**Windows Server 2022 Installation and Configuration Report**

**Introduction**

This report details the installation, configuration, and management of a Windows Server 2022 environment. The project aims to build a functional server infrastructure by implementing key network services such as Active Directory Domain Services (AD DS), Dynamic Host Configuration Protocol (DHCP), and Domain Name System (DNS). These services form the backbone of enterprise networks, providing centralized management of users, computers, IP addressing, and name resolution.

**Objectives**

* Install and configure Windows Server 2022.
* Deploy Active Directory to manage users, groups, and policies centrally.
* Set up DHCP to automate IP address allocation within the network.
* Configure DNS to resolve hostnames and support Active Directory.
* Apply security and administrative best practices.
* Document all configurations for replication and learning.

**Installation of Windows Server 2022**

The installation was performed on a virtual machine using [specify hypervisor, e.g., Hyper-V, VMware]. The standard installation with Desktop Experience was chosen to enable a GUI-based management environment.

Key initial configuration steps included:

* Assigning a static IP address to the server to ensure consistent network communication.
* Setting a descriptive hostname aligned with the organization's naming conventions.
* Joining the server to the local network for connectivity.

**Installing Server Roles and Features**

Using the Server Manager and PowerShell, the following roles were installed:

* **Active Directory Domain Services (AD DS):** Enables centralized management of domain resources.
* **DHCP Server:** Provides automated IP address assignment to clients.
* **DNS Server:** Resolves hostnames within the network and supports AD DS.
* **Management Tools:** Facilitates administration through GUI and command-line tools.

**Promoting to Domain Controller**

The server was promoted to a Domain Controller to manage a new Active Directory forest. The process involved:

* Creating a new domain, yourdomain.local, representing the internal namespace.
* Setting the Directory Services Restore Mode (DSRM) password, critical for disaster recovery.
* Installing and configuring the integrated DNS server as part of the promotion process.
* Verifying replication and domain functionality post-promotion.

**Active Directory Configuration**

To organize network resources efficiently, the following steps were completed:

* Created Organizational Units (OUs) to group users and computers logically.
* Created user accounts and security groups to control access rights.
* Configured Group Policies to enforce security standards, including password complexity and account lockout policies.

**DHCP Configuration**

The DHCP server was configured to dynamically assign IP addresses to client devices, reducing manual network administration. Key configurations included:

* Creating a DHCP scope with an IP range (e.g., 192.168.1.100 to 192.168.1.200).
* Defining subnet mask and lease duration for IP address allocation.
* Setting exclusions for statically assigned devices such as servers and printers.
* Authorizing the DHCP server in Active Directory to ensure secure operation.

**DNS Configuration**

DNS is critical for Active Directory operation and network resource accessibility. The configuration steps included:

* Setting up forward lookup zones corresponding to the Active Directory domain.
* Configuring DNS forwarders to external public DNS servers (e.g., Google DNS at 8.8.8.8) to resolve external names.
* Testing DNS resolution internally and externally to verify correctness.

**File Sharing and Permissions**

To facilitate collaboration, shared folders were created with appropriate NTFS and share permissions, ensuring secure access control for different departments.

**Additional Server Configuration**

* Configured Windows Firewall rules to allow necessary traffic for AD, DHCP, DNS, and remote administration.
* Enabled Remote Desktop Protocol (RDP) to permit remote server management.
* Applied Windows Updates and security patches to ensure the server is up-to-date and secure.

**Troubleshooting and Challenges**

During the setup, the following issues were encountered and resolved:

* **DHCP Scope Conflicts:** Initial overlapping IP ranges caused address conflicts, resolved by adjusting scope ranges.
* **DNS Forwarder Errors:** Incorrect IP entries caused external resolution failures; corrected by verifying IP addresses.
* **Group Policy Application Delays:** Ensured policies applied correctly by running gpupdate /force and restarting clients.

**Conclusion**

This project successfully set up a Windows Server 2022 environment with essential network services configured for enterprise use. The implementation of Active Directory, DHCP, and DNS provides a robust foundation for centralized network and user management. Documentation and scripts included will facilitate future maintenance and scalability.

**Recommendations**

* Implement regular backups of Active Directory and DHCP databases.
* Monitor DHCP leases and DNS zones to prevent exhaustion and conflicts.
* Extend Group Policies for finer control and automation.
* Consider deploying additional roles such as File Server, Certificate Authority, or WSUS based on organizational needs.