Lanka Education and Research Network

Firewalls in Linux
Linux Desktops

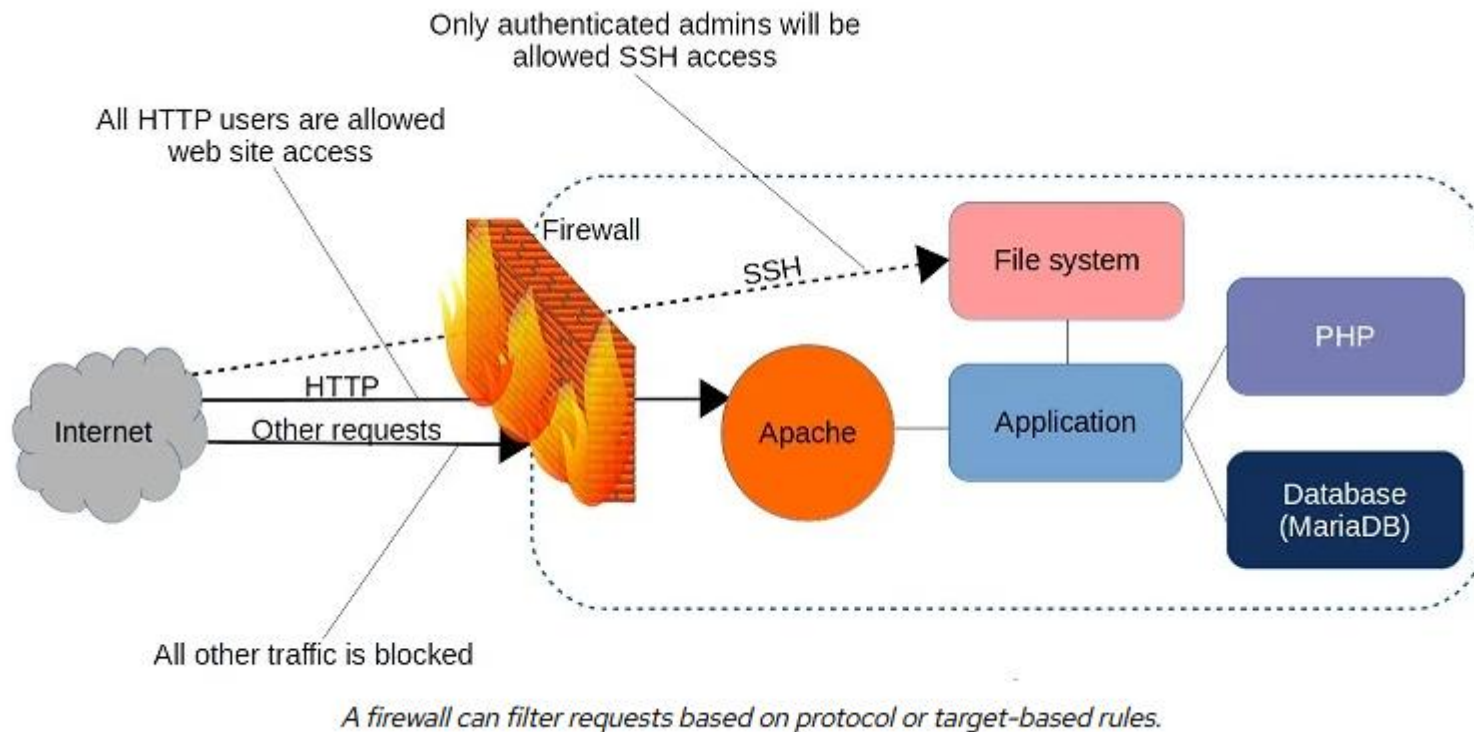Geethike Jayasinghe/ LEARN

Introduction to Linux Firewall

- A firewall can be defined as a system of network security that controls and filters the traffic on the rule's predefined set. It is an intermediary system between the Internet and the device.

- The kernel of Linux contains a subsystem, i.e., Netfilter. It is used for deciding or manipulating the network traffic fate headed through or into our server. All latest solutions of Linux firewall apply this system for a process which is known as "packet filtering".

- The packet filtering system process of the kernel will be of tiny use to many administrators without any userspace interface for managing it. It is the goal of iptables: if a packet reaches our server, it would be handed off for rejection, acceptance, or manipulation to the Netfilter subsystem based on various rules supplied to it through userspace by iptables.

