Linux'21 Talk

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        1. What is Linux System Administration ?
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Linux

What is Linux ?

- Just like Windows, iOS, and Mac OS, Linux is an operating system.
- In fact, one of the most popular platforms on the planet, Android, is powered by the Linux operating system.

What is an Operating System ?

- An operating system is software that manages all of the hardware resources associated with your desktop or laptop. To put it simply, the operating system manages the communication between you and your hardware. Without the operating system (OS), you have to manually tell the hardware everything you want to do in the form of codes.

Why is it Essential for People in The Tech Industry to Use Linux ?

1. Linux is free, reliable, secure
2. Linux is Widely Customizable
3. Most servers run Linux

What is a Server ?

- A server is a computer that **stores and serves data** , meaning that it provides data to other computers.
- It may serve data to systems on a local area network LAN or a wide area network WAN over the Internet. The computers served are called clients.

- To access a server data you have to do that using the terminal, and pretty much everything you want to do on a server you have to do it using the command line interface, So we can see where learning Linux commands may come in handy.
    - What is a command line interface ? **[maria stops ayman and explain CLI]**
    - And as a developer or someone in the development industry you will have to interact with a server, for example you might have to push or pull code from a server, deploy your application on a server, or configure a server that will have the databases.

4. Controlling the updates and the whole environment
5. Linux runs much more faster and smoother
6. Installing Softwares, and Compilers is Faster and Easier

Linux Dependant Fields

1. **Linux System Administration**
2. **Cyber Security**
3. **DevOps Engineering**
4. **and many more**

Linux System Administration

- Most of the web-server, mobile phones, personal computers, supercomputers, and cloud-servers are powered by Linux
- The job of a Linux systems administrator is to manage the operations of a computer system like maintain, enhance, create user account/report, taking backups using Linux tools and command-line interface tools.

- ### Duties of Linux System Administrator

    1. **Install and Configure Linux Systems**
        - Linux administrator's main responsibility is to install and set up Linux systems and servers, often for organization-wide deployment.
        - Linux administrators also set up the architecture of the system, including back-end databases and scripts for specific applications and use cases.
    2. **Perform System Maintenance**
        - Linux administrators also perform routine system maintenance and resolve server-side issues as they arise. This aspect of the role requires the Linux administrator to review error logs and reported errors and seek out solutions.
    3. **Create System Backups**
        - Linux administrators also conduct system backups according to company or industry standards.
    4. **Monitor System Performance**

- Linux administrators also monitor system performance to prevent slowdowns and crashes. They may examine daily traffic logs and reports or receive direct reports from end users.

5. **Provide Technical Support and Guidance**
    - Linux administrators provide technical support and guidance to users and other administrators.
6. **Maintain System Security**
    - Linux administrators maintain system security by actively identifying faults and vulnerable areas within the system's architecture.

Cyber Security

- ### What is Cyber Security ?
    - Cyber Security is the protection of computer systems and networks. Its Focus is the Balanced Protection of Confidentiality, Integrity, and Availability of data.
    - Confidentiality means ensuring that the sensitive data is accessed only by an authorized person.
    - Integrity means the data is accurate and complete.
    - Availability means the data is available to those who should access it. Those three words represent the CIA triad and it is a model to guide the policies that keep the data safe.
    - In simple words, Cyber Security is securing anything related to computers. So it involves different techniques and it has many branches such as:
        1. Network Security.
        2. Application Security.
        3. Digital Forensics.
        4. Reverse Engineering.
        5. Cryptography.
        6. Social Engineering.
- ### Whats is The Relation Between Cyber Security and Linux ?

1. **Most of the servers run Linux**

- Linux is widely used among servers, you have to be familiar with the OS you will be attacking or defending

2. **Extensive tools and libraries**

- A lot of tools and libraries are easier to install on Linux, or already come installed with some distros such as Kali and Parrot Linux

3. **Place to analyze Windows Malware**
    - Linux can't run .exe files (without using a compatibility layer or emulator) so it is a great place to do static analysis and to analyze Windows malware. distros such as REMnux are ready to use VMs for malware analysis.

Linux also has to be used when analyzing ELF files (Linux executables) dynamically. The same goes for Windows regarding its dynamic analysis.

4. **Scripting**
    - Scripting, in general (and before Powershell existed) scripting on Windows was very weak. It was almost always better to use the natively installed zsh/bash/sh on your Linux system. Now that Powershell exists, this point doesn't stand too well but a lot of people still prefer Bash

DEVOPS

- ## What is DevOps ?
    - DevOps is a set of practices that works to automate and integrate the processes between software development and IT teams, so they can build, test, and release software faster and more reliably.
    - DevOps is a combination of two words, **one is software Development, and second is Operations.** This allows a single team to h**andle the entire application life-cycle**, from development to testing, deployment, and operations.
    - DevOps **automates** a huge part of the software development life cycle which leads to:
        1. **less human errors** .
        2. quick **feedback** , which leads to **quick bug fixing** .
        3. building and testing of each phase in **parallel** to the development.
- ## Whats is The Relation Between DevOps and Linux ?
    1. Most DevOps tools runs on servers, and as mentioned before most servers runs Linux