Linux Essentials

Kahoot!

Download the Kahoot! App on your phone for today's session!

Session Schedule

Time	Item
7:00 - 7:45	Introduction to Linux
7:45 - 8:00	Break
8:00 - 8:45	Introduction to Open Source
8:45 - 9:00	Break
9:00 - 10:00	Install WSL or GitBash

Kahoot!

Download the Kahoot! App on your phone for today's session!

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Introduction to Linux

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WAY TO REINVENT YOURSELF

What is Linux?

- **Linux is a Free and Open-Source operating system**

Other Operating Systems

Popular Linux Distributions

- [Debian](#)
- [Ubuntu](#)
- [Mint](#)
- [Manjaro](#)
- [openSUSE](#)
- [RedHat](#)
- [Fedora](#)

Linux Embedded Systems

Embedded System

An embedded system is a computer system that is dedicated to one or two specific functions.

What Does Linux Look Like?

Components of Linux

Applications
Graphical Interface
X Server
GNU Core
Linux Kernel
Boot-Loader

Hardware

Hardware   Shell

Kernel   Utilities

MEMORABLE LINUX EVENTS
CELEBRATING 30 YEARS OF GNU LINUX

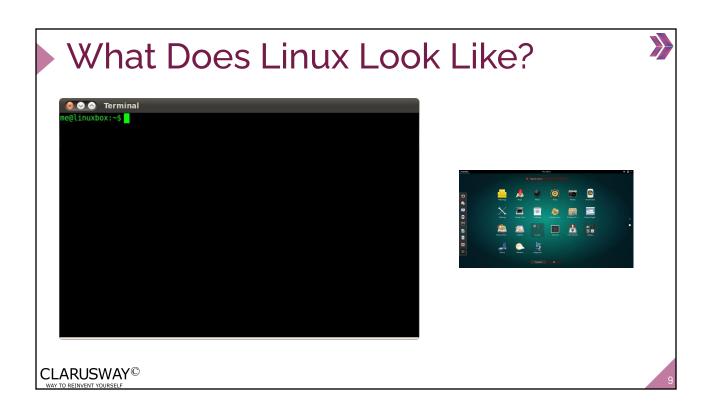THE FREE SOFTWARE FOUNDATION IS CREATED BY RICHARD STALLMAN TO PROMOTE SOFTWARE FREEDOM AND FUND THE GNU PROJECT

LINUS TORVALDS POSTS HIS FAMOUS MESSAGE - "HELLO EVERYBODY OUT THERE USING MINIX..." AND RELEASES THE FIRST VERSION OF THE LINUX KERNEL

LINUX DISTRIBUTIONS ARE CREATED IN THIS YEAR WE SEE SLACKWARE AND DEBIAN BEING LAUNCHED

JASPER NUYENS STARTS DELIVERING THE FIRST 24 BY 7 LINUX SUPPORT IN EUROPE. ENTERPRISE LINUX USE KICKS OFF AND FUELS THE INTERNET BOOM

LINUX BELGIUM IS CREATED AS THE BUSINESS INTERFACE TO THE LINUX COMMUNITY

PUPPET LABS IS FOUNDED TO SUPPORT THE MOST POPULAR CONFIGURATION MANAGEMENT SOFTWARE EVER

THE FIRST ANDROID BASED SMARTPHONE IS LAUNCHED. AFTER 2 YEARS, MOST SMARTPHONES ARE ANDROID BASED

8 YEARS AFTER LINUS CREATED GIT, IT HAS BECOME THE MOST POPULAR VERSION CONTROL SYSTEM IN THE WORLD

30 YEARS OF GNU HAVE BEEN VERY EXCITING AND CHANGED THE FACE OF THE PLANET. FROM SUPER COMPUTERS TILL EMBEDDED DEVICES. LINUX IS EVERYWHERE

1985 1989 1991 1992 1993 1996 1998 1999 2000 2004 2005 2007 2008 2012 2013 2014 2015

GNU GPL VERSION 1 IS PUBLISHED TO ENSURE ELECTRONIC RIGHTS AND ALLOW COLLABORATION

LINUS LICENSES VERSION 0.99 OF LINUX UNDER THE GNU GPL. "DEFINITLY THE BEST THING I EVER DID"

