Tesla-CMC User Guide

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Contents

- Requirements
- Tesla-CMC Cluster
- Sonnecting to Tesla-CMC
- Data transfers
- Text Editors
- Compiling and Running

Requirements



Requirements

- User account to Tesla-CMC
- 🔇 Unix
 - Shell: sh, csh, bash...
 - OpenSSH client (with SSH-2 protocol support)
 - Optional X-server
- Windows
 - SSH client: PuTTY, WinSCP, Cygwin, TTSSH2...
 - Optional X-server: Xming

Tesla-CMC Cluster

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Tesla-CMC Cluster





Configuration

- 2 x Intel(R) Xeon(R) CPU E5620 @ 2.40GHz
- 36GB Host Memory
- 8 x Tesla C1060 @ 1.44GHz (4GB Memory)
- SSH port: 65028
- Hostname: cuda.cs.msu.su

Connecting to Tesla-CMC



Connecting from Unix

ssh - OpenSSH SSH client (remote login program)
 ssh connects and logs into the specified hostname (with optional username)

ssh [-X] [-i identity_file] [-p port] [username@]hostname

- S -X Enables X11 forwarding
- **-p port** Port to connect to on the remote host
- -i identity_file Selects a file from which the identity (private key) for RSA or DSA authentication is read

bsd-air:~ conqueror\$ ssh -X -p 65028 conqueror@cuda.cs.msu.su The authenticity of host '[cuda.cs.msu.su]:65028 ([158.250.10.158]:65028)' can't be established. RSA key fingerprint is 96:34:a4:06:72:9d:e3:05:a1:f1:11:82:e5:07:0b:c9. Are you sure you want to continue connecting (yes/no)? yes Warning: Permanently added '[cuda.cs.msu.su]:65028,[158.250.10.158]: 65028' (RSA) to the list of known hosts. conqueror@cuda.cs.msu.su's password: Last login: Thu Jun 21 14:38:40 2012 from bsd-book.socio.msu.ru [conqueror@tesla-cmc ~]\$

Unix - ssh



Connecting from Windows

- **PuTTY** is a free (MIT-licensed) Win32 Telnet and SSH client
- Ownload link:
- http://the.earth.li/~sgtatham/putty/latest/x86/putty.exe

Windows - PuTTY

🕵 PuTTY Configuration	n 🔀
Category:	
Category: Session Logging Terminal Keyboard Bell Features Window Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet Rlogin SSH Serial	Basic options for your PuTTY session Specify the destination you want to connect to Host Name (or IP address) Port cuda.cs.msu.su 65028 Connection type: Raw Raw Telnet Rlogin Connection type: Serial Load, save or delete a stored session Saved Sessions Default Settings Load Save Delete Close window on exit: Only on clean exit
About	Open Cancel

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Windows - PuTTY



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Windows - PuTYY

🗬 conqueror@tesla-cmc:~ login as: conqueror conqueror@cuda.cs.msu.su's password: Last login: Thu Jun 21 14:43:32 2012 from bsd-book.socio.msu.ru [conqueror@tesla-cmc ~]\$

Data Transfers



Transferring Data in Unix

scp – secure copy (remote file copy program)
 scp copies files between hosts on a network. It uses ssh for data transfer, and uses the same authentication and provides the same security as ssh.

scp [-r] [-i identitty_file] [-P port] [[user@]host1]:file1 [[user@]host2]:file2

- -r Recursively copy entire directories
- file1 and file2 can be absolute paths or relative paths with filenames or directories' names



© Copying a file from localhost to Tesla-CMC

me:~ conqueror\$ scp -P 65028 Downloads/test.txt cuda.cs.msu.su:~/

S Copying a file from Tesla-CMC to localhost

me:~ conqueror\$ scp -P 65028 cuda.cs.msu.su:~/test.cpp test.cpp

S Copying a directory to Tesla-CMC

me:~ conqueror\$ scp -r -P 65028 Downloads/test dir cuda.cs.msu.su:~/

Unix - scp

Transferring Data in Windows

WinSCP is an open source free SFTP client, SCP client, FTPS client and FTP client for Windows.