- Hence, iptables is all we require to handle our firewall if we are known to it. However, several frontends are present for simplifying the task.

Some key points about Linux firewall:

- A firewall is a group of rules.

- When a packet of data moves out or into a protected space, then its contents (information about its target, protocol, and the origin it plans for using) are checked against the rules of the firewall to see if it must be permitted through.

- Besides, iptables is another tool of CLI to manage the rules of firewall on any Linux machine.

- Also, Firewalld is a tool to manage the rules of a firewall on any Linux machine.

- Linux firewall can also be described as a device that checks Network traffic (outbound/inbound connections) and establishes a decision to traffic out or pass the traffic.

- In the traditional packet, firewall filtering deals with filtering and routing packets, where else NGFWs would work with some other functions (with OSI layers).

Some key points about Linux firewall:

Only authenticated admins will be allowed SSH access

All HTTP users are allowed web site access

Firewall

SSH — File system

HTTP

Internet — Other requests

Apache — Application — PHP

Database (MariaDB)

All other traffic is blocked

A firewall can filter requests based on protocol or target-based rules.

firewalld

- Firewalld provides a dynamically managed firewall with support for network/firewall zones that define the trust level of network connections or interfaces. It has support for IPv4, IPv6 firewall settings, ethernet bridges and IP sets. There is a separation of runtime and permanent configuration options. It also provides an interface for services or applications to add firewall rules directly.

- As you might have guessed from its name, firewalld is part of the systemd family. Firewalld can be installed on Debian/Ubuntu machines, but it's there by default on Red Hat and CentOS.

- https://firewalld.org/

iptables

- Network traffic is composed of packets. Data is divided into various small pieces (known as packets), transferred over a network, put back altogether. Specifically, iptables recognizes the packets which are received and applies a group of rules for deciding what we can do to them.

- Iptables is a command-line interface application that permits an administrator for configuring particular rules that would enforce a Linux kernel to implement an action like drop, modify, or inspect network packets.

- In a Linux device or machine, enabling the iptables will act as a router or/and Network Firewall.

- https://help.ubuntu.com/community/IptablesHowTo

iptables

Iptables is used for filtering packets according to:

- **Tables:** These are files that can join the same operations. A table is composed of various chains.

- **Chains:** The chains are the rule's string. Iptables finds an appropriate table if any packet is received, then executes it from the rule's chains until it searches for a match.

- **Rules:** The rules are the statement that informs a system what needs to do with the packets. They can block a single packet type, or forward other types of packets. The result, in which a packet is transferred, is known as the target.

- **Targets:** The target is a determination of what needs to do with the packets. It is typically is for accepting it, rejecting it, or dropping it (which transfers the error back to a sender).

UFW - Uncomplicated Firewall

- The default firewall configuration tool for Ubuntu is ufw. Developed to ease iptables firewall configuration, ufw provides a user friendly way to create an IPv4 or IPv6 host-based firewall. By default UFW is disabled.

- Gufw is a GUI that is available as a frontend.

- https://help.ubuntu.com/community/UFW

- https://help.ubuntu.com/community/Gufw

Linux Desktops

What is a Linux desktop?

- A Linux desktop is a set of components that create graphical user interface (GUI) elements, like icons, toolbars, and wallpapers. This enables people to use Linux graphically, the way it's done on macOS or Windows.

- Without a desktop, you can interact with your Linux system only with commands.

How to choose the best Linux desktops for you?

- There are plenty of aspects you'll want to consider before choosing the best Linux desktop for yourself.

- If you're migrating from Windows or macOS, it may help to choose a Linux desktop that feels familiar to them. If you need a desktop for old hardware, it'll be wise to pick something that's lightweight and easy on the system's resources.

- If you're not quite proficient with Linux, then look for desktops that offer an easy out-of-box experience and can be configured easily. Then there's the aesthetic of the desktop — while some are colorful and beautiful, others are more minimalist and plain, focused on functionality.

What's your favourite desktop?

