational at the most 3 days in total. The planning is that as JIMS is widely deployed in all sites a special service for locating JIMS servers will be made available. For the time the list is obtained via http from [www.ac.usc.es](http://www.ac.usc.es), and it is maintained by the packages author. This solution is a temporary hack.

#### 3.2. ISSUES FOUND IN THE DOCUMENTATION

##### 3.2.1. Issue 001 ( bug id #489)

**(Severity: medium Priority: medium)**

There are many unavailable features in the current version of PPC that are mentioned as working in the documentation, like the forecast menu, and entries in the Kernel menu that the current version is missing. The online help is more up to date. The developer has been made aware of the issue.

#### 4. RECOMMENDATION

Since the current version of PPC functions properly the proposal is:

- The overall recommendation is “MINOR ISSUES”.
- The software can be deployed in the Production Testbed

However it *\*must\** be noted that currently its usefulness is limited by the fact that JIMS is not widely deployed and there has not been a proper way to obtain JIMS server list implemented yet.

## 5. REFERENCES

[PPC User's manual](#)

[PPC T&V request](#)

## 6. INTEGRATION/VALIDATION REQUEST

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**REQUEST ID: 10881852004.40030005565895****Component name:** Performance Prediction Component (PPC)**Version (CVS tag):** v1\_2\_0      **Request priority:** 2**Package brief description:**

The Performance Prediction Component (PPC) is a tool that provides information about the behaviour of some important kernels when they are executed in the Grid. The tool consists of two components:

1. The performance model itself, that is an analytical model obtained from multiple executions of the kernels that are correlated with Grid features when they execute. There are two kinds of kernels to be considered, in one hand low level kernels that are useful for any Grid user when programming in parallel using MPICH-G2: they are the communication routines provided by MPICH-G2, in the other hand, high level kernels that are specific of the applications, and that are mainly computational intensive including communications.
2. A visualization tool to show the performance information allowing interactivity. The final product does not need to execute in the Grid, but in the user interface (any personal computer, desktop or laptop).

**Code:****Source code in X# CVS ? (Y/N):** Y**Autobuild generates RPMs ? (Y/N):** Y**Software download URL:** <http://gridportal.fzk.de/distribution/crossgrid/autobuilt/i386-rh7.3-gcc2.95.2/wp2/RPMS/cg-wp2.4.2-perfpred-1.2-0.noarch.rpm>**List of RPMs produced:**

cg-wp2.4.2-perfpred-1.2-0.noarch.rpm

**Changes:****List of all bugs fixed by this release:****List of backwards compatibility issues (installation, configuration or run-time:**

Node

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**Documentation:**

- Installation manual URL:** [https://savannah.fzk.de/cgi-bin/viewcvs.cgi/\\*checkout\\*/crossgrid/crossgrid/wp2/wp2\\_4-perf/wp2\\_4\\_2-perfpred/wp2\\_4\\_2-perfpred-PPC/INSTALL?rev=HEAD&only\\_with\\_tag=v1\\_2\\_0&content-type=text/plain](https://savannah.fzk.de/cgi-bin/viewcvs.cgi/*checkout*/crossgrid/crossgrid/wp2/wp2_4-perf/wp2_4_2-perfpred/wp2_4_2-perfpred-PPC/INSTALL?rev=HEAD&only_with_tag=v1_2_0&content-type=text/plain)
- Users manual URL:** [https://savannah.fzk.de/cgi-bin/viewcvs.cgi/\\*checkout\\*/crossgrid/crossgrid/wp2/wp2\\_4-perf/wp2\\_4\\_2-perfpred/wp2\\_4\\_2-perfpred-PPC/doc/user-manual.pdf?rev=1.3&only\\_with\\_tag=v1\\_2\\_0&content-type=application/pdf](https://savannah.fzk.de/cgi-bin/viewcvs.cgi/*checkout*/crossgrid/crossgrid/wp2/wp2_4-perf/wp2_4_2-perfpred/wp2_4_2-perfpred-PPC/doc/user-manual.pdf?rev=1.3&only_with_tag=v1_2_0&content-type=application/pdf)
- Development manual URL:** [https://savannah.fzk.de/cgi-bin/viewcvs.cgi/\\*checkout\\*/crossgrid/crossgrid/wp2/wp2\\_4-perf/wp2\\_4\\_2-perfpred/wp2\\_4\\_2-perfpred-PPC/doc/Development\\_manual.pdf?rev=1.1&only\\_with\\_tag=v1\\_2\\_0&content-type=application/pdf](https://savannah.fzk.de/cgi-bin/viewcvs.cgi/*checkout*/crossgrid/crossgrid/wp2/wp2_4-perf/wp2_4_2-perfpred/wp2_4_2-perfpred-PPC/doc/Development_manual.pdf?rev=1.1&only_with_tag=v1_2_0&content-type=application/pdf)
- Software requirements URL:** [https://savannah.fzk.de/cgi-bin/viewcvs.cgi/\\*checkout\\*/crossgrid/crossgrid/wp2/wp2\\_4-perf/wp2\\_4\\_2-perfpred/wp2\\_4\\_2-perfpred-PPC/README?rev=HEAD&only\\_with\\_tag=v1\\_2\\_0&content-type=text/plain](https://savannah.fzk.de/cgi-bin/viewcvs.cgi/*checkout*/crossgrid/crossgrid/wp2/wp2_4-perf/wp2_4_2-perfpred/wp2_4_2-perfpred-PPC/README?rev=HEAD&only_with_tag=v1_2_0&content-type=text/plain)
- Software design URL:** <http://grid.fzk.de/CrossGrid-WP2/CG-2.4-DOC-CYFONET001-SRS.pdf>

