Linux OS

Group member:

Senquan,

Javen,

Nicholas,

Thom,
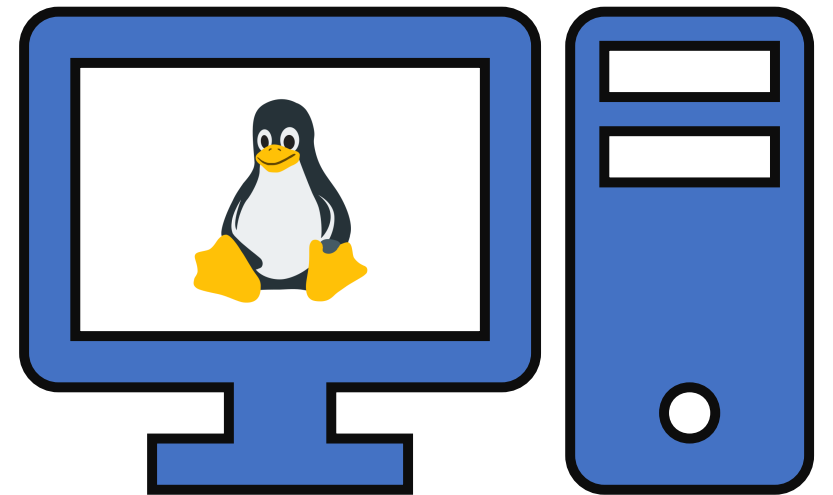
Luke

Contents: (Flow of Presentation)

What is Linux?

Linux Kernel was developed by Linus Torvalds, a software engineer, in 1991.

Linux became the most preferred Operating System (OS) among Programmers due to its simplicity and speed.

Supported on almost every major platform.

Android is built from Linux.

Features

- **Multiuser capability** to access the same system resources.
- **Multitasking** to perform many functions simultaneously.

- **3 Security measures:**

Authentication (Login ID and Password)

Authorization (Permission to read, write and execute)

Encryption (Converts file into an unreadable format).

- **Live CD/USB:** Users can run Linux OS without installing it.

- **Graphical User Interface (GUI):**

Linux is a Command Line Interface (CLI) OS,

but GUI can be integrated by installing packages.

Features

- **Customizable keyboard** that supports different languages.

- **Application support:** repository to allow Users to install many applications.

- **File Storage:** Tree-like hierarchical file system.

- **Open Source:** Linux code is a free, on-going, community-based development project.
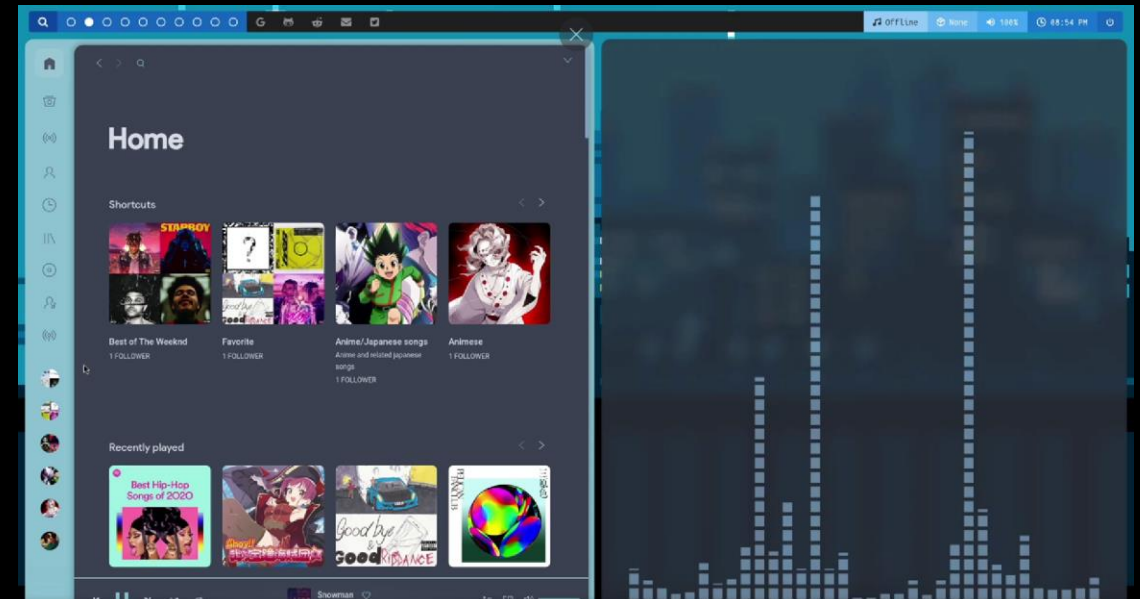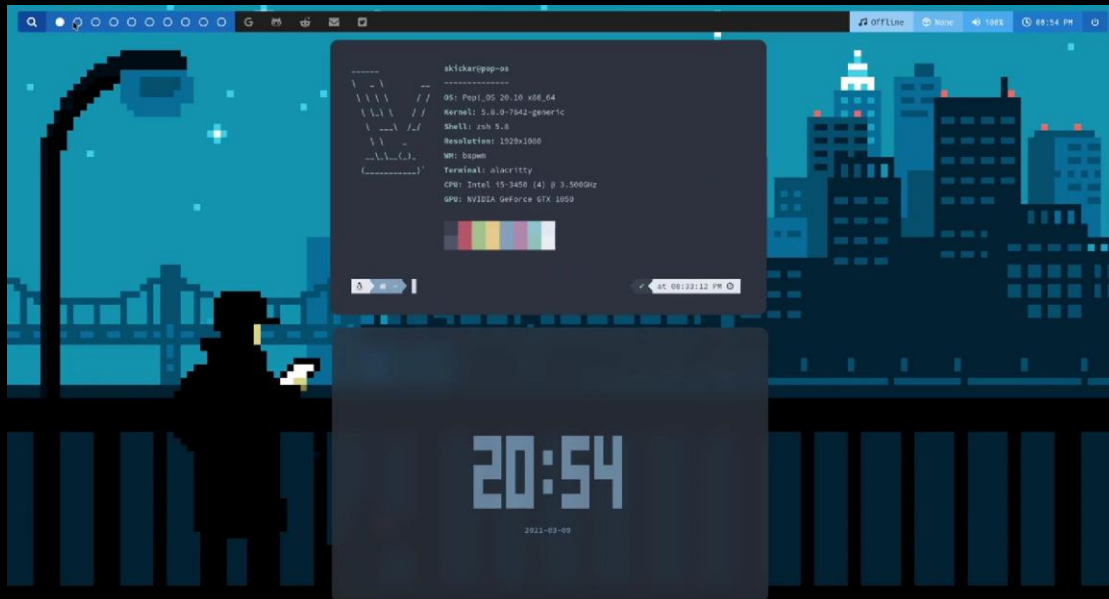*Only open-source OS*

