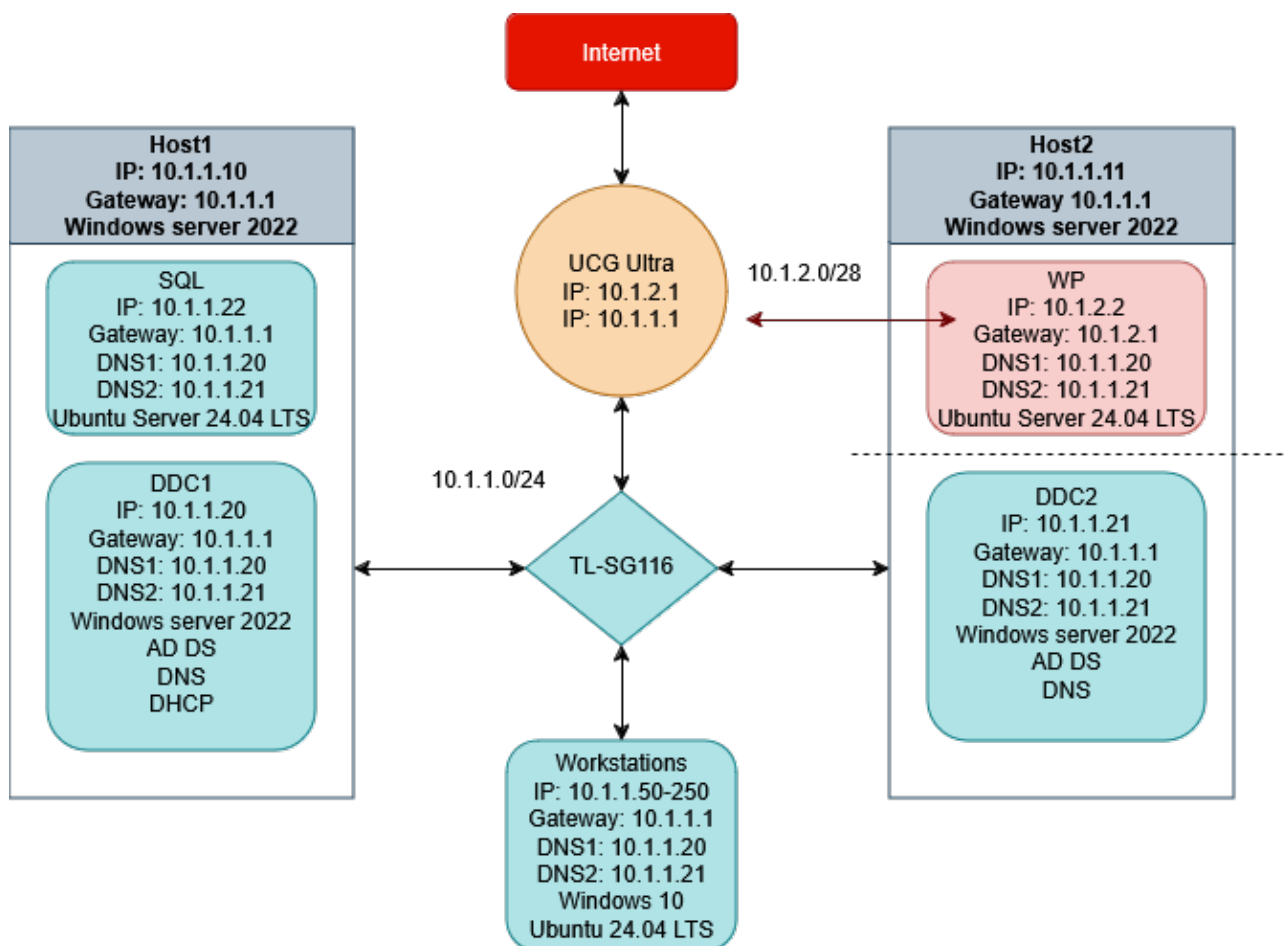




# Technical Documentation



<b>Network.....</b>	<b>2</b>
<b>Physical Servers.....</b>	<b>4</b>
<b>Virtual Servers.....</b>	<b>5</b>
<b>OU Structure.....</b>	<b>7</b>
<b>Users.....</b>	<b>8</b>
<b>Groups.....</b>	<b>8</b>
<b>GPOs.....</b>	<b>9</b>
<b>PSOs.....</b>	<b>14</b>
<b>Sysvol.....</b>	<b>14</b>
<b>Scripts.....</b>	<b>14</b>
<b>Apache2.....</b>	<b>15</b>
<b>WordPress.....</b>	<b>15</b>
<b>References.....</b>	<b>16</b>



