AZ-800 - Microsoft Server Hybrid Core Inf.

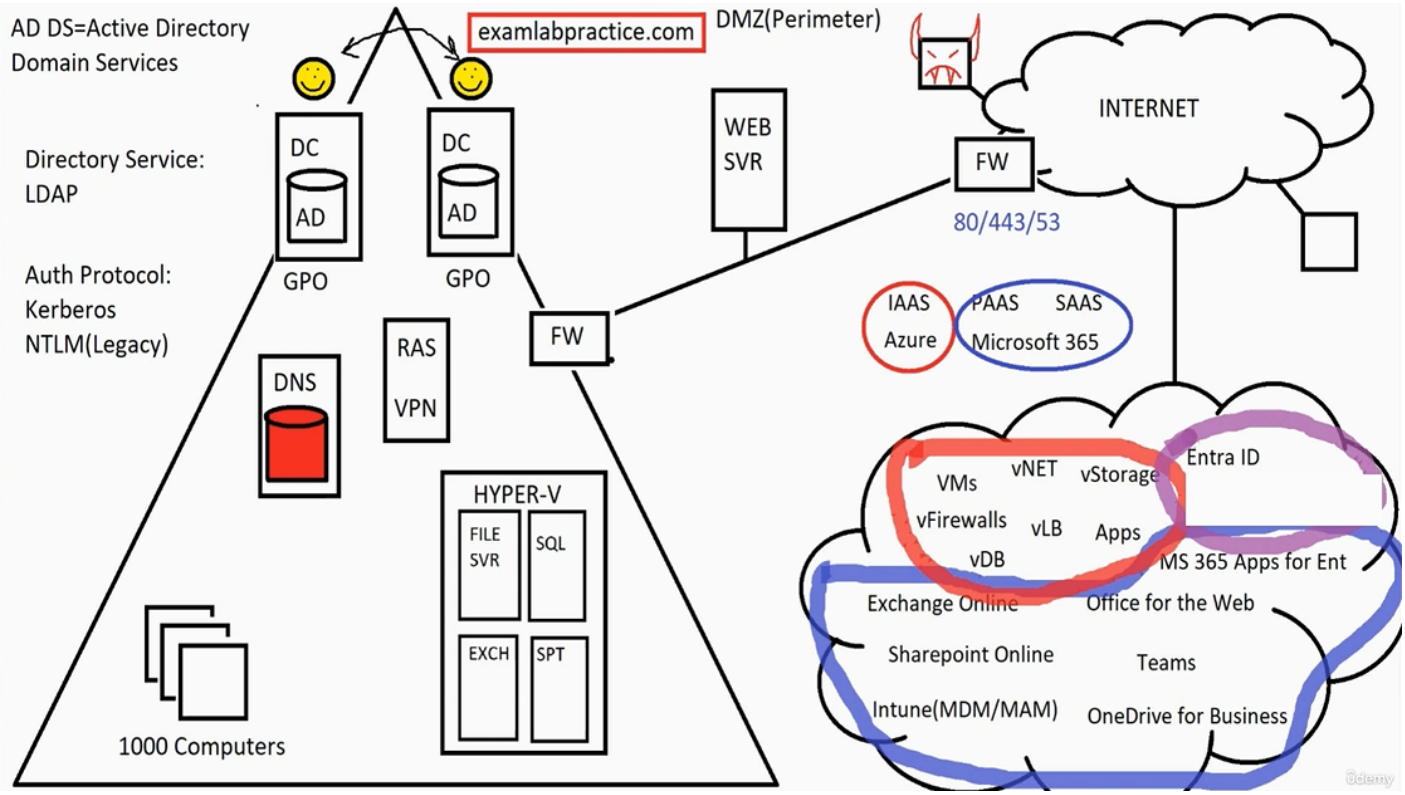
Overview

- Entra ID (formerly Azure AD) - PAAS
- Exchange Online - PAAS (Admin side) & SAAS (User side)
- Sharepoint Online - Paas (Admin side) & SAAS (User side)

- Intune (MDM) - Mobile Device Management, Across multiple OSs (Android, Windows, etc)
- SCCM (Older) - Windows only, Group Policy

Main system - Microsoft 365 - Sits on top of Azure

- Microsoft 365 - PAAS & SAAS
- Azure - IAAS



Microsoft Cloud

- Blue - Microsoft 365
- Red - Azure Infrastructure
- Purple - Microsoft 365 & Azure both share Entra ID (directory services)

Cloud Sync - SSO logs users in via on-prem D.C, and Entra ID via cloud (syncs out but not in)

- Entra Connect server (formerly Azure AD Connect) - link on-premise with cloud services
- Entra ID Sync (light weight version)

Powershell

Verb-Noun	Structure
Verb-N...	Tab for intellisense
Stop-Service <inputObject>	Parameters are required

Example:

```
Get-Eventlog -LogName System -Newest 5 | Format-List Out-File c:\log.txt
```

Remote Access via Powershell

winrm quickconfig	brings the service on
Get-Process -ComputerName SVR	
Stop-Process	
Get-Service -ComputerName SVR	
Invoke-Command -ComputerName SVR -ScriptBlock {get-eventlog -LogName Security -Newest 5}	
Enter_PSSession -ComputerName SVR	
Exit	
Get-Process -ComputerName SVR,DC (runs on both)	

CredSSP

Scenario:

1. Logged into ServerA, remote powershell to ServerB
2. ServerB powershell command attempts to access ServerC
3. Access is denied because credentials not passed from ServerB to ServerC

Credential Security Support Provider (CredSSP)

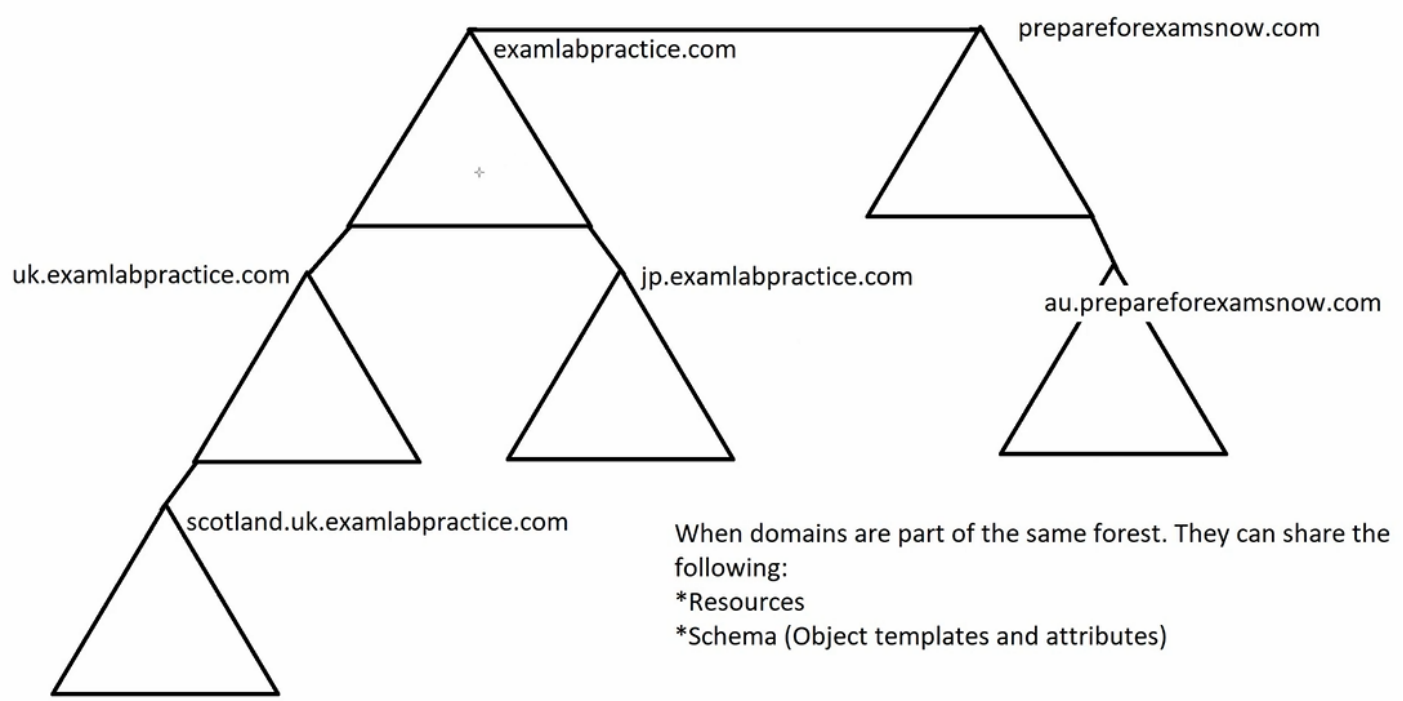
- CredSSP caches credentials on the remote server (ServerB)
- Opens up credential theft attacks if the remote server is compromised
- Disabled by default, only enable this in trusted environments

