CHRIST
UNIVERSITY

OPERATING SYSTEMS

TYPES & TIMELINE

TIMELINE

History

OPERATING SYSTEMS

1950 - 60
BATCH OS

- Batch Operating Systems emerged in the early 1950s–1960s, mainly used in large mainframe computers to automate job processing..

1960 - 70
TIME SHARING OS

- Time-sharing systems were developed in the mid-1960s, becoming widely used in the 1970s.
- s.

1970 - 80
DISTRIBUTED OS

- Distributed OS concepts started emerging in the late 1970s to early 1980s with a networking advancements.

1980 -PRESENT
REAL TIME OS

RTOS concepts began in the 1960s–1970s for military, aerospace, and industrial control systems.

1980 -PRESENT
DESKTOP OS

Desktop OS development began in the late 1970s to early 1980s with systems like MS-DOS, early Windows, and Macintosh.

1980 -PRESENT
MOBILE OS

Mobile OS development started in the early 1990s with systems like Palm OS and Symbian.

1990 - PRESENT
MULTIPROCESSING OS

- Multiprocessing concepts emerged in the 1960s, mainly in large mainframe and scientific systems.
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2010- PRESENT
CLOUD OS

A Cloud OS manages cloud-based resources and allows users to access computing over the internet.

TYPES OF OPERATING SYSTEMS

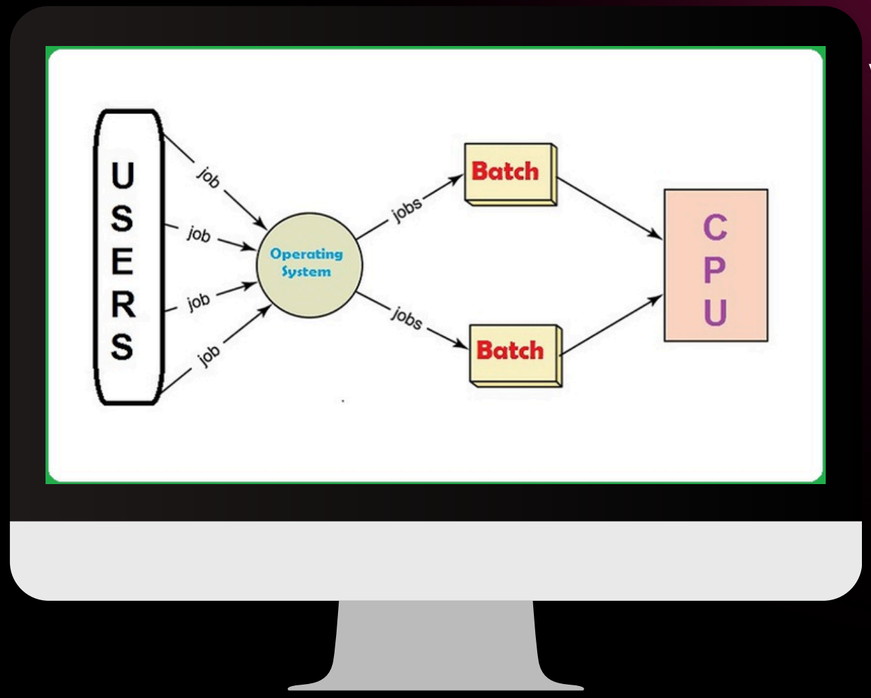
1950s- 60s

BATCH OS

ADVANTAGE

- **SAVES TIME**
- **EFFICIENT RESOURCE USE**
- **REDUCED CPU IDLE TIME**
- **GREAT FOR LARGE DATA WORKLOADS**

- **DISADVANTAGE**
- **DEBUGGING DIFFICULT**
- **OUTPUT DELAYS**
- **NO REAL-TIME CONTROL**
- **SLOW FOR SMALL TASKS**



What is a Batch OS?