- **Built-in Compilers:** Linux supports many popular coding languages.
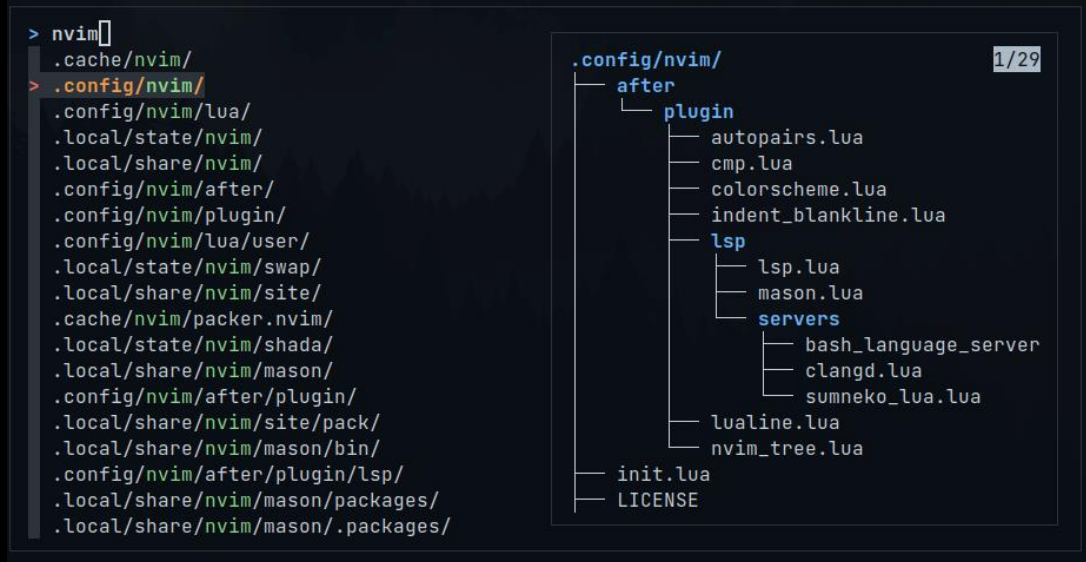
Features

- **Complete Customizability:**

Only OS which allows for fully personalized UI/UX.

- **Lightweight (Low RAM usage)**

A Linux interface specifically for music enthusiasts/lovers:

Linux for Usability

Tree-Like File System:

Organized File Structure

Easy Navigation for files

Exclusive/Custom GUI designed by User.