Integrated Scripting Environment (ISE)

Get-Variable	
$Number1 = 5	Stores the value in a new variable
$Number	outputs 5
$Name = "SVR"	Can now use -ComputerName $Name
ISE	opens integrated scripting environment (click show script pane)
$name = Read-Host "Which computer would you like to connect to?"	
$log = Read-Host "Which log would you like to see?"	
$amount = Read-Host "How many of the newest entries would you like to see?"	
Get-Eventlog -ComputerName $name -LogName $log -Newest $amount	

Domains, Trees, Forests

Domains, Trees & Forests



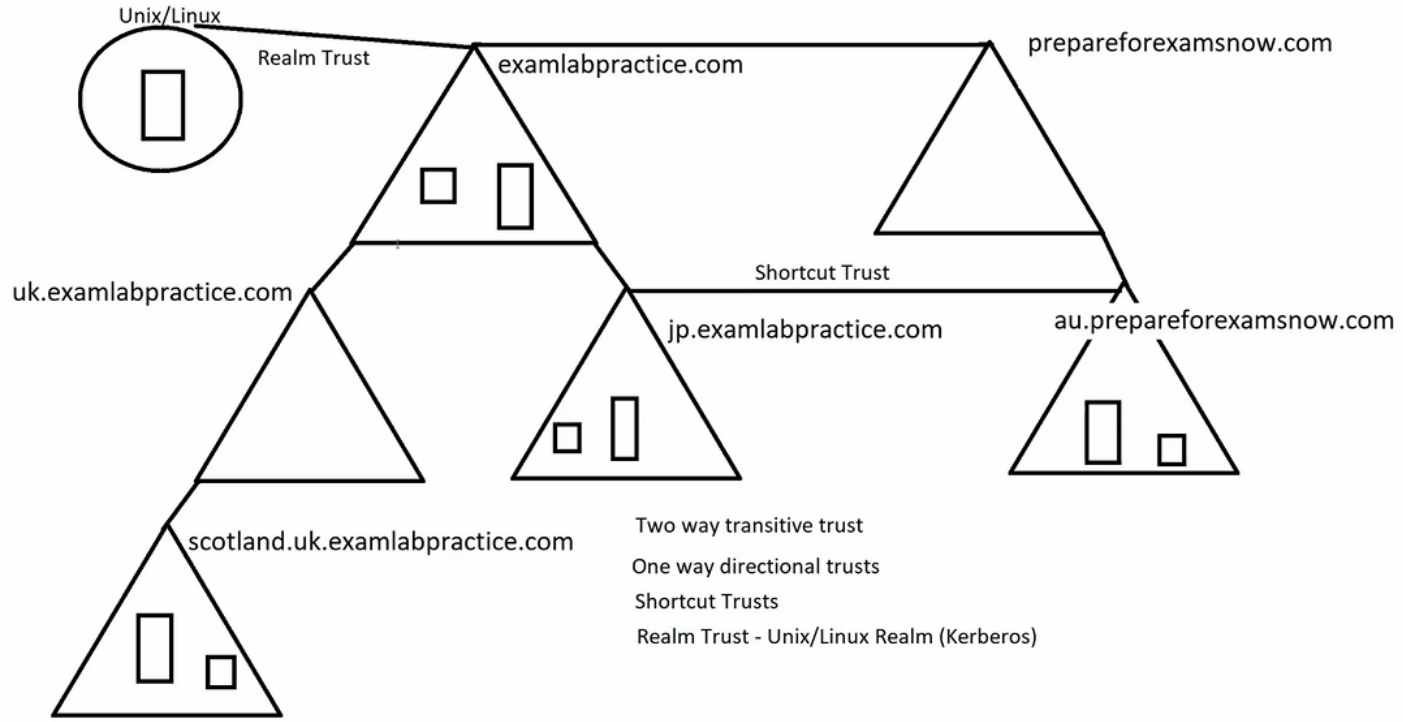
- Every **Domain** is part of a **Tree**, is part of a **Forest** (even a single domain)
- Domains which share the parent domain name belong to the same tree
- **Trust Relationships** connect domains
- **Forest Root (Root Domain)** - First domain, cannot change
  - Enterprise admins control entire forest
  - Domain admins control their domain
- Trees later merged via forest trust will share resources but not schema
- Global catalogue is replicated across the whole forest

Trusts

- Trust Relationships can have a
  - Two-way transitive trust (follows through to sub-domains)
  - One-way directional trust
  - Shortcut trust (can be either of the above) (two or one way)
  - Forest trust - between two forests (unlike below) (two or one way)
  - Realm trust - Unix/Linux Realm (Kerberos)

Setup via Active Directory Domains and Trusts

Configure DNS to ensure they can communicate (conditional forwarders)



KCC

- Knowledge consistency checker - all D.Cs have it
- Creates a circular ring of trust between D.Cs in close proximity (latency) within the same site (intrasite replication)
- Updates based on D.C. Availbility, checks every 15 minutes

Separation of sites frees up bandwidth.

KCC Creates new rings within each site and appoints one D.C. as a Bridge Head (every 180 minutes) (can be altered) (Inter-Site Replication)