- **A system that processes similar jobs together in batches without user interaction.Eg: IBM OS/360 UNIVAC systems**

APPLICATIONS:

- Payroll processing
- Bank statements
- Data centers
- Scientific computations

Key Features

- Automatic batch handling
- Job scheduling
- No user involvement while running
- Ideal for repetitive tasks

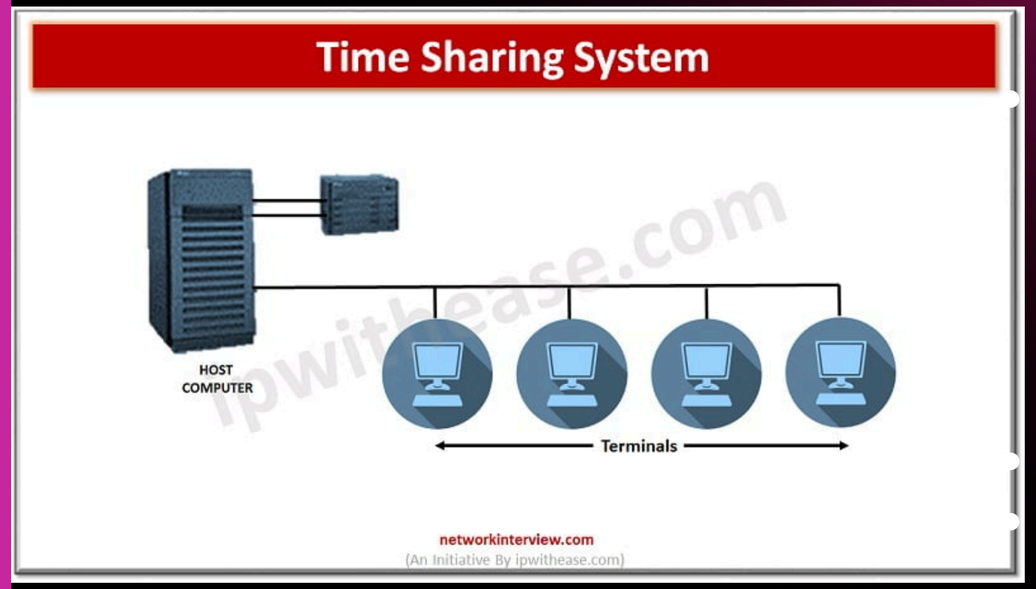
TYPES OF OPERATING SYSTEMS

1960s- 70s

TIMESHARING OS

ADVANTAGE

- **FAST RESPONSE FOR ALL USERS**
- **EFFICIENT CPU UTILIZATION**
- **INTERACTIVE COMPUTING**
- **MINIMAL IDLE TIME**



What is TimeSharing OS?
A system that allows multiple users to share system resources simultaneously by rapidly switching between them.eg: UNIX,MULTICS

- **DISADVANTAGE**
- **SECURITY RISKS (MULTI-USER ACCESS)**
- **COMPLEX SYSTEM MANAGEMENT**
- **REQUIRES POWERFUL HARDWARE**

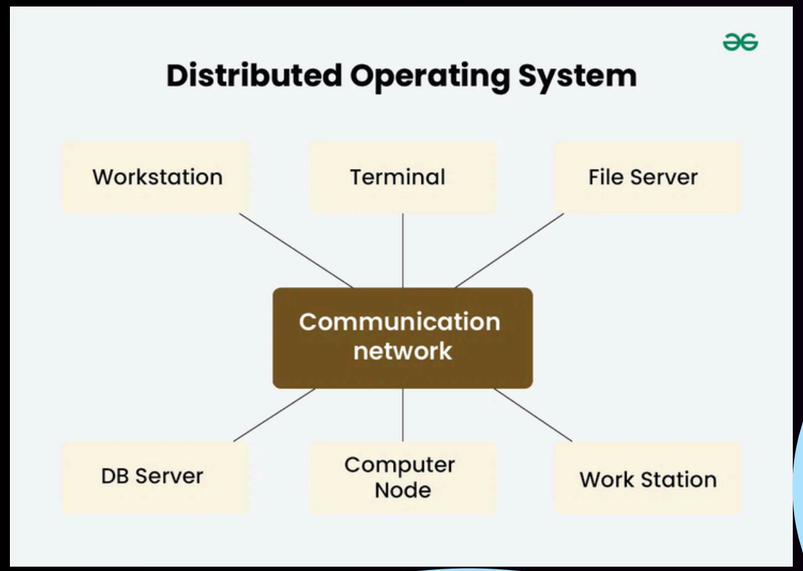
APPLICATIONS:

- Educational institutions
- Online terminals
- Cloud computing environments
- Multi-user databases