Configured to have convenient accessibility.

Performance

Linux:

- Smooth and Speedy – consistent   `Reliable`

(Most **Supercomputers use Linux**)

- Better File System Management   `CLI & GUI`

  - CLI File System is Fastest

- Lightweight Performance:

  - Better Memory (RAM) Management

  - No bloatware

  - No Spyware

Windows:

- Performance degrades over time   `Not Sustainable`

- Reboot after Software Installation or Update   `Inconvenient`

- Forced to update to new versions (Auto)   `Not Flexible`

- Spyware to collect User data

  For reasons like:

  - Adware

  - Government Surveillance

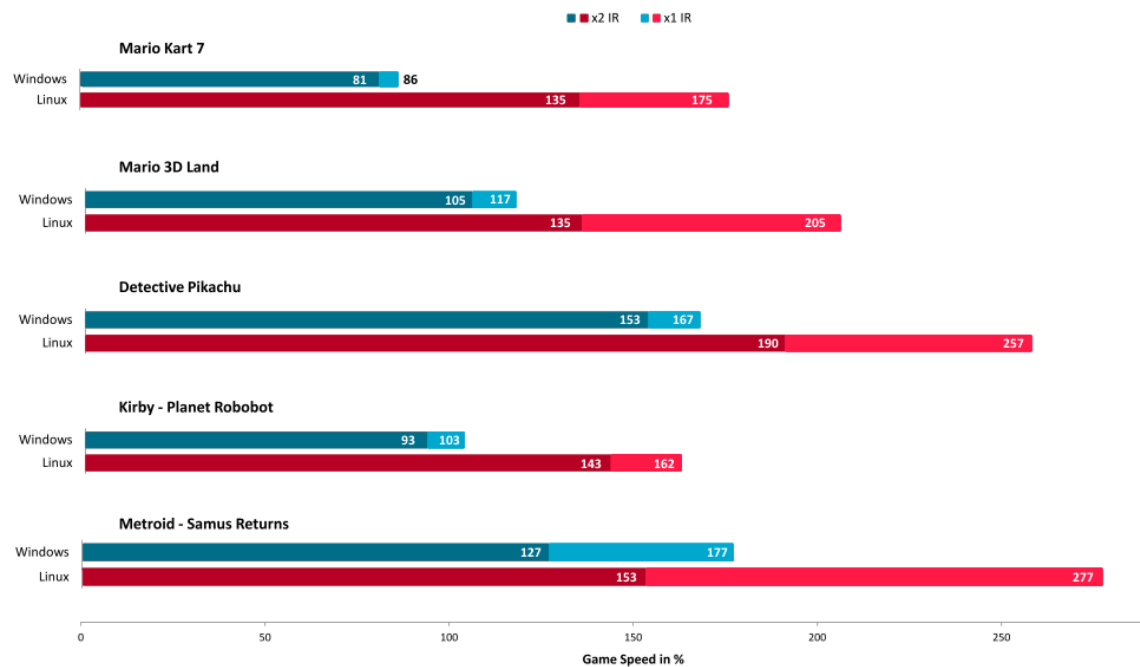- Still has instabilities in System (Bugs)

Performance

- The System can receive **blazingly fast patches** as soon as vulnerabilities or flaws are spotted **– quicker than all other OS.**

- From **helpful Community of Talents**

- Linux OS has the most robust code.

