



UNIVERSITY OF SRI JAYEWARDENEPURA

Faculty of Technology

Department of Information and Communication Technology

ITS 3102 / ITN 3102 -System Administration

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BUSINESS SCENARIO: A

Current cost calculation



Contact your AWS representative: [Contact Sales](#)

Export Date: 02/03/2025

Language: English

[Estimate url](#)

Estimate summary

Upfront cost	Monthly cost	Total 12 months cost
0.00 USD	14,257.86 USD	171,094.32 USD Includes upfront cost

Detailed Estimate

Name	Group	Region	Upfront cost	Monthly cost
Amazon EC2	-	US East (N. Virginia)	0.00 USD	2,146.20 USD
Status	-			
Description:	-			
Config summary	Tenancy (Shared Instances), Operating system (Linux), Workload (Consistent, Number of instances: 60), Advance EC2 instance (m5.large), Pricing strategy (Compute Savings Plans 3yr No Upfront), Enable monitoring (disabled), DT Inbound: Not selected (0 TB per month), DT Outbound: Not selected (0 TB per month), DT Intra-Region: (0 TB per month)			
Name	Group	Region	Upfront cost	Monthly cost
Amazon EC2	-	US East (Ohio)	0.00 USD	2,124.30 USD
Status	-			
Description:	-			
Config summary	Tenancy (Shared Instances), Operating system (Linux), Workload (Consistent, Number of instances: 30), Advance EC2 instance (m5.xlarge), Pricing strategy (Compute Savings Plans 3yr No Upfront), Enable monitoring (disabled), DT Inbound: Not selected (0 TB per month), DT Outbound: Not selected (0 TB per month), DT Intra-Region: (0 TB per month)			
Name	Group	Region	Upfront cost	Monthly cost
Amazon EC2	-	US West (N. California)	0.00 USD	2,768.16 USD
Status	-			
Description:	-			
Config summary	Tenancy (Shared Instances), Operating system (Linux), Workload (Consistent, Number of instances: 40), Advance EC2 instance (c7g.xlarge), Pricing strategy (Compute Savings Plans 3yr No Upfront), Enable monitoring (disabled), DT Inbound: Not selected (0 TB per month), DT Outbound: Not selected (0 TB per month), DT Intra-Region: (0 TB per month)			
Name	Group	Region	Upfront cost	Monthly cost
Amazon Simple Storage Service (S3)	-	US East (N. Virginia)	0.00 USD	2,304.00 USD
Status	-			
Description:	-			
Config summary	S3 Standard storage (100 TB per month)			
Name	Group	Region	Upfront cost	Monthly cost
Amazon Simple Storage Service (S3)	-	US East (Ohio)	0.00 USD	2,304.00 USD
Status	-			
Description:	-			
Config summary	S3 Standard storage (100 TB per month)			
Name	Group	Region	Upfront cost	Monthly cost
Amazon Simple Storage Service (S3)	-	US West (N. California)	0.00 USD	2,611.20 USD
Status	-			
Description:	-			
Config summary	S3 Standard storage (100 TB per month)			

Acknowledgement

AWS Pricing Calculator provides only an estimate of your AWS fees and doesn't include any taxes that might apply. Your actual fees depend on a variety of factors, including your actual usage of AWS services. [Learn more](#)

- Assumptions → we assume that S3 service is used for each and every region separately and it is 100 TB per month.

Proposed solution



Contact your AWS representative: [Contact Sales](#)

Export Date: 02/03/2025

Language: English

[Estimate url](#)

Estimate summary

Upfront cost	Monthly cost	Total 12 months cost
0.00 USD	5,923.44 USD	71,081.28 USD Includes upfront cost

Detailed Estimate

Name	Group	Region	Upfront cost	Monthly cost
Amazon EC2	-	US East (N. Virginia)	0.00 USD	2,132.62 USD
Status	-			
Description:	-			
Config summary	Tenancy (Shared Instances), Operating system (Linux), Workload (Consistent, Number of instances: 60), Advance EC2 instance (m6i.large), Pricing strategy (Compute Savings Plans 3yr No Upfront), Enable monitoring (disabled), DT Inbound: Not selected (0 TB per month), DT Outbound: Not selected (0 TB per month), DT Intra-Region: (0 TB per month)			
Name	Group	Region	Upfront cost	Monthly cost
Amazon EC2	-	US West (N. California)	0.00 USD	1,591.69 USD
Status	-			
Description:	-			
Config summary	Tenancy (Shared Instances), Operating system (Linux), Workload (Consistent, Number of instances: 23), Advance EC2 instance (c7g.xlarge), Pricing strategy (Compute Savings Plans 3yr No Upfront), Enable monitoring (disabled), DT Inbound: Not selected (0 TB per month), DT Outbound: Not selected (0 TB per month), DT Intra-Region: (0 TB per month)			
Name	Group	Region	Upfront cost	Monthly cost
Amazon Simple Storage Service (S3)	-	US West (N. California)	0.00 USD	1,192.14 USD
Status	-			
Description:	-			
Config summary	S3 Standard storage (20 TB per month) S3 INT Average Object Size (16 MB), Percentage of Storage in INT-Frequent Access Tier (1), S3 INT storage (20 TB per month) S3 Glacier Deep Archive Average Object Size (16 MB), S3 Glacier Deep Archive storage (60 TB per month)			
Name	Group	Region	Upfront cost	Monthly cost
Amazon Simple Storage Service (S3)	-	US East (N. Virginia)	0.00 USD	1,006.99 USD
Status	-			
Description:	-			
Config summary	S3 Standard storage (20 TB per month) S3 INT Average Object Size (16 MB), Percentage of Storage in INT-Frequent Access Tier (1), S3 INT storage (20 TB per month) S3 Glacier Deep Archive Average Object Size (16 MB), S3 Glacier Deep Archive storage (60 TB per month)			

Acknowledgement

AWS Pricing Calculator provides only an estimate of your AWS fees and doesn't include any taxes that might apply. Your actual fees depend on a variety of factors, including your actual usage of AWS services. [Learn more](#)

Availability zone	Proposed number of servers	Proposed instance type	Expected cost saving	justification
Us-east-1	60	M6i.large	(2,146.20+ 2,124.30) - 2,132.62 USD = 2,137.88 USD	<p>Improved Performance and Efficiency: The shift to M6i.large instances provides better price/performance than the previous M5 instances.</p> <p>15% CPU Efficiency Improvement: The new setup achieves lower CPU utilization (71.4%) compared to the previous 84%, meaning better resource utilization.</p> <p>No Increase in Server Count: Despite improved efficiency, the number of servers remains the same, ensuring sufficient capacity for future growth.</p>
Us-east-2	removed	removed	removed	<p>Underutilized resources (8% CPU utilization) in the previous setup, making these servers inefficient.</p> <p>Cost savings by eliminating unnecessary servers and consolidating</p>

				<p>workloads into more efficient zones.</p> <p>Simplifies infrastructure management by removing redundant instances.</p>
Us-west-1	23	C7g.xlarge	<p>2,768.16- 1,591.69 USD = 1,176.47 USD</p>	<p>Right-Sizing Compute Resources: The number of servers is reduced from 40 to 23, while still maintaining workload capacity.</p> <p>Better CPU Utilization: The CPU utilization increases from 40% to 69.5%, ensuring resources are used efficiently.</p> <p>Efficient Instance Type: Using C7g.xlarge instances optimizes performance for the given workloads.</p>

us-east-1 (Combined us-east-2 with us-east-1)

- ✓ Current compute capacity in us-east-1 →
 - Number of servers :- 60
 - CPU utilization with 100 customers - 80%
 - CPU utilization with 105 customers - 84%
 - Instance type - m5.large
 - vCPUs per instance – 2
 - No of vCPUs – $60 \times 2 = 120$
 - Total workload = $84\% \times 120 = 100.8$ vCPU

- ✓ Proposed setup →

- Instance type – m6i.large (better price/performance than M5. M6i.large improves CPU efficiency)
 - Number of servers – 60
 - vCPUs per server – 2
 - total vCPUs – $2 \times 60 = 120$ vCPUs
 - CPU utilization is 15% efficient than m5.large
 - Effective vCPU workload reduction = $100.8 \times (1 - 0.15)$

$$= 100.8 \times 0.85$$

$$= \underline{\underline{85.68}} \text{ vCPUs}$$

- New CPU utilization = $(85.68 / 120) \times 100$

$$= \underline{\underline{71.4\%}}$$

us-west-1

- ✓ Current compute capacity in us-west-1 →
 - Number of servers - 40
 - CPU utilization with 68 customers - 40%
 - Instance type – c7g.xlarge
 - vCPUs per instance – 2
 - No of vCPUs – $40 \times 2 = 80$ vCPUs
 - Total workload – $40\% \times 80 = 32$ vCPUs
- ✓ Proposed setup →
 - Instance type – c7g.xlarge
 - Number of servers – 23
 - vCPUs per server – 4
 - total vCPUs – $23 \times 4 = 92$ vCPUs
 - New CPU utilization = $(32/92) \times 100 = 34.8%$

$$= \underline{69.5\%}$$

According to the above calculations,

Expected cost reduction **per month** = $14,257.86 - 5,923.44$ USD
= 8,334.42 USD

Expected cost reduction **per year** = $171,094.32 - 71,081.28$ USD
= 100,013.04 USD

S3 optimization

We had initially assumed that all **100 TB of data a month** was kept in Amazon S3 Standard with high availability and durability but high costs. That created inefficiency in cost management since infrequently accessed data was kept in the most expensive tiers of storage. However, after using an optimized strategy of storage, distribution of data into multiple storage classes resulted in cost savings along with improved performance.

With the new approach, **20 TB of frequently accessed data will be stored in S3 Standard**, where high performance for active workloads will be guaranteed. **The rest of the data will be maintained using S3 Glacier Deep Archive**, which offers a storage class for 60 TB of rarely accessed data. In addition, Glacier Deep Archive has up to 95% lower cost compared with S3 standard. Additionally, 20 TB of data is used with **dynamic access via S3 Intelligent Tiering**. AWS will automatically move data between tiers on their own when usage decreases, without interference. This way, the data will always be in the most cost-effective tier, optimizing storage costs while maintaining accessibility.

The benefits of such an optimized storage model are straightforward, **cost savings by moving less frequently accessed data to the Glacier Deep Archive and taking advantage of automated tiering in S3 Intelligent Tiering**. For performance, the S3 Standard tier offers fast access for frequently used data, whereas Glacier Deep Archive stores it at minimal cost over the long term. Finally, the solution provides scalability and flexibility in case of changes to data access patterns without involving any complicated management that would compromise AWS standards for high availability and durability.