Key Features

- Multitasking and multi-user support
- Quick response time
- Fair resource sharing
- CPU scheduling (Round Robi common)

DISTRIBUTED OS



- A Distributed OS manages multiple computers and makes them appear as a single unified system to the user.Eg:Mach, locus

ADVANTAGES

- Improved performance through parallelism
- High system reliability
- Efficient resource utilization

- Key Features
- Transparency (single-system view)
- Resource sharing across nodes
- Scalability and load balancing
- Distributed file and process management

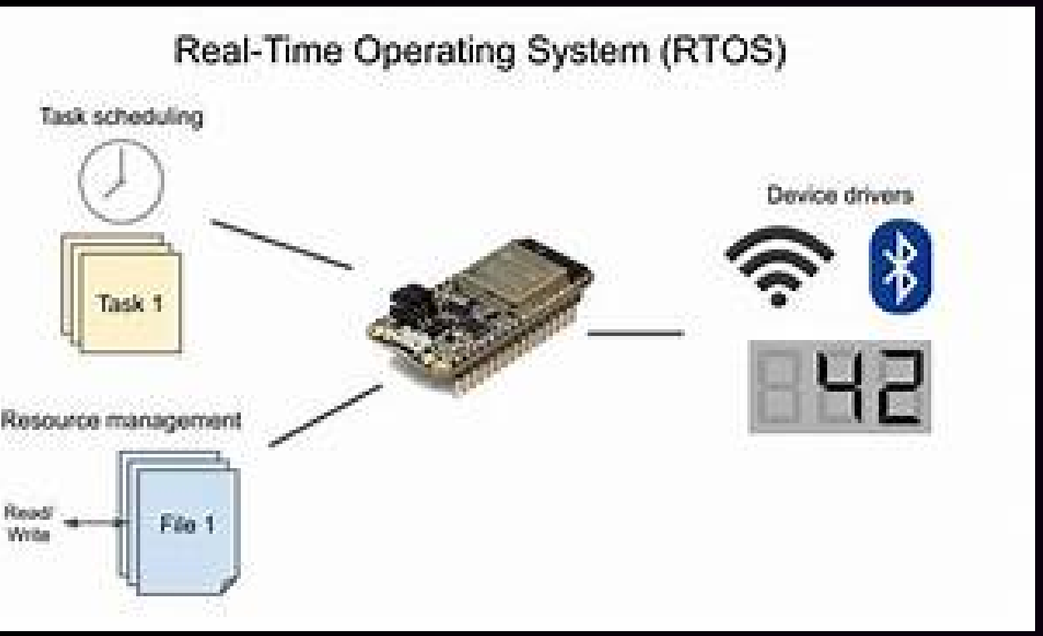
DISADVANTAGES

- Complex system design and maintenance
- Network dependency can cause delays
- Security issues in distributed communication

Applications:

- Cloud computing platforms
- Distributed databases
- Internet of Things (IoT) networks
- Large scientific and research systems

REALTIME OS



- A Real-Time OS guarantees that tasks are executed within a strict, predefined time limit, making it ideal for time-critical applications. Eg: FreeRTOS,RTLinux

Key Features
- Deterministic response time
- Priority-based scheduling
- High reliability and precision