- **Generally, the most stable and secured OS -** even when compared with MacOS.
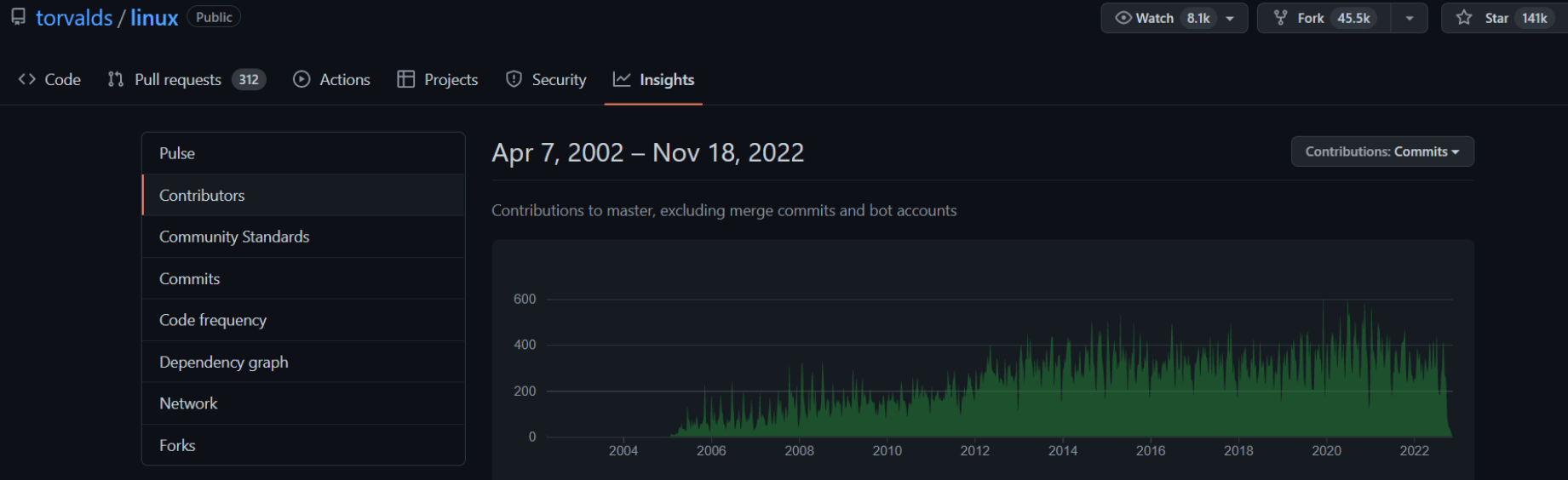
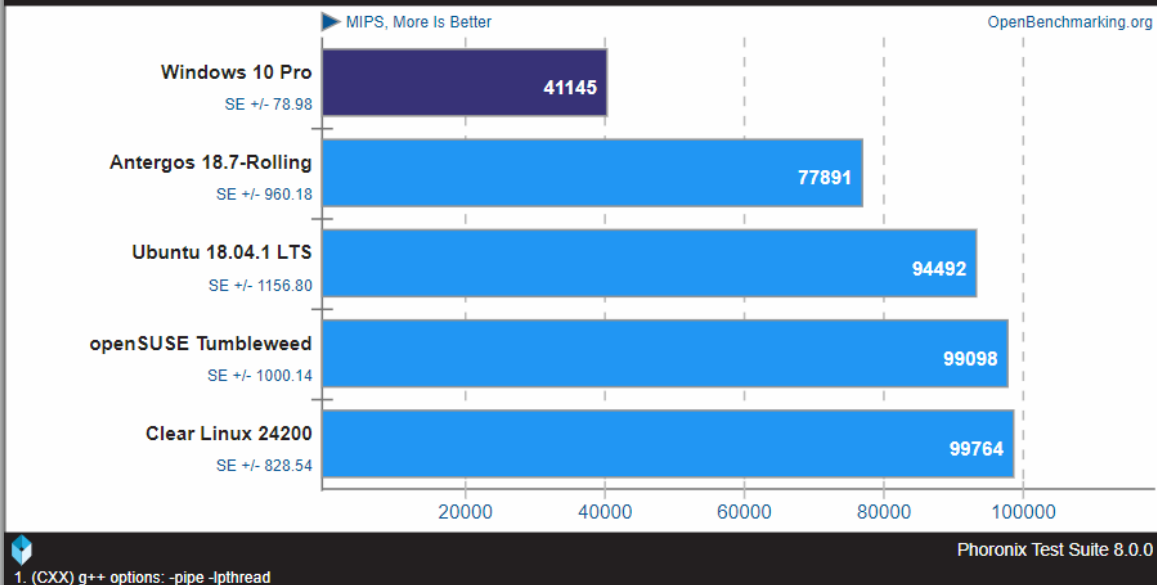# Performance

- Fastest **overall performance and runtime speed.**

https://community.citra-emu.org/t/citra-performance-on-intel-igpu-linux-beats-windows/390382

