# Topic 1:
# What is Server ?

# Overview

- What is a server?
- What are the functions and responsibilities of a server?
- What types of servers exist in the world today?
- Which technology companies produce servers?
- What components make up a server configuration? Describe and explain the role of each component in a server's configuration .
- What are the strengths of servers compared to PCs?
- Explore two commonly used servers today: HP DL380 G11 and Dell PowerEdge R760.
- What is the initial setup process for installing a server and operating system?
- Understand the tools for configuring servers from HP and Dell.

# 1. What is a server?

A server is a computer

- Connected to a computer network or the internet
- With a static IP address
- High processing capabilities.

Software is installed on it to serve other computers, which can access it to request services and resources.

# 2. What are the functions and responsibilities of a server?

- Store, provide, and process data for continuous access by users or organizations via LAN or the Internet.
- Store information, manage, and operate enterprise software.
- For individual users, servers also serve as primary storage and operational components of a system.

# 3. What types of servers exist in the world today?

- Classify Servers in two ways
  - According to the method of building a server system.
  - According to functions

# 3. What types of servers exist in the world today?

- According to the method of building a server system.
  - Dedicated Server
  - Virtual Private Server (VPS)
  - Cloud Server

# Function

| | |
|---|---|
| **Dedicated Server** | It is exclusively dedicated to a single client or purpose, ensuring high performance and security. |
| **Virtual Private Server (VPS)** | VPS is created through virtualization technology, dividing a single physical server into multiple virtual servers. |
| **Cloud Server** | Cloud servers are built from multiple physical servers combined with SAN (Storage Area Network) storage systems. |

# 3. What types of servers exist in the world today?

- According to functions
  - Database server
  - File servers
  - Mail servers
  - Print servers
  - Web servers
  - Game servers
  - Application servers

# Function

| | |
|---|---|
| **Database server** | These servers are dedicated to managing and serving databases. |
| **File servers** | Responsible for file storage and management, file servers store and organize files in a centralized location. |
| **Mail servers** | Mail servers manage email services, handling tasks such as sending, receiving, and storing emails. |
| **Web servers** | These servers facilitate printing tasks within a network environment. |

# Function

| | |
|---|---|
| **Print servers** | Web servers host websites and web applications, serving web content to users over the internet. |
| **Game servers** | Game servers support online gaming experiences, providing the infrastructure for multiplayer games to run smoothly. |
| **Application servers** | These servers run application software, such as ERP (Enterprise Resource Planning) or CRM (Customer Relationship Management) systems, within businesses. |

# 4. Which technology companies produce servers?

- **Dell**
- **HP**
- **Supermicro**
- **IPM**

# Dell

- **Dell:**
  - Renowned for computers and laptops
  - Leading in server usage and top quality
  - Manufactured with simplicity and ease of use
  - Large storage capacities; Fast speeds
  - Best-selling Dell server line: Dell PowerEdge R440 (Dell R440); Dell PowerEdge R740


**Dell PowerEdge R740**

# HP

- **HP :**
  - Familiarity with computer users and website developers
  - Leading in high performance
  - Energy efficiency
  - Easy and convenient upgrades
  - Cost-effectiveness, suitable for startups
  - Prominent in x86 server and Unix server markets