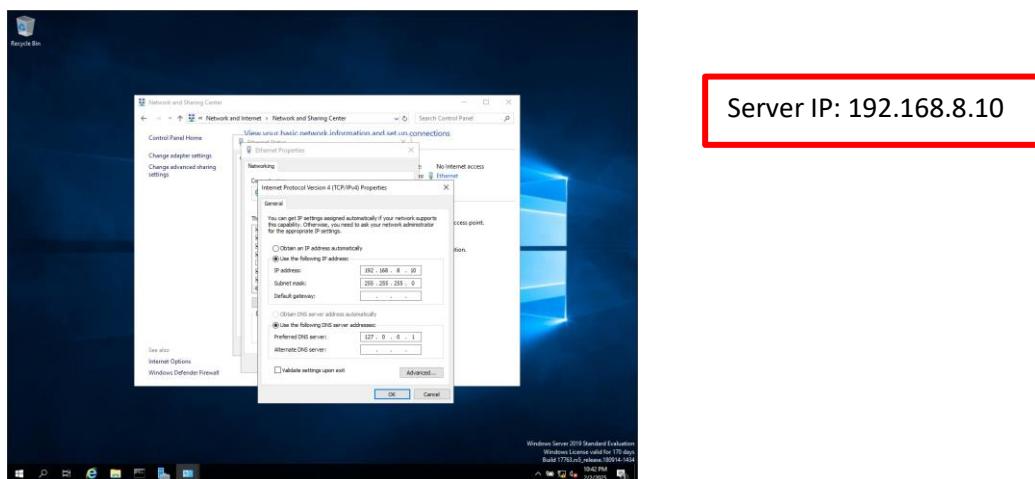
It moved from a single-tier S3 Standard to a multilevel structure, comprising S3 Standard, S3 Glacier Deep Archive, and S3 Intelligent Tiering. This has enabled huge cost savings on storage. Thus, it creates a fine balance between cost efficiency, performance, and accessibility in an optimized way for cloud-based data storage management.

BUSINESS SCENARIO: B

- Domain implementation

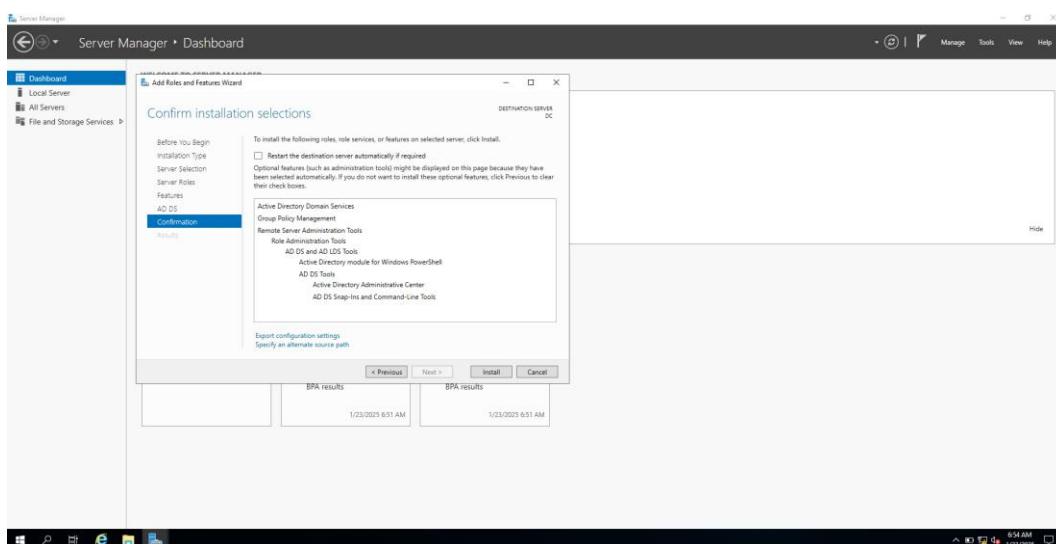
- We are setting up Windows Server 2019 to act as a Domain Controller. The Domain Controller is like a "boss" of all user accounts in company (usjpsolutions.lk). It's responsible for managing users, setting password policies, and giving users access to computers in the domain.

- Adding static IP address for server.

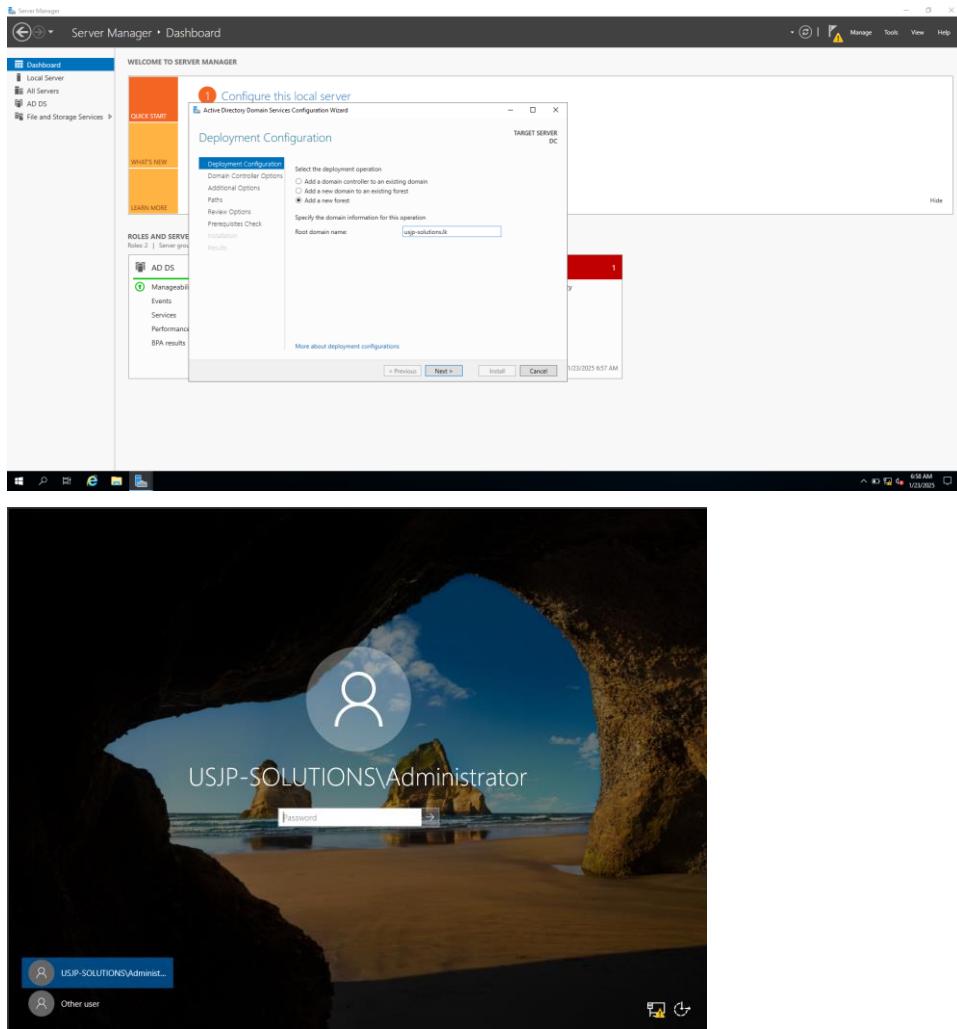


Server IP: 192.168.8.10

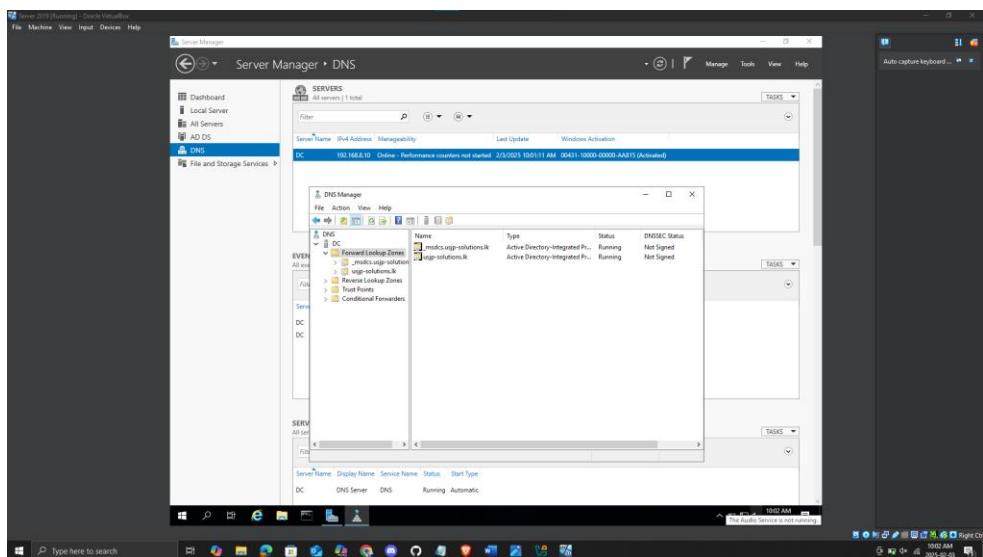
- Active Directory installed on Windows Server.



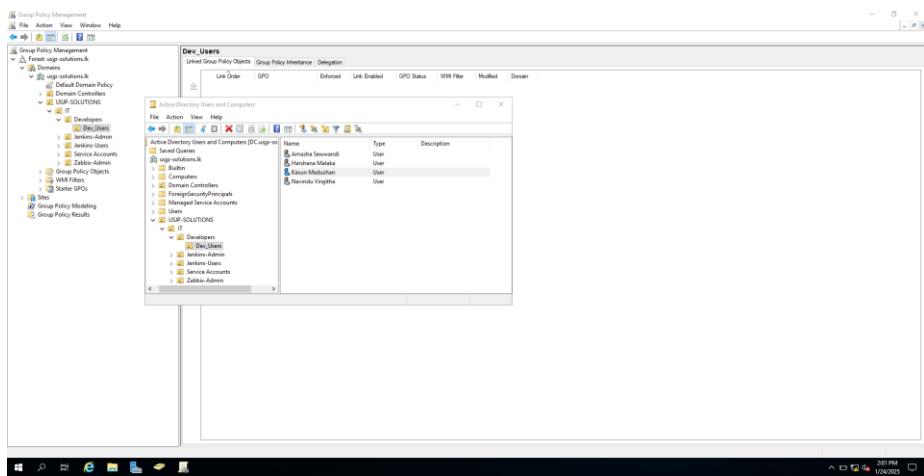
- Setting up domain name usjp-solutions.lk.



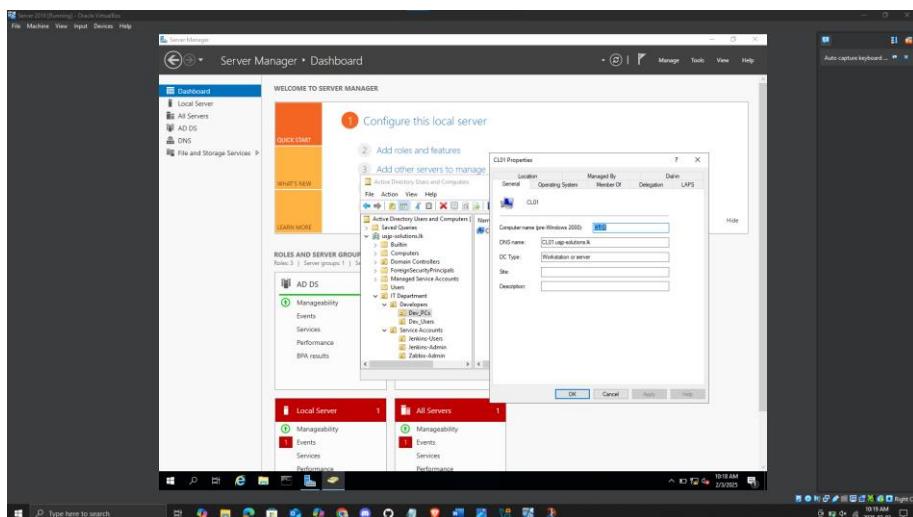
- DNS setup for domain name resolution.