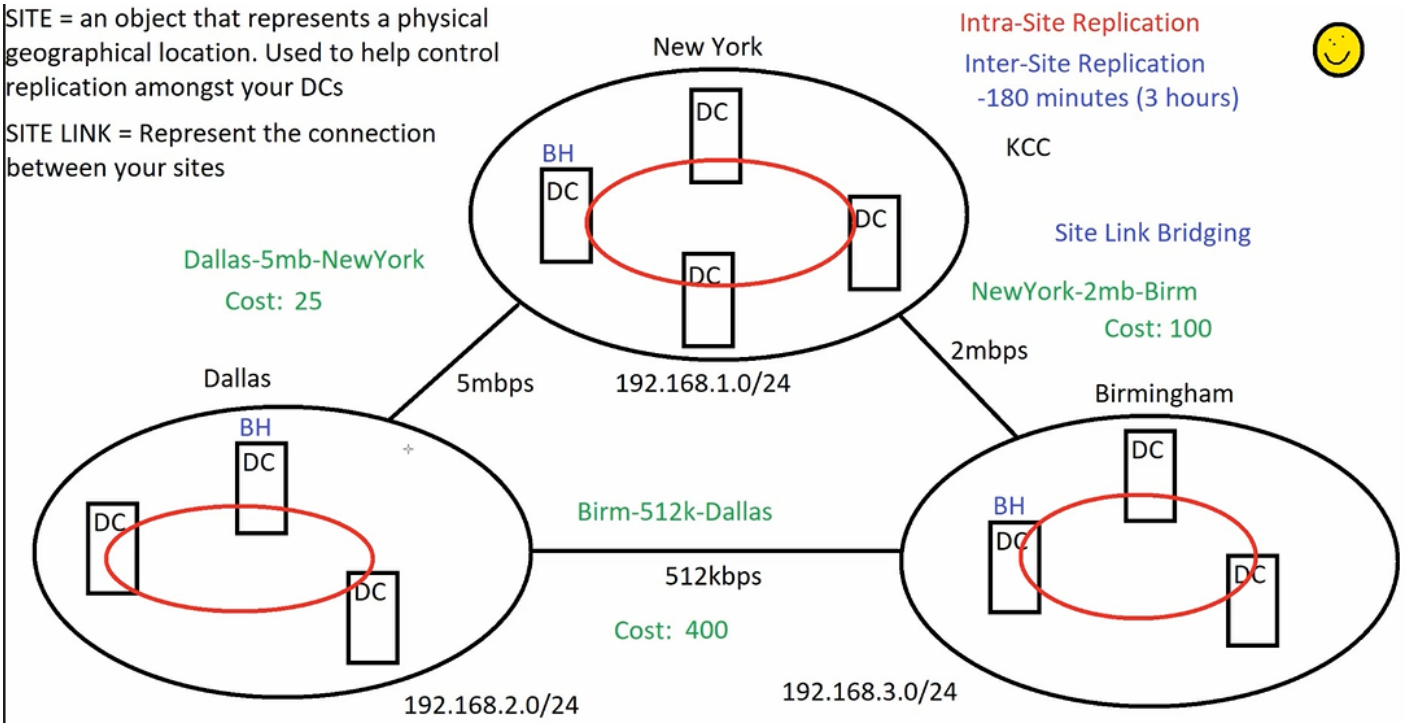
Site Links

- Redundant site links are setup, each have a cost (default 100)
- Adjust cost based on primary and secondary links
- IP Addresses are set such that devices interact with their local D.C. (Subnets)
- Site link bridging can be setup based on a hierarcy (default all on)
- May wish to disable site link bridging where a site has multiple sub-sites

Configured and Managed via AD DS > Sites

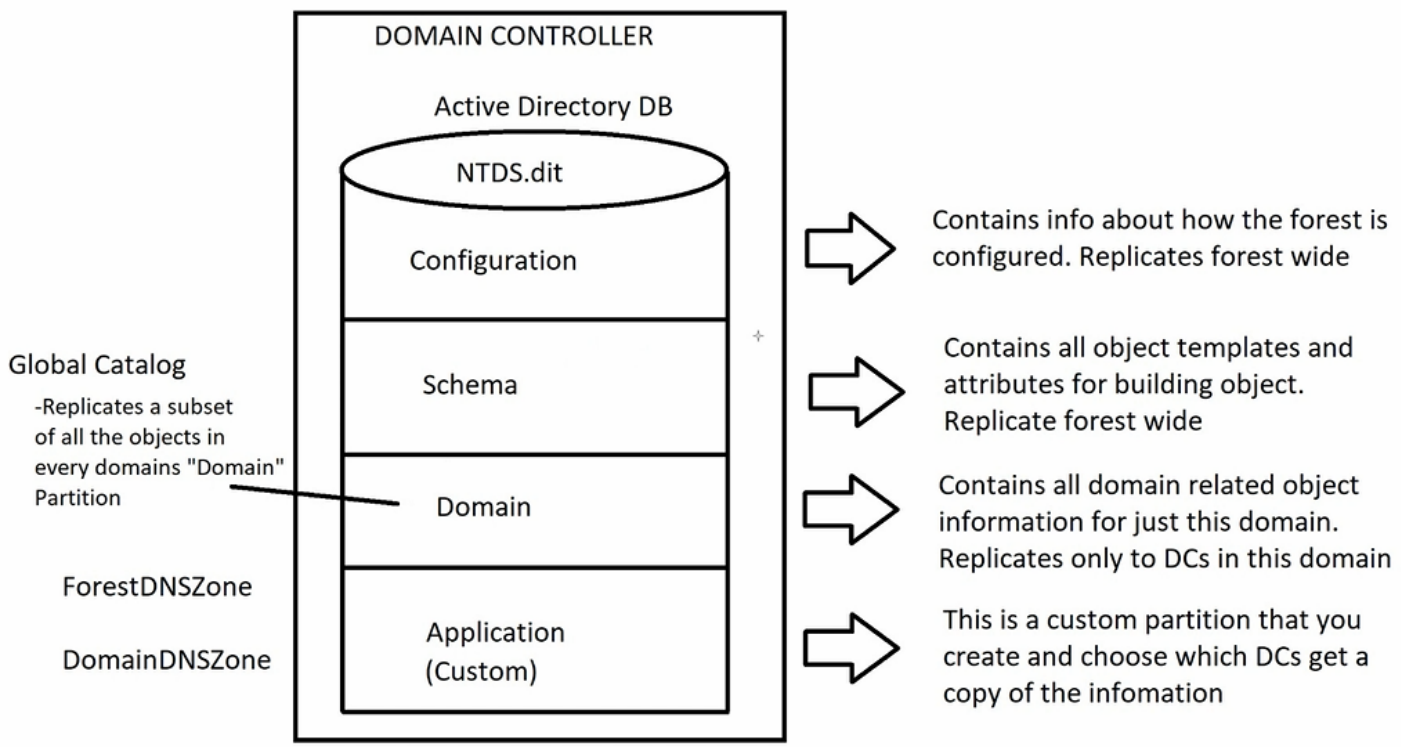
SITE = an object that represents a physical geographical location. Used to help control replication amongst your DCs

SITE LINK = Represent the connection between your sites



Domain Controller AD Partitions

Active Directory Partitions



Global Catalog Server

- Not all Domain Controllers must be Global Catalog Servers
- All Global Catalogue Servers must be Domain Controllers
- Ideally have a GCS in every site D.C but adds replication load

Configured in Active Directory Sites and Services > Services > DC > NTDS Settings > Properties > Tick "Global Catalog"

