Injibara University

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Network and System Administration (CoSc 4036)

Chapter Six: Managing Network Services

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Introduction

- Managed network services are **networking applications**, **functions and services** that can be remotely operated, monitored and maintained by a **managed service provider (MSP)**.
- It ranges from **basic network access** like WAN and LAN to newer **software-defined WAN (SD-WAN)** connections and virtual network services.
- Beyond network access and transport services, the following are the variety of **available managed services.**

✓ WAN optimization
✓ Network administration
✓ Network provisioning
✓ Network monitoring
✓ Managed security firewalls
✓ Virtual private networks (VPNs)

The role of Message Service Providers (MSPs)

- **MSPs** primarily host **virtual private functions** and managed enterprise network services in **their own data centers and facilities**.
- MSPs range in size from small service providers to **large global telecommunications** providers.
- MSPs typically offer managed network services with **service-level agreements (SLAs)** for customers, which are **contractual arrangements** on the performance and quality metrics for the managed service will be provided.

Benefits of managed network services

- Small and medium-sized businesses often **contract with MSPs** because they have limited IT capabilities and staff.
- Managed network services offer a way for organizations to obtain IT and networking expertise **without hiring more staff.**
- MSPs can handle enterprise networking issues that include **integration, troubleshooting, technical support and policy setting**.
- Managed network services are also and option for companies that are interested in trying out **new technologies.**

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- Managed network services enable IT staff to **focus on other tasks**.
- This results in **operational efficiency** because MSPs can monitor the needed services and troubleshoot when needed.
- MSPs **prevent IT problems** from disrupting business operations.
- Larger enterprises, organizations or government agencies also contract with **MSPs** when they face **budget pressure** and **hiring limitations to IT staff**.

Managed Network Service Provider

- The network is one of the most critical parts in IT environment.
- It delivers applications and data to end users.
- **Managed network services** are a range of networking solutions remotely operated, monitored and maintained by a **managed service provider** designed to allow users to **access centralized services, information and applications hosted at other locations.**
- This **reduces the responsibility and time away** from your internal IT teams to manage the network and connectivity.
- It allows to focus on value driving activities.

Troubleshooting

- Network troubleshooting is a process used to **identify, diagnose and solve problems** within a computer network.
- It’s a process that **network engineers** use to resolve network problems and improve network operations.
- Having **a systematic approach** to solving the problem will make you a faster and smarter troubleshooter.

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Troubleshooting steps:

- ✓ Collect information
- ✓ Develop a hypothesis
- ✓ Test the hypothesis
- ✓ Implement and fix
- ✓ Verify the problem was solved
- ✓ Notify the users
- ✓ Document the fix

What type of information should be collected?

- When collecting information on the problem, it is critical to make sure that knowing enough about the scope of what part of the network is **included in the problem**, and what part of the network can **be safely excluded**.
- Start by asking the necessary questions to define the scope of the problem:

✓ Who is having the problem (one user, multiple users)?

✓ Is it just one application, or all applications?

✓ Has anything changed?

✓ Has this happened before, if so, when?

✓ Was anything done differently?

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Faster troubleshooting is better troubleshooting

- All engineers engage in troubleshooting but getting to **the root cause of a problem** is key.
- It requires different information to achieve its goal.
- Troubleshooting a network can be a **manual or automated** process.
- There are network troubleshooting automation tools that help **to identify the root cause** and its location.

Developing General Strategies

Basic Network Problems

- **Cable problem**: the cable which is used to connect two devices can **get faulty or can be physically damaged**.
- **Connectivity problem**: the **port or interface** on which the device is connected or configured can be **physically down or faulty** due to which the source host will not communicate with the destination host.

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- **Configuration issue**: due to a **wrong configuration**, routing problem and other configuration issues.
- **Software issue**: software compatibility issues and version mismatch, the transmission of IP data packets between the source and destination is interrupted.