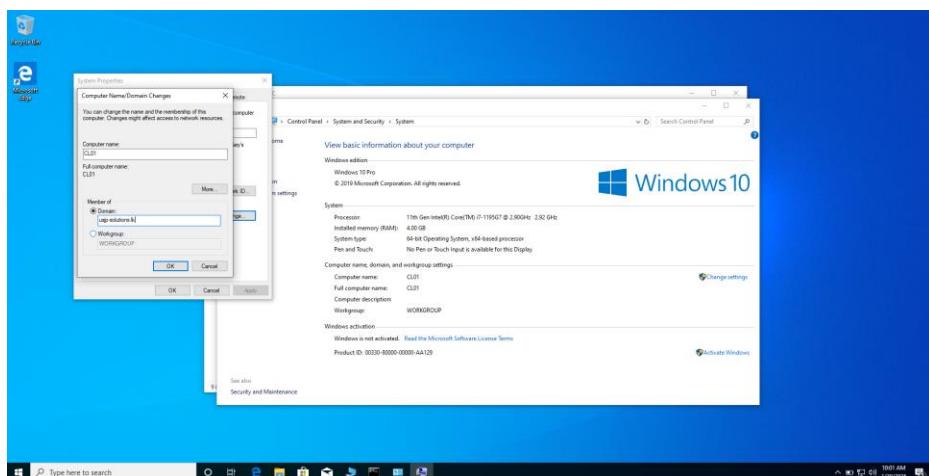
- Create Organization Units and adding Developer users with logon names.



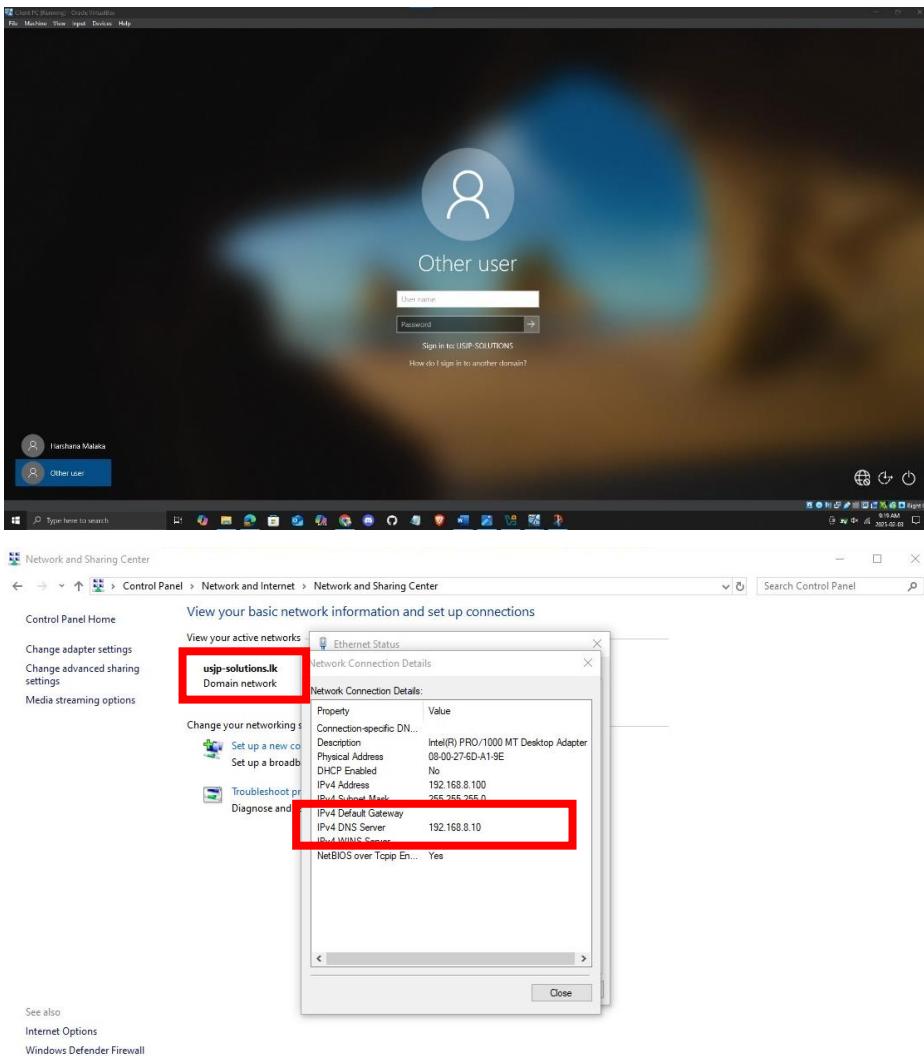
- Add a new Developer PC with Client PC name.



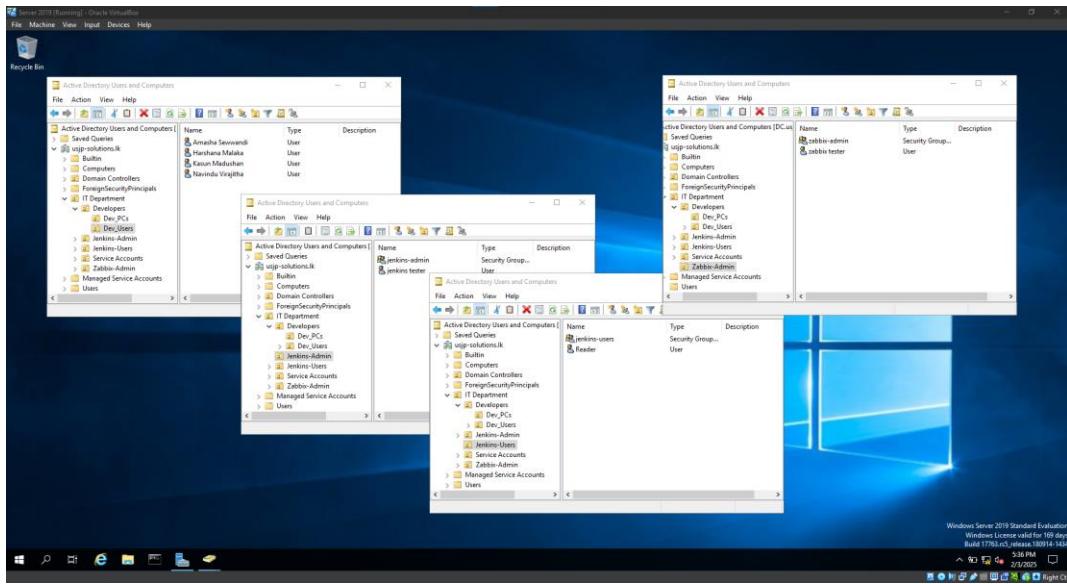
- Join developer PC to the domain.



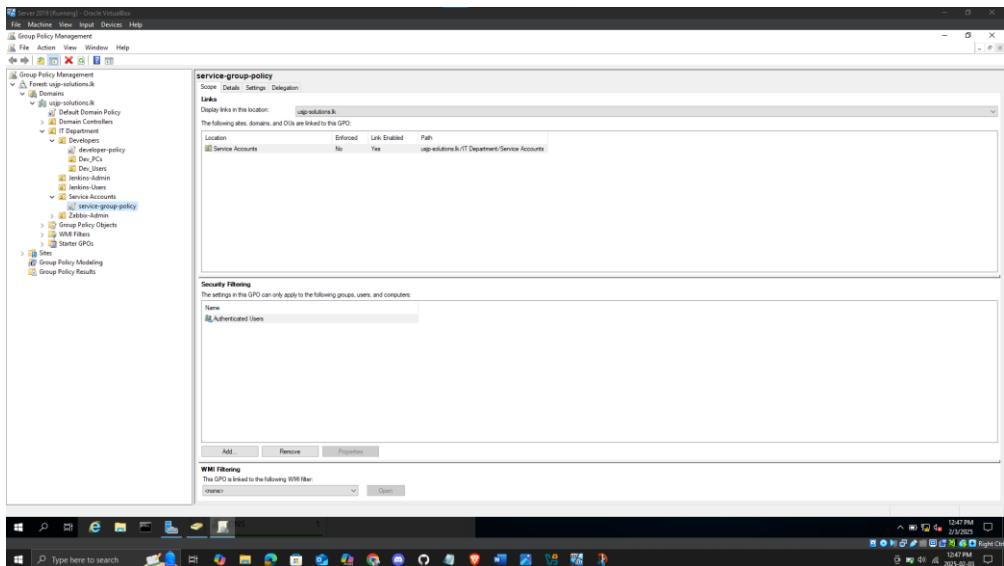
- Developer PC successfully joined the domain.



- Group Policy and User account setup
 - Configure policies for password expiration, wallpaper, browser title, and service account restrictions to enforce security, branding, and access control within the domain.
- Create separated Jenkins-Users, Jenkins-Admin and Zabbix-Admin usergroups in own Organizational Units.

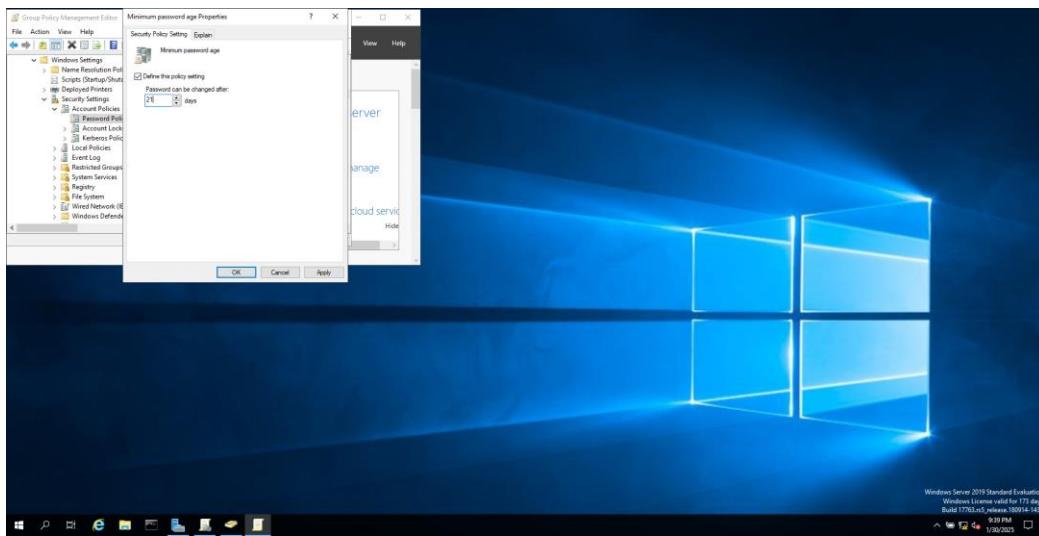


- Adding developer policy and service-group policy.