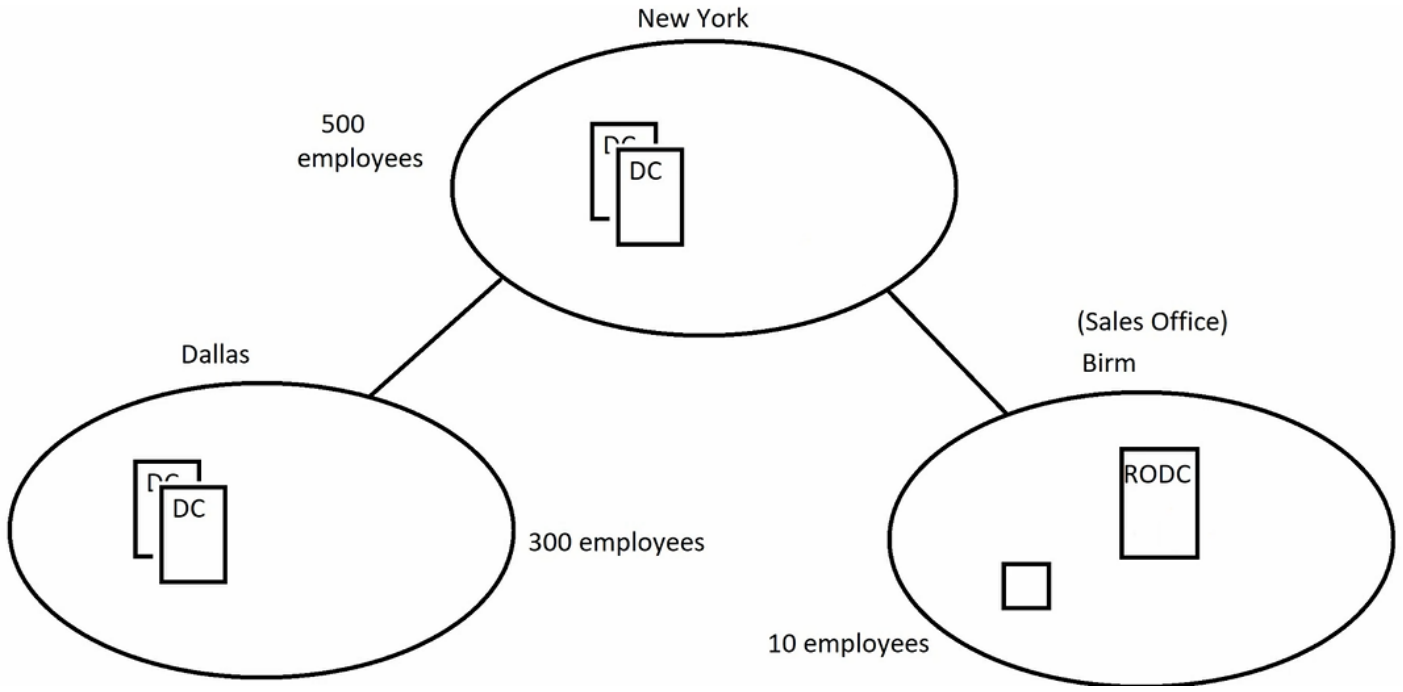
Read-Only Domain Controller (RODC)

Read Only Domain Controller (RODC)

- Receives replication (one way), does not store login information, authenticates via the main D.C.
- May only carry local credentials for immediate staff, no admins
- Used under specific circumstances
- Can also perform DNS

Scenario

- A smaller office with less employees may find it is slow to log in due to having to authenticate with the D.C from another site



How to setup: (would normally be done via RDP or install locally and ship it to the location)

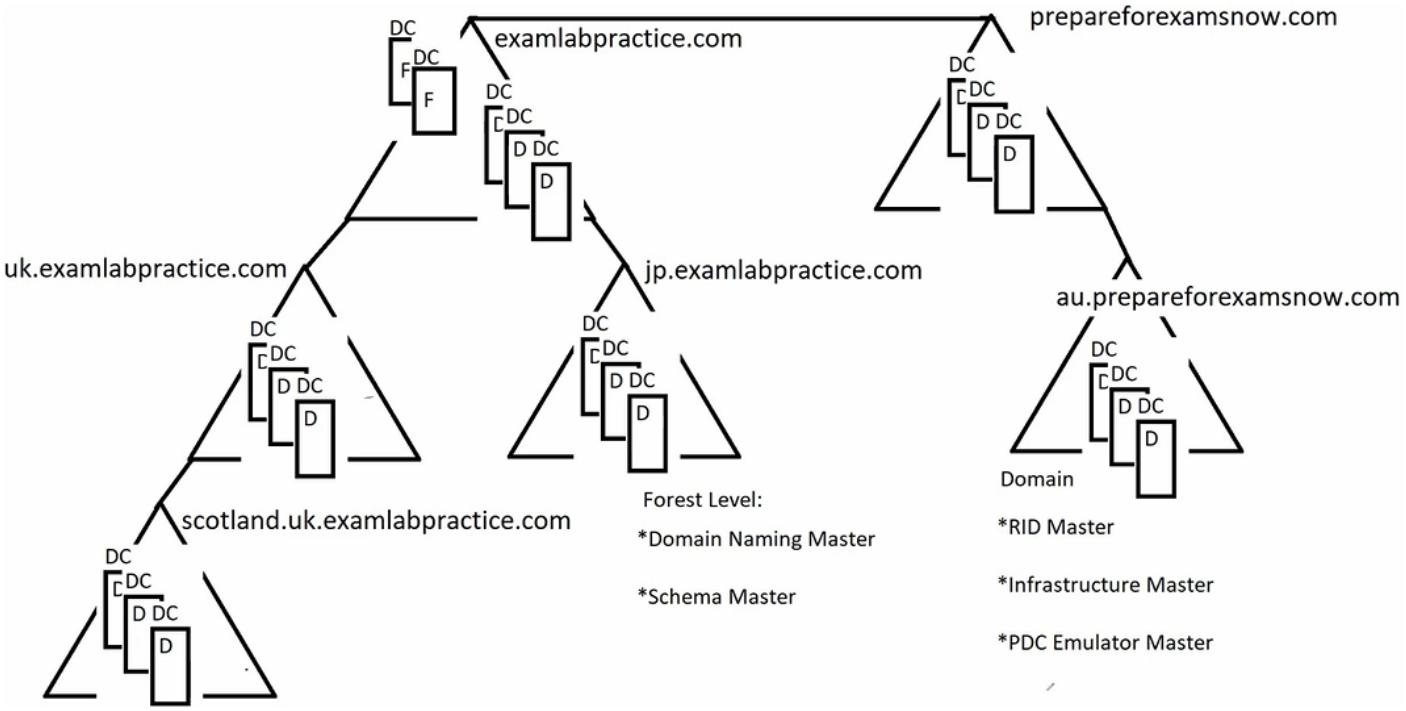
- On a Domain Controller
- Active Directory Users and Computers
- Right click Domain Controllers > Pre-create a read-only Domain Controller account
- Specify User/Group to be able to log in
- Finish
- Right click > Properties > Password replication policy
- Allowed RODC Password Replication Group
- Add local users' credentials to this group (non admins)

- Log into the other server
- After installing ADDS, when promoting the server to a D.C., Tick "RODC"
- Complete Setup

Flexible Single Master Operations (FSMO)

Flexible Single Master Operations (FSMO)

- Certain roles / jobs that can't have multiple writeable copies (conflicts)
- Every D.C has a read only copy of all roles, for recovery
- Seizing converts a read only copy of one of the above roles to a writeable copy
- 5 FSMOs
  - Forest level (these will generally live in the root)
    - Domain Naming Master - Config. Partition of AD - Trust Relationships, Unique Domain Names
    - Schema Master - Master copy of schema database (must be registered)
  - Domain Level (read only copy lives on every D.C.) - can be recovered via transfer and seizing
    - RID Master - Ensures unique identifiers for every object in domain
    - Infrastructure master - allocates groups/resources across different domains
    - PDC Emulator Master - Passwords, time, GPO replication across domains



AD DS Users, OUs, & Groups

Users and OUs

Organisational Units - a means of separating users and devices/objects based on location, site, role, job, department

- A user account can only be a part of one OU (unlike groups)
- OUs can be used to handle Group Policy objects - will filter down to OUs below the specified OU
- Helps to visually separate objects