ADVANTAGE
- FAST RESPONSE TO CRITICAL EVENTS
- STABLE AND RELIABLE
- EFFICIENT RESOURCE UTILIZATION

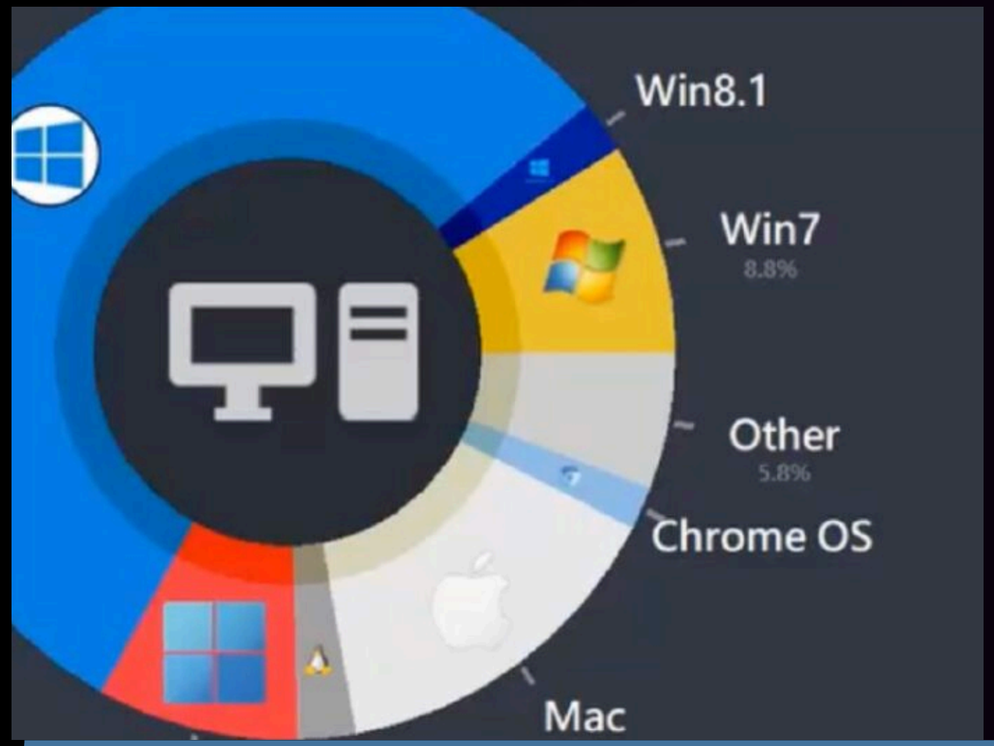
DISADVANTAGES
- COMPLEX SYSTEM DESIGN
- LIMITED MULTITASKING FLEXIBILITY

Applications:
- Medical devices (pacemakers, monitors)
- Automotive systems (ABS, airbags)

TYPES OF OS

1980S - PRESENT

DESKTOP OS



A Desktop Operating System is software that manages computer hardware and provides a user-friendly interface for performing personal or professional tasks
.Eg:ChromeOS

Key Features

- Graphical User Interface (GUI)
- Multitasking support
- File and memory management

ADVANTAGE

- EASY TO USE
- SUPPORTS MULTIPLE APPLICATION
- STRONG ECOSYSTEM OF SOFTWARE

DISADVANTAGES

- NOT SUITABLE FOR REAL-TIME TASKS
- HIGH RESOURCE CONSUMPTION

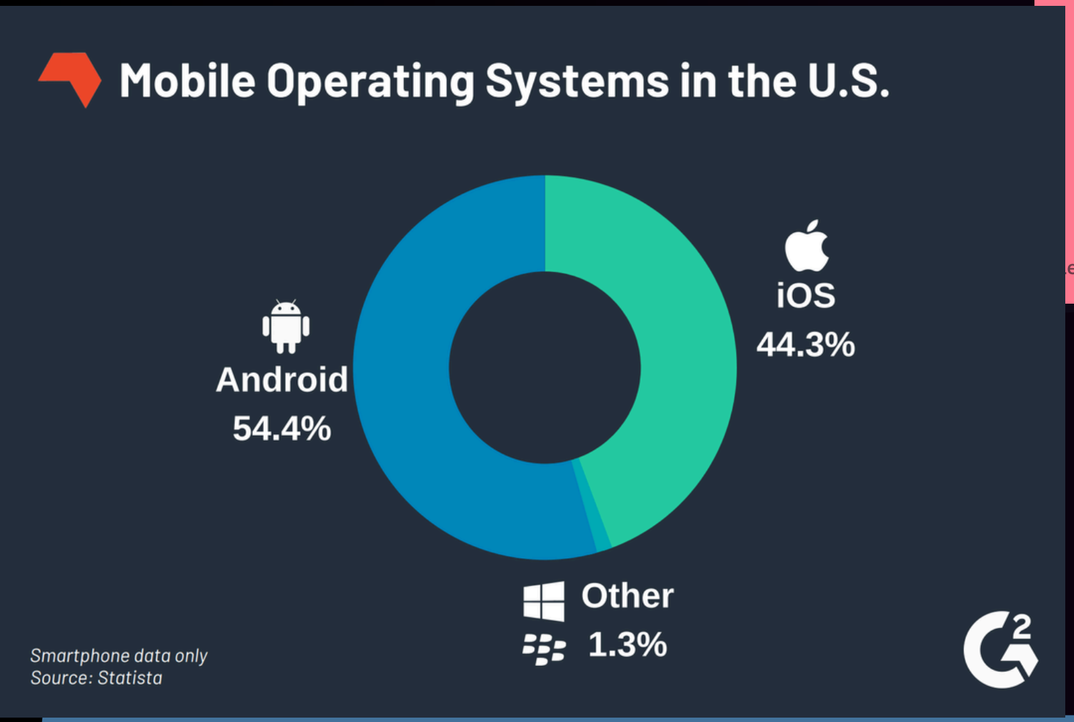
Applications:

- Entertainment and media playback
- Software development

TYPES OF OS

1990S - PRESENT

MOBILE OS



- A Mobile Operating System is software that manages the hardware and applications of smartphones and tablets, providing touch-friendly interfaces and power-efficient operation. Eg: Android 14

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Key Features

- Touch-based interface
- App store ecosystem
- Battery optimization
- Connectivity (WiFi, Bluetooth, LTE, 5G)

Applications:

- Communication (calls, messaging)
- Social media and entertainment

DISADVANTAGES

- SMALLER STORAGE CAPACITY
- APP RESTRICTIONS AND SANDBOXING

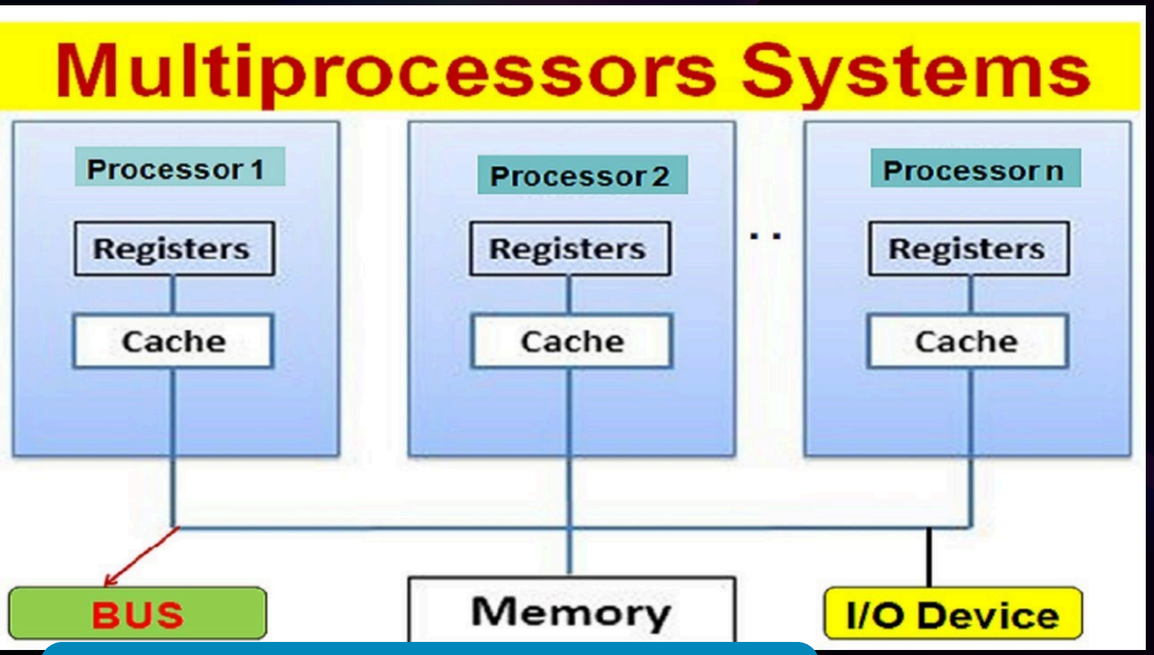
ADVANTAGE

- OPTIMIZED FOR LOW POWER USAGE
- STRONG APP ECOSYSTEM

TYPES OF OS

1990S - PRESENT

MULTIPROCESSING OS



A Multiprocessing OS uses two or more processors/cores within a single computer system to execute multiple processes simultaneously, improving speed and efficiency.Eg:Linux (SMP-enabled kernels)

