SInRG Mini-HOWTO

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Abstract

As part of the SInRG cluster, `alces.tiem.utk.edu` offers a certain login environment to members involved with in research in this project. This document details how to obtain a login account on the TIEM SInRG node, `alces.tiem.utk.edu`, what SInRG-specific software is available, and where it is located. If you find any information contained herein to be in error, please feel free to contact me and supply a correction.

Mail your advice to:

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This document is available in an online format at http://www.tiem.utk.edu/ help/sinrg/sinrg/index.html, and the author may also be reached via email to sinrg@tiem.utk.edu.

Contents

1 What Is SInRG?

SInRG stands for the Scalable Intreacampus Research Grid. For more information please see the SInRG web page at http://www.cs.utk.edu/sinrg/.

2 How do I obtain an account?

Contact Dr. Louis J. Gross for account information. Specify in your message:

1. Your name.
2. Your SInRG project manager's name.
3. Your prefered username.
4. Your SSH public key[1].
5. An email address where you may be contacted.

After your request has been submitted, you will be contacted by the TIEM system administrator when your account is ready.

3 About your account...

There are a few things that you will need to know about using your account on alces.

3.1 Obtaining help

At any time you may submit an email request to "`help@tiem.utk.edu`". However, you must do this from your home account and not from your account on alces. See the notes about email below.

3.2 Your shell

The default shell on alces is zshell (`/usr/local/bin/zsh`). In addition to this shell, the following shells are available upon request: `csh`, `jsh`, `ksh`, `bash`, `tcsh`, and `sh`. Understanding how to get around in your own shell environment is essential. All UNIX users are expected to know and understand at least these basics of their own shell environment:

- What an environment variable is and how to set, unset, or modify it's value. Special emphasis is placed on knowing and understanding the following:
  - PATH
  - MANPATH
  - LD_LIBRARY_PATH
  - PAGER
  - EDITOR
  - PRINTER

[1] Access to SInRG nodes is restricted to the use of SSH only. If you do not have SSH, you will need to install it and set up your SSH passkeys before you can use your account on alces.tiem.utk.edu. For more information on SSH, see http://www.ssh.com.

- LPDEST

- What dot-files are and the role they play in setting your shell environment.
- What dot-files your particular shell uses and how to modify them.

For more information, see the manpage **zshall(1)** for the online zshell manual.

3.3 Email

Users on alces are not expected to use alces for email. Sending email to "*your username*`@tiem.utk.edu`" will bounce.

3.4 SSH

SSH is the sole means of entry into alces for users outside the TIEM network[2]. All users on alces are expected to know and understand at least the basic usage of `ssh`, `slogin`, and `scp`.

The complete use of SSH is outside the scope of this document, but below is a simplified instruction list for how to set up your SSH keys and how to log in to your account on `alces.tiem.utk.edu`. For complete information about SSH, see http://www.ssh.com., **ssh-keygen(1)**, **ssh(1)**, **scp(1)**, **slogin(1)**.

3.4.1 How to set up your SSH keys

From the command line on your remote computer (i.e., not on `alces.tiem.utk.edu`):

1. Type: `ssh-keygen`
   You will see output similar to the following:

   ```
   Initializing random number generator...
   Generating p: ..............++ (distance 340)
   Generating q: ......................++ (distance 388)
   Computing the keys...
   Key generation complete.
   Enter file in which to save the key (/some/where/user/.ssh/identity):
   ```

2. Press return.
   You will see the following output:

   ```
   Enter passphrase:
   ```

3. Choose a phrase (one or more words seperated by spaces) to use as your passphrase. Choose something easy for you to remember. *Do not simply press return*. Your passphrase is your SSH password.

4. Enter your chosen passphrase at the prompt. You will then be asked to enter your passphrase a second time to insure that there were no typing mistakes.
   You will see the output similar to the following:

[2]This may cause problems for users of Exceed Hummingbird's Windows-based X-terminal emulator, as it seems to rely on `in.rexecd` for it's connections.

```
Your public key is:
1024 35 133949538048220770003537846533014610446181662017777547673224352787156533
772099201572198950941509256317620540474683563507332926754439974477061848463406 58
122702393965983204121380311744118526519042384735182151026561392075274705911964 50
798681679859644924585419127464507075139703386243481830844571155938588422073 51 us
er@host
Your public key has been saved in /some/where/user/.ssh/identity.pub
```

When you have completed these steps, you will have two files in ~/.ssh/: identity.pub and identity. The file identity is your private identity key – it should never be given out to anyone under any circumstances. The identity.pub file can be freely distributed.