Example 1

- Sydney OU
  - Users
  - Computers
- Brisbane OU
  - Users
  - Computers

Example 2

- Sales OU
  - Users
  - Computers
- Finance OU
  - Users
  - Computers

Groups

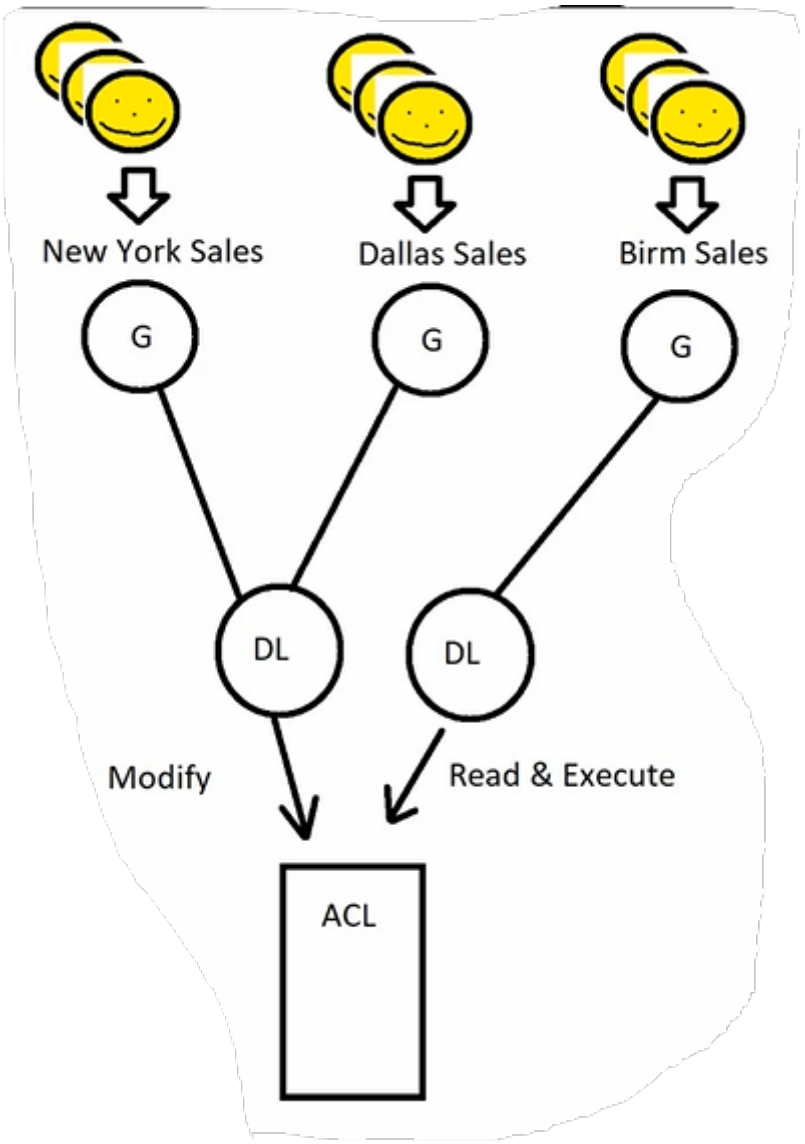
- Dsitribution Groups (DLs) for Email
- Security Groups (Permissions) and Email

Group Scopes

- Global
- Domain Local
- Universal

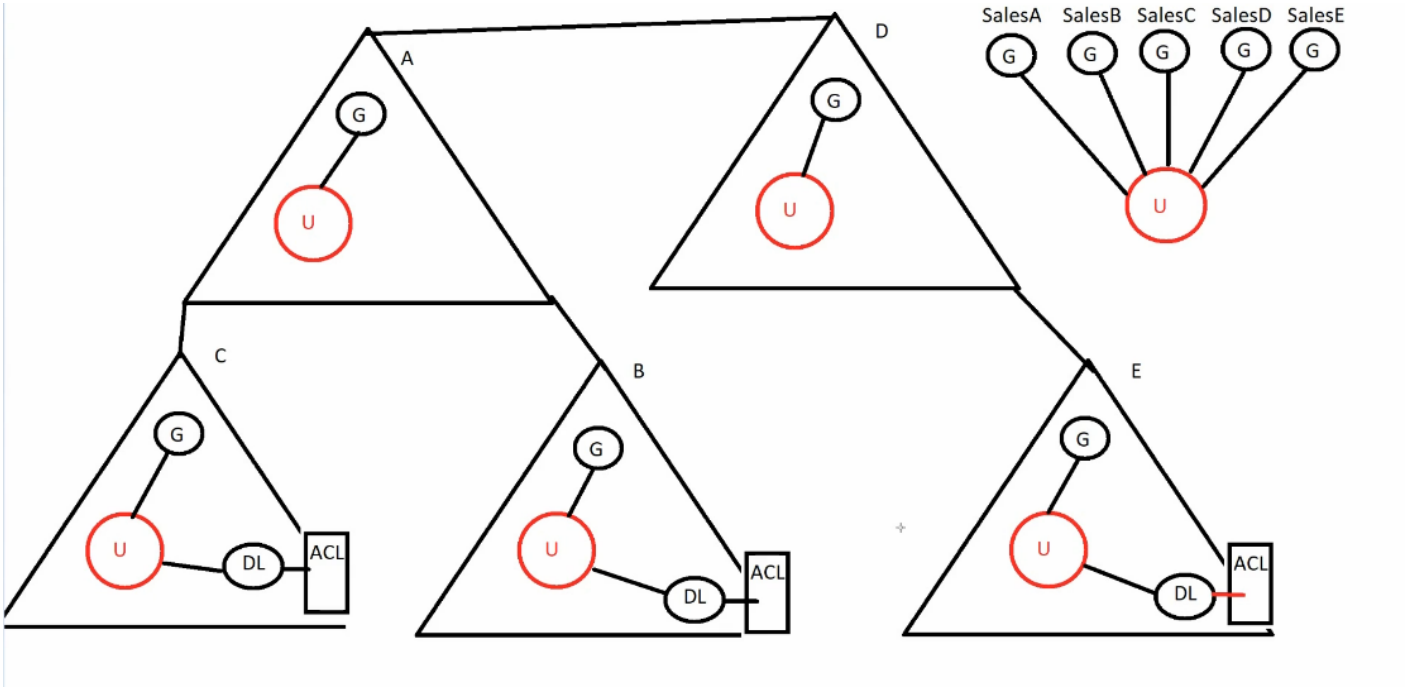
Microsoft Strategy

- Accounts
  - Global
    - Domain Local
      - Permissions



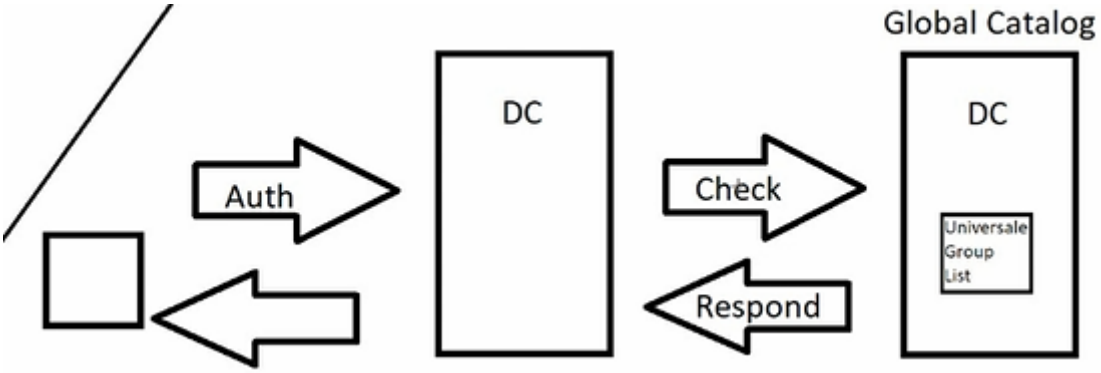
Universal Groups

*For larger organisations multiple globval groups can be linked to a single universal group, which is replicated across all domains



Universal Group Membership Caching Feature

- Global Catalog Servers contain a Universal Group List
- User Authentication occurs on D.C.s via Kerberos
- Kerberos needs to validate with the GCS to identify which groups this user is a member of (via the universal group list)



Scenario: users are finding it take a long time to log in - the global catalog server might be located in a different site to where the user and the domain controller are located