https://www.phoronix.com/review/2990wx-linux-windows/2
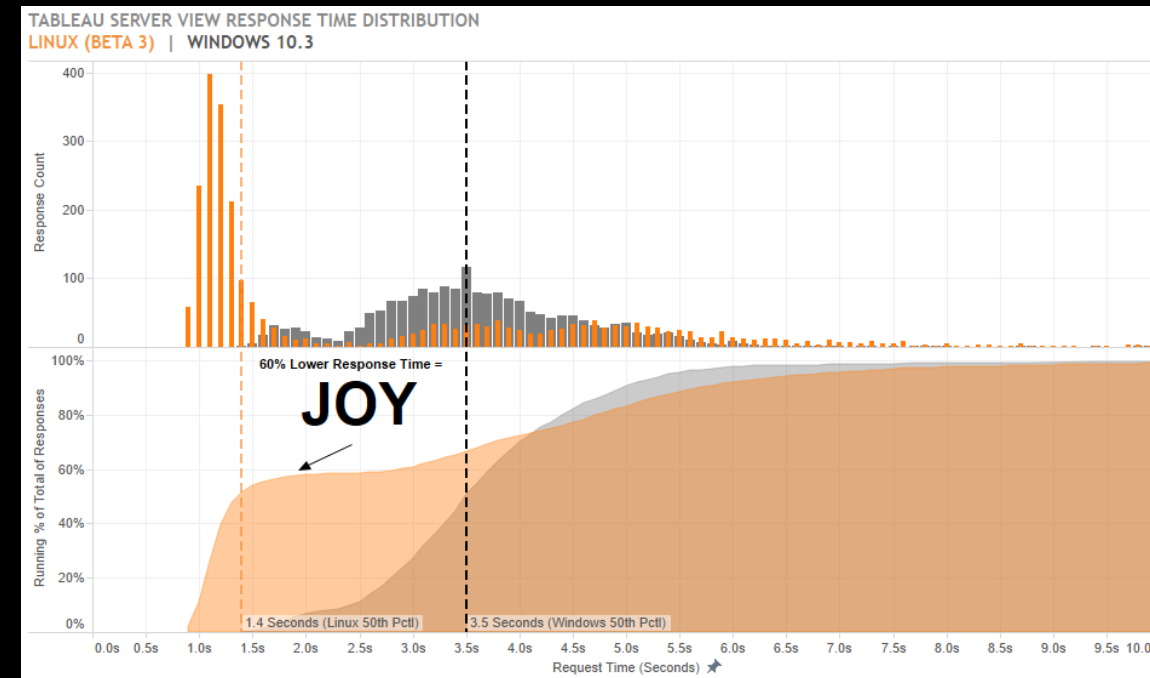
Performance of Linux Servers

- **<u>Cheapest</u>** to setup and maintain

- **Free* and Active support** from Community.

- **Cater to <u>specific</u> needs or requirements** of the company.

- **Best runtime; maximized optimization** – crucial for big and busy servers.

- **No Spyware.**

- **No Bloatware.**

- **Better in EVERY way; Best OS for Servers**

As such,

~97% of Cloud Servers use Linux

*Based on 2016, **just for the License** to use*

Open License No-Level	Processors	Cores per Processor	License-Only Cost (ERP)	% Increase
Windows Server 2016 Datacenter Edition	2	8	$6,156.00	0%
	2	10	$7,695.00	25%
	2	12	$9,234.00	50%
	2	14	$10,773.00	75%
	2	16	$12,312.00	100%

TABLEAU SERVER VIEW RESPONSE TIME DISTRIBUTION
LINUX (BETA 3) | WINDOWS 10.3

60% Lower Response Time =

JOY

1.4 Seconds (Linux 50th Pctl)
3.5 Seconds (Windows 50th Pctl)

Linux for Internet Of Things (IOT)

Similarly, here's why Linux OS is favorable for IOT Devices:

- Great Portability and Performance

- Flexible and Compatible

- Free to use

- Capable of Multi-Processing

- Scalable

- Efficient Power Usage

Why is Linux a cost-effective solution?

- Free*
- Many Distributions (distros)
- No hidden service fee
- Low Maintenance cost
- Require lesser payment for security

Ubuntu (Most Popular):

Elementary OS:

https://elementary.io/
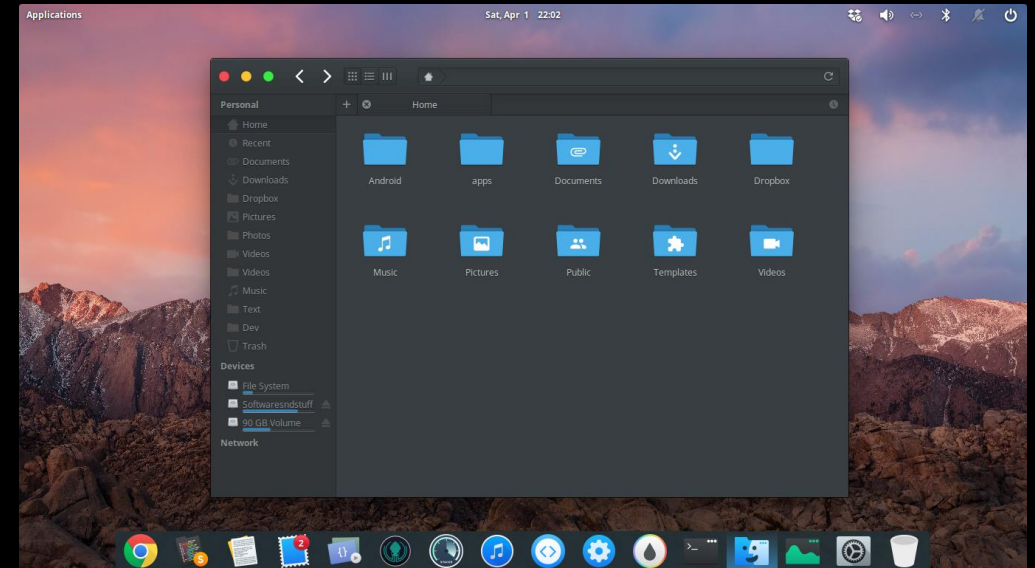
Linux Security

- Linux's open-source security advantage

- Whereas other operating systems like Microsoft and Apple hides their code to prevent threat actors from causing any harm

- Through a strict user privilege model, Linux can beef its security

- On the other hand, Microsoft freely provides root access to all its users

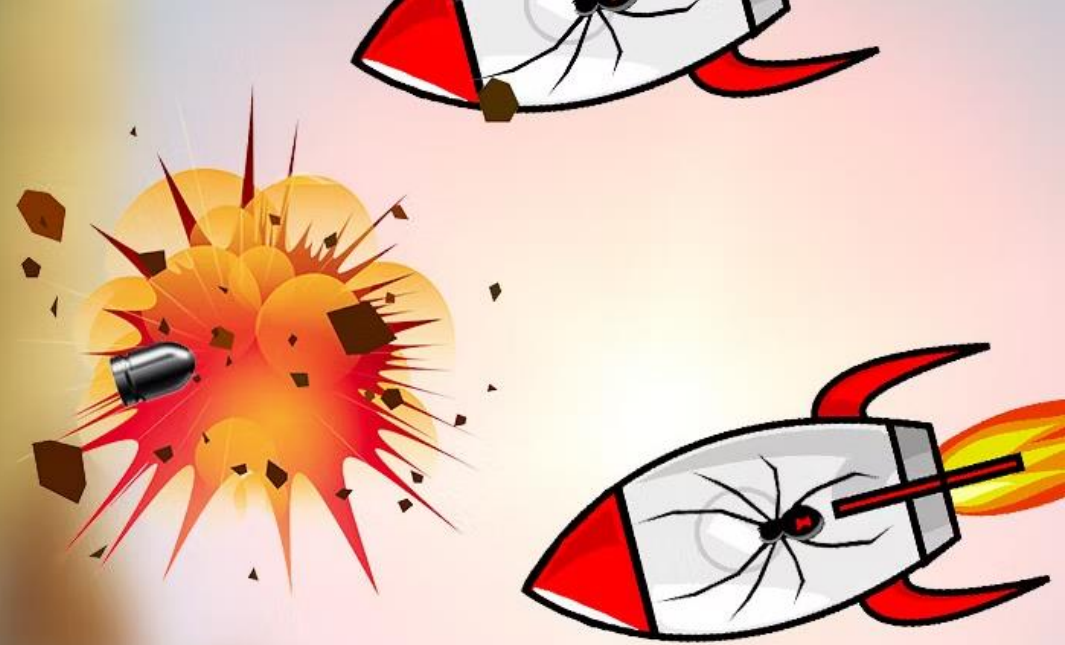# How secure is Linux?

- Firewalls and the Linux kernel lockdown configuration option are part of Linux's built-in self-protection security defences

- Additionally, administrators can add another layer of protection

- "Security through Diversity", Linux features many different system architectures and components

- On the flip side, the homogeneous Windows "monoculture" makes this operating system very vulnerable against malicious actors

Security Concerns against other OS

Windows	OS X	Unknown	Linux	Chrome OS	FreeBSD
75.93%	15.74%	3.34%	2.6%	2.38%	0.01%

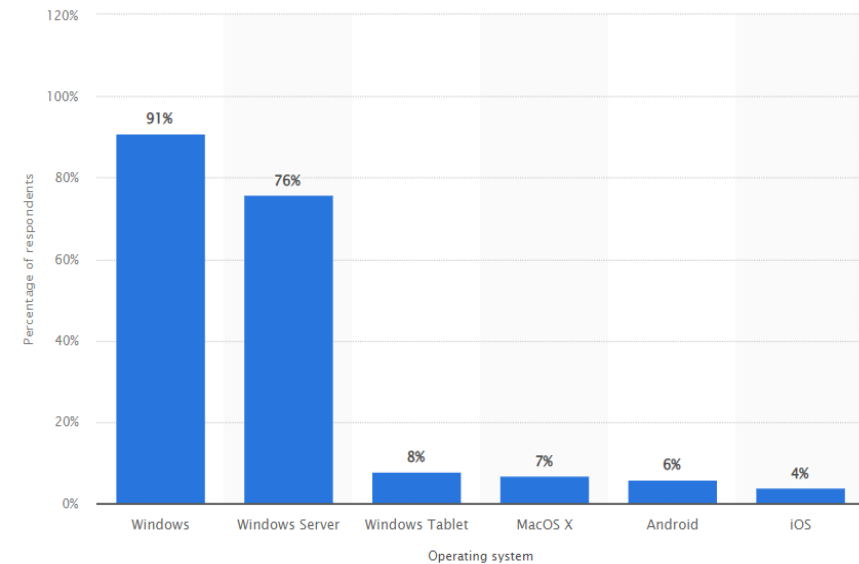Desktop Operating System Market Share Worldwide - October 2022