ADVANTAGES:

- Increased system performance
- Faster execution of programs
- High reliability (if one CPU fails, others continue)

APPLICATIONS:

- High-performance computing (HPC)
- Servers and data centers
- Scientific simulations

DISADVANTAGES

- Complex system design
- Higher cost due to multiple CPUs
- Requires advanced scheduling algorithms

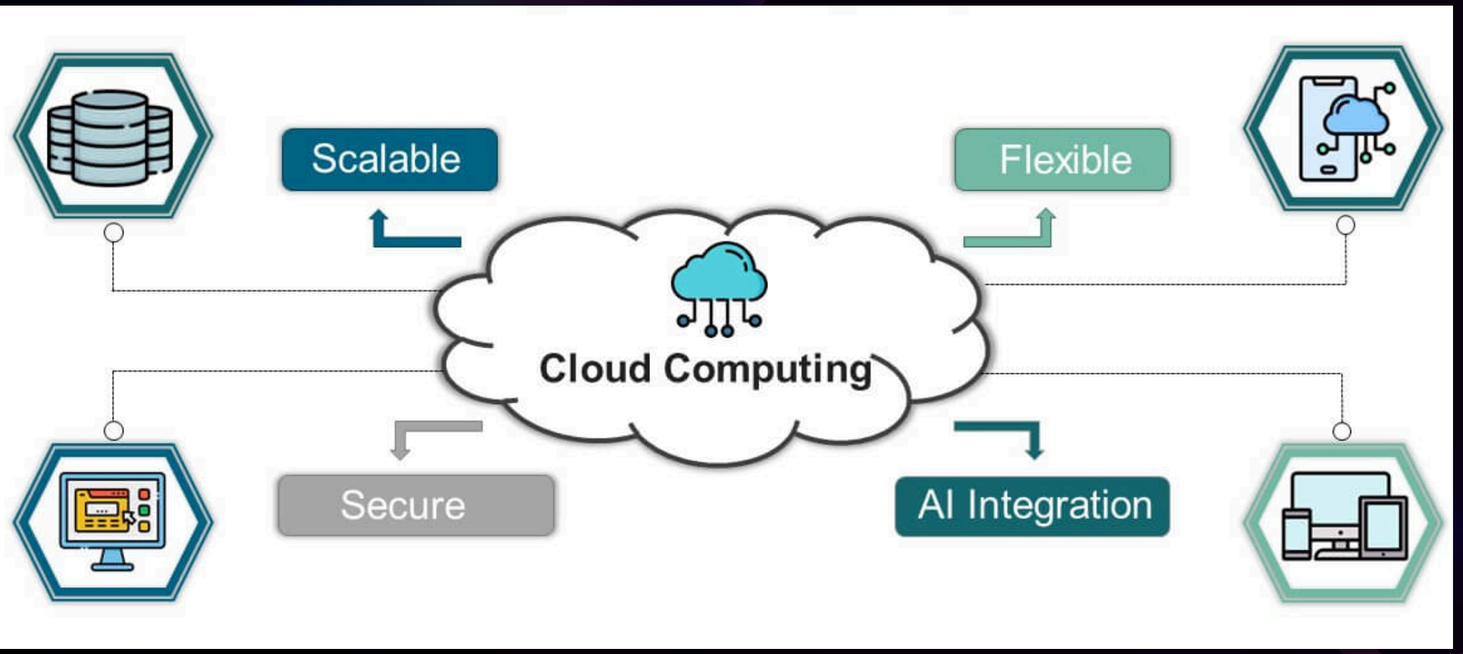
KEY FEATURES

- Multiple CPUs or cores working together
- Parallel execution of programs
- Shared memory management

TYPES OF OS

CLOUD OS

2010S - PRESENT



A Cloud OS manages and delivers computing resources—such as storage, applications, and processing power—over the internet.Eg: VMware Cloud OS

ADVANTAGES:

- Accessible on any device
- Lower hardware requirements

APPLICATIONS:

- Enterprise cloud systems
- Web-based operating environments
- Cloud gaming platforms

DISADVANTAGES

- Requires stable internet connection
- Data security and privacy concerns
- Subscription-based costs
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KEY FEATURES

- Web-based access from anywhere
- Virtualization and containerization support
- Automatic scaling and load balancing.