Solutions

- Make the D.C. a Global Catalog server (adds processing overhead)
- Universal Group Membership Caching
  - Every 8 hours (default) domain controller will cache the Universal Group List locally

Hybrid Identity Authentication & Entra Connect

Hybrid identity model & directory synchronisation is the most common for enterprise users

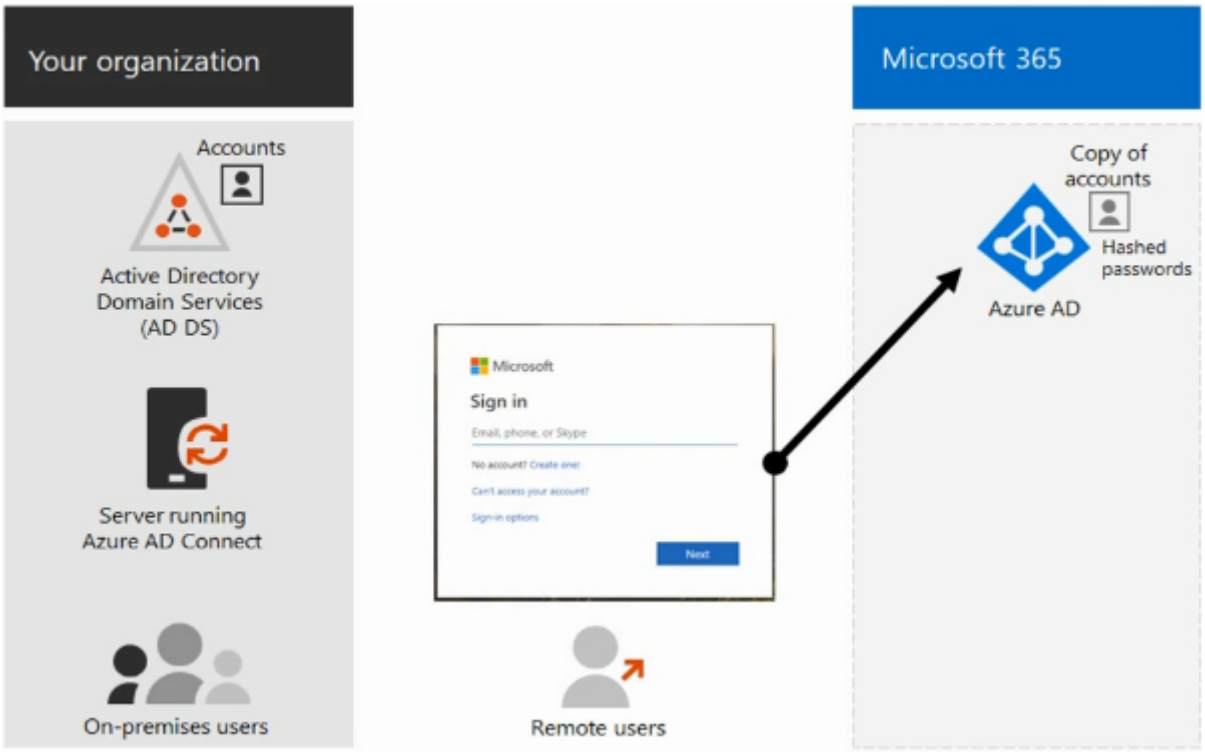
- Directory synchronisation allows updates to AD DS to synchronise with the Entra ID
- AD DS identities are synchronised with Microsoft 365 and users are managed on-prem

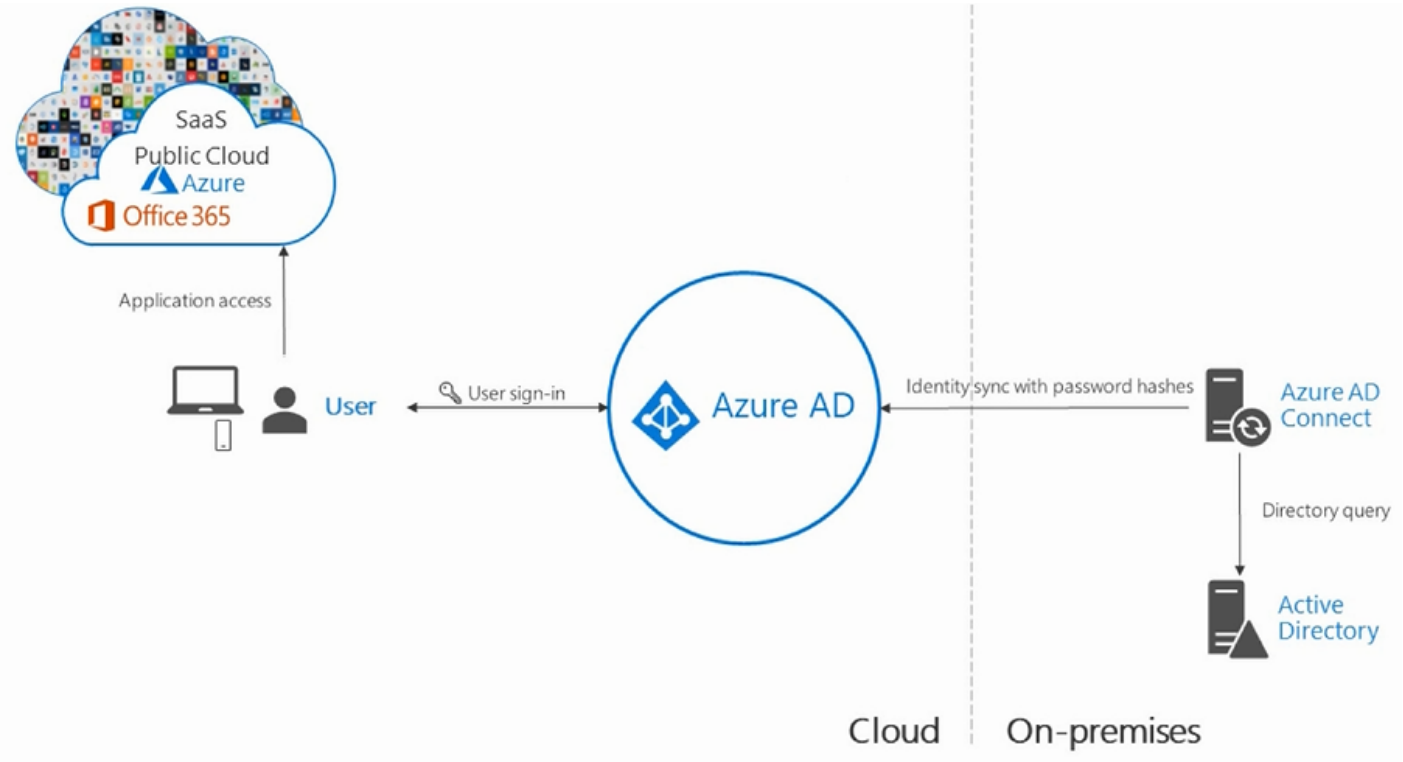
Managed Authentication

Password Hash Synchronisation (PHS) (Recommended)