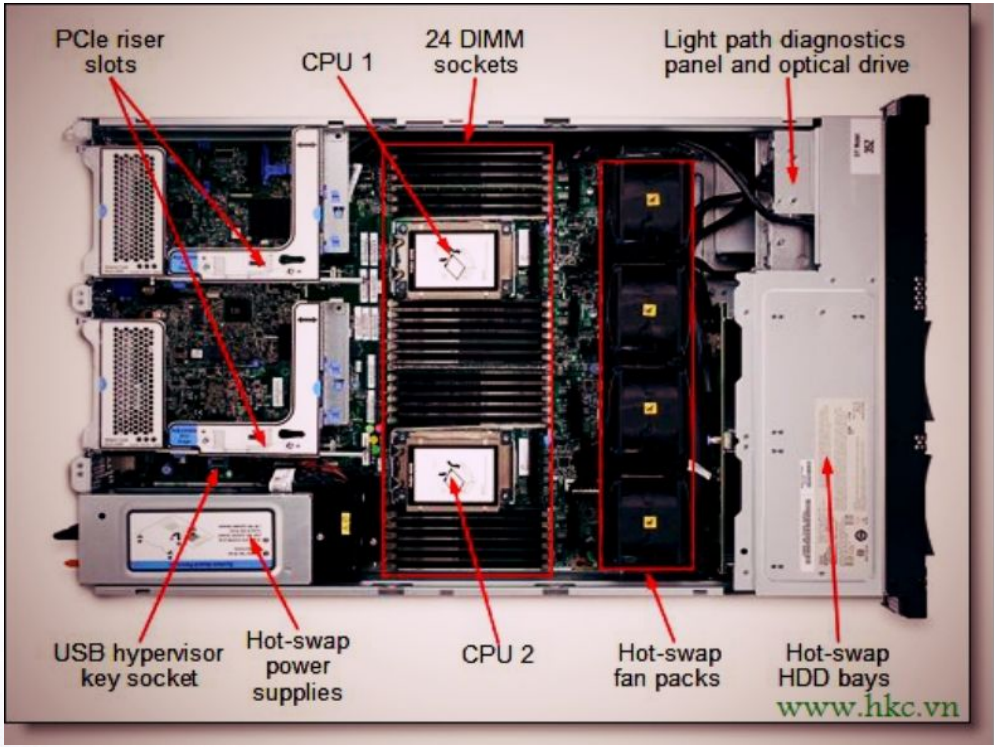
# Supermicro

- **Supermicro:**
  - Leading server provider globally
  - Ensures quality production; Resource-efficient
  - Low-latency and fast storage performance
  - Diverse designs catering to various business needs:
    - Tower servers;
    - 1U rackmount servers; 2U rackmount servers
    - GPU servers; Blade servers
    - High-Density servers

# IBM

- **IBM:**
  - Renowned international technology conglomerate
  - Focuses on producing advanced technology servers
  - Offers servers with large storage capacity and high quality
  - Prominent for Z-series servers, notably the latest IBM z14 server

# 5.What components make up a server configuration?



# Chassis Server

- **Chassis Server**
  - Tower Server: Vertical or tower form factor, suitable for standalone use.
  - Rackmount Server: Traditional horizontal form factor, fixed but adaptable to various spaces.
  - Blade Server: Vertical form factor, utilized for dense server systems.

# Hardwere- Server

- **Hardwere- Server**
  - Server hard drives have the function of storing data in the form of external memory, storing software, operating systems and other system data.
  - A server can have multiple hard drives if you want to increase storage capacity.

# RAM

- **Ram**
  - RAM is a part of the server, determining the server's processing ability
  - There are two types of RAM: DDR RAM and SDR RAM.
  - Comparing speed, DDR ram can transfer data twice as fast.
  - The function of the ram server is to correct errors and check errors promptly for small detailed errors.

# MAINBOARD

- **Main-board**
  - Mainboard is a part that constitutes the server.
  - Mainboard also known as main server, is a part in devices such as computers or servers.
  - They are composed of an electrical circuit created with the task of connecting and transmitting between different components such as memory slots, processors, etc. to form a unified connection.

# CPU Server

- **CPU Server**
  - CPU is the processing center of the server system
  - Server CPU is the most important part like a normal CPU.
  - The CPU is the operating center of the system, consisting of a complex circuit consisting of many transistors on a very small network board.
  - CPU is the processing center of the server system.

# Card RAID

- **Card RAID**
  - Created with the purpose of linking hard drives together with error prevention and backup mechanisms while protecting the server when problems occur.

# Card đồ hoạ

- **Card đồ hoạ**
  - Graphics card is the part that functions to process image content in the server.
  - Graphics card is the part that functions to process image content in the server.
  - In fact, the server board is linked to the server monitor so that the user has the ability to perform operations on the computer.

# 6. What are the strengths of servers compared to PCs?

- Servers contain more powerful processors than a desktop computer.
- The server has expandable memory, providing for a better performance and more security.
- Access to data faster than with desktop computers.
- Servers usually have a high storage capacity.
- Server hard disk may spin faster in some servers and storage data.
- The Server supports advanced storage connectivity technologies such as SAS – Serial Attached SCSI which provides a much higher performance than SATA.