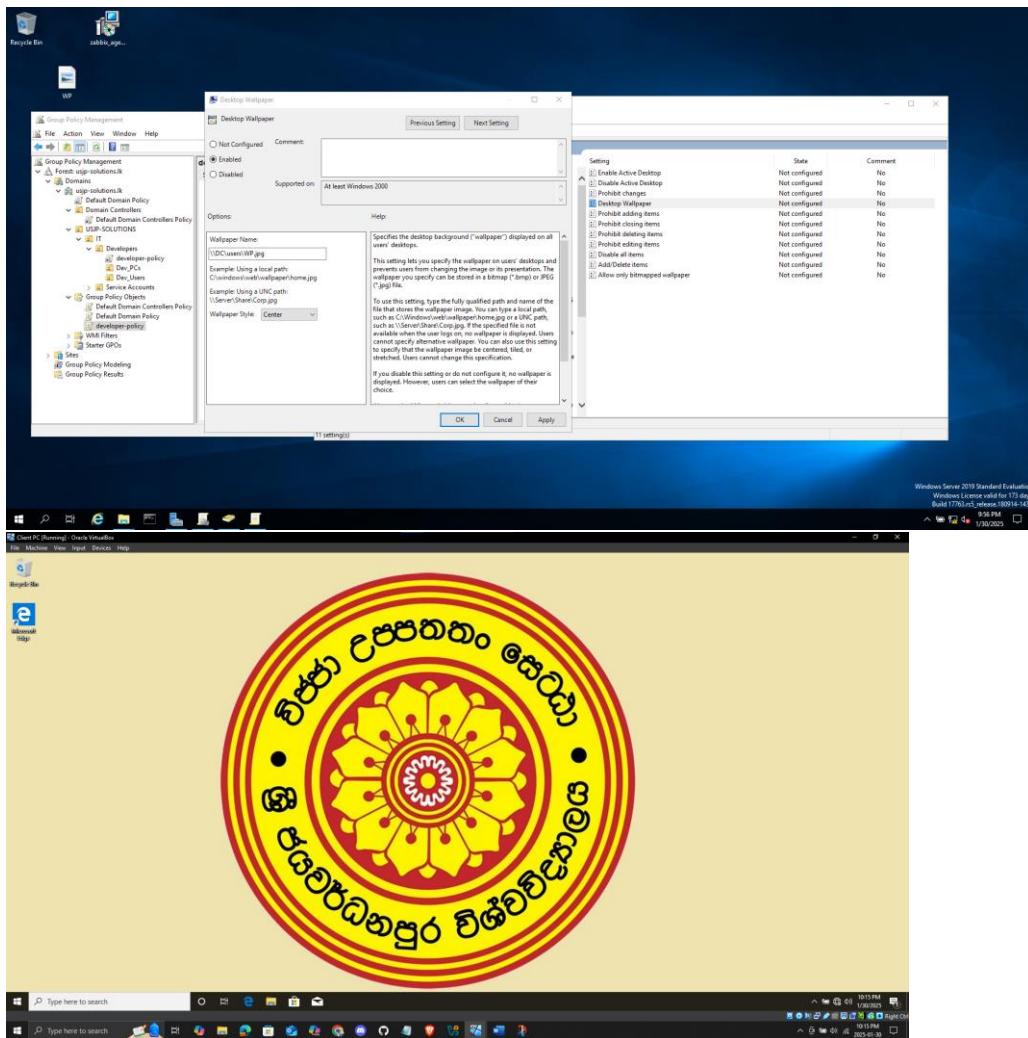


Developer Accounts Group Policy Settings

- Configure Password Expiry to 21 Days
 - Computer Configuration > Policies > Windows Settings > Security Settings > Account Policies > Password Policy

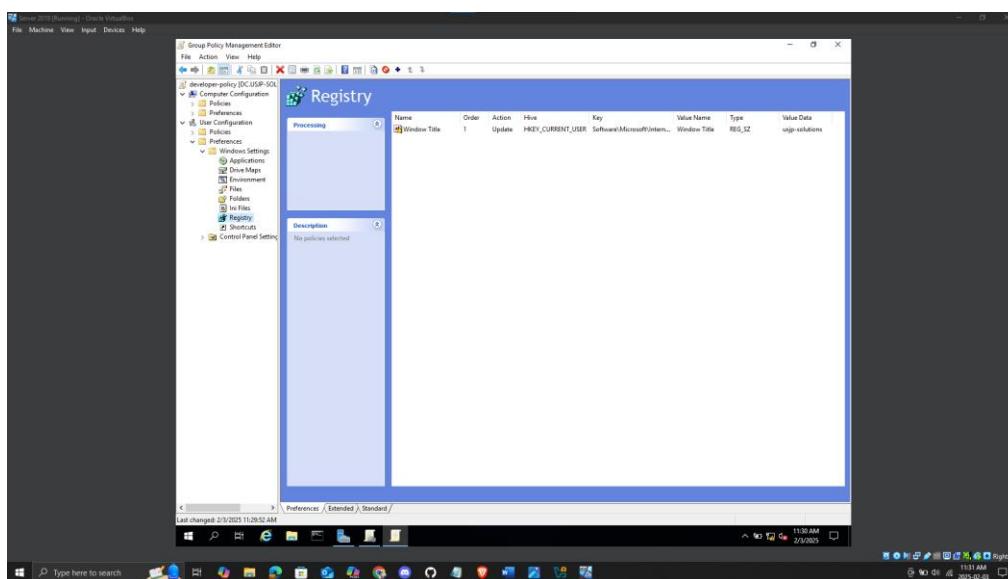
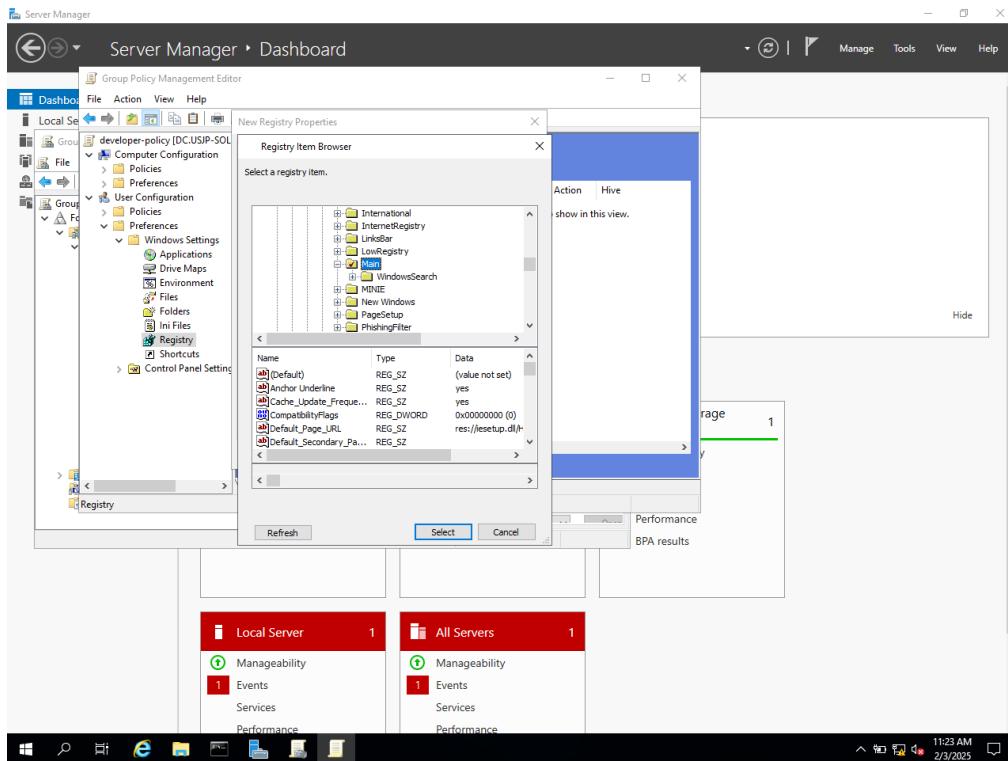


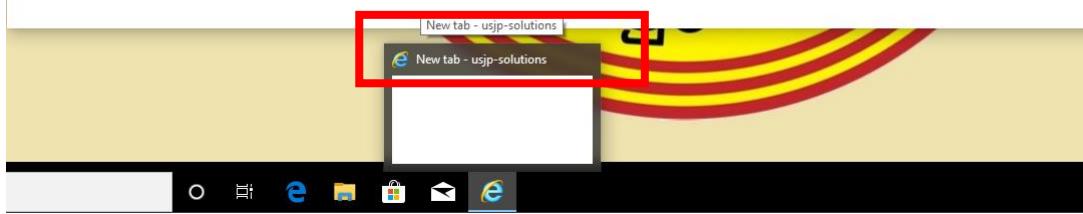
- Set Company Wallpaper for developers.
 - User Configuration > Policies > Administrative Templates > Desktop > Desktop > Desktop Wallpaper
 - Set the wallpaper path it should be accessible for the developer pc.



- Set Browser Title Bar Name

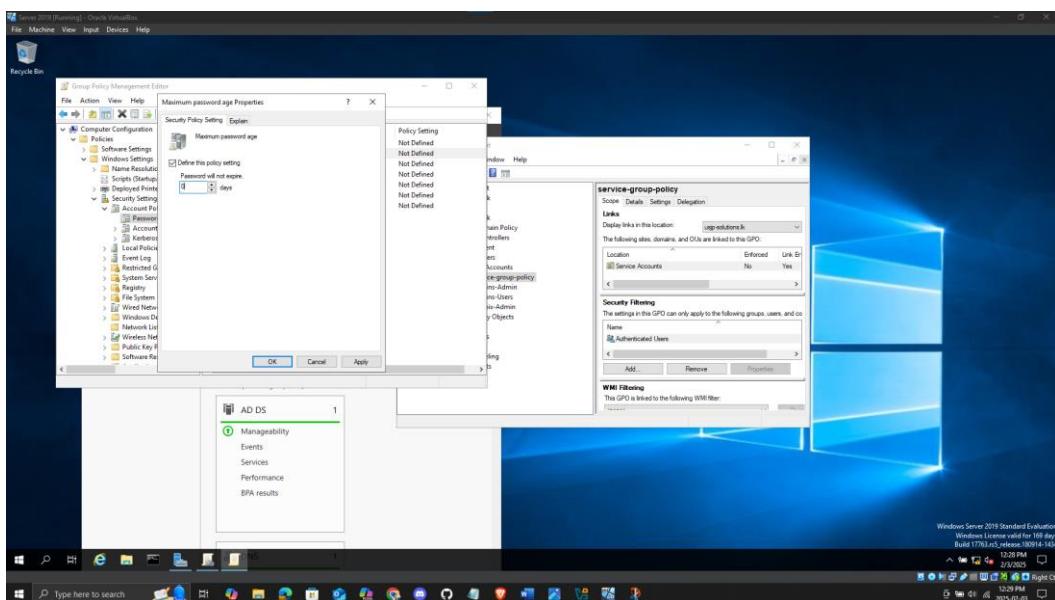
- User Configuration > Preferences > Windows Settings > Registry
- Add a new Registry Item:
 - Hive: HKEY_CURRENT_USER
 - Path: Software\Microsoft\Internet Explorer\Main
 - Value Name: Window Title
 - Type: REG_SZ
 - Value: usjp-solutions