## Network:

**Gateway:** Ubiquiti Unifi Cloud Gateway Ultra

**WAN:** ISP DHCP

**Port 1:** 10.1.1.1

**Port 2:** 10.1.2.1

**Switch:** TP-Link TL-SG116

**Firewall rules:** (Both means UDP and TCP)

10.1.1.0:

Inbound:

Allow Both/53 to any from 10.1.2.0  
 Allow Both/88 to any from 10.1.2.0  
 Allow Both/135 to any from 10.1.2.0  
 Allow Both/389 to any from 10.1.2.0  
 Allow TCP/445 to any from 10.1.2.0  
 Allow TCP/3306 to any from 10.1.2.0

- DNS  
 - Kerberos  
 - RPC Handler  
 - LDAP  
 - SMB  
 - SQL

Deny all

Outbound:

None

10.1.2.0:

Inbound:

- Allow TCP/22 to any from 10.1.1.0 - SSH
- Allow TCP/80 to any from All - HTTP
- Allow Both/49152-65535 to any from 10.1.1.0 - RPC
- Deny all

Outbound:

None

## DNS:

Forward Lookup Zone:

Zone name: dd.com

Records:

- ddc1.dd.com A 10.1.1.20
- ddc2.dd.com A 10.1.1.21
- sql.dd.com A 10.1.1.22
- wp.dd.com A 10.1.2.2

Reverse Lookup Zone:

Zone name: 1.1.10.in-addr.arpa

Records:

- 10.1.1.20 PTR ddc1.dd.com
- 10.1.1.21 PTR ddc2.dd.com
- 10.1.1.22 PTR sql.dd.com

Zone name: 2.1.10.in-addr.arpa

Records:

- 10.1.2.2 PTR wp.dd.com

## DHCP:

IPv4 Scope:

Name: DDHCP

Range: 10.1.1.50-250

Subnet mask: 255.255.255.0

Lease duration: 8h

Default Gateway: 10.1.1.1

DNS Servers:

10.1.1.20

10.1.1.21

## Physical servers:

Server 1:

**Hostname:** Host1

**Operating System:** Windows Server 2022 Standard Edition 21H2

**Specs:**

- CPU: Intel Xeon W-1350, 6c/12t 5Ghz
- RAM: 2x16 GB DDR4 ECC RAM 3200 Mhz
- HDD: 2x512GB NVME SSD (Raid 1)

**Location:** Server Room

**Network:**

IP: 10.1.1.10

Subnet mask: 255.255.255.0

Default Gateway: 10.1.1.1

DNS: 1.1.1.1, 8.8.8.8

**Hyper-V settings:**

Virtual Switches:

DD-SW:

External:

Intel 82579LM Gigabit Ethernet

Server 2:

**Hostname:** Host2

**Operating System:** Windows Server 2022 Standard Edition 21H2

**Specs:**

- CPU: Intel Xeon E-2144G, 4c/8t 4,5Ghz
- RAM: 2x16 GB DDR4 ECC RAM 2666 Mhz
- HDD: 2x256 GB SATA SSD (Raid 1)
- NIC2: TP-Link TX201

**Location:** Server Room

**Network:**

IP: 10.1.1.11

Subnet mask: 255.255.255.0

Default Gateway: 10.1.1.1

DNS: 1.1.1.1, 8.8.8.8

**Hyper-V settings:**

Virtual Switches:

DD-SW:

External:

Intel 82579LM Gigabit Ethernet

DDMZ-SW:

External:

TP-TX201

Allow management operating system to share this network adapter: False

## Virtual servers:

Domain Controller 1:

**Hostname:** DDC1

**Operating System:** Windows Server 2022 Standard Edition 21H2

**Specs:**

- 4 vCPU
- 4 GB RAM
- 60 GB Storage

**Location:** Host1 (VM)

**Network:**

IP: 10.1.1.20

Subnet mask: 255.255.255.0

Default Gateway: 10.1.1.1

DNS: 10.1.1.20, 10.1.1.21

**Roles/Features:**

- Active Directory Domain Services
- DNS Server
- DHCP Server

**Remote Desktop:** Enabled

Database:

**Hostname:** SQL

**Operating System:** Ubuntu Server 24.04 LTS

**Specs:**

- 4 vCPU
- 8 GB RAM (fixed)
- 80 GB Storage

**Location:** Host1 (VM)

**Network:**

IP: 10.1.1.22

Subnet mask: 255.255.255.0

Default Gateway: 10.1.1.1

DNS: 10.1.1.20, 10.1.1.21

**Packages:** (main packages installs dependencies)

- realmd
- krb5-user
- adsys
- openssh-server
- mariadb-server

Domain Controller 2:

**Hostname:** DDC2

**Operating System:** Windows Server 2022 Standard Edition 21H2

**Specs:**

- CPU: 4 vCPU
- RAM: 4 GB
- HDD: 60 GB

**Location:** Host2 (VM)

**Network:**

IP: 10.1.1.21

Subnet mask: 255.255.255.0

Default Gateway: 10.1.1.1

DNS: 10.1.1.20, 10.1.1.21

**Roles/Features:**

- Active Directory Domain Services
- DNS Server

**Remote Desktop:** Enabled

WordPress:

**Hostname:** WP

**Operating System:** Ubuntu Server 24.04 LTS

**Specs:**

- 4 vCPU
- 8 GB RAM
- 120 GB Storage

**Location:** Host2 (VM)

**Network:**

IP: 10.1.2.2

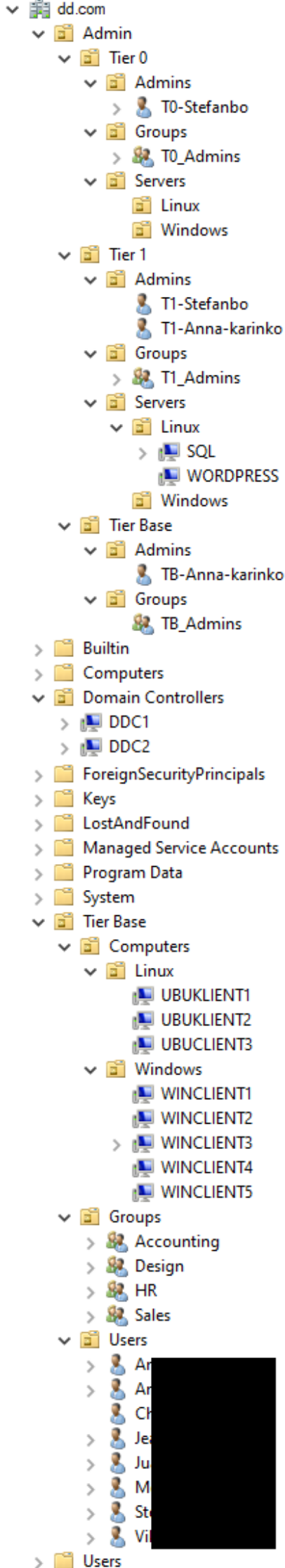
Subnet mask: 255.255.255.240

Default gateway: 10.1.2.1

DNS: 10.1.1.20, 10.1.1.21

**Packages:** (main packages installs dependencies)

- realmd
- krb5-user
- adsys
- openssh-server
- apache2
- libapache2-mod-php
- php-mysql, php-mbstring, php-ldap, php-gd, php-curl, php-imagick, php-xml, php-zip, php-intl



## OU Structure:

OU Delegations:

OU: dd.com/Tier Base

Users and groups: TB\_Admins

Tasks to Delegate:

- Create, delete and manage user accounts
- Reset user passwords and force password change at next logon
- Read all user information
- Create, delete and manage groups

OU: dd.com/Tier 0/Servers/Linux:

Block Inheritance: True

OU: dd.com/Tier 1/Servers/Linux:

Block Inheritance: True

## Users:

(These are manually created users, use the import-script to import from csv.)