# 6. What are the strengths of servers compared to PCs?

- Servers are manufactured and optimized for continuous 24/7 operations all hours of the day whereas desktop computers are not.
- The Servers have redundant power supplies and redundant fan cooling modules.
- A server is built to support many users of applications and users who access it frequently and frequently, while a desktop computer usually supports one person operating at the time.
- Servers Servers usually have multiple networks and supporting technologies such as cooperative adapters and link aggregation .

# 6. What are the strengths of servers compared to PCs?

- Server graphics capabilities  Servers are generally very basic as servers are optimized for multi-user applications such as accessing databases.
- Some servers support easy hard drive replacement.
- Servers are mainly rack mountable Servers . With  compact 1U / 2U  size  design  and thus does not take up much space .
- Servers  are maintained by a system administrator from a central location like a data center.

# 7. Explore two commonly used servers today

- **Dell PowerEdge R760**
- **HP DL380 G11**

# Dell PowerEdge R760

- **Dell PowerEdge R760**
  - Dell PowerEdge R760 is equipped with 2 Intel Xeon Scalable Gen4 processors, providing powerful multitasking capabilities.
  - With an 8-core or more architecture per processor, it can handle multiple concurrent tasks efficiently.
- Dell R760 design analysis
  - Dell EMC R760 with 2U design belongs to the latest Dell 16G product line on the market.
  - R760 server with 4 hard drive options on the front helps users flexibly choose data storage space for businesses.

# Dell PowerEdge R760

Figure 1. Front view of 24 x 2.5-inch drive system

Figure 2. Front view of 16 x 2.5-inch drive system

Figure 3. Front view of 8 x 2.5-inch drive system

Figure 4. Front view of 12 x 3.5-inch drive system

- **Server R760 front design**
  - Up to 12 x 3.5-inch SAS/SATA (HDD/SSD) max 240 TB
  - Up to 8 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) max 122.88 TB
  - Up to 16 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) max 245.76 TB
  - Up to 24 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) max 368.64 TB

# Dell PowerEdge R760

Figure 5. Rear view of the system

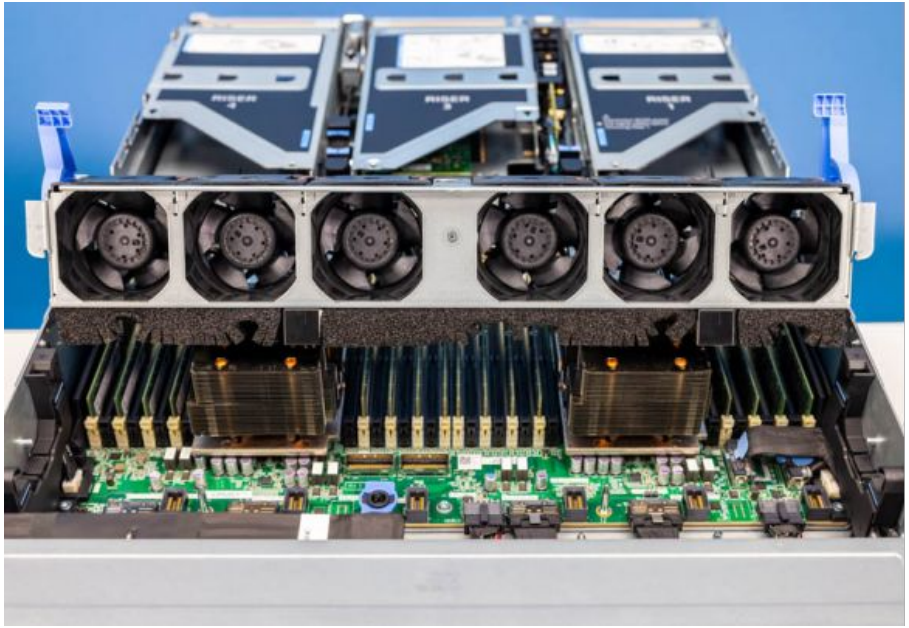
Figure 6. Rear view of the system with optional liquid cooling

Figure 7. Rear view of the system with 2 x 2.5-inch rear drive module

Figure 8. Rear view of the system with 4 x 2.5-inch rear drive module

- **Server R760 back panel design**
  - Up to 2 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) max 30.72 TB
  - Up to 4 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) max 61.44 TB

# Dell PowerEdge R760



- **Dell R760 Central Unit**.
  - Removing the fan chassis quickly means that this area can be accessed as well as servicing front-mounted PERC cards, for example.
  - Those airflow guides push air over the CPU and memory heatsinks.

