Document for external users to login to SERC facility network

This document contains instructions for users outside of IISc to reach and use the SERC computational facility. All such users are named as external users in this document. The external users first need to login to IISc network through a server named "external.serc.iisc.ac.in" to reach the SERC facility. The authentication details on this server are shared with the external user once he/she is granted access to use SERC facility. The SERC facility machines are then reachable from the server external.serc.iisc.ac.in through ssh commands using the same credentials. This machine can be ssh'ed to only from the external networks. Once you are inside the IISc network this address is not reachable. Further details along with instructions are listed below:

1. **Reaching IISc network:** An external user can reach IISc network using any public network as follows:

   [*] Instructions to use

   1. username : as given to the user
   2. passwd   : [same as username]

   Connection to SERC facilities is via external.serc.iiac.ac.in server using ssh on port 32452

   3. $ ssh external.serc.iisc.ac.in -l **username** -p 32452
   4. password : [same as username]

   All external users are provided a restricted shell environment on any machine they are allowed access to. The restricted shell is configured differently on each of these machines based on expected purpose and use. On the external.serc.iisc.ac.in server, the commands ssh and scp are available for users to reach IISc network and transfer any data files from their systems. Once you successfully login to the external.serc.iisc.ac.in server you will land into your home area located under /home/ext/**username** this is the user's home area that is common to any machine of the SERC facility. This area is small in space (quota: 1.5GB per user) and should be used to store critical and commonly used files. Apart from this there is a machine specific scratch space created on each of the SERC facility systems. For the external.serc.iiac.ac.in server this is located under /scratch directory. Access to this directory is given by way of user specific directories as /scratch/**username**. Users can use this space to stage in or stage out their data to or from the SERC facility using scp command.

2. Login Procedure to access SahasraT (CrayXC40) @ SERC

[*] After you have logged into the external.serc.iisc.ac.in you need to login into CrayXC40 using the following command:

1. ssh username@cray-login
2. password : [same as username]

After successful login you will land into a restricted shell called "lshell". Your lshell is configured to give you a list of commands that would be useful to work on the system with utilities and software access based on your accepted proposal.

3. Type '?' or 'help' to get the list of allowed commands.

4. User lands into their respective "/home area " and can access "/localscratch area"

    [1] PATH FOR HOME AREA   :- /home/ext/**username**   *** [quota: 1.5GB per user]
    [2] PATH FOR SCRATCH AREA   :- /mnt/lustre/ext/**username**   *** [quota: 5TB per user]

In order to transfer data to/from CrayXC40, you need to stage data through the external.serc.iisc.ac.in server from the /scratch/**username** directory. That is, from your local machine, you would first scp to external.serc.iisc.ac.in server and then scp the file(s) to CrayXC40. Sample command usage for this is given below:

5. $ scp -P 32452 foo.tar.gz **username**@external.serc.iisc.ac.in:/scratch/**username**

6. $ scp /scratch/**username**/foo.tar.gz **username**@cray-login:/localscratch/**username**

7. CrayXC40 system executes applications in batch mode and only accepts them as jobs. Jobs can be submitted by using job scripts that contain description of the job in terms of its resource and software requirements. CrayXC40 uses PBSPro as the batch scheduler and user needs to submit jobs using the PBSPro commands which are listed below:

    [1] qsub myscript.sh   *** [To submit jobs in CrayXC40 using PBS]
    [2] qstat -Qf queuename   *** [To get the info and queue & job state]

[3] qdel jobid   *** [To cancel the jobs]

For more information about queues, sample jobscripts and system configuration please visit the following link: http://www.serc.iisc.ac.in/pbspro-batch-scheduler-cray/

If you face any issues, kindly contact support team through email: supercomputing.serc@iisc.ac.in

3. **Login Procedure to Dellvs machine@ SERC**

The Dellvs machine is meant for pre and post processing of data generated through computations executed on CrayXC40 system. To facilitate this, the CrayXC40 specific scratch is made available on this system also as /mnt/lustre/**username**. To access this machine you need to ssh from the external.serc.iisc.ac.in server to **Dellvs** using the following command:

   a.   ssh -l cray-login or ssh -l **username** dellvs-login or ssh username@dellvs-login
   b.   password : [same as username]

 For more info and system configuration.Kindly visit the following link below:
 http://www.serc.iisc.ac.in/high-end-graphic-stations/dell-visualization-servers/

   c.   Type '?' or 'help' to get the list of allowed commands.

If you face any issues, kindly contact support team.[supercomputing.serc@iisc.ac.in]

4. **Login Procedure to NVIDIA-DGX-1 @ SERC NETWORK**

5.   # Instruction to use NVIDIA-DGX-1 @ SERC NETWORK

6.   [*] After you have logged into the gatewayserver you need to login into DGX-1 using the following command

7. $ ssh -l nvidia-dgx.serc.iisc.ac.in [or] ssh -l **username** nvidia-dgx.serc.iisc.ac.in
8.   password : [same as **username**]

      # On the gatewayserver and DGX, a user is provided a restricted shell environment for security purposes.

On gatewayserver, the commands ssh and scp are available. And on the DGX, the commands

available are listed below.

If you face any issues, kindly contact support team.

9. *** For more info and queues and system configuration.Kindly visit the following link below:-

    http://www.serc.iisc.ac.in/queue-configuration/

    # ----[Commands with can be used by User on DGX-1] ---- #
    [*] Type '?' or 'help' to get the list of allowed commands.
        cd   cp   exit history ls   pwd   scancel scp squeue vim
        clear date help lpath lsudo sbatch scontrol sinfo sstat

    # ---- [Filesystem] ----#

10. User can only be able to login into there respective "/home area " & "/localscratch area"

    1] PATH FOR HOME AREA   :- /home/ext/**username**   *** [quota: 1.5GB per user]
    [2] PATH FOR LOCALSCRATCH AREA :- /localscratch/**username**

    # ---- [Data transfer] ---- #

    In order to transfer data to/from nvidia-dgx , you need to stage data through the
    gatewayserver. (path: /scratch/**username**). That is, from your local machine, you would first
    scp to gatewayserver and then scp the file(s) to NVIDIA_DGX-1

11. $ scp -P 32452 foo.tar.gz **username**@external.serc.iisc.ac.in:/scratch/**username**

    [*] login to gatewayserver

12. $ scp /scratch/**username**/foo.tar.gz **username**@nvidia-dgx:/localscratch/**username**

    # ---- [Job Submission] ----#

13. DGX-1 uses Slurm as job controller.

[1] sbatch myscript.sh   *** [To submit jobs in DGX using slurm]
[2] squeue -a   *** [To get the info and queue & job state]
[3] scancel jobid *** [To cancel the jobs]

----- [Sample Job Script] ----

```
#!/bin/sh
#SBATCH --job-name=serial_job_test   # Job name
#SBATCH --ntasks=1       # Run on a single CPU
#SBATCH --time=24:00:00  # Time limit hrs:min:sec
#SBATCH --output=serial_test_job.out # Standard output and error log
#SBATCH --gres=gpu:1
#SBATCH --partition=q_1day-1G
pwd; hostname; date | tee result
nvidia-docker run -it ${USE_TTY} --name $SLURM_JOB_ID --user $(id -u $USER):$(id -g
$USER) --rm -v </home or /localscratch path>:/workspace -v /etc/passwd:/etc/passwd -
v /etc/group:/etc/group -v /etc/shadow:/etc/shadow nvcr.io/nvidia/pytorch:18.07-py3
python -c 'import torch; print(torch.__version__)'
```