THE 'TUX' LINUX MASCOT WAS CREATED BY LARRY EWING

RED HAT GOES PUBLIC ON THE NASDAQ STOCK MARKET

UBUNTU LINUX DISTRIBUTION IS FOUNDED WITH AN INITIAL INVESTEMENT OF 10M USD BY MARK SHUTTLEWORTH

THE GPLv3 IS CREATED TO ADDRESS ISSUES LIKE SOFTWARE PATENTS AND THE 'MICROSOFT PACT'

THE RASPBERRY PI IS INTRODUCED TO MAKE EMBEDDED LINUX MORE ACCESSABLE TO THE GENERAL PUBLIC. IN 3 YEARS 5 MILLION UNITS ARE SOLD

THE DEDICATED LINUX EDUCATION CENTER IS OPENED IN DIEGEM.

Linux is a registered trademark of Linus Torvalds. Linux Belgium is a registered trademark of Linux Belgium b.v.b.a. Red Hat is a registered trademark of Red Hat Inc. Android is a trademark of Google Inc.
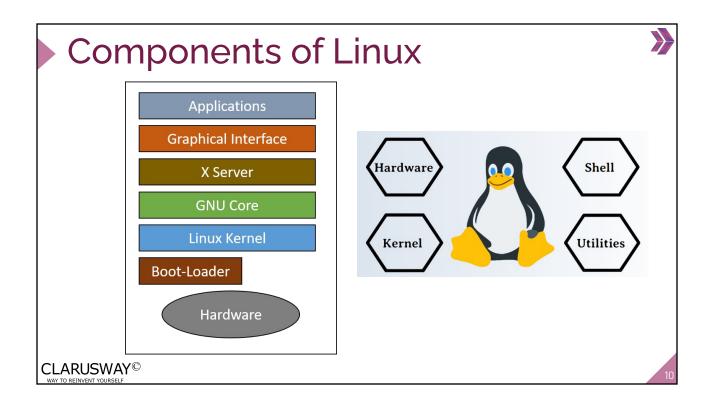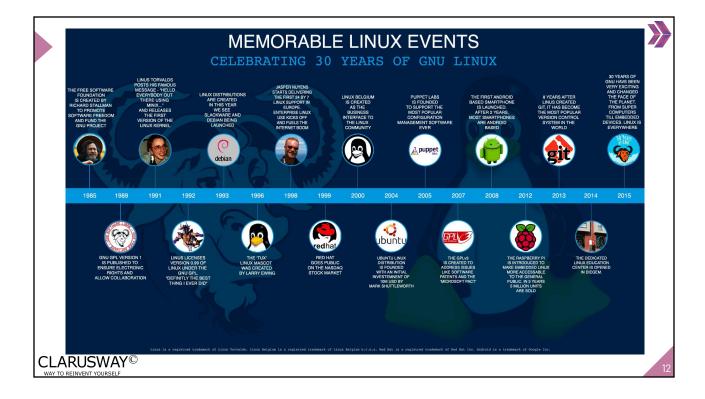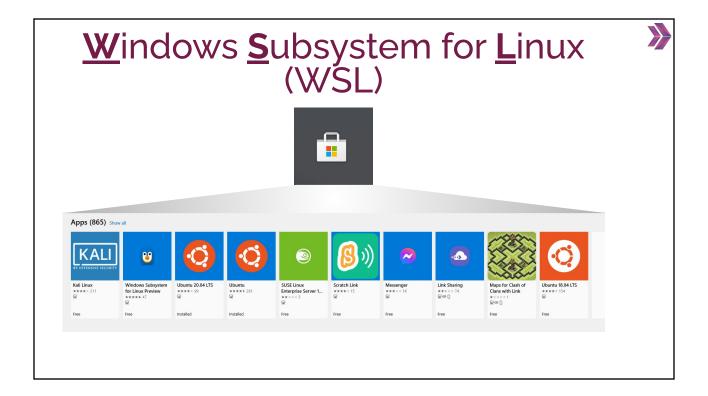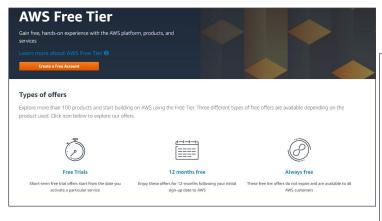
Using Linux on Different Platforms