# Dell PowerEdge R760

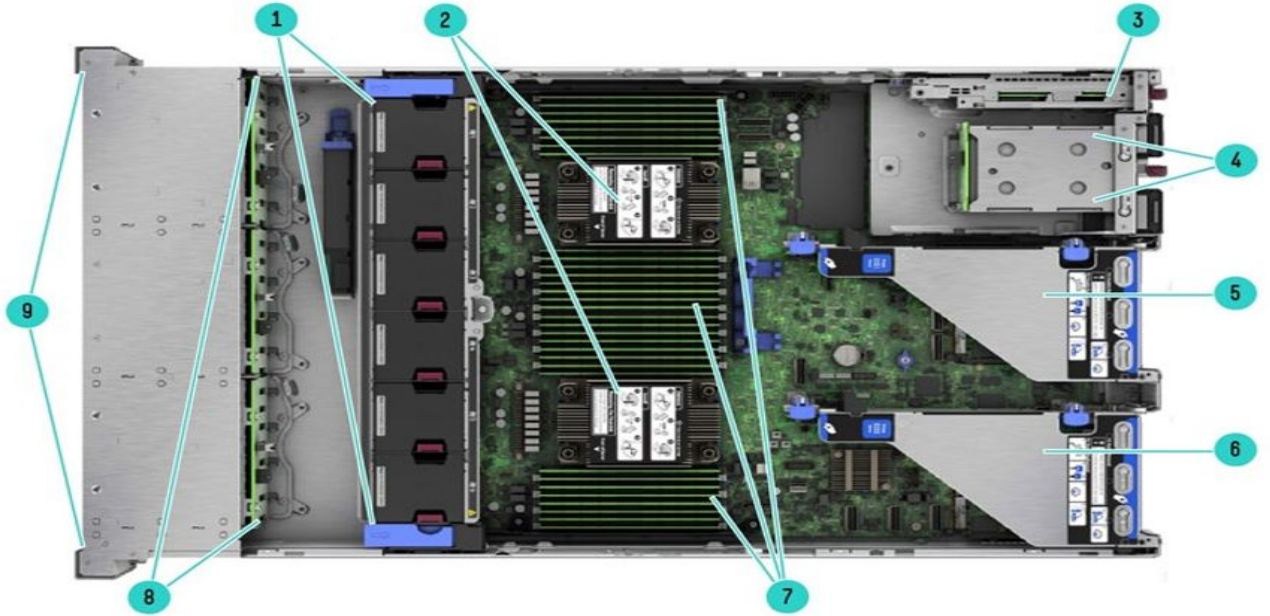

- **Dell PowerEdge R760 iDRAC 9 Management**
  - Data can be collected across multiple components and configurations set up.
  - These can then be fed into Dell's OpenManage solution so organizations can monitor and manage groups of servers easily.

# Dell PowerEdge R760

- **Analyze hardware configuration support on Dell R760**
  - 4th generation Intel Xeon Scalable “Sapphire Rapids” dual processor.
  - The Dell R760 server supports high scalability, with the ability to increase memory and hard drives.
  - With 32 DIMM slots, it can support up to 8TB of DDR5 RDIMM RAM.
  - It also has multiple hot-plug hard drive slots available.
  - Another big feature of the new platform is PCIe Gen5. GPU support up to 2 x 350 W DW and 6 x 75 W SW.