Entra ID handles authentication using a locally hashed password

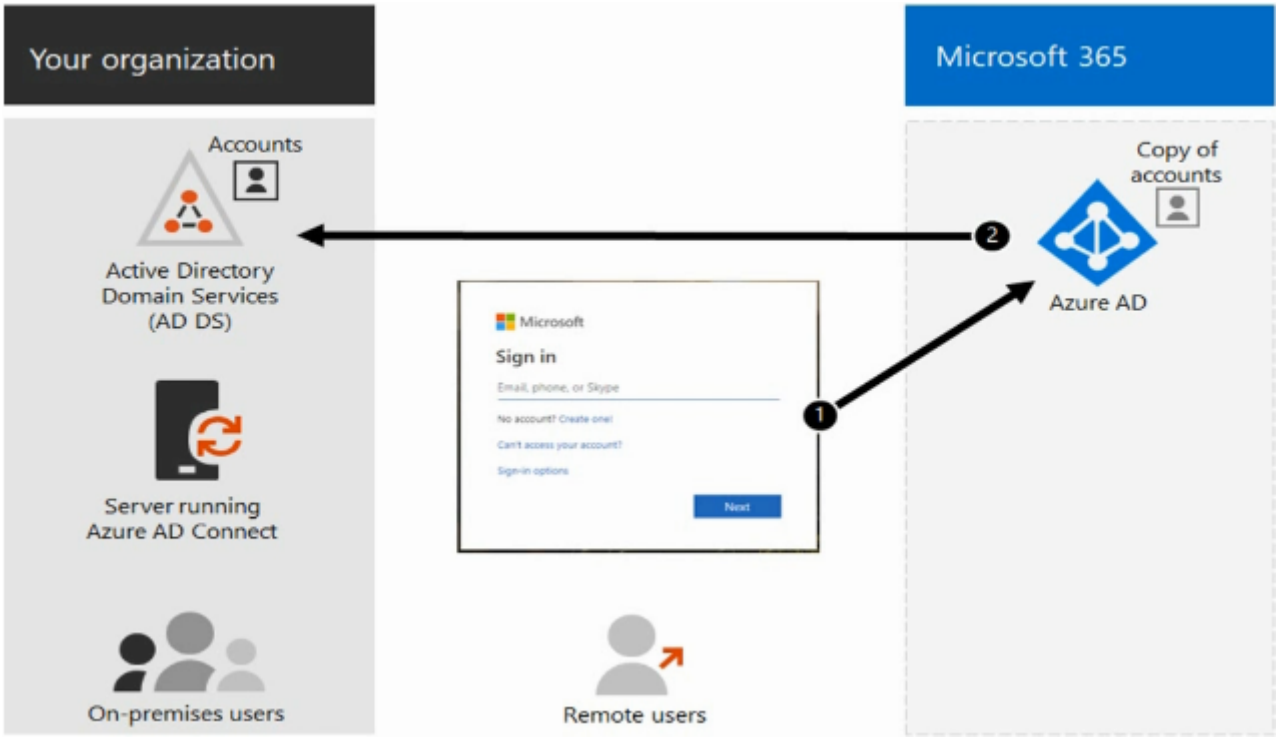
- Password hashes are synchronised out from AD DS to Entra ID so that users have the same password

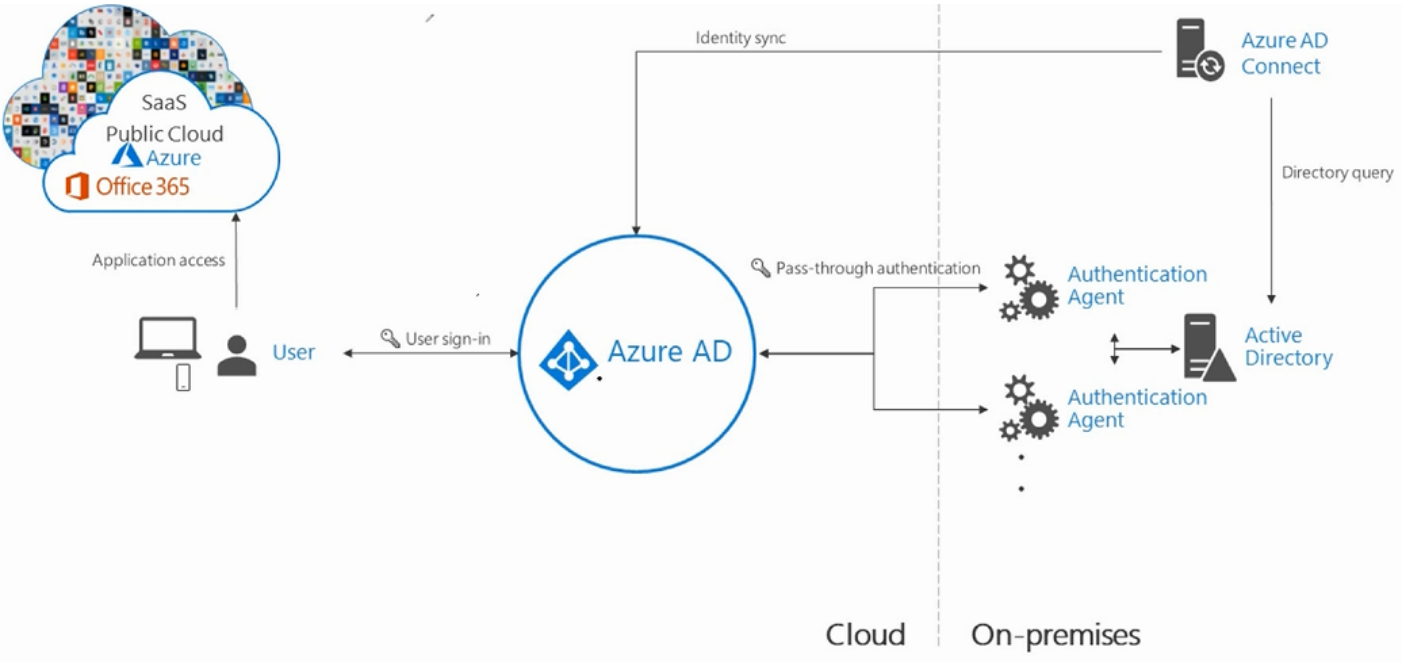




Pass-Through Authentication (PTA)

`Entra ID sends the credentials to an on-prem software agent to be authenticated by AD DS`