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Windows **S**ubsystem for **L**inux (WSL)

Apps (865) Show all

Kali Linux	Windows Subsystem for Linux Preview	Ubuntu 20.04 LTS	Ubuntu	SUSE Linux Enterprise Server 1...	Scratch Link	Messenger	Link Sharing	Maps for Clash of Clans with Link	Ubuntu 18.04 LTS
★★★★☆ 211	★★★★★ 47	★★★★☆ 99	★★★★★ 261	★★☆☆☆ 5	★★★★☆ 15	★★★☆☆ 1K	★★☆☆☆ 74	★☆☆☆☆ 1	★★★★☆ 154
Free	Free	Installed	Installed	Free	Free	Free	Free	Free	Free

Amazon Web Services (AWS)

https://copy.sh

https://linuxzoo.net

Welcome to linuxzoo

Learn Linux from the safety of your chair using a remote private linux machine with root access.

- **Welcome to linuxzoo**
  - Our environment
  - Essential Linux
  - System Administration

Status: Normal. Service is running normally.

Look at the *Our Environment* link, and then *Running Your Machine* for getting started.

Quick start hints: register/login, Join Queue, Switch On (in Control tab), Wait for successful boot, click the Connect tab, and then click "telnet: linuxzoo.net" (or type *telnet linuxzoo.net* at your command prompt). Username *root*, password *secure*.

Image	Username	Password
Linux Centos 7	root	secure
	alice	secure
Caine Forensics 10.0	caine	caine
Kali 2020-4	root	kali

FAQ for VNC: There are a few options to getting a remote graphical desktop. In "connect" you can click on Java VNC, which requires java 7 installed on your machine. JavaScript VNC is more flexable, but it may be slower (it is experimental). Some systems do not like

Minimize

Login Details
Email:
Password:
Login | Account Links
NOT currently queued   Refresh in: 2:50.
0 user(s) ahead in queue.

| Queue | Stats |

You must register and login before you can use a virtual machine

---

Linux Distros on Virtual Machines

MacOS/Windows
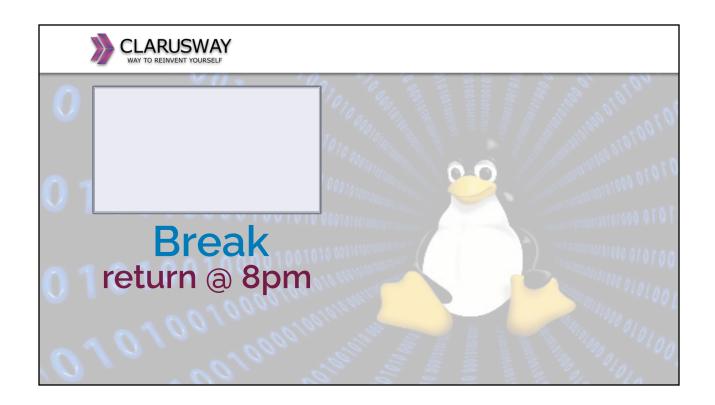
https://www.virtualbox.org/wiki/Downloads

ORACLE
VM
VirtualBox

Windows

VMware Player

https://www.vmware.com/products/workstation-player/workstation-player-evaluation.html

Break
return @ 8pm

Open-Source Software and Licensing

What is open-source

Open-source software is software with source code that anyone can inspect, modify, and enhance.

Open-source Licensing

Open source licenses are licenses that comply with the Open Source Definition — in brief, they allow the software to be freely used, modified, and shared. To be approved by the Open Source Initiative (also known as the OSI), a license must go through the Open Source Initiative's license review process.