Ownload link:

http://winscp.net/download/winscp438.zip

Windows - WinSCP

WinSCP Login		? 🛛
Session Stored sessions Environment Directories SSH Preferences	Session Host name: cuda.cs.msu.su User name: conqueror Private key file: Protocol File protocol: SFTP< ♥ Alloc	Port number: 65028 📚 d: ow SCP fallback Select color
Advanced options		
About Langu	ages Login S	Gave Close

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Windows - WinSCP



Windows - WinSCP

🖥 C:\ - conqueror@cud	a.cs.msu.si	ı - WinSCP									
Local Mark Files Commands Session Options Remote Help											
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🥪 C: Local Disk	- 🖮 🗄	(+ - ⇒ - (<u>A</u>	🔊 🚮 👔 🛛		Conqueror	- 🖮 🗄	(+ + + + 🗈	🗀 🚮 👔	1		
C:\					/home/conqueror						
Name 🔶 Ext	Size	Туре	Changed	β	Name 🔶 Ext	Size	Changed	Rights	^		
2764cd1b400687254b5		File Folder	2/13/2012		🖻		6/15/2012 2:21	rwxr-xr-x			
🛅 Config. Msi		File Folder	6/15/2012	sł	🚞.ccache		1/21/2012 5:22	rwxrwx			
Documents and Settings		File Folder	7/8/2008		🚞 .config		1/21/2012 10:5	rwx			
🚞 Inetpub		File Folder	7/16/2008		🚞 .dbus		1/21/2012 10:5	rwx			
🚞 InotecB.32		File Folder	7/14/2011		🚞 .emacs.d		6/20/2012 3:56	rwxrwxr-x			
🛅 MSOCache		File Folder	12/14/201	hr	🚞 .gconf		6/20/2012 3:21	rwx			
🚞 Program Files		File Folder	2/13/2012	r	🚞 .gconfd		6/20/2012 3:26	rwx			
RECYCLER		File Folder	4/8/2009	sł	ignome2		1/21/2012 10:5	rwxr-x			
🛅 System Volume Informa		File Folder	7/8/2008	sł	🛅 . java		3/26/2012 2:00	rwxrwx			
🚞 temp		File Folder	4/5/2012		🛅 .mozilla		10/22/2010 10:	rwxr-x			
🗀 VKLife		File Folder	5/13/2011		🛅 .nv		1/19/2012 11:3	rwx			
C WINDOWS		File Folder	6/21/2012		iparts		5/19/2012 1:36	rwxr-xr-x			
🖬 .DS_Store	6,148	DS_STORE File	1/7/2010	а	🚞 .ssh		6/21/2012 2:43	rwxr-x			
AUTOEXEC.BAT	0	MS-DOS Batch File	7/8/2008	а	Common		6/15/2012 6:16	rwxrwxr-x			
BankStatement_Credit	110,792	PDF File	12/14/201	а	🚞 example		11/15/2011 6:2	rw×r-×			
📴 boot.ini	211	Configuration 5	7/8/2008	sł	🚞 Labs		2/9/2012 3:52:	rwxr-x			
📕 checklist-ru.pdf	83,524	PDF File	12/9/2010	а	🛅 linux86		6/15/2012 6:16	rwxrwxr-x			
CONFIG.SYS	0	System file	7/8/2008	а	🚞 linux86-64		6/15/2012 6:16	rwxrwxr-x			
🖬 IO.SYS	0	System file	7/8/2008	a:	Cmsu_spring_2012		4/10/2012 10:2	rwxr-x			
🖬 MSDOS.SYS	0	System file	7/8/2008	as	Call Sc1		2/15/2012 4:50	rw×r-×			
TTDETECT.COM	47,564	MS-DOS Applica	8/4/2004	as	Carl Sc2		2/9/2012 3:44:	rwxr-x			
🖬 ntldr	250,048	File	2/13/2012	as	Carl Sc3		11/13/2011 10:	rw×r-×			
🖬 pagefile.sys	805,306,	System file	6/22/2012	as	🚞 test_dir		6/21/2012 11:4	rwxr-xr-x			
Programs.ini	3,633	Configuration S	4/9/2010	а	🛅 Tutorial1		3/14/2012 3:35	rwxr-x			
1				5	Tutovial?		4/11/2012 12:1	PITTOP 10			
0.0 -4 700 M/D % 0 -4 04					0.0 - (1.505 M/D in 0(112				-		
🛿 👷 F2 Kename 📑 F9-torc 🖏 F5 Copy 📖 F6 Move 🊁 F7 Create Directory 🔀 F8 Delete 🎬 F9 Properties 🚛 F10 Quit											
						2	SFTP-3	0:00:3	22		

