



LINUX USER GROUP AT UTA

www.luguta.org

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Goals of Linux User Group

- promote the use of the Linux operating system and other open source software.
- provide a venue for students to gain experience giving technical presentations.
- provide a forum for students to learn about new aspects of Linux and open source software.
- promote fellowship among students who participate in the group.



What is Linux

- Linux is an Operating System (OS) – the software that manages its processor, memory and devices and lets you run different programs on it.
- It is free and open source.
- It has been developed collaboratively by many developers across the globe making it extremely robust and transparent.
- It is the number one OS running on the Internet^[1]
 - Google and Facebook's sites run on Linux OS.



Getting started with Linux

- Install Linux on a virtual machine (VM)
- Read some good Linux tutorials on the web
- Watch some Linux introductory videos on the Internet
- Try your new skills on your Linux VM
- Attend LUG meetings



Using Linux at UTA

- Install it on a virtual machine on your laptop
 - Virtual machine is safe – your actions cannot harm the data on your computer
 - Quickly switch between Win/Mac and Linux
 - Use VM-Ware Player or VirtualBox
 - These slides will help: http://www.uta.edu/studentorgs/lug/files/LUG_Intro_Linux.pdf
- Use the UNIX accounts provided by UTA
 - Uses SSH (Secure Shell) software
 - Omega and Gamma servers
 - <http://www.uta.edu/oit/cs/unix/UNIX--Linux.php>



Omega/Gamma accounts

- Omega is typically used for computer programming and Oracle applications.
- Gamma has many engineering software installed.
- Both account are disabled by default (maybe)
 - To enable, login at: <https://ithelp.uta.edu/>
 - Use your net-ID and password
 - Complete the form as shown on the next page
 - CSE students' accounts might already be enabled



Omega accounts

Type Of Ticket	Request	▼
Service	*Accounts & Passwords	▼
Category	NetID	▼
SubCategory	Student	▼
Type Of Request	New Linux/Unix Account	▼

The information below is required in order to resolve this service request in a timely manner.

Modification requested for	Individual	▼
NetID	jxd1234	
Course Number		
Course Section		
Omega	<input checked="" type="checkbox"/>	
Gamma	<input type="checkbox"/>	
MySQL	<input type="checkbox"/>	
Oracle	<input type="checkbox"/>	



Connecting to the server

- SSH is a protocol for secure communication between a **client** and a **server**
- The **server** in this case is omega.uta.edu
- You install an ssh **client** on your machine
 - Get the windows client from [here](#)
 - Linux/MacOS comes with an ssh client pre-installed



Software on Omega

- C/C++/Python compilers
- Oracle SQL
- SAS
- CGAL
- Mathematica



Software on Gamma

- MATLAB
- Electronics
 - ADS – Advanced Design System
 - Cadence
 - EM Pro
 - IC Cap
- AFNI – Advance Functional Neuro-Imaging
- ANSYS



High Performance Computing (HPC) Cluster

- Only for researchers and faculty
- Lengthy parallel computing tasks
- Available software:
 - ANSYS, Materials Studio, MATLAB, Mathematica
 - Compilers for C, C++, FORTRAN, MPI
- Knowledge of batch processing required



Installing SSH client

- If you are running Linux or Mac OS, no extra software is needed.
- On Windows, you need to install:
 - **SSH client** (UTA provided) or **Putty**
and
 - **XMing** (this allows you to run graphical software over SSH)



Connecting

- On Linux/Mac, open a Terminal and run
ssh -X **jxd1234@omega.uta.edu**
- On Windows
 - Create a new profile with
 - Hostname: omega.uta.edu
 - Port: 22
 - Username: jxd1234
 - Tunnelling → X11 → Enable X11 forwarding



Your remote shell

```
rohit@MyPC:~$ ssh -X rxr1234@gamma.uta.edu
```

```
This UT Arlington information resource, including all related equipment,  
networks and ne
```

```
..  
and there is no expectation of  
privacy except as otherwise provided by applicable privacy laws.
```

```
rxr1234@gamma.uta.edu's password:
```

```
Last login: Tue Feb 10 17:23:28 2015 from
```

```
*****  
U N I V E R S I T Y   O F   T E X A S   A T   A R L I N G T O N  
*****
```

```
The gamma
```

```
..  
OIT Policies and Procedures are available online at http://oit.uta.edu/
```

```
*****  
[rxr1234@gamma ~]$
```



Basic commands

```
[rxr1234@gamma ~]$ pwd  
/home/r/rx/rxr1234
```

```
[rxr1234@gamma ~]$ ls  
abc.cpp  hello_world.m  hpeesof  launcher.120.log
```

```
[rxr1234@gamma ~]$ logout
```

```
Connection to gamma.uta.edu closed.  
rohit@MyPC:~$
```



Example: MATLAB on Gamma

```
[rxr1234@gamma ~]$ matlab
```

You should see the MATLAB GUI load on your machine.

If, instead, you receive a message:

Warning: No display specified. You will not be able to display graphics on the screen.