Open-source Licensing

Popular Licenses

The following OSI-approved licenses are popular, widely used, or have strong communities:

- Apache License 2.0
- BSD 3-Clause "New" or "Revised" license
- BSD 2-Clause "Simplified" or "FreeBSD" license
- GNU General Public License (GPL)
- GNU Library or "Lesser" General Public License (LGPL)
- MIT license
- Mozilla Public License 2.0
- Common Development and Distribution License
- Eclipse Public License version 2.0

FSF and OSI

Free Software Foundation (FSF)

- The Free Software Foundation (FSF) is a nonprofit with a worldwide mission to promote computer user freedom.

- The FSF is working to secure freedom for computer users by promoting the development and use of free software and documentation.

FSF and OSI

Open Source Initiative (OSI)

- **The Open Source Initiative (OSI) is a non-profit organization dedicated to the promotion of open-source software.**

- **OSI was founded in 1998 by Bruce Perens and Eric Raymond..**

https://www.debian.org/intro/free

Major Open Source Applications

Desktop Applications

- **Firefox**
- **Thunderbird**
- **LibreOffice**
- **GIMP**

Server Applications

- **Apache Web Server**
- **NGINX**
- **MySQL**
- **Samba**
- **ownCloud**

Development Languages

Shell

Shell is a command language interpreter that executes commands read from the standard input device such as a keyboard or from a file.n as a "Bash shell script" (or "script").

Development Languages
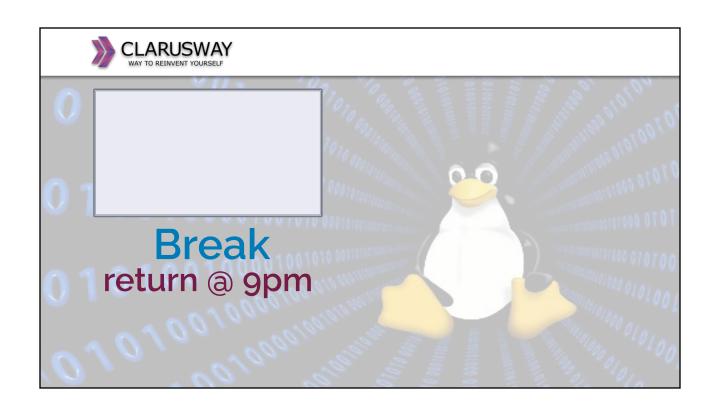
- C
- Java
- JavaScript
- Perl
- Python
- PHP

Package Management Tools

- Contemporary distributions of Linux-based operating systems install software in pre-compiled packages, which are archives that contain binaries of software, configuration files, and information about dependencies.
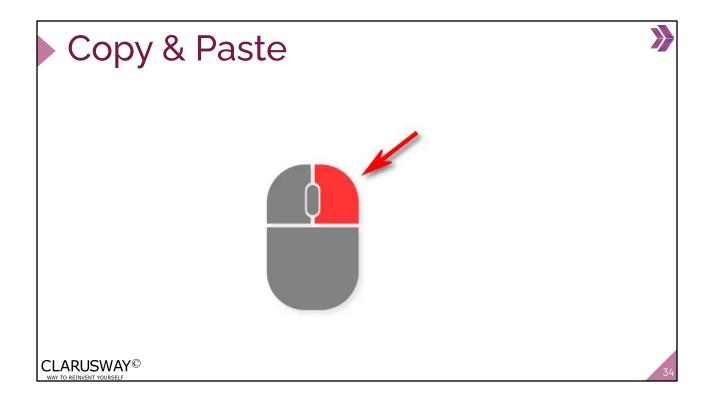
- **Dpkg**
- **apt-get**
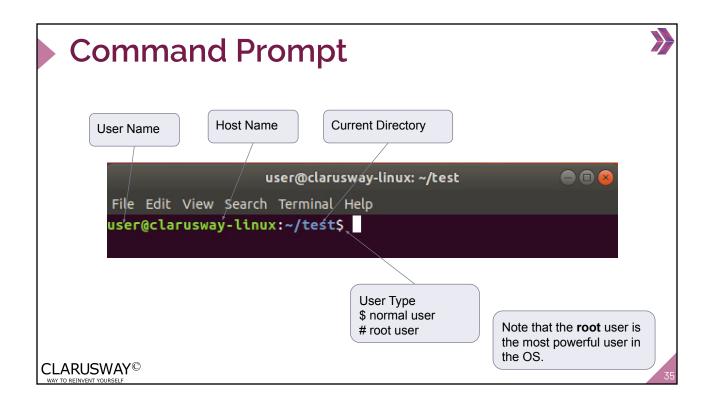- **rpm: Red Hat Package Manager**
- **yum: yellowdog updater modified**

LINUX PACKAGE MANAGEMENT

Break
return @ 9pm

Hands On!