Email the contents of the identity.pub file to "help@tiem.utk.edu". Once the contents of this file have been placed in the authorization file on alces, you may gain access to your account.

3.5 Backups

Currently the TIEM network lacks the ability to back up the 512 giggabytes of hard drive space available on alces.tiem.utk.edu. Because of this, only portions of the operating system itself are backed up. Users are expected to back up their own data onto their own home machine.

3.6 Machine Ussage Policy

Users will be able to reserve time on alces, during which all other users will be expected to stop any running processes. Initially, such reservations will be managed by the TIEM Sys Admin. If any conflicts develop regarding usage, requiring limitations being placed, the following priorities shall apply:

1. Highest priority shall be given to externally-funded projects in computational ecology for which the proposal specifically mentioned the use of this machine.
2. Second priority shall be given to staff of TIEM and associated faculty and students (e.g. Michael Berry and group in CS).
3. Third priority shall be given to those working on projects directly related to SInRG goals of middleware development for grid computing.
4. Fourth priority shall be given to projects which make use of the parallel implementation advantages of an SMP (e.g. parallel code).
5. Lowest priority shall be given to projects simply wishing to use the cpu power available on this machine (e.g. embarrasingly parallel problems).

4 What is alces.tiem.utk.edu?

Alces is:

- Enterprise 4500 midrange server
  - 14 400MHz UltraSPARC modules, each with 8MB external cache

  - 10 GB of RAM
  - 3.2 GB/s backplane
  - Gigabit network interface

- Sun StoreEdge A5200
  - Gigabit interface w/ E4500
  - 14 36GB hard drives (512GB total)

5 What software is available?

5.1 Compilers

5.1.1 Sun Forte

- /export/opt/SUNWspro/bin/cc (C compiler)
- /export/opt/SUNWspro/bin/CC (C++ compiler)
- /export/opt/SUNWspro/bin/f77 (Fortran 77 compiler)
- /export/opt/SUNWspro/bin/f90 (Fortran 90 compiler)

5.1.2 GNU

- /usr/local/bin/gcc (C compiler)
- /usr/local/bin/g++ (C++ compiler)

5.2 Network Weather Service

Network Weather Service is installed in /export/nws.[3]

5.3 MPICH

Mpich is installed in /export/mpich.[4] There are two seperate installations:

1. Mpich compiled with the p4 driver

   Mpich with the p4 driver is installed in /export/mpich/p4. Set the environment variable **MPI_ROOT** to /export/mpich/p4 before using.

2. Mpich compiled with the p4 driver and shared memory

   Mpich with the shared memory p4 driver is installed in /export/mpich/p4_shared. Set the environment variable **MPI_ROOT** to /export/mpich/p4_shared before using.

MPI_ROOT Set this environment variable to: /export/mpich

[3] For more information about NWS, see NWS
[4] For more information about MPICH, see MPICH

5.4 Condor

Condor is installed in /export/condor.[5] Set the following environment variables before using:

CONDOR_CONFIG Set this environment variable to /export/condor/condor_config

5.5 Netsolve

Netsolve is installed in /export/netsolve, with a server running that is pointed to netsolve.cs.utk.edu for an agent.[6] Set the following environment variables before using:

NETSOLVE_ROOT Set this environment variable to /export/netsolve/src/NetSolve-1.3.beta-6

NETSOLVE_ARCH Set this environment variable to SUN4SOL2

NETSOLVE_AGENT Set this environment variable to netsolve.cs.utk.edu

5.6 Lapack

Lapack is installed as part of the Sun Performace Library for Forte under /export/opt/SUNWspro.[7]

5.7 Globus

Globus is installed in /export/globus.[8] (At the time of this writing, Globus is neither configured nor running.)

5.8 ScaLapack

ScaLapack is located in /export/scalapack.[9] (At the time of this writing, ScaLapack is not compiled nor installed.)

5.9 IBP

IBP is installed in /export/ibp.[10] The server is located in /export/ibp/src/IB0P/server, and the client is located in /export/ibp/src/IBP/client. (At the time of this writing, IBP compiles but crashes when the server is run.)

[5] For more information about Condor, see Condor
[6] For more information about Netsolve, see Netsolve
[7] For more information about Forte or the Sun Performance Library, see Forte Tools
[8] For more information about Globus, see The Globus Project
[9] For more information about ScaLapack, see The ScaLAPACK Project
[10] For more information about IBP, see IBP