Text Editors

Vim – Vi IMproved

vim - Vi IMproved, a programmers text editor

S Enhancements:

- multi level undo
- multi windows and buffers
- syntax highlighting
- command line editing
- filename completion
- on-line help
- visual selection
- Vim on-line help system can be started
 - So by typing ":help" command,
 - or by pressing **<HELP>** key or **<F1>** key instead.

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Vim – General Modes

- Normal For navigation and manipulation of text.
 - This is the default mode.
 - Source To switch to Normal mode type <ESC>
- Insert For inserting new text. From the Normal mode
 - S To append after cursor type <a>
 - So To insert before cursor type <i>
 - To append at end of line type <A>
 - To insert at beginning of line type <I>

- **Visual** For navigation and manipulation of text selections, this mode allows you to perform most normal commands, and a few extra commands, on selected text.
 - To switch to Visual mode from Normal mode type <v>
- Command-line For entering editor commands.
 - Source is a straight of the second second
 - To exit saving changes type <wq!> <Enter>
 - To exit without saving changes type <q!> <Enter>

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Vim – Basic Commands

- S Moving around:
 - <h> moves the cursor one character left
 - <j> moves the cursor one character down
 - <k> moves the cursor one character up
 - <l> moves the cursor one character right
- Solution Deleting (Normal mode):

 - Some state of the state of
 - <dd> deletes one line

Selecting, Cutting, Copying and Pasting (Visual mode):

- To select a text enter Normal mode, move the cursor to the first position of the text, enter Visual mode, and move the cursor to the last position of the text
- S To cut selected text type <x>
- To copy selected text type <c>
- To paste selected text after the position of the cursor type
- Undo and Redo (Normal mode):
 - **◊ To undo last change** type **<u>**
 - So To redo last undone change type <.>



MC – Midnight Commander

- If Vim is too complicated, use MC instead!
- The Midnight Commander (MC) is a directory browser/ file manager for Unix-like operating systems with built-in text editor.

Basic functional keys:

- Some set of the se
- Some state is a state of the state of th
- Some set of the se
- Some set of the se
- Some set of the se

- <F6> move
- <F7> new dir
- <F8> delete
- Some set of the se

Compiling and Running

Installed Compilers

The following compilers are installed on Tesla-CMC:

- GCC 4.5.1
- OpenMPI 1.4.3 and 1.5.3
- NVCC CUDA Toolkit 4.0 and 4.1
- PGI 12.5

Compiling programs: compiler_name [options] filename compiler_name ::= gcc | gfortran | mpicc | mpic++ | mpif90 | nvcc | pgcc | pgc++ | pgfortran



Running Programs

- OpenMP programs:
 - ./openmp_pr [arguments]
 - \$OMP_NUM_THREADS must be set first!
- MPI programs:
 - mpirun –np number_of_MPI_processes mpi_pr [arguments]
- CUDA programs:
 - ./cuda_pr [arguments]

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