- Install Linux for yourself
    - WSL
    - GitBash

- Basic commands

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▶ Copy & Paste

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Command Prompt

User Name

Host Name

Current Directory

```
user@clarusway-linux: ~/test
File  Edit  View  Search  Terminal  Help
user@clarusway-linux:~/test$
```

User Type
$ normal user
# root user

Note that the **root** user is the most powerful user in the OS.

Modifying Command Prompt

- Use **PS1** variable

- PS1="**\e[x;ym**<element>**\e[m**"

- Possible <element> items:
  - Free text
  - \u – username
  - \h – hostname
  - \@ – time
  - \W – base directory
  - \$ – $ if not root, # otherwise

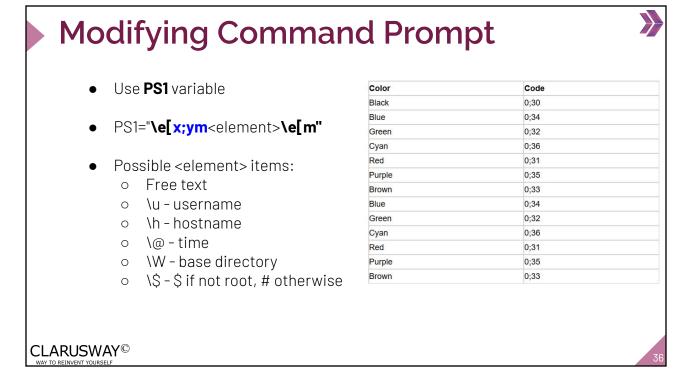| Color	Code
Black	0;30
Blue	0;34
Green	0;32
Cyan	0;36
Red	0;31
Purple	0;35
Brown	0;33
Blue	0;34
Green	0;32
Cyan	0;36
Red	0;31
Purple	0;35
Brown	0;33

Try This!

- First, **Backup** you $PS1
    - export PS1_backup=$PS1

Try This!

- PS1="**\e[x;ym**<element>**\e[m**"

- What do you think this will give?
    - PS1="\e[0;36m\u > \e[m"

Possible <element> items:
- Free text
- \u - username
- \h - hostname
- \@ - time
- \W - base directory
- \$ - $ if not root, # otherwise

Color	Code
Black	0;30
Blue	0;34
Green	0;32
Cyan	0;36
Red	0;31
Purple	0;35
Brown	0;33
Blue	0;34
Green	0;32
Cyan	0;36
Red	0;31
Purple	0;35
Brown	0;33

Try This!

- PS1="**\e[x;ym**\<element>**\e[m"**

- What do you think this will give?
  - PS1="\e[0;36m\u \e[m\e[0;32m\@ >\e[m"

Possible \<element> items:
- Free text
- \u – username
- \h – hostname
- \@ – time
- \W – base directory
- \$ – $ if not root, # otherwise

Color	Code
Black	0;30
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Green	0;32
Cyan	0;36
Red	0;31
Purple	0;35
Brown	0;33
Blue	0;34
Green	0;32
Cyan	0;36
Red	0;31
Purple	0;35
Brown	0;33

Try This!

- Create a prompt that shows
  - **Hello**
  - **Hello \<username>**

Possible \<element> items:
- Free text
- \u – username
- \h – hostname
- \@ – time
- \W – base directory
- \$ – $ if not root, # otherwise

Color	Code
Black	0;30
Blue	0;34
Green	0;32
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Cyan	0;36
Red	0;31
Purple	0;35
Brown	0;33

THANKS!

Any questions?