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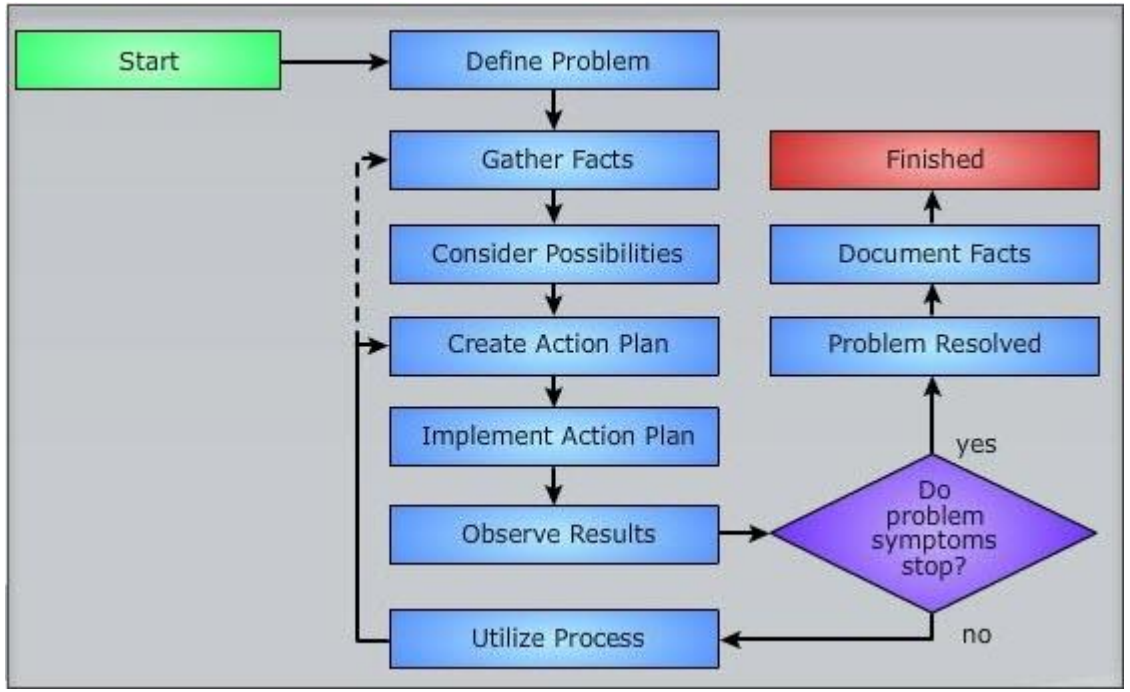
- **Network IP issue:** due to improper configuration of IP addresses and subnet mask and **routing IP to the next hop**, the source will not reach the destination IP through the network.



Resolve Boot Problems

- Booting from LAN also known as **booting from network**, is a process that enables a computer to **load an operating system (OS)** or other applications directly from the **LAN without any local storage device** such as CD-ROM, DVD-ROM, USB flash drive, or floppy disk.

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What is network boot?

- Network booting, shortened as **netboot**, is the process of **booting up** a computer from a network instead of a local disk.
- This booting method can **be applied to centrally managed computers** like public machines in schools, diskless workstations.

Network Booting Use Case

- Network boot (netboot) can be used to centralize the **management of hard drive storage.**
- It can also be applied in **cluster computing**, in which nodes may not have local drives.
- Network booting was used to **save the cost of a hard drive.**
- Almost all modern desktop and laptop computers with **Ethernet jack called RJ45** offer an option **to boot from LAN** in their BIOS through PXE (Preboot Execution Environment).
- On Intel architecture computers, **network boot** is enabled with the PXE standard.
- PXE extends the features of BIOS.
- PXE can **run the software directly** from the LAN.

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- On Intel Desktop Boards that support the PXE, **you can set the network as a boot device.**
- The following is a step on **how to boot from onboard LAN**.
  - ✓ Press **F2** continuously when you power up your machine until it enters its BIOS Setup.
  - ✓ Navigate to the **Boot menu**.
  - ✓ Enable **Boot to Network**.
  - ✓ Press **F10** to save changes and exit the BIOS setup.
  - ✓ Restart your computer and press **F12** during POST to boot from **a remote server within LAN**.

Thank you