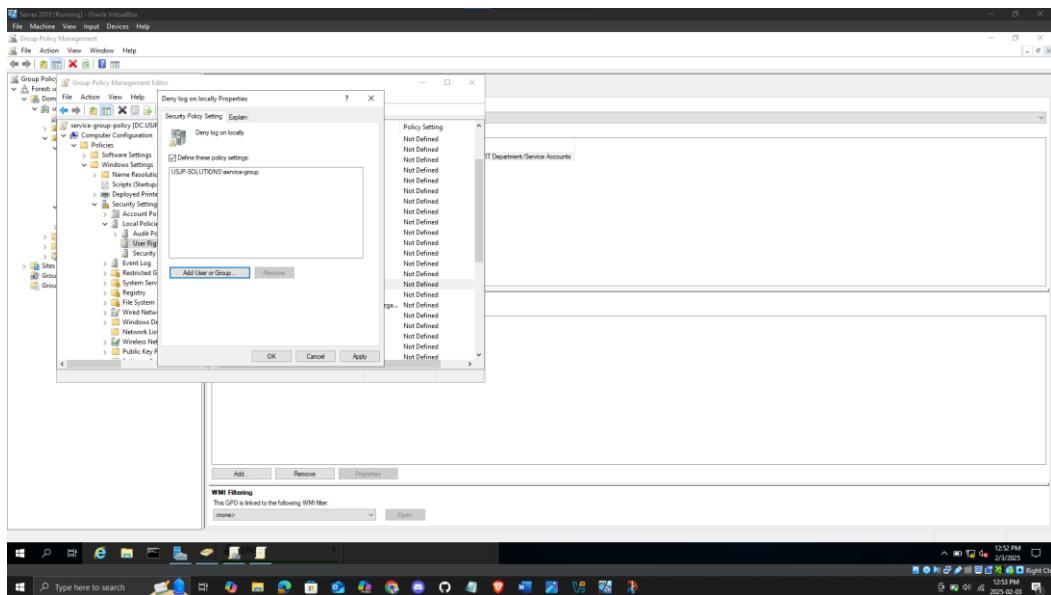


Service Accounts Group Policy

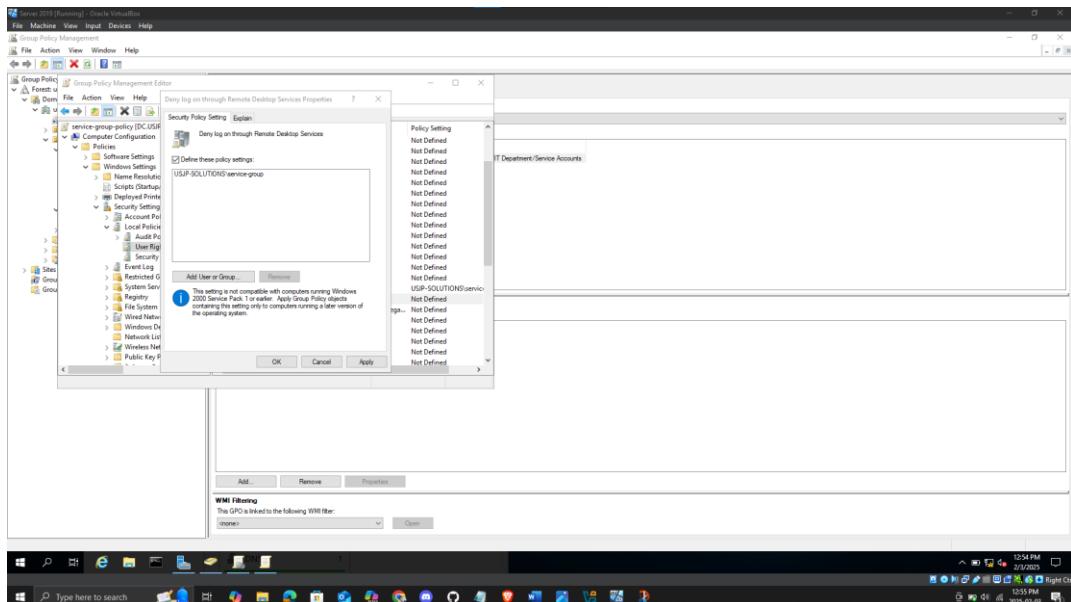
- Password Never Expire should be set
 - Computer Configuration > Policies > Windows Settings > Security Settings > Account Policies > Password Policy



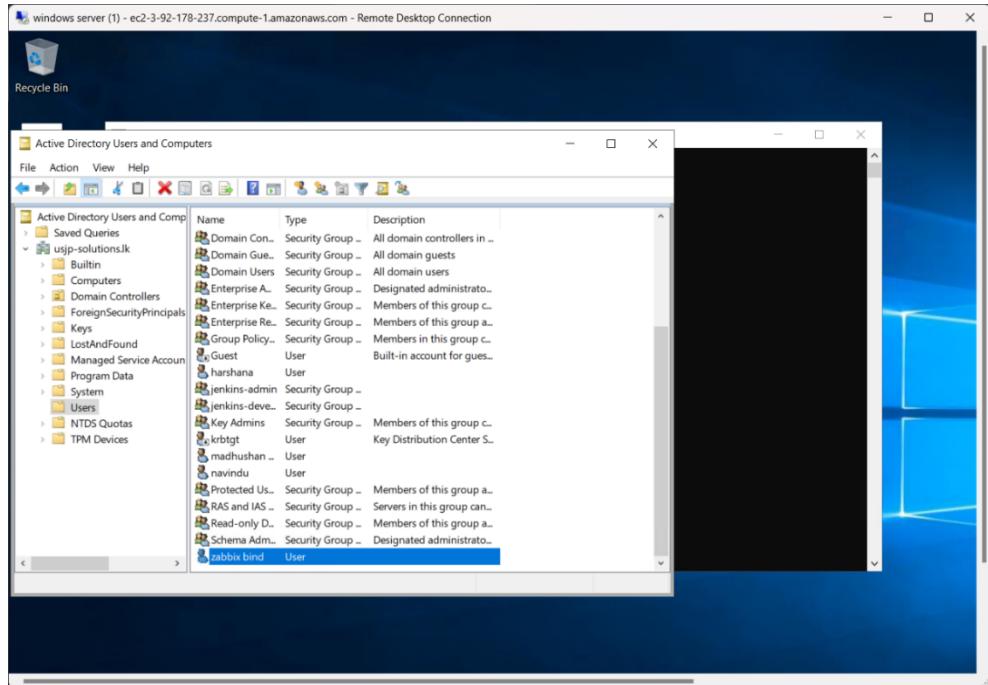
- Prevent Login for Service Accounts
 - Computer Configuration > Policies > Windows Settings > Security Settings > Local Policies > User Rights Assignment
 - Deny log on locally



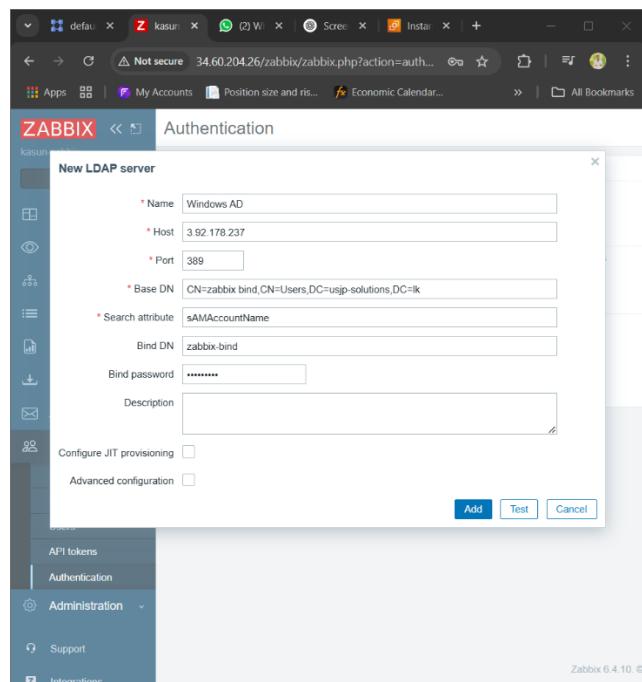
- Deny log on through Remote Desktop Services



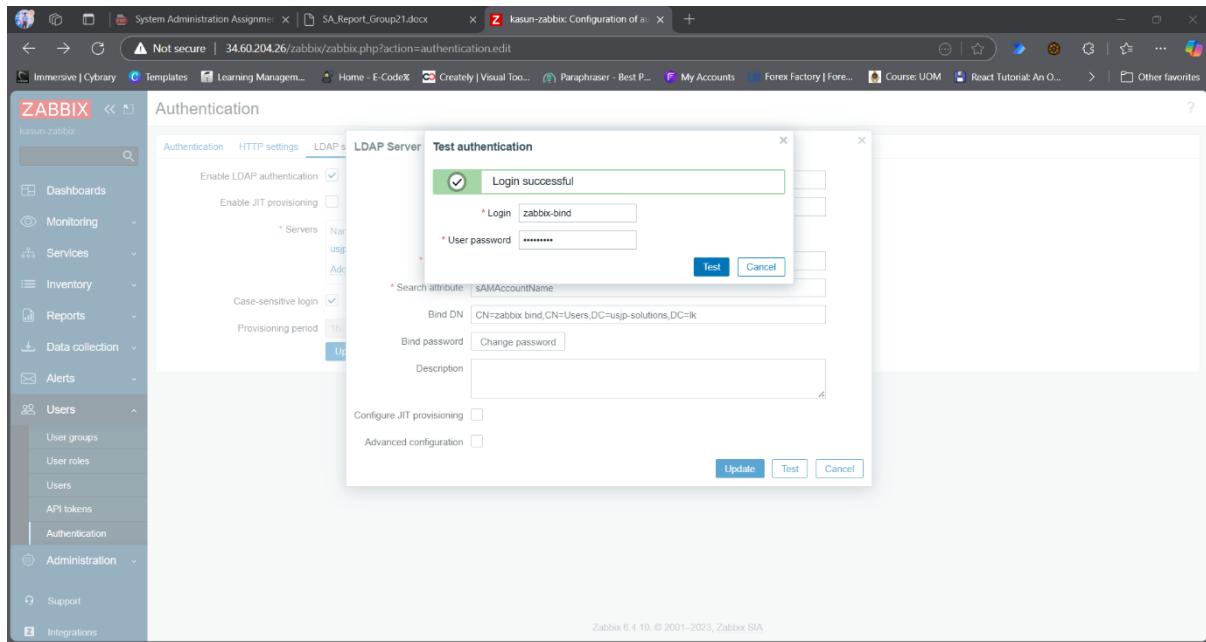
- Zabbix implementation with Domain Integration