It means that you forgot to enable X11 tunneling. Go back to profile settings to make sure your settings are correct.



Example: Compiling C++ code

```
[rxr1234@omega ~]$ pwd
/home/r/rx/rxr1234
[rxr1234@omega ~]$ gedit hello_world.cpp
[rxr1234@omega ~]$ g++ hello_world.cpp -o hello_world.run
[rxr1234@omega ~]$ ./hello_world.run
Hello World
[rxr1234@omega ~]$
```



Transferring files

- You can use the SFTP client

gamma.uta.edu - Omega - SSH Secure Shell

Edit View Window Help

New Terminal

New File Transfer

New Terminal in Current Directory

New File Transfer in Current Directory

Close

Close All Others

login: Tue Feb 10 01:12:23 2015 from asa-r

UNIVERSITY OF TEXAS A

2:gamma.uta.edu - Omega - SSH Secure File Transfer

File Edit View Operation Window Help

Quick Connect Profiles

Local Name	Size	Type	Remote Name	Size	Type
Libraries		System F.	hpeesof		Folder
Rohit		System F.	hello_world.m	47	M File
Computer		System F.	launcher.120.log	114	Text Do
Network		System F.			
Control Panel		System F.			
Recycle Bin		System F.			
Control Panel		System F.			
Mozilla Firefox	1,151	Shortcut			
SSH Secure File Transfer C...	2,294	Shortcut			
SSH Secure Shell Client	1,336	Shortcut			

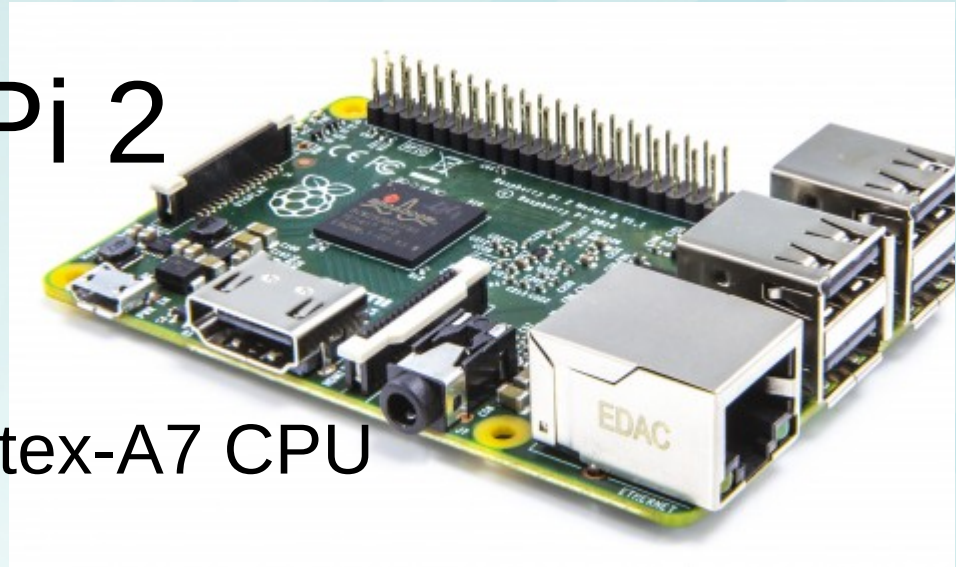
Transfer Queue

/	Source File	Source Directory	Destination Dire...	Size	Status	Speed	Time

Connected to gamma.uta.edu - /hor SSH2 - arcfour - hmac-sha1 - none 3 items (161 B)



Raspberry Pi 2



- \$35 Linux computer
- A 900MHz quad-core ARM Cortex-A7 CPU
- 1GB DDR2 SDRAM
- 4 USB ports, 1 Ethernet port, HDMI out
- You will also need:
 - An SD card 4GB+ for storage
 - Micro USB charger (5V, 1+ Amp) for power
 - Monitor, Keyboard, Mouse (or you can use SSH)
 - Ethernet cable or USB Wi-Fi dongle for Internet access



Raspberry Pi – popular uses

- Media center
- Retro gaming console
- Small & low power web server
- Home automation and Internet enabled DIY projects
- Low cost computer for classrooms



Why Raspberry Pi

- Cheap tablets are available for a little more price and have a screen too, but
 - Stuck with Android apps and SDK
 - Closed and inaccessible hardware
 - Cannot install Linux software



Getting the Raspberry Pi 2

- Official suppliers: [Element14](#)
- Available from 3rd party suppliers for a premium
 - SparkFun, AdaFruit etc.
- Note that older models are still available (B, B+, A, A+) but they have a slower processor. Get the new one.



QnA

- What is Xming?
 - Linux and MacOS use a client (application) – server (manages the drawing) approach to graphics. Lookup X11. With X forwarding, the program runs on the remote machine but draws on the X server here on your machine. Xming is an X server for Windows.
- Which Linux distro should I try on a VM?
 - Ubuntu and Linux Mint are highly recommended. You can experiment with anything on a VM.