**Course of PBS actions and web based monitoring via PHP**

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**Abstract**

Most recent developments, such as high performance and parallel computingofferings are having rapidly growing requirements for homogeneous and heterogeneous cluster solution approaches. High Performance Computing adds power to computation by providing a cluster solution for industrial applications using simulations, modeling, analysis in industries such as pharmaceuticals, CAD/CAM, ecommerce, life sciences, meteorology, aerospace, oil and gas exploration.

To handle the management and monitoring of the computational workload on clusters, the Portable Batch System (PBS) plays a vital role as a resource management system. To this management system the users submit jobs where they are queued up until the system is ready to run them. PBS selects which job to run and decides when and where to run the job in order to balance competing user needs and to maximize efficient use of the cluster resources. A control script file which includes the script to execute the operation is submitted to the PBS server by a PBS command to run on the HPC cluster. The control script is a shell script containing the set of commands which the user wants to run on cluster computer nodes. In this paper, we present “Course of PBS actions and web based monitoring via PHP” system that allows usage of PBS actions like job controlling (qsub, qdel, qrls) and job monitoring (qstat, qselect) on web based monitoring platform so that it is user-friendly by automating via PHP.

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**Preface**

**Chapter 1: Introduction**

* 1. **Overview**

Most recent developments, such as high performance and parallel computing offerings are having rapidly growing requirements for homogeneous cluster solution approaches. High Performance Computing adds power to computation by providing a cluster solution for applications using simulations, modeling, analysis in industries such as pharmaceuticals, CAD/CAM, ecommerce, life sciences, meteorology, aerospace, oil and gas exploration.

To handle the management and monitoring of the computational workload on clusters, the Portable Batch System (PBS) plays a vital role as a resource management system. To this management system the users submit jobs where they are queued up until the system is ready to run them. PBS selects which job to run and decides when to run the job in order to balance competing user needs and to maximize efficient use of the cluster resources. A control script file which includes the script to execute the operation is submitted to the PBS server by a PBS command to run on the HPC cluster. The control script is a shell script containing the set of commands which the user wants to run on cluster computer nodes. In this paper, we present “Course of PBS actions and web based monitoring via PHP” system that allows usage of PBS actions like job controlling (qsub, qdel, qrls) and job monitoring (qstat, qselect) on web based monitoring platform so that it is user-friendly by automating via PHP.

1. **Brief Description**

Small and medium sized company businesses have a necessity for coordination between their data hence they need to be connected together with a centralized cluster. This centralization cluster brings all together by virtually or physically close such that it is easy to manage, monitor and account the users. It helps the users to perform calculations, simulations, etc. Basically, the high performance computer comes into picture and play a curial role by connecting the workstations with a network and organizing it centrally with a web based software application. The cluster provides a solution to mass production processing networks by the means of parallelization of web based applications present on the server. Batch systems used to distribute the application uniformly over the resources of the cluster. The application gives the possibility of uniformly and providing availability to execute the user process threads. The batch system abstracts the technical details like CPU, memory used, Disk I/O information on each node and also the information regarding the nodes which are free for the users to perform their calculations on the web based application.

The submission of user process is nothing but the user jobs to the batch system. Here the PBS system acts batch system and the web based application is the PHP web based application. The PBS system processes the user process by standard specified commands which are known as the PBS commands or also are called as standard TORQUE commands. The user calculations are written in a program and the TORQUE commands are used at the shell command line that runs the user program. For an instance, we can say that the user *qs*creates some calculation, so now the user has developed a logic in the form of program. Assuming it as user’s job and well now the job needs to submit it on the server to get output of the user calculations. With the help of TORQUE commands *qsub* the user submits the job.

*qsub job\_script*

Currently the user’s use **PuTTY** as a platform to execute their commands. PuTTY is a free SSH, Telnet and Rlogin client for Windows system. PuTTY is command line interface to users to use TORQUE commands via SSH, Telnet and Rlogin network protocols. These protocols login from one multi user system to another system by the means of network or over the network.[[1]](#footnote-1)

In this thesis document we are going to talk about these commands to be user-friendly and how can we put it on the monitoring tool.

1. **Theoretical context of the problem**
2. **Practical context of the problem**

How PBS deletes the job from front end

**Chapter 2:Literature Survey**

on bases of paper my jam

1. **Software Requirements Specification**
2. **HPC Overview:**
3. **Management of accounts**
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    1. Web scraping
    2. Finding text within files

**grep :** Looks for text within files. For example:

*grep this\_word this\_file.txt*

Example options:

-v --- this option is used to display lines which do not contain the string.

-n --- this option displays the line numbers

-w --- this option makes grep match the whole word

-A x or -B x (where x is a number) --- display “x” lines After or Before the section where the particular word is found.

-r or rgrep --- search for text within files recursively.

This command uses regular expressions

For example, this command would look in the file “rpmlist.txt” for anything starting with “rpm”:

*grep rpm rpmlist.txt*

Or you could use it like this, to search through the output of another file:

*rpm -qa | grep ogg*

The first command lists all RPM's installed on your system, the second finds any containing the string “ogg” and outputs them.

*rgrep*

A "recursive" version of grep (this is a different program to grep). This will search all the files in the current directory and all it's subdirectories and print the names of the files and the matching line. Follows similar syntax to grep (see above). You could also use grep with the -r option to achieve the same affect.

*fgrep*

This version of grep calls grep with the -F option. This will look for literal strings only, it won't use or expand any kind of regular expression. For example you could type:

fgrep 'a$\*b?' file.txt

And fgrep would look for the string “a$\*b?” in the file “file.txt”.

Other Versions: There are various versions of grep which are designed to do different things try searching for them on the internet or within your distribution.[[2]](#footnote-2)

* 1. Finding jobs within files

grep : looks for job within files.

* 1. Torque Commands

TORQUE’s command is used at the shell command line; others are embedded in the shell script that runs the program. Below mentioned commands are the shell commands commonly used.

**Frequently Used Shell Commands Basic Usage Example**

**qsub** submit a pbs job qsub [*script*]$ qsub job.pbs

**qstat** show status of pbs batch jobs qstat [*job\_id*] $qstat 12345

**qdel** delete pbs batch job qdel [*job\_id*] $qdel 12345

**qhold** hold pbs batch jobs qhold [*job\_id*] $qhold 12345

**qrls** release hold on pbs batch jobs qrls [*job\_id*] $qrls 12345

**#PBS in Job Script**

The best way to control execution of a job is through the use of #PBS commands embedded in the job script. The job script is any shell script you normally run to execute your programs. The #PBS commands appear to be comments to the shell but when the script is submitted to the PBS job scheduler they can alter job attributes and select scheduler options.

**Basic #PBS commands**

#PBS -N myjob Set the job name

#PBS -m ae Mail status when the job completes

#PBS -M [your@email.address](mailto:your@email.address) Mail to this address

#PBS -l nodes=4 Allocate specified number of nodes

# PBS -l walltime=1:00:00 Inform the PBS scheduler of the expected runtime

1. **Technical Specification**
2. **Software Testing**
3. **Development and Maintenance**
4. **Conclusion and future scope**
5. **References**
6. **Appendix A:**

1. http://tartarus.org/~simon/putty-snapshots/htmldoc/Chapter1.html#intro [↑](#footnote-ref-1)
2. http://www.tldp.org/LDP/GNU-Linux-Tools-Summary/html/x7969.htm [↑](#footnote-ref-2)