# HP DL380 G11

- **HP DL380 11**




**Internal View 8SFF chassis**

1. Hot Plug Fans[1]
2. Processors, heatsinks showing
3. Optional NS204i-u Boot Device
4. Hot Plug redundant HPE Flexible Slot Power Supplies
5. Secondary Riser (Optional) (Requires second processor)
6. Primary Riser
7. DDR5 DIMM slots, shown fully populated in 32 slots[2]
8. Drive Backplanes
9. Drive Cages

# HP DL380 G11

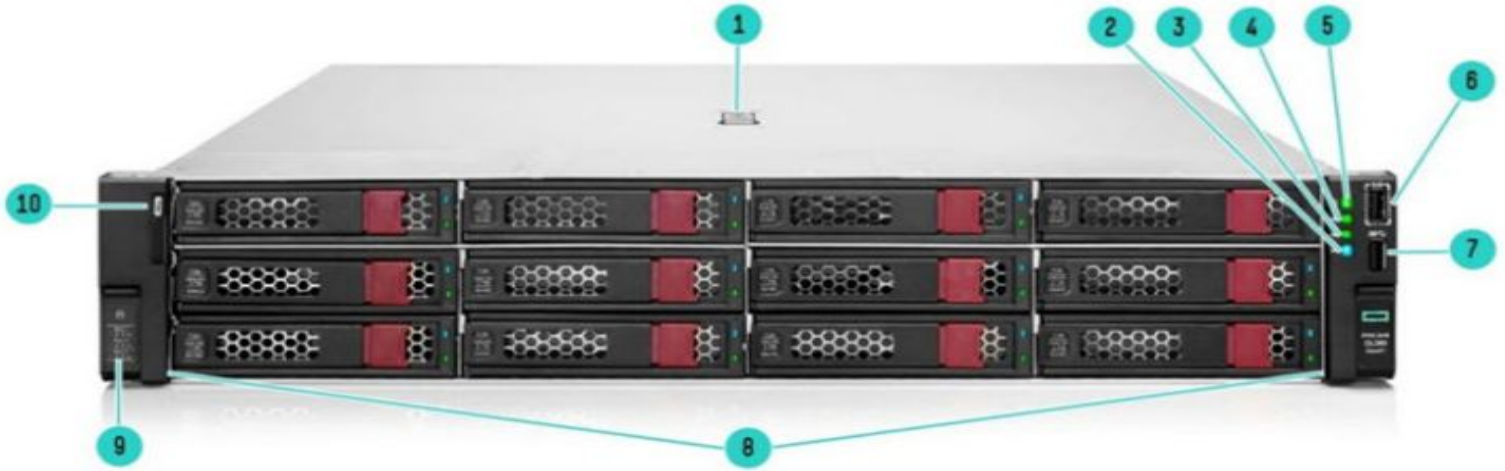
- **HP DL380 G11**
  - The Gen 11 server line was announced in early 2023, after Intel officially launched the Intel Xeon Scalable Gen 4 "Sapphire rapids" processor product line with the Socket FCLGA4677.
  - The HPe DL380 Gen11 server's appearance does not have many changes compared to the Gen 10 Plus version, the main difference lies in the front bezel of the machine as it is quite beautifully designed.

# HP DL380 G11


**Front View – SFF chassis with optional Universal Media bay shown**

1. Optional Front Display Port (via Universal Media Bay)
2. Box 1 (shown with optional Universal Media Bay installed)
3. Box 2 (shown blank)
4. Quick removal access panel
5. UID button/LED
6. NIC Status
7. Health LED
8. Power On / Standby button and LED
9. iLO Service Port
10. USB 3.0
11. Box 3 (shown with 8SFF drives populated)
12. Optional USB 2.0 (via Universal Media Bay)
13. Drive Support Label
14. Serial Number Label Pull Tab