T0-Stefanbo:

OU: dd.com/Admin/Tier 0/Admins

Group Memberships:

- T0\_Admins

Properties→Account:

- Account is sensitive and cannot be delegated

T1-Stefanbo:

OU: dd.com/Admin/Tier 1/Admins

Group Memberships:

- T1\_Admins

Properties→Account:

- Account is sensitive and cannot be delegated

T1-Anna-karinko:

OU: dd.com/Admin/Tier 1/Admins

Group Memberships:

- T1\_Admins

Properties→Account:

- Account is sensitive and cannot be delegated

TB-Anna-karinko:

OU: dd.com/Admin/Tier Base/Admins

Group Memberships:

- TB\_Admins

Properties→Account:

- Account is sensitive and cannot be delegated

WP-Read:

OU: dd.com/Managed Service Accounts

## Groups:

Global Groups:

T0_Admins	- Manage AD, domain controllers and T0 servers.
T1_Admins	- Manage T1 servers.
TB_Admins	- Manage users and workstations.
Accounting	- Manage financial records.
Design	- Designing sites.
Sales	- Promotion and sales.
HR	- Manage employees.



## GPOs:

Ubuntu ADMX-files: <https://github.com/ubuntu/adsys/tree/main/policies/Ubuntu/all>

### T0 Linux Access Rights:

OU: dd.com/Admin/Tier 0/Servers/Linux

#### Settings:

Windows Settings/Security Settings/Local Policies/User Rights/Allow log on locally:

BUILTIN/Administrators

DD/Domain Admins

Windows Settings/Security Settings/Local Policies/User Rights/Allow log on terminal serv.:

BUILTIN/Administrators

DD/Domain Admins

Administrative Templates/Ubuntu/Client Management/Privilege Authorization:

Allow local administrators: Disabled

Client administrators: [%Domain Admins@dd.com](#)

Administrative Templates/Ubuntu/Client Management/Computer Scripts:

Startup Scripts: Enabled

t0-polkit-1.sh

### T0 Restricted Groups:

OU: dd.com/Admin/Tier 0/Servers/Windows

#### Settings:

Windows Settings/Security Settings/Restricted Groups:

BUILTIN/Administrators

Members:

DD/Domain Admins

### T1 Linux Access Rights:

OU: dd.com/Admin/Tier 1/Servers/Linux

#### Settings:

Windows Settings/Security Settings/Local Policies/User Rights/Allow log on locally:

BUILTIN/Administrators

DD/T1\_Admins

Windows Settings/Security Settings/Local Policies/User Rights/Allow log on terminal serv.:

BUILTIN/Administrators

DD/T1\_Admins

Administrative Templates/Ubuntu/Client Management/Privilege Authorization:

Allow local administrators: Disabled

Client administrators: [%T1 Admins@dd.com](#)

Administrative Templates/Ubuntu/Client Management/Computer Scripts:

Startup Scripts: Enabled

t1-polkit-1.sh

#### T1 Restricted Groups:

OU: dd.com/Admin/Tier 1/Servers/Windows

##### Settings:

Windows Settings/Security Settings/Restricted Groups:

BUILTIN/Administrators

##### Members:

DD/T1\_Admins

#### TB Computers Access Rights:

OU: dd.com/Tier Base/Computers

##### Settings:

Windows Settings/Security Settings/Local Policies/User Rights/Deny log on locally

DD/T0\_Admins

DD/T1\_Admins

DD/Domain Admins

DD/Enterprise Admins

Windows Settings/Security Settings/Local Policies/User Rights/Deny log on terminal serv.