7538 votes tallied

GNOME

24% (1828 votes)

Plasma Desktop (KDE)

32% (2426 votes)

Pantheon

2% (121 votes)

XFCE

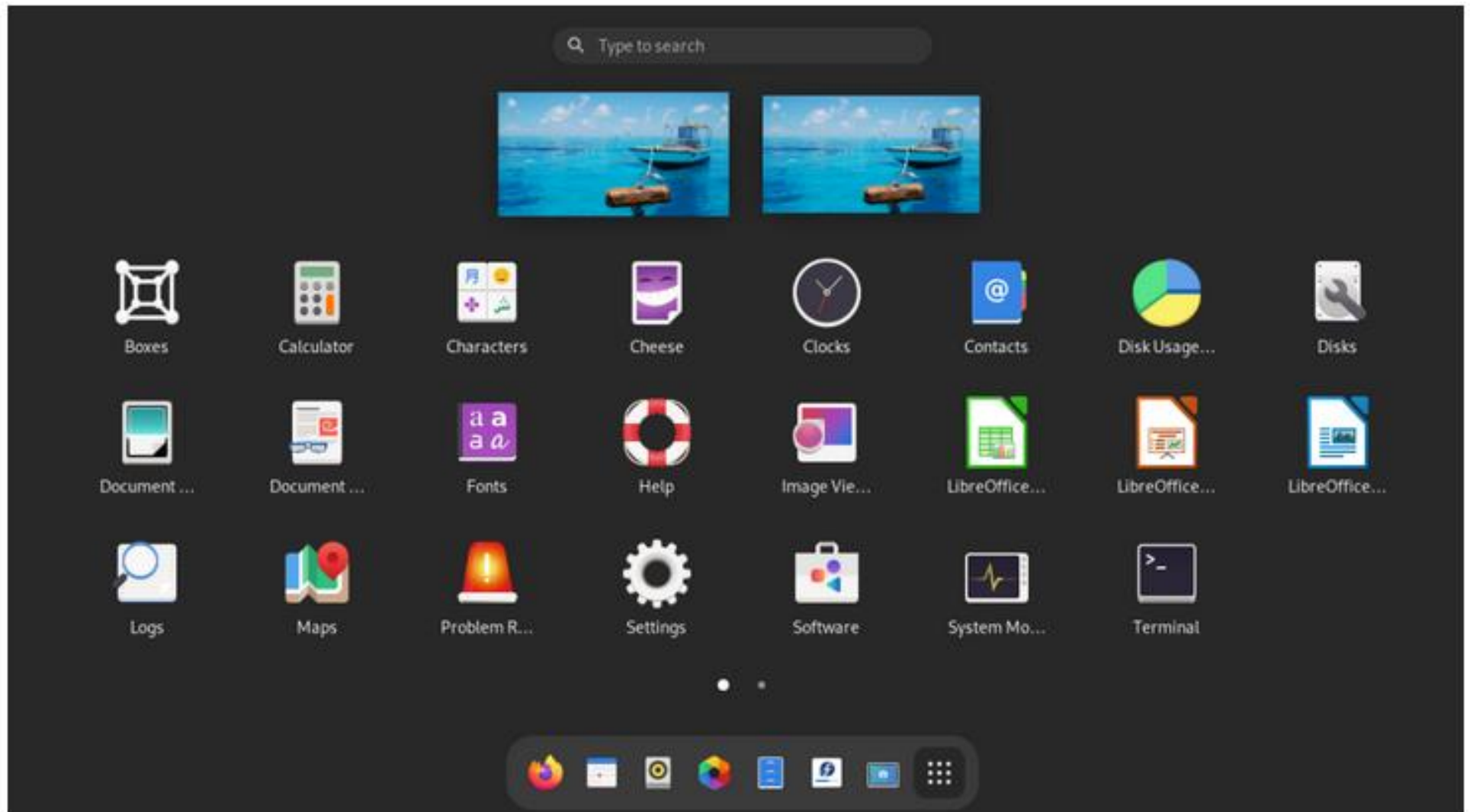12% (887 votes)