**Files:****List of all configuration files (with full path):**

None

**List of all log files (with full path):**

None

**List of LCFG configuration objects (and versions):**

n.a.

**List of daemons provided:**

None

**List of init.d scripts and supported directives (start, stop, restart, etc.):**

n.a.

**Deployment:****Affected machine types (UI, WN, CE, SE, etc) and packages to be deployed on each:**

Only User's Interface

**Component dependencies (required libraries, packages, etc.):**

PPC depends on:

1. Migrating Desktop (X# WP3.1,  
<http://ras.man.poznan.pl/crossgrid/plugins/tool/ToolPlugin.html>), libraries  
ToolPlugin.jar, cog-jglobus.jar
2. JIMS (X# WP3.3, [http://gridportal.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp3/wp3\\_3-moninfr/wp3\\_3\\_3-jims/lib](http://gridportal.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp3/wp3_3-moninfr/wp3_3_3-jims/lib) and  
[http://gridportal.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp3/wp3\\_3-moninfr/wp3\\_3\\_3-jims/share/java](http://gridportal.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp3/wp3_3-moninfr/wp3_3_3-jims/share/java))  
libraries SoapGateway.jar, axis.jar, commons-discovery.jar,  
commons-logging.jar, jaxrpc.jar, saaj.jar
3. JFreeChart v0.9.18 (<http://www.jfree.org/jfreechart/>) libraries  
jfreechart-0.9.18.jar, jcommon-0.9.3.jar, log4j-1.2.8.jar
4. SGT Graphics Package v3.0  
(<http://www.epic.noaa.gov/java/sgt/index.html>) library sgt\_v30.jar
5. JavaHelp System (<http://java.sun.com/products/javahelp/>) library jh.jar

All these libraries can be found in:

[https://savannah.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp2/wp2\\_4-perf/wp2\\_4\\_2-perfpred/wp2\\_4\\_2-perfpred-PPC/share/java/](https://savannah.fzk.de/cgi-bin/viewcvs.cgi/crossgrid/crossgrid/wp2/wp2_4-perf/wp2_4_2-perfpred/wp2_4_2-perfpred-PPC/share/java/)

**Credentials (if any) used by the service:**

**List of service ports (inbound,outbound):**

n.a.

**Who communicates with the service and from where:**

JIMS server through 7702 Web Service port

**Range of temporary ports used by the service (inbound,outbound):**

INBOUND PORTS: JIMS Web Service 7702

**Testing and Validation:**

**Unit tests that have been performed on the package:**

n.a.

**Features to be tested:**

Stability of the GUI. Access to Grid information using JIMS.

**Features not to be tested:**

None

**Test  
programs  
download  
URL:**

[None - the tool is GUI based. Test have been performed manually.](#)

**Other considerations:**

None

**Contacts:**

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