DD/T0\_Admins

DD/T1\_Admins

DD/Domain Admins

DD/Enterprise Admins

Windows Settings—Security Settings—Local Policies—User Rights—Deny log on locally

DD/T0\_Admins

DD/T1\_Admins

DD/Domain Admins

DD/Enterprise Admins

Windows Settings/Security Settings/Local Policies/User Rights/Deny log on as a service

DD/T0\_Admins

DD/T1\_Admins

DD/Domain Admins

DD/Enterprise Admins

#### TB Restricted Groups:

OU: dd.com/Admin/Tier Base/Computers/Windows

##### Settings:

Windows Settings/Security Settings/Restricted Groups:

BUILTIN/Administrators

##### Members:

DD/TB\_Admins

#### TB Linux Access Rights:

OU: dd.com/Tier Base/Computers/Linux

##### Settings:

Administrative Templates/Ubuntu/Client Management/Privilege Authorization:

Allow local administrators: Disabled

Client administrators: [%TB Admins@dd.com](#)

Administrative Templates/Ubuntu/Client Management/Computer Scripts:

Startup Scripts: Enabled

tb-polkit-1.sh

#### Default Domain Policy:

OU: dd.com

##### Settings:

Policies/Windows Settings/Security Settings/Account Policies/Password Policy:

Enforce password history: Not Defined

Maximum password age: Not Defined

Minimum password age: Not Defined

Minimum password length: Not Defined

Password must meet complexity requirements: Not Defined

Store password using reversible encryption: Not Defined

Beyond these handmade GPOs Windows Server 2022 Security Baselines are also installed.

<https://www.microsoft.com/en-us/download/details.aspx?id=55319>

They are linked according to:

MSFT Windows Server 2022 – Defender Antivirus

OU: dd.com

MSFT Windows Server 2022 – Member Server

OU: dd.com/Tier 0/Servers/Windows

OU: dd.com/Tier 1/Servers/Windows

MSFT Windows Server 2022 – Member Server Credential Guard

OU: dd.com/Tier 0/Servers/Windows

OU: dd.com/Tier 1/Servers/Windows

MSFT Windows Server 2022 – Domain Controller

OU: dd.com/Domain Controllers

MSFT Windows Server 2022 – Domain Controller Virtualization Based Security

OU: dd.com/Domain Controllers

MSFT Windows Server 2022 – Domain Security

OU: dd.com/Domain Controllers

MSFT Windows 10 22H2 – Computer

OU: dd.com/Tier Base/Computers/Windows

MSFT Windows 10 22H2 – User

OU: dd.com/Admin/Tier 0/Admins

OU: dd.com/Admin/Tier 1/Admins

OU: dd.com/Admin/Tier Base/Admins

OU: dd.com/Tier Base/Users

- ▼ Forest: dd.com
  - ▼ Domains
    - ▼ dd.com
      - Default Domain Policy
      - MSFT Windows Server 2022 - Defender Antivirus
      - ▼ Admin
        - ▼ Tier 0
          - ▼ Admins
            - MSFT Windows 10 22H2 - User
          - Groups
          - ▼ Servers
            - ▼ Linux
              - T0 Linux Access Rights
            - ▼ Windows
              - MSFT Windows Server 2022 - Member Server
              - MSFT Windows Server 2022 - Member Server Credential Guard
              - T0 Restricted Groups
        - ▼ Tier 1
          - ▼ Admins
            - MSFT Windows 10 22H2 - User
          - Groups
          - ▼ Servers
            - ▼ Linux
              - T1 Linux Access Rights
            - ▼ Windows
              - MSFT Windows Server 2022 - Member Server
              - MSFT Windows Server 2022 - Member Server Credential Guard
              - T1 Restricted Groups
        - ▼ Tier Base
          - ▼ Admins
            - MSFT Windows 10 22H2 - User
          - Groups
      - ▼ Domain Controllers
        - Default Domain Controllers Policy
        - MSFT Windows Server 2022 - Domain Controller
        - MSFT Windows Server 2022 - Domain Controller Virtualization Based Security
        - MSFT Windows Server 2022 - Domain Security
        - T0 Restricted Groups
      - ▼ Tier Base
        - ▼ Computers
          - TB Computers Access Rights
        - ▼ Linux
          - TB Linux Access Rights
        - ▼ Windows
          - MSFT Windows 10 22H2 - Computer
          - TB Restricted Groups
        - Groups
      - ▼ Users
        - MSFT Windows 10 22H2 - User
    - > Group Policy Objects