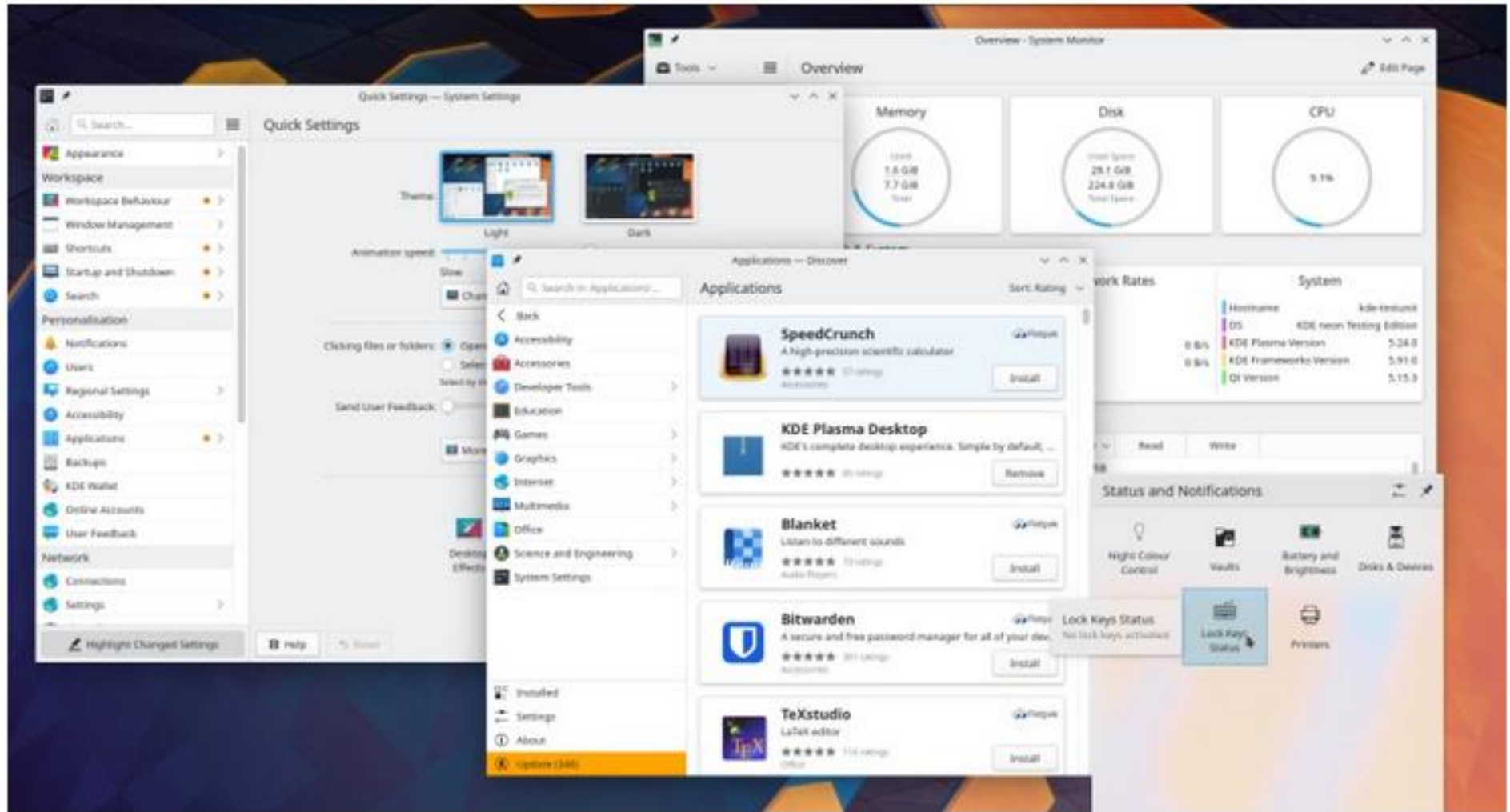**Cinnamon**

11% (864 votes)

Mate

5% (384 votes)

GNOME

GNOME

- GNOME (GNU Network Object Model Environment) is a free and open-source software initiative that aims to create network-independent programs based on open-source technologies. Currently, GNOME is the most used Linux desktop environment.

- Features:

- GNOME Shell Extensions can be used to increase functionality.

- The Settings app is well-organized and simple to use.

- Dynamic and flexible workspaces

- With a variety of themes and designs to choose from, you can personalize your UI and UX.

- Search throughout the entire system

KDE Plasma

KDE Plasma

- Features:

- Highly Flexible – The desktop may be customized in various ways, including using widgets.

- An appealing, polished UI that is smart and user-friendly.

- Exceptionally adaptable and integrated advanced search.

- "Convergence" across many devices

Cinnamon

Cinnamon

- Features:

- Packed with the newest features for traditional desktops.

- The Interface is quick, attractive, and stable

- Very flexible and easy to customize

- Cinnamon allows you to customize icon placement across many displays.

- The Themes and plugins that come pre-installed are very nice.

- Apps designed for any other desktop environment can be run on cinnamon.

Thank You

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