Mastering EOS
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GRAND VALLEY STATE UNIVERSITY
SCHOOL OF COMPUTING AND INFORMATION SYSTEMS

Inter-EOS Password-less SSH

```
# Generate SSH key
ssh-keygen # Press Enter at each prompt
# Add new SSH key to authorized_keys
< ~/.ssh/id_rsa.pub >> ~/.ssh/authorized_keys
_trust_host() {
  ssh -o StrictHostKeyChecking=no -o ConnectTimeout=2 "$1" exit
}
# Trust all EOS machines
for i in {1..24}; do _trust_host "eos$(printf '%02d' $i)"; done
# Trust all Arch machines
for i in {1..8}; do _trust_host "arch$(printf '%02d' $i)"; done
ssh eos15 # Automatic login
```

For more security, use a passphrase and ssh-agent.

Manipulating the PATH

When you type a command, the shell searches for the executable using the PATH environmental variable. PATH should be set to a colon-delimited list of directories containing executables. To view your PATH, type:

```
PATH
```

For instance, to add a local scripts directory (conventionally called ~/bin) to your PATH, run:

```
PATH=~/bin:$PATH
```

Note that this causes the shell to find your scripts before system executables of the same name.

Multiple terminals

As an alternative to opening multiple terminals running ssh or multiple PuTTY windows, terminal multiplexers such as screen and tmux may be used. tmux is recommended. Type tmux once SSH'd to start it.

Default tmux bindings:
C-b c means Control + b, then c.

New window	C-b c	Kill window	C-b &
Last window	C-b l	Jump to window 4	C-b 4
Next window	C-b n	Previous window	C-b p
Enter copy mode	C-b [	Paste buffer	C-b]

Warning: Detached sessions will be killed periodically. Please do not leave important jobs running.

Getting help on commands

To get help on the dd command...
- Brief help: man dd, available for most commands
- Detailed help: info dd, available for some commands

Version control systems

Version control systems are used to track changes to a set of files. Their use is considered professional software development practice.

- Distributed Version Control Systems (recommended)
  - Git (git) <git-scm.com>
  - Mercurial (hg) <mercurial.selenic.com>
- Centralized Version Control Systems
  - Subversion (svn) <subversion.apache.org>
  - Concurrent Versions System (cvs) <cvs.nongnu.org>

Installing software to your EOS account

Installs version 1.17.0 of aria2, a download utility similar to wget but with more features. This install is typical of many programs using the GNU build system. The option of note is the --prefix option to ./configure. You may install to any directory you like, but ~/.local is a common convention.

```
mkdir -p ~/.local/src
cd ~/.local/src
wget 'http://downloads.sourceforge.net/project/'\
'aria2/stable/aria2-1.17.0/aria2-1.17.0.tar.gz'
tar -xf aria2-1.17.0.tar.gz
cd aria2-1.17.0
./configure --prefix ~/.local
make # builds the program
make install # installs program to ~/.local/bin
export PATH=~/.local/bin:$PATH # consider adding to ~/.bashrc
aria2c 'http://www.irs.gov/pub/irs-pdf/fw4.pdf'
```

Directory navigation

pushd *dir*	Switch to *dir* and add the current directory to the directory stack
popd	Remove the top directory on the directory stack and switch to it
dirs	Show contents of the directory stack

Using the clipboard

```
alias copy='xclip -selection clipboard -in'
alias paste='xclip -selection clipboard -out'
echo 'EOS Rocks' | copy
copy eos.txt
paste > eos.txt
```

Downloading files

Download a copy of the W4 form.

```
wget 'http://www.irs.gov/pub/irs-pdf/fw4.pdf'
curl 'http://www.irs.gov/pub/irs-pdf/fw4.pdf' > fw4.pdf
```

Interacting with other users

w	Show system uptime, who is logged in, and what they are doing
last	Show login history
write	Write a message to another user's terminal
mesg [yn]	Enable or disable write access to your terminal

Software build systems

Using a build system offers an alternative to repetitively typing compiler commands and is considered professional practice.

- C/C++
  - SCons <scons.org> (recommended)
  - CMake <cmake.org>
  - make <gnu.org/s/make>
- Java
  - Buildr <buildr.apache.org> (recommended)
  - SCons <scons.org>
  - Maven <maven.apache.org>
  - Ant <ant.apache.org>

Run make faster by using all processors

```
make --jobs="$(grep '^processor' /proc/cpuinfo | wc --lines)"
```

Miscellaneous

- If a user is already logged on to a machine, press Ctrl-Alt-Backspace to kill the X server and log them out.
- Change your password with passwd.
- Check your quota with quota --human-readable or quota -s.