Desktop Operating System Market Share Worldwide
Oct 2021 - Oct 2022

Edit Chart Data
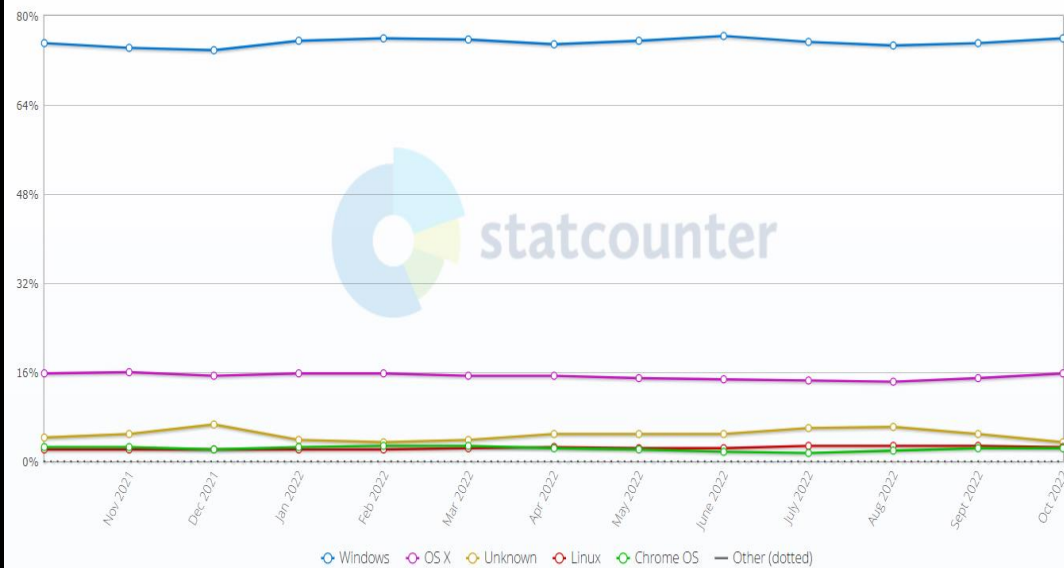
What systems have you seen infected by ransomware?

Why Linux?

Linux is the undisputable choice for performance.
Even with such performance, it is still the cheapest option among the other OS.

Apple products are known to be overpriced (Apple Premium), due to its reputable reliability, security and performance.
However, many still dub Linux as the best for these aspects.

Windows, the most popular OS, is still at the top due to its marketing. Since Linux is free, it can't afford to spend money to advertise to get more people to know it.

Linux has 100% Data Privacy like no other OS.

Linux is a hidden gem.

Where is Linux being utilized in companies?

- In companies that require heavy computing power.

- For many IT companies which require a lot of programming

- In many backend-server (97% of all server runs on Linux)

- Security system

Other considerations

- Other OS code are private

- Most OS are profit-driven, with intentions of selling other products.

- Rigged OS for profit (E.g. Planned Obsolescence)

- As such, there are many 'Bloatware' that many Users will likely never use.

- Such bloatware slows the device. Collectively, they can cause significant runtime issues.

- Hidden things within the OS (Spyware)

- Linux Users can rest assure there are no spywares etc. due to Linux transparency in code.

Conclusion

Choose Linux Because:

- Top in Performance
- Lowest Cost

- Best Compatibility

- Strong Security
  - Open Source
  - Military Grade Encryption
  - Less appealing for Hackers

- Many distros
  - Flexible
  - Use what you like

No Corporate Greed
  - Users' needs first, not money.