## PSO:

Admin Password Policy:

Precedence: 1

Enforce minimum password length: 16 characters

Enforce maximum password age: 900

Enforce account lockout policy:

Number of failed logon attempts allowed: 5

Reset failed logon attempts count after (mins): 30

Account will be locked out:

For a duration of (mins): 30

Directly applies to:

Domain Admins

TO\_Admis

T1\_Admis

TB\_Admis

## Sysvol:

To deploy scripts through GPOs, a folder named Ubuntu needs to be created inside the domains SYSVOL directory. Inside this folder, a scripts directory will be created along with a GPO.ini file. The GPO.ini contains:

[General]

Version=15

displayName=UbuntuAssetsDirectory

Scripts intended for execution via GPOs will be placed in the scripts folder. Each time a script is modified, the version number in the GPO.ini file must be incremented.

## Scripts:

### importUsers.ps1:

Imports users based on a predefined template format, which includes the following fields:

**First Name, Surname, Department, Phone, and City.**

For each unique department listed in the import file, a corresponding group is created within the **Groups OU** under **Tier Base**, and the relevant users are added to these groups. If a user belongs to multiple departments (separated by a whitespace) in the CSV file, they will be added to all the applicable groups.

Users sAMAccountName is calculated by their first name and first two letters in their surname. The UPN becomes the sAMAccountName@dd.com.

Each user is assigned a unique, randomized 14-character password, which must be changed on their first login. The user information, along with their generated password, is saved back to a new CSV file named userpass.csv for easy distribution.

## linuxJoin.sh:

This script joins a computer to a domain using realmd. It accepts two key parameters:

- domain Specifies domain name.
- server Installs OpenSSH server for management.

Alongside domain integration, the script also configures the system timezone to GMT+1 and ensures the NTP server matches the one used by Windows. To enable features like GPO integration, the script prompts for an Ubuntu Pro key.

## t%-polkit-1.sh:

Create a Polkit rule on Linux clients that enables GNOME to authenticate administrative actions using an AD admin account specific to the clients tier.

## Apache2:

HTTPS enabled with a self-signed certificate.  
Redirection from HTTP to HTTPS enabled.

## WordPress:

Settings:

Permalinks:

Permalink structure: Post name

Next Active Directory Integration:

Configuration:

Environment:

Domain controllers:

- DDC1.dd.com
- DDC2.dd.com

Use encryption: STARTTLS

Base DN: dc=domain,dc=nu

Username: [WP-Read@dd.com](mailto:WP-Read@dd.com)

Password: <password>

User:

Account Suffix: @dd.com

Prevent email change: True

Display name: CN

## wordpress.conf

```
<VirtualHost _default_:443>
    SSLEngine On
    SSLCertificateFile /etc/apache2/certs/wp-cert.pem
    SSLCertificateKeyFile /etc/apache2/certs/wp-key.pem
    DocumentRoot /var/www/wordpress
    <Directory /var/www/wordpress>
        Options FollowSymLinks
        AllowOverride Limit Options FileInfo
        DirectoryIndex index.php
        Require all granted
    </Directory>
    <Directory /var/www/wordpress/wp-content>
        Options FollowSymLinks
        Require all granted
    </Directory>
</VirtualHost>

<VirtualHost *:80>
    Redirect 301 / https://wordpress.dd.com
</VirtualHost>
```

Permissions:

Authorize by group memberships: True

Authorization groups:

- T1\_Admins
- Design
- Sales

Role equivalent groups:

- T1\_Admins → administrator
- Design → editor
- Sales → author

## References:

[Integrating RHEL systems directly with Windows Active Directory](#)

[System-Level Authentication Guide](#)

[ADSys Documentation](#)

[Active Directory Tiering](#)

[Domain Join Ubuntu 22.04 to Active Directory](#)

[Install and configure WordPress](#)

[WP-CLI](#)

[polkit](#)

[Next Active Directory Integration](#)