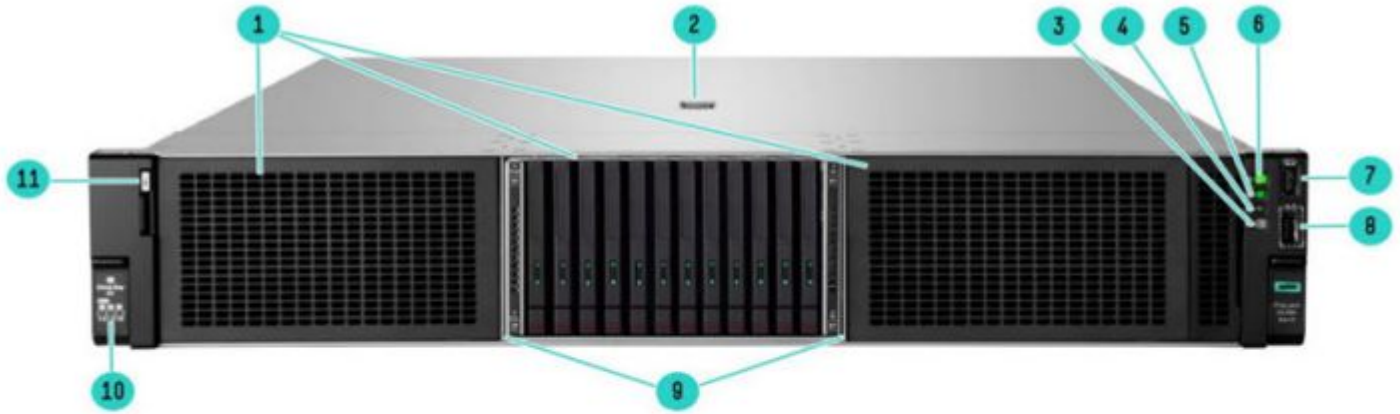
# HP DL380 G11




**Front View – 12LFF chassis shown**

1. Quick removal access panel
2. UID Button / LED
3. NIC Status
4. Health LED
5. Power On / Standby button and LED
6. iLO Service Port
7. USB 3.0
8. 12 x LFF Media
9. Drive support label
10. Serial Number Label Pull Tab

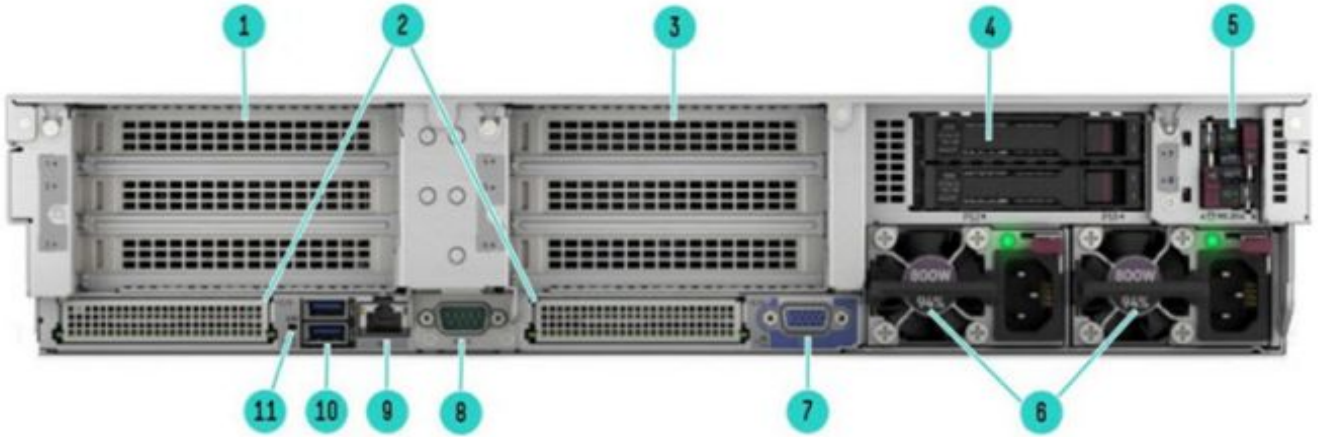
# HP DL380 G11




**Front View –12EDSFF chassis shown**

| | | | |
|---|---|---|---|
| 1 | 12EDSFF drive bays optical drive | 7 | iLO Service Port |
| 2 | Quick removal access panel | 8 | USB 3.0 |
| 3 | UID Button / LED | 9 | 12x EDSFF Media |
| 4 | NIC Status | 10 | Drive support label |
| 5 | Health LED | 11 | Serial Number Label Pull Tab |
| 6 | Power On / Standby button and LED | | |

# HP DL380 G11




**Rear View – Standard for all DL380 Gen11**

1. Primary Riser. PCIe 5.0 Slots (Slots 1-3)
2. OCP 3.0 Slots, shown covered
3. Secondary Riser. PCIe 5.0 Slots (Slots 4-6)
4. Tertiary Riser (Slots 7-8) shown with optional 2SFF drive cage installed
5. Optional NS204i-u Boot Device
6. Power Supply 1 and 2
7. VGA Connector
8. Optional Serial Port
9. Dedicated iLO Management Port
10. USB 3.0 Connectors (2)
11. UID Indicator LED