Annual On-Demand Cost: Standard 2 vCPU in US, Linux vs. Windows, no Local Disk
Source: RightScale (as of 11/16/2017)

AWS-OD: Linux $876, Windows $1,682
GCE-SUD: Linux $583, Windows $1,283
Azure-OD: Linux $876, Windows $1,682
IBM-OD: Linux $981, Windows $1,384

Linux US (red) Windows US (blue)
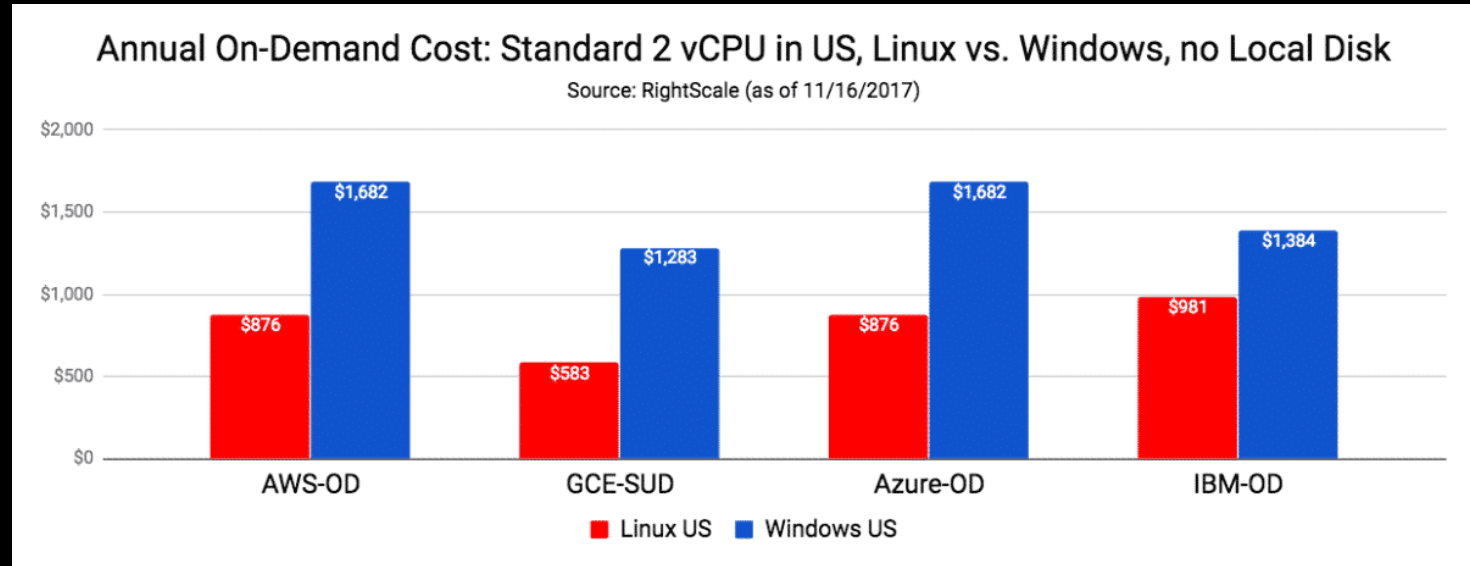
References / acknowledgements

- https://www.freepnglogos.com/uploads/linux-png/file-icons-flat-linux-svg-wikimedia-commons-6.png (Linux Icon)

- https://monovm.com/blog/Linux-Features/ (features)

- https://www.softwaretestinghelp.com/linux-vs-windows/#:~:text=Linux%20offers%20great%20speed%20and,by%20business%20users%20and%20gamers. (features)

- Linux vs Mac | Find Out The 5 Most Amazing Comparison (educba.com) (cost)

- Linux vs Windows – a cost comparison - Longitude (heroix.com) (cost)

- Linux for dummies by Richard Blum (IOT features) (book)

- https://www.edureka.co/blog/linux-vs-windows/#:~:text=Linux%20is%20an%20open%20source,code%20according%20to%20his%20need. (linux vs windows)

- https://www.softwaretestinghelp.com/linux-vs-windows/amp/#Linux_and_Windows_Performance_Comparison (Linux Vs Windows)

- Statistic charts:

- https://interworks.com/blog/tkau/2017/09/13/tableau-server-linux-performance-sneak-peek/

- https://interworks.com/blog/2021/02/11/put-to-the-test-is-windows-or-linux-faster/

- Security Statistics:

https://cdn.comparitech.com/wp-content/uploads/2016/12/2016-12-03-16_45_16-Operating-system-market-share.png

https://www.statista.com/statistics/701020/major-operating-systems-targeted-by-ransomware/

- Linux vs Mac OS X:

https://www.pcworld.com/article/503596/5_things_linux_does_better_than_mac_os_x.html

Conclusion statistics:

https://www.flexera.com/blog/cloud/comparing-cloud-instance-pricing-aws-vs-azure-vs-google-vs-ibm/