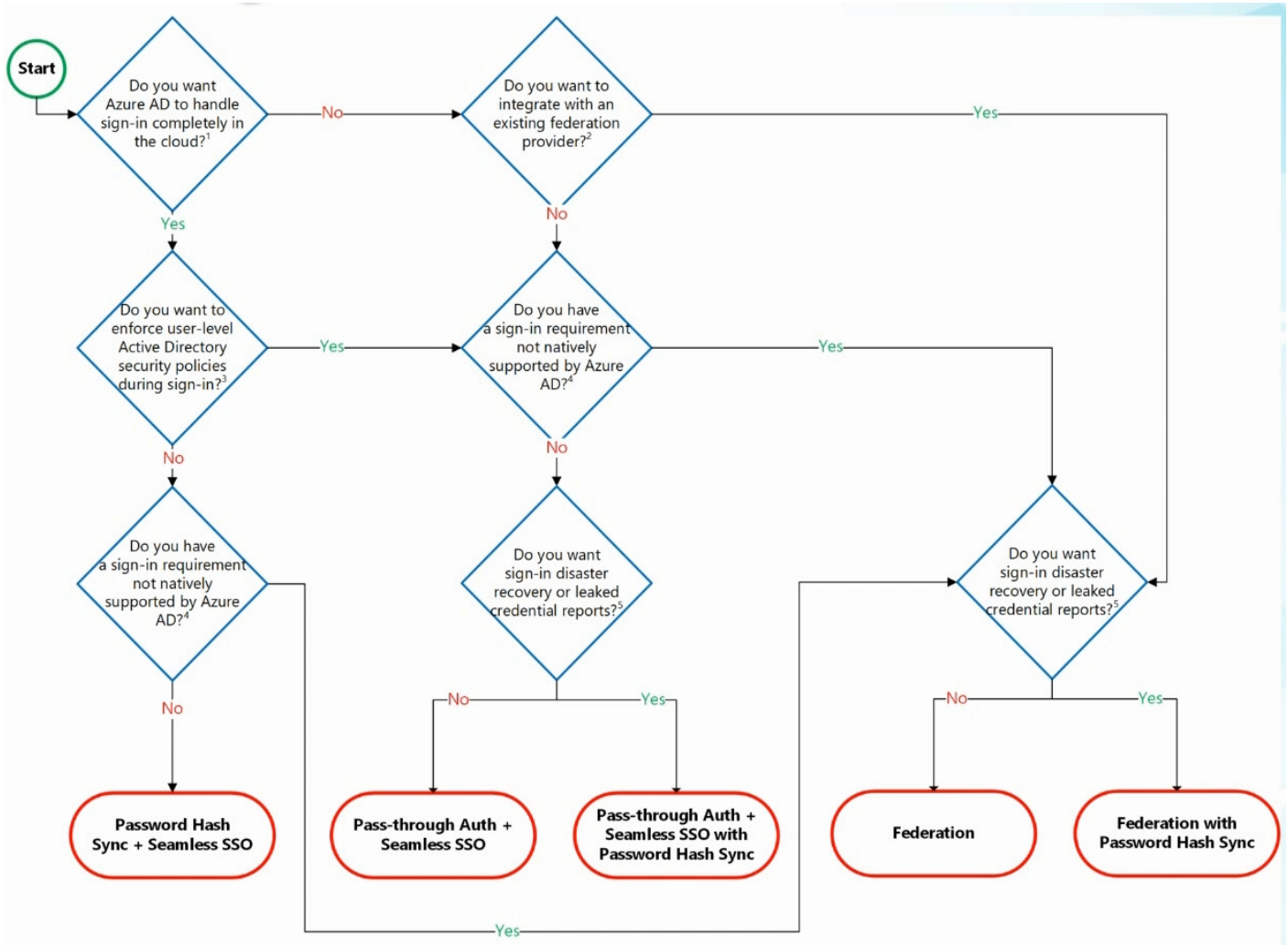




Federated Authentication

Federated Authentication - Entra ID redirects the client's authentication request to another identity provider

- Primarily for large enterprises with more complex requirements
- Users have the same password on-prem and in the cloud and do not have to sign in again to use 365
- Supports additional requirements such as smartcards or third party MFA


Start
Do you want Azure AD to handle sign-in completely in the cloud?[1]
No
Do you want to integrate with an existing federation provider?[2]
Yes
Yes
Do you want to enforce user-level Active Directory security policies during sign-in?[3]
Yes
Do you have a sign-in requirement not natively supported by Azure AD?[4]
Yes
No
No
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Do you want sign-in disaster recovery or leaked credential reports?[5]
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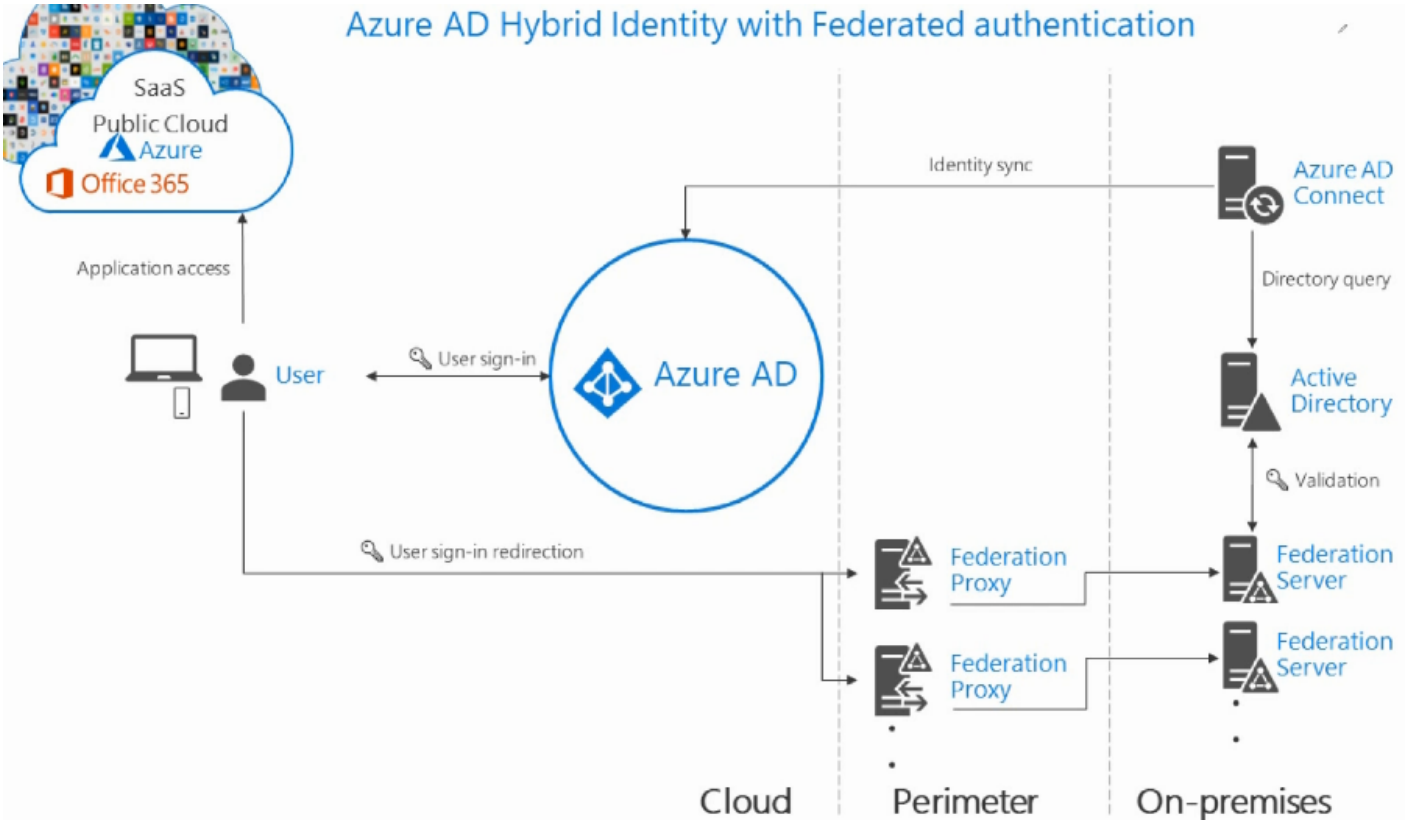
No
No
Yes
No
Yes
Password Hash Sync + Seamless SSO
Pass-through Auth + Seamless SSO
Pass-through Auth + Seamless SSO with Password Hash Sync
Federation
Federation with Password Hash Sync
Yes


Azure AD Hybrid Identity with Federated authentication
SaaS
Public Cloud
Azure
Office 365
Application access
User
User sign-in
Azure AD
Identity sync
Azure AD Connect
Directory query
Active Directory
Validation
User sign-in redirection
Federation Proxy
Federation Proxy
Federation Server
Federation Server
Cloud
Perimeter
On-premises

Group Policy

Group Policy

Policies are filtered down:

- Block inheritance - applied at a level to block all policies (except password policies) from above
- Enforced - applied at a level to overwrite below policies (ignores block inheritance)

Hyper-V

- Nested Virtualisation - Allows enabling of Hyper-V inside a virtual server to create nested virtual servers
- Enhanced session mode - Allows utilisation of local resources from host machine inside virtual machines
- Integration services
  - Operating system shutdown
  - Time synchronisation
  - Data exchange
  - Heartbeat
  - Backup
  - Guest Services
- Discrete Device Assignment - pass PCIe devices into a VM
- Resource Groups - Allow management of multiple VMs (similar to Azure RGs)