# HP DL380 G11


**Broadcom BCM5719 Ethernet 1Gb 4-port BASE-T OCP3 Adapter for HPE**


**HPE MR408i-o Gen11 Controller**

# 8. What is the initial setup process for installing a server and operating system?

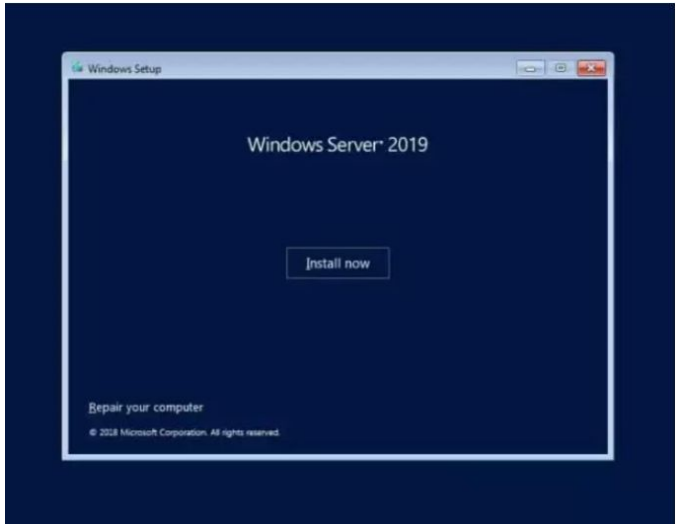
- **The initial installation process installs the server**
- **The initial installation process installs the operating system**

# Installs the server

- **Installs the server**
  - Set up server configuration
  - Install server
  - Manage and change server names
  - Configure the server IP address
  - Install Remote Management
  - Updated and refreshed
  - Activate Windows Server

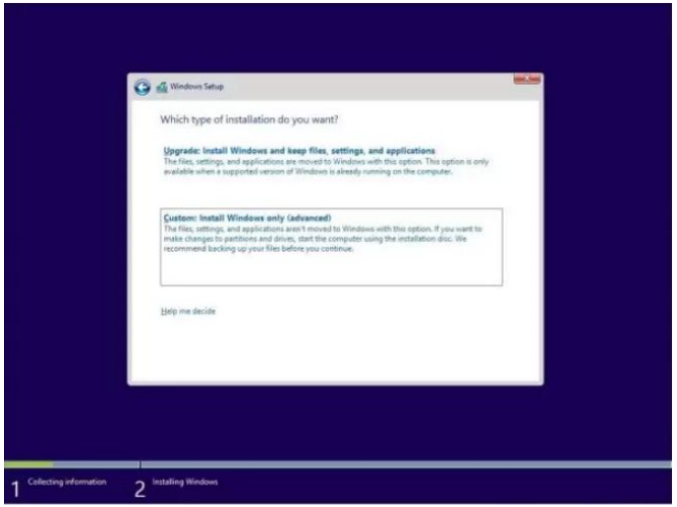
# Installs the operating system

- **Installs the operating system**
  - Step 1: Boot the drive
    - Insert the drive into the server and press the button to start
    - Select language and time of use
    - Select “Install” for the system to move to step 2



# Installs the operating system

- **Installs the operating system**
  - Step 2: Agree to the terms
    - Click on the “Check” mark to agree to the terms
    - Then select “Next”
  - Step 3: Choose the installation type
    - Select “Custom: Install Windows only (advanced)”



# Installs the operating system

- **Installs the operating system**
  - Step 4: Install
    - A screen will appear asking the user to determine the location to install Windows, you just need to choose to install the operating system on the main partition.
    - Windows begins server installation. Installation time depends on server parameters.
    - When the server installation is complete, enter the password and click "Next" to complete.

# 9. Understand the tools for configuring servers from HP and Dell.

https://www.etb-tech.com/dell-poweredge-r730-configure-to-order.html

https://intelligentservers.co.uk/

https://www.dell.com/en-us/shop/dell-poweredge-servers/poweredge-r760-rack-server/spd/poweredge-r760/pe_r760_15724_vi_vp


THANK YOU
Your listenning