

## Research Paper on Active Directory

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**Abstract** - Microsoft's Active Directory (AD) is a directory service used to store information about network resources across and provides a hierarchal way to the entire network of devices and applications. Active Directory was introduced in windows 2000 server. AD is a central collection of users, groups and computers, enabling single sign-on (SSO) for devices and applications joined to the AD domain. Active directory stores information about network resource such as users, user's password, groups, network printer and computer and makes the information available to users and administration. Active directory allows administrator to manage centralized management with the help of group policy. When a user logs into a computer that is a member of a window domain, active directory checks the submitted users name and password and allows access to network resource such as network printer and other computer on network. The tools provided by Microsoft that helps to manage the AD services do not offer the capabilities of bulk user, group and computer management. Existing tools provide mechanisms for managing user properties, passwords and group membership in bulk; however, each tool solves an individual problem. In this project. Integrating these tools aids system administrators by providing a single tool to manage multiple components of AD.

**Key words:** Active directory, AD services, Logical Structure, Workgroup, Domain.

### INTRODUCTION

Active Directory is a directory services Microsoft developed for window domain network. Active directory is a directory service used to store information about the network resource across a domain. Active directory includes most of the windows server operating systems as a set of process and service. An active directory (AD) structure is a hierarchal framework of objects. The objects falls into three broad categories resource(printer), service(e-mail), user (accounts or user and group). The active directory information on the objects, organizes the objects, controls access and sets security. Active Directory uses Lightweight Directory Access Protocol (LDAP) versions 2 and 3, Microsoft's version of Kerberos, and DNS. Active Directory allows network administrators to create and manage domains, users, and objects within a network. For example, an admin can create a group of users and give them specific access privileges to certain directories on the server. Before Windows 2000, Microsoft's authentication and authorization model required breaking down a network into domains, and then linking those domains with a complicated, and sometimes, unpredictable system of one- and two-way trusts. Active Directory was introduced in Windows 2000 as a way to provide directory services to larger more complex environments.

### ACTIVE DIRECTORY SERVICES

Active Directory is a hierarchal structure that stores the information about the objects on the network. An Active directory has major such services as domain service, certificate service, leightweight directory, federation services, rights management.

1. **Domain service:-** The domain service of active directory stores the centralized data and manages the communication between user and domain. The domain services also includes login authentication and search functionality. The active directory domain services also used as servers role, that allow admin to manage and stores information about the resource network, also helps to manage elements of network and record them in a hierarchy.
2. **Certificate Services:-** The certificate services of active directory is used to manage, generate and share certificates. Microsoft Active Directory Certificate service is used to provide a platform for managing public key infrastructure certificate. According to Microsoft themselves, AD CS is the "Server Role that allows you to build a public key infrastructure (PKI) and provide public key cryptography, digital certificates, and digital signature capabilities for your organization."
3. **Directory Federation Service:-** The Directory Federation Services of Active Directory provides the user for single sign in to authenticate a user in multiple web application in a single session. The federation services works on based upon the federated identity. Also it is a functionality of a window server OS that extends user for a Single Sign On access to application and system outside the corporate firewall.

4. **Rights Management** :- The Federation management of active directory protects copyrighted information by preventing the unauthorized use and distribution of digital content. The rights management is used as a security tool that provides the persistent data protection by enforcing the data access policy. It uses encryption and a form of selective functionality denial for limiting access to documents such as corporate emails, Microsoft Word documents, and, web pages and the operations authorized users can perform on them.

## LOGICAL STRUCTURE OF ACTIVE DIRECTORY

Microsoft Active Directory logical Structures includes the major:-

1. **Object**
2. **Forest**
3. **Tree**
4. **Domain**
5. **Partition**

The framework that holds the object is viewed at a no. of levels. At the top structure is Forest. Forest is the collection of every objects, its attribute and rule (attribute syntax) in the Active directory. The forest holds one or more transitive trust linked trees.

A Tree holds one or more domain and domain tree, again linked in the transitive trust hierarchy.

Domains are identified by their DNS name structure, the name space. A domain a single DNS name.

The object held within a domain can be grouped into organizational units. Organizational units give a domain a hierarchy ease its administration and can give a semibalance of structure of Active Directory company in organizational or geographical terms.

Organizational units can contain OUs includes, domains are container in this sense & can hold multiple nested OUs. Microsoft recommends as few domains possible in AD and relies on organizational unit to produce structure and improve the implementation of policies and administration.

## FILE NAME OF ACTIVE DIRECTORY

File name:- NTDS.DIT

Location:- %systemroot%/NTDS/ntds.dit

## FLEXIBLE SINGLE MASTER OPERATION (FSMO)

The FSMO contains major 5 roles

1. **Domain naming master**:- The domain controller manages the addition and removal of domain in the forest. A forest can have only one domain naming master, which can be transferred to another domain controller through the active directory domain and trust snaps in.
2. **Schema Master**:- It controls update to the domain schema data. This is one schema master in entire forest. It can be transferred to another domain controller through Active Directory schema master snaps in.
3. **PDC Emulator master**:- in a mixed 2000 & window NT environment, the PDC emulator master supports BDCs. Thus it manages user account and password change and forward that information to the Window NT BDC. In a native mode window 2000 environment, the PDC emulator master received preference in replication of user account password. Before a login fails, it is checked for updated information. This master role can be transferred to another domain controller through active directory user and computer snaps in.
4. **Relative ID Master**: A single relative ID master in each domain of a tree manages the allocation of sequential relative ID(RID) to each domain controller. This makes all security ID (SID) created in domain relative to domain

controller. This master role can be transferred to another domain controller through active directory and computer snaps in.

5. **Infrastructure Master:** - It is responsible for managing group and user reference. Except a delay in change to user when they are made across domain. Update to other domain are made by the infrastructure master domain controller via a process called master replication. The master role can be transferred to another domain controller through active directory user and computer snaps in.

## WORKGROUP AND DOMAIN

Workgroup is best understood as peer to peer network i.e. each computer is a sustainable on its own. It has its own user list, its own access control and own resources. In order for a user to access resource on another workgroup, computer that exact user must be setup on other computer. Workgroup offer little security outside of basic access control. Window "share permission" are very basic and do not offer any kind of granularity "Who" can access "What" etc. Workgroup is used for small business and home use etc.

Domain is a trusted group of computer shares security, access control and have data passed down from a centralized domain controller server. Domain controller handles all aspects of granting user permission to login. They are gatekeeper. Most domain uses active directory which allows more centralized point for software distribution, user management and computer control.

## CONCLUSION

1. Describe the role of Active Directory in Windows
2. Describe which Internet standards and technologies supported by Active Directory
3. Describe the naming conventions in Active Directory that you must consider when establishing a Windows 2000 network
4. Describe the logical structure of Active Directory
5. Define the role of domains
6. Define the role of organizational units (OUs)
7. Define the relationship between trees and forests

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