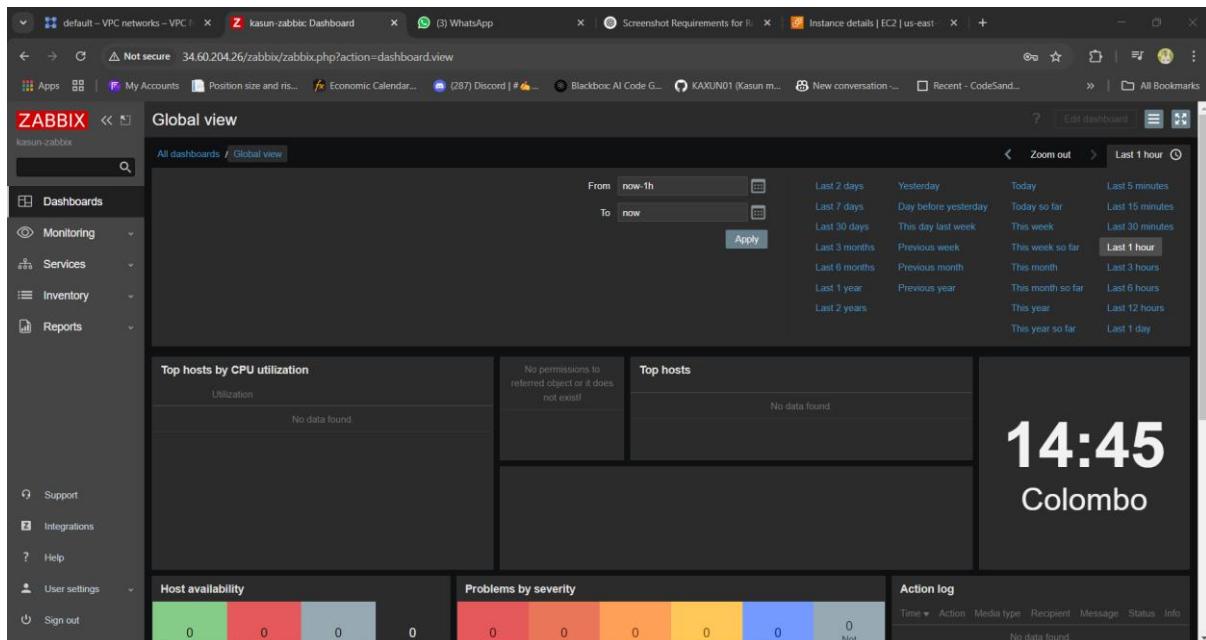
Creating new user for Zabbix LDPA authentication



Create LDPA server for make a connection between active directory to Zabbix server



Zabbix LDAP server config successfully connected



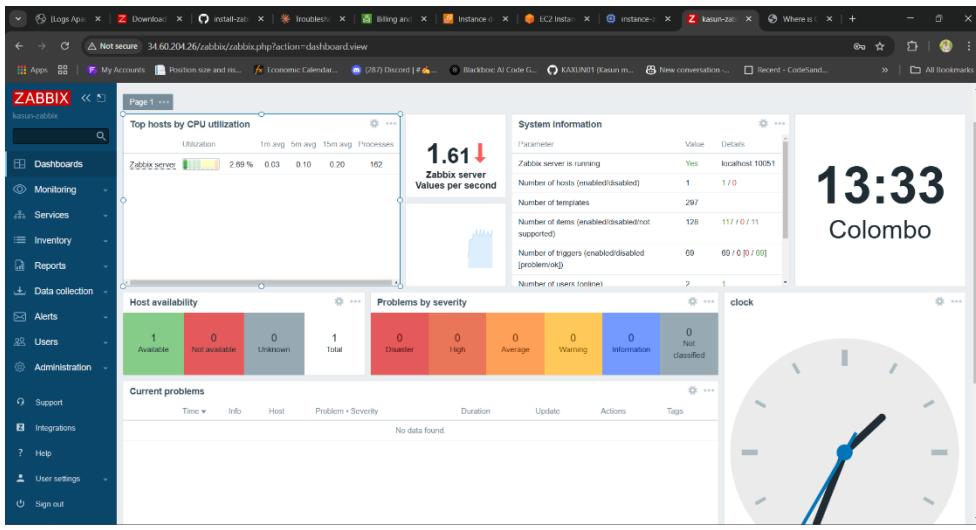
Zabbix user dashboard. This user has minimum user privileges.

The screenshot shows the Zabbix User profile page for the user 'zabbix-bind'. The left sidebar includes links for Dashboards, Monitoring, Services, Inventory, Reports, Support, Integrations, Help, User settings (Profile selected), API tokens, and Sign out. The main content area is titled 'User profile: zabbix-bind' and contains fields for Password, Language (System default), Time zone (System default: (UTC+05:30) Asia/Colombo), Theme (Dark), Auto-login (checked), Auto-logout (15m), Refresh (30s), Rows per page (50), and URL (after login). Buttons for 'Update' and 'Cancel' are at the bottom.

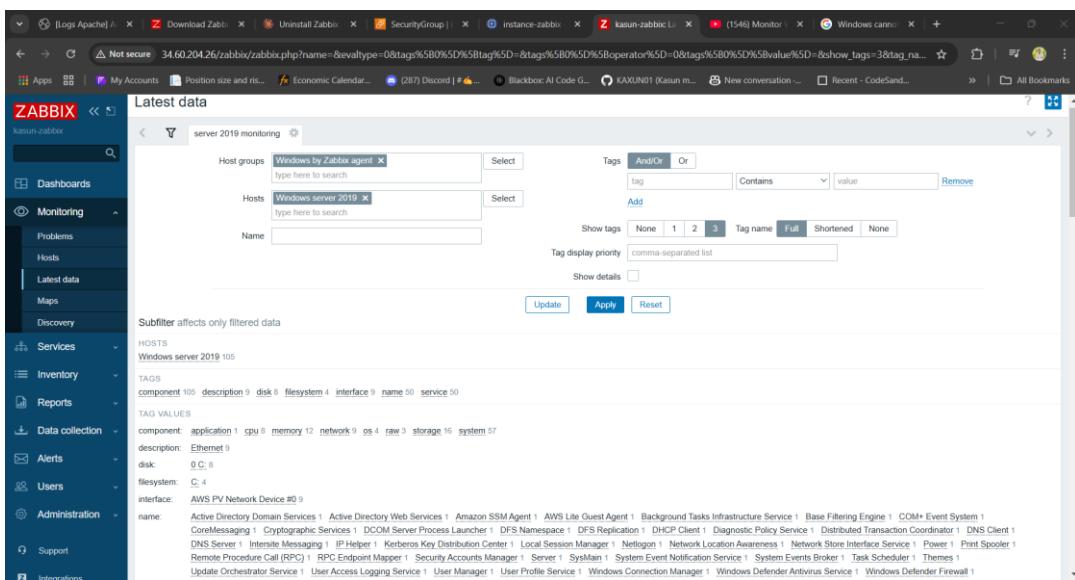
Predefined theme and user privileges automatically added this user.

- Install Zabbix on ubuntu server

The screenshot shows the Zabbix 6.4 Installation welcome screen. It features a 'ZABBIX' logo and a navigation menu on the left with options: Welcome, Check of pre-requisites, Configure DB connection, Settings, Pre-installation summary, and Install. The main content area displays the text 'Welcome to Zabbix 6.4' and a 'Default language' dropdown set to 'English (en_US)'. At the bottom, it says 'Licensed under GPL v2' and has 'Back' and 'Next step' buttons. The footer indicates 'Zabbix 6.4.10 © 2001–2023, Zabbix SIA'.



- Add service monitoring for DNS, AD, Jenkins, Apache.



Windows server monitoring. Getting the latest data from the server

The screenshot shows the Zabbix interface for configuring items. The left sidebar is titled 'ZABBIX' and includes sections for Dashboards, Monitoring, Services, Inventory, Reports, Data collection, Templates, Hosts, Maintenance, Event correlation, Discovery, Alerts, Users, and Administration. The 'Templates' section is currently selected.

The main content area is titled 'Items' and shows a search bar for 'All templates / Template DNS Service Monitoring'. Below the search bar are various filter options: 'Template groups' (Search: 'Template DNS Serv'), 'Type' (all), 'Tags' (And/OR Or, tag: 'log', Contains: 'value'), 'Name' (Search: 'DNS Service Status'), 'Key' (Search: 'service.info[DNS Server]'), 'History' (Search: '90d'), 'Trends' (Search: '365d'), 'Update interval' (Search: '1m'), 'Status' (all, Enabled, Disabled), 'Triggers' (all, Yes, No), and 'Inherited' (all, Yes, No). There are 'Apply' and 'Reset' buttons.

The table below lists the item 'DNS Service Status' with the key 'service.info[DNS Server]'. It shows the interval as 1m, history as 90d, trends as 365d, type as Zabbix agent, status as Enabled, and tags as 'Created'. There are buttons for 'Enable', 'Disable', 'Copy', 'Mass update', and 'Delete'.

At the bottom right of the table, it says 'Displaying 1 of 1 found'.

Configure template for DNS service monitoring.

The screenshot shows the Zabbix interface for configuring triggers. The left sidebar is identical to the previous screenshot.

The main content area is titled 'Triggers' and shows a search bar for 'All templates / Template DNS Service Monitoring'. Below the search bar are filter options: 'Template groups' (Search: 'Template DNS Service Monitoring'), 'Tags' (And/OR Or, tag: 'log', Contains: 'value'), 'Name' (Search: 'DNS Service is not running'), 'Severity' (Not classified, Warning, High, Information, Average, Disaster), 'Inherited' (all, Yes, No), 'With dependencies' (all, Yes, No), 'Status' (all, Enabled, Disabled), and 'Severity' (High). There are 'Apply' and 'Reset' buttons.

The table below lists the trigger 'DNS Service is not running' with the expression 'last([Template DNS Service Monitoring.service.info[DNS Server]])=0'. It shows the status as Enabled. There are buttons for 'Enable', 'Disable', 'Copy', 'Mass update', and 'Delete'.

At the bottom right of the table, it says 'Displaying 1 of 1 found'.

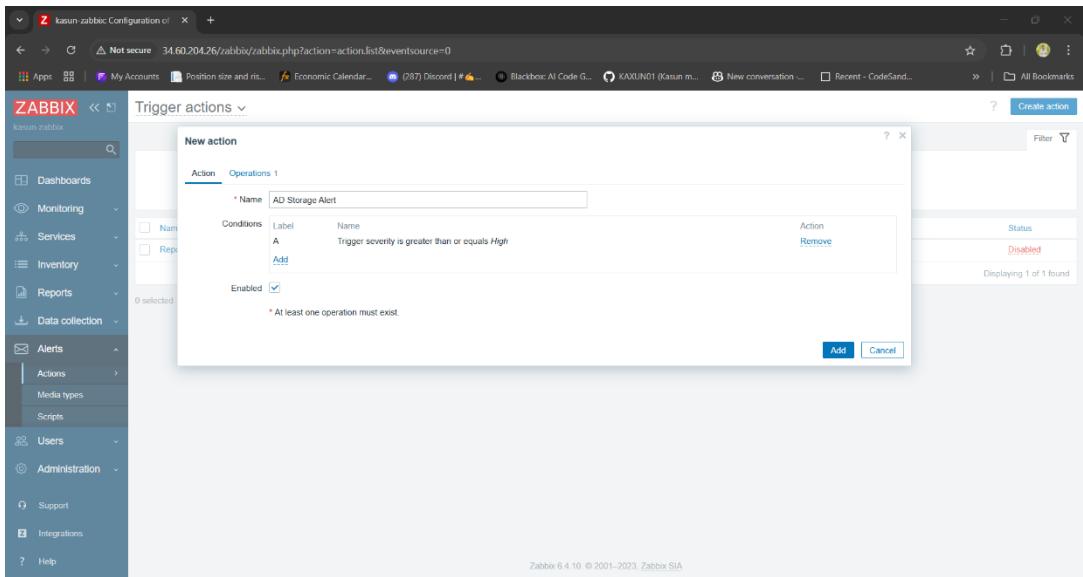
Configure triggers for DNS service

The screenshot shows the Zabbix configuration interface for creating a new item. The left sidebar navigation includes 'Dashboards', 'Monitoring', 'Services', 'Inventory', 'Reports', 'Data collection', 'Templates' (selected), 'Hosts', 'Maintenance', 'Event correlation', 'Discovery', 'Alerts', 'Users', and 'Administration'. The main content area is titled 'Items' and shows a success message 'Item added'. It includes filters for 'Template groups', 'Templates', 'Type', 'Tags', 'History', 'Trends', 'Status', 'Triggers', and 'Inherited'. A table lists items under 'Zabbix agent 1 - Zabbix agent (active) 1', specifically 'AD DS Service Status' and 'NetLogon Service Status', both of which are enabled. Buttons at the bottom include 'Enable', 'Disable', 'Copy', 'Mass update', and 'Delete'.

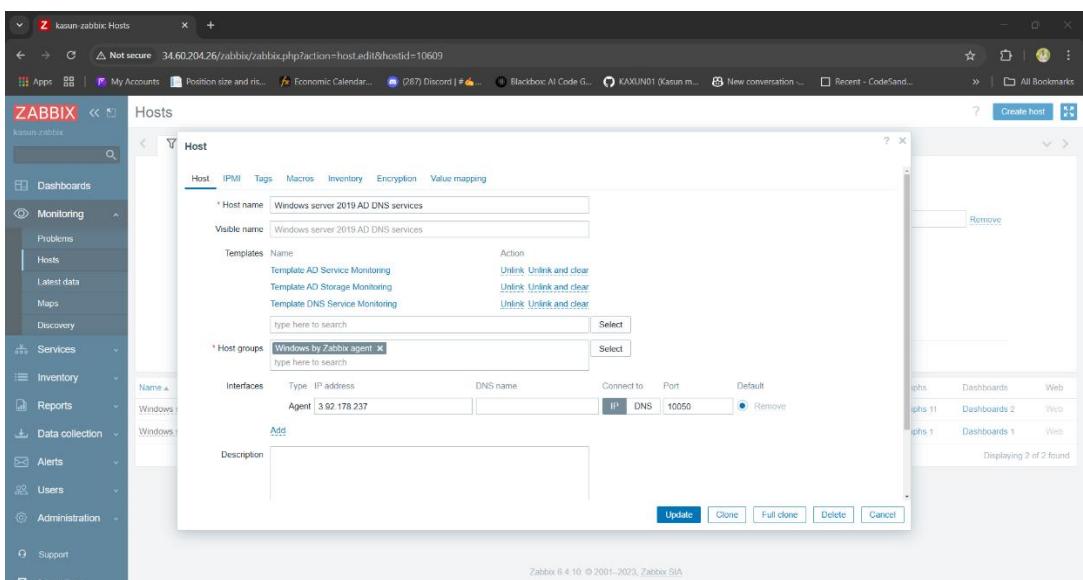
Configure template for Monitor Active Directory Service health.

The screenshot shows the Zabbix monitoring interface for configuring a host group. The left sidebar navigation includes 'Monitoring' (selected), 'Hosts', 'Latest data' (selected), 'Maps', 'Discovery', 'Services', 'Inventory', 'Reports', 'Data collection', 'Alerts', 'Users', and 'Administration'. The main content area is titled 'Latest data' and shows a host group named 'server 2019 monitoring' with a selected host 'Windows server 2019 AD DNS services'. It includes filters for 'Host groups', 'Hosts', 'Name', 'Tags', 'Show tags', 'Tag display priority', and 'Show details'. A table lists hosts under 'HOSTS' and 'DATA' sections, specifically 'Windows server 2019 AD DNS services' with 'AD DS Service Status', 'DNS Service Status', and 'NetLogon Service Status' listed. Buttons at the bottom include 'Display stacked graph', 'Display graph', and 'Execute now'.

Monitor Active Directory & DNS Service health



Configure AD Storage Alert action



Add hosts to monitor AD, AD storage and DNS services.

- Apache server monitoring

The screenshot shows the Zabbix Configuration interface with the URL 34.60.204.26/zabbix/items.php?context=template. The left sidebar is titled 'kasun-zabbix' and includes sections for Dashboards, Monitoring, Services, Inventory, Reports, Data collection, Templates, Hosts, Maintenance, Event correlation, Discovery, Alerts, Users, and Administration. The main content area is titled 'Items' and shows a table of items under the 'Template Apache Service Monitoring' template. The table columns include Name, Triggers, Key, Interval, History, Trends, Type, Status, and Tags. The items listed are:

Name	Triggers	Key	Interval	History	Trends	Type	Status	Tags
Apache Active Connections		net.tcp.listen[80]	1m	90d	365d	Zabbix agent	Enabled	
Apache Service Status		service.info[apache2]	1m	90d	365d	Zabbix agent	Enabled	
Apache Web Response		apache.http.status	1m	90d	365d	HTTP agent	Enabled	
Apache Worker Processes		proc.num[apache2]	1m	90d	365d	Zabbix agent	Enabled	

At the bottom of the table, there are buttons for '0 selected', 'Enable', 'Disable', 'Copy', 'Mass update', and 'Delete'.

Apache server monitoring template

The screenshot shows the Zabbix Latest data interface with the URL 34.60.204.26/zabbix/zabbix.php?name=&evaltype=0&tags%5B0%5D%5Btag%5D=&tags%5B0%5D.... The left sidebar is titled 'kasun-zabbix' and includes sections for Dashboards, Monitoring, Problems, Hosts, Latest data, Maps, Discovery, Services, Inventory, Reports, Data collection, Alerts, Users, Administration, Support, and Integrations. The main content area is titled 'Latest data' and shows a table of data for the host 'apache server'. The table columns include Host, Name, Last check, Last value, and Change. The data rows are:

Host	Name	Last check	Last value	Change
apache server	Apache Active Connections	58s	1	
apache server	Apache Service Status			
apache server	Apache Web Response			
apache server	Apache Worker Processes	57s	11	

At the bottom of the table, there are buttons for '0 selected', 'Display stacked graph', 'Display graph', and 'Execute now'.

- All hosts

The screenshot shows the Zabbix interface for managing hosts. A modal window at the top left indicates "Host added" with a green checkmark. The main table lists five hosts:

Name	Interface	Availability	Tags	Status	Latest data	Problems	Graphs	Dashboards	Web
apache server	127.0.0.1:10050	ZBX		Enabled	Latest data 4	Problems	Graphs	Dashboards	Web
jenkins server monitoring	127.0.0.1:10050	ZBX		Enabled	Latest data 4	Problems	Graphs	Dashboards	Web
Windows server 2019	3.92.178.237.10050	ZBX	class: os target: windows	Enabled	Latest data 105	Problems	Graphs 11	Dashboards 2	Web
Windows server 2019 AD DNS services	3.92.178.237.10050	ZBX		Enabled	Latest data 5	2	Graphs 1	Dashboards 1	Web
Zabbix server	127.0.0.1:10050	ZBX	class: os class: software target: linux ***	Enabled	Latest data 128	0	Graphs 24	Dashboards 4	Web

At the bottom right of the table, it says "Displaying 5 of 5 found".

The screenshot shows the Zabbix dashboard. On the left, the navigation menu includes "Dashboards", "Monitoring", "Services", "Inventory", "Reports", "Data collection", "Alerts", "Users", "Administration", "Support", "Integrations", "Help", "User settings", and "Sign out".

The main dashboard area displays several key metrics and status indicators:

- Top hosts by CPU utilization:** Shows "Windows server 2019" with 0.78% utilization.
- Top hosts:** Shows 240.29 hosts.
- Current problems:** A table listing issues such as "Zabbix server" with "Linux. Number of installed packages has been changed" and "Windows server 2019 AD. NetBIOS Service is not running".
- Host availability:** Shows 5 Available, 0 Not available, 0 Unknown.
- Problems by severity:** A bar chart showing counts for Disaster (0), High (2), Average (0), Warning (1), Information (0), and Not classified (0).
- Action log:** A table showing no data found.
- Time and location:** Displays "13:12 Colombo".

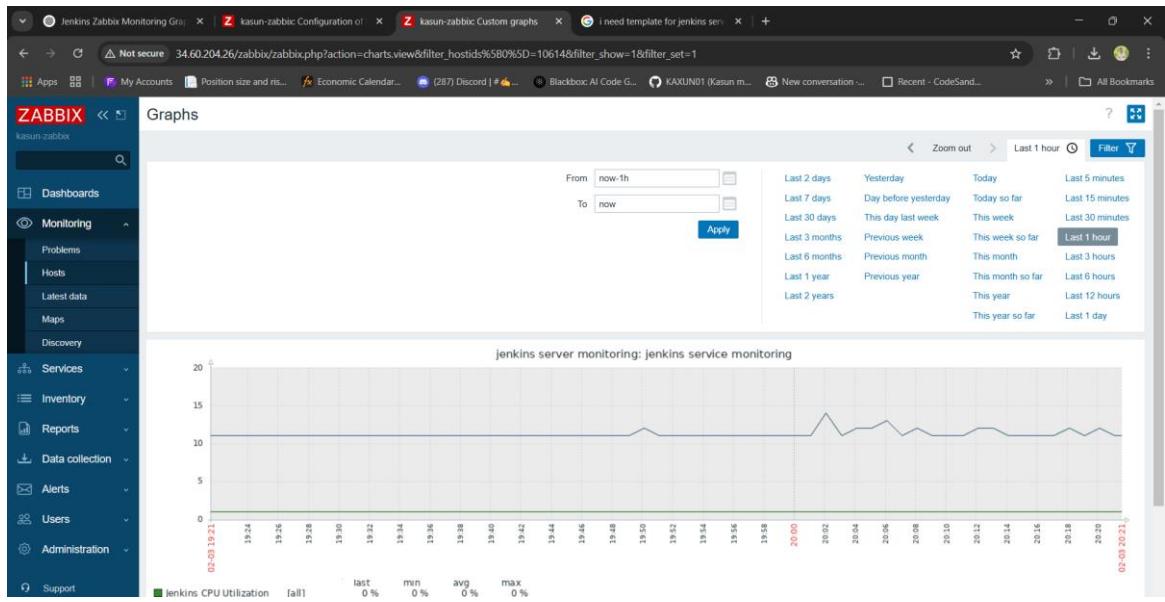
monitor services and Test service failure alert in Zabbix

Zabbix alert notification for failed service.

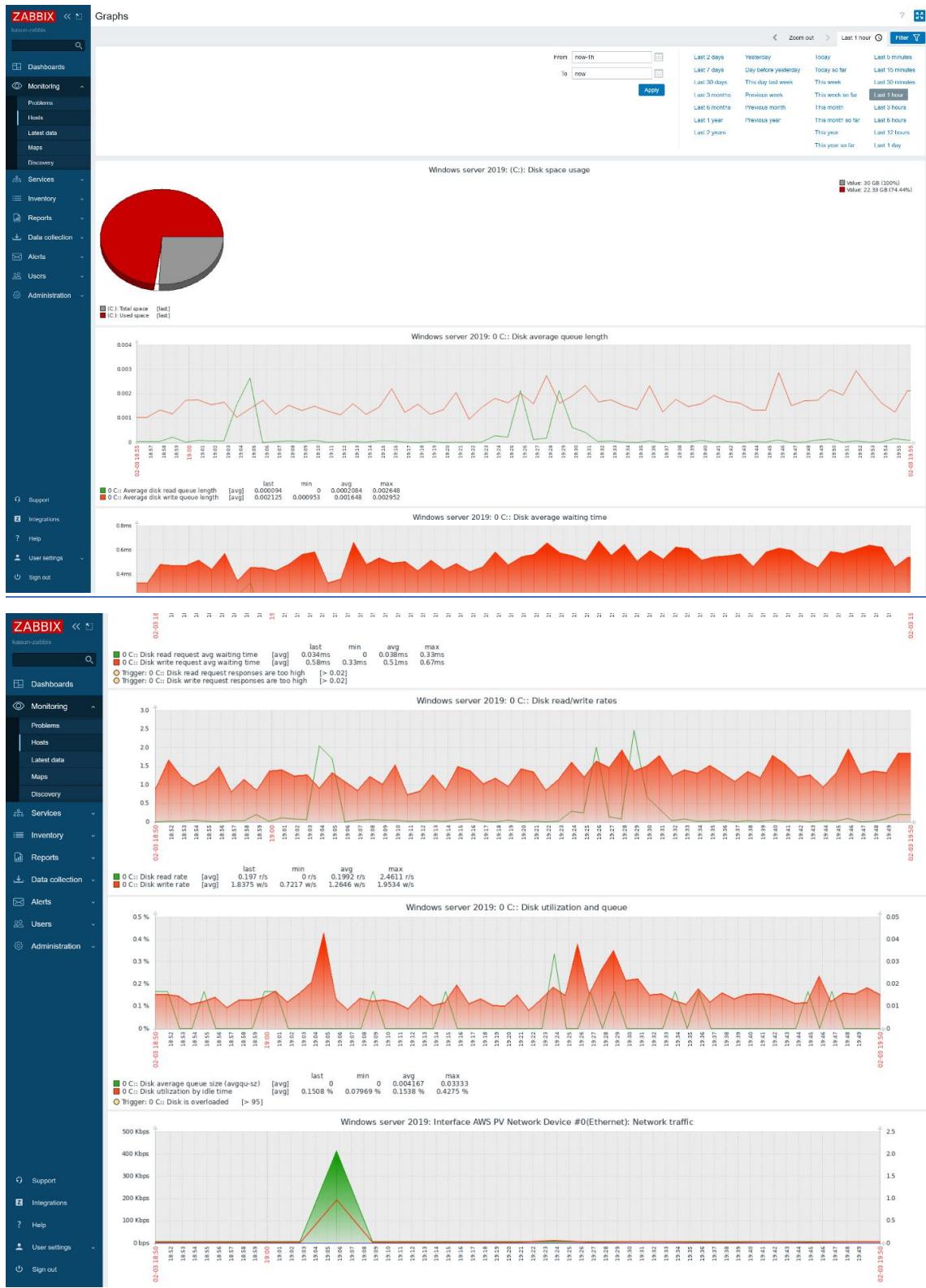
- Service health monitoring



Apache server health monitoring using Zabbix agent

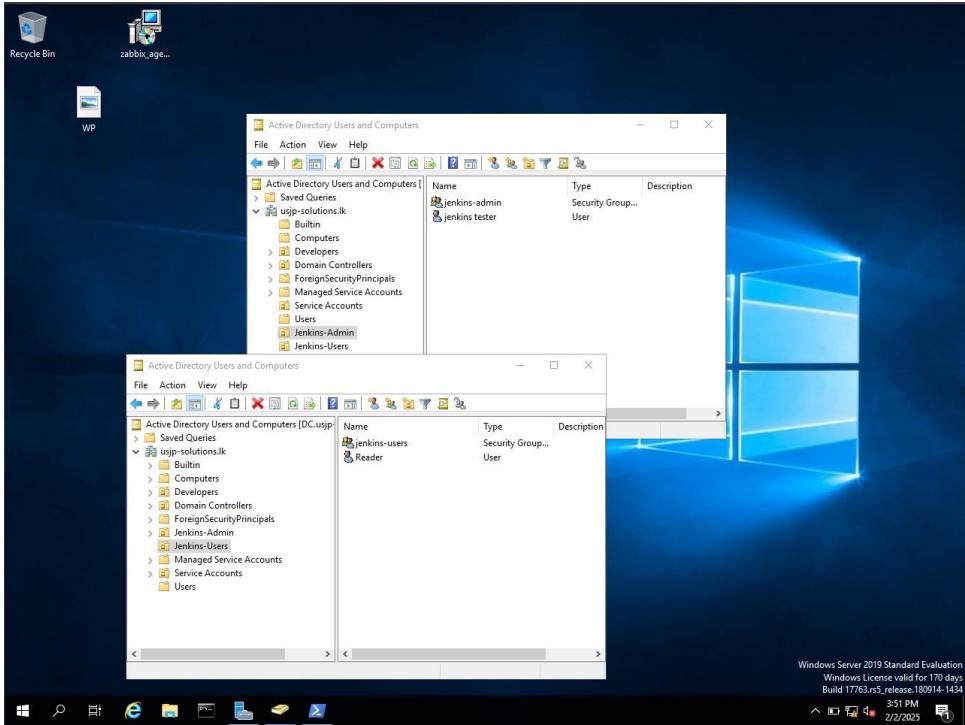


Jenkins service health monitoring using Zabbix agent.

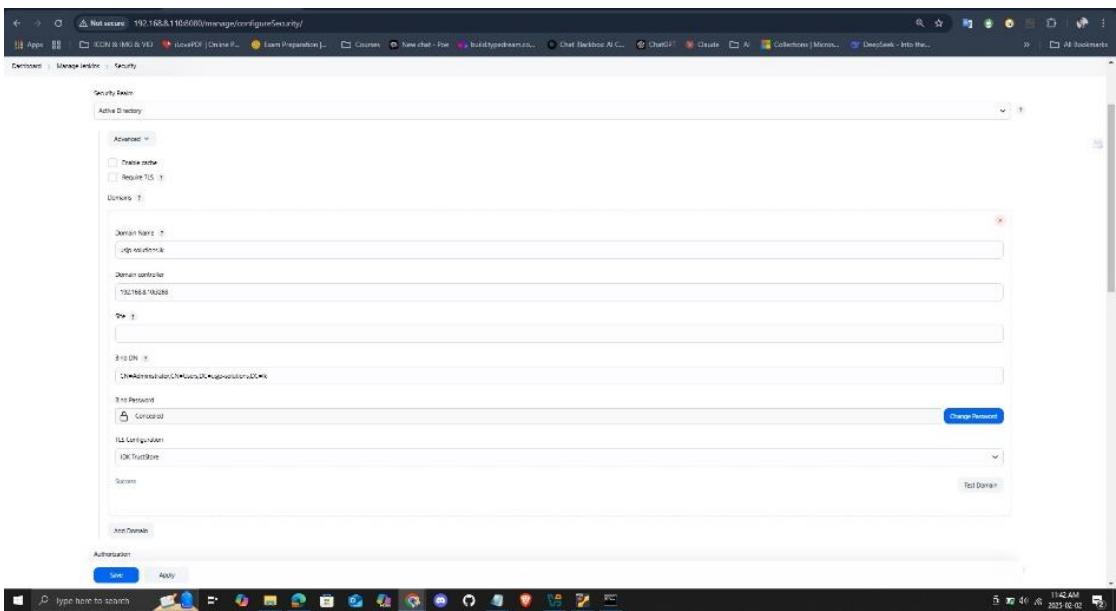


Windows server health monitoring using Zabbix agent

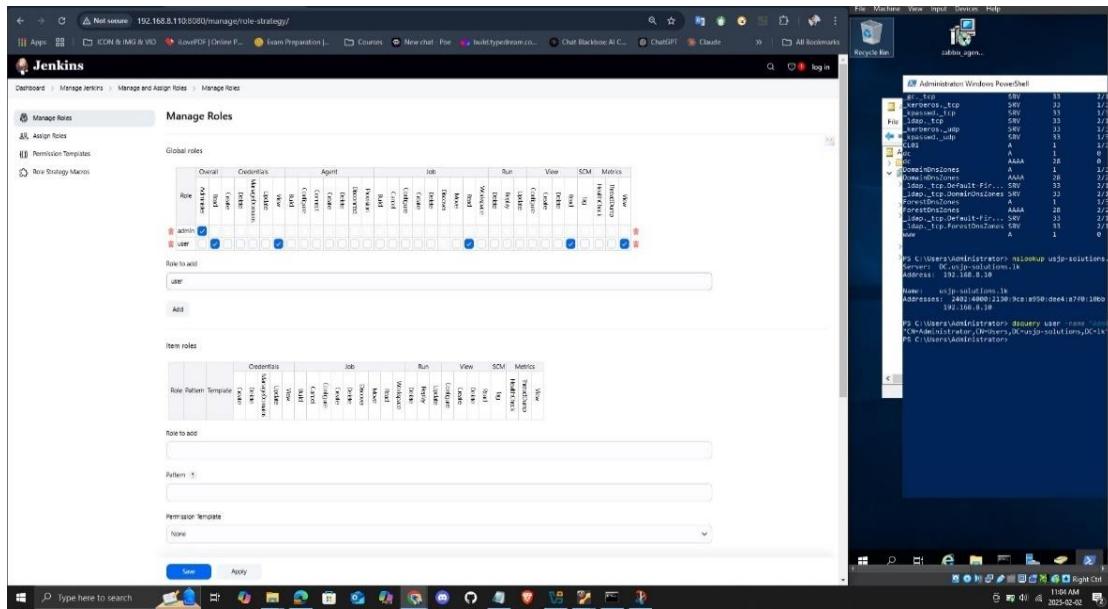
- Jenkins implementation with Domain Integration
- Creating Organizational Units for Jenkins User and Admin groups and assigning users for them.



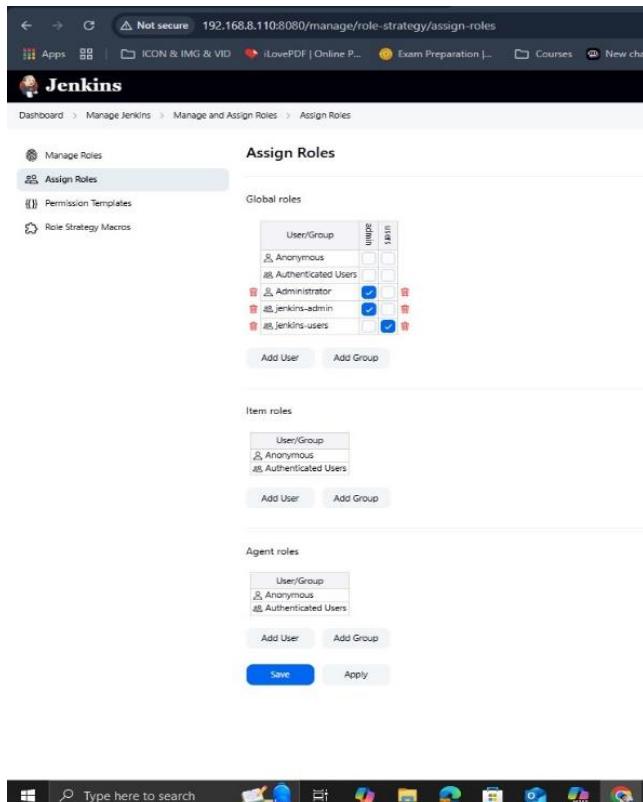
- Configuring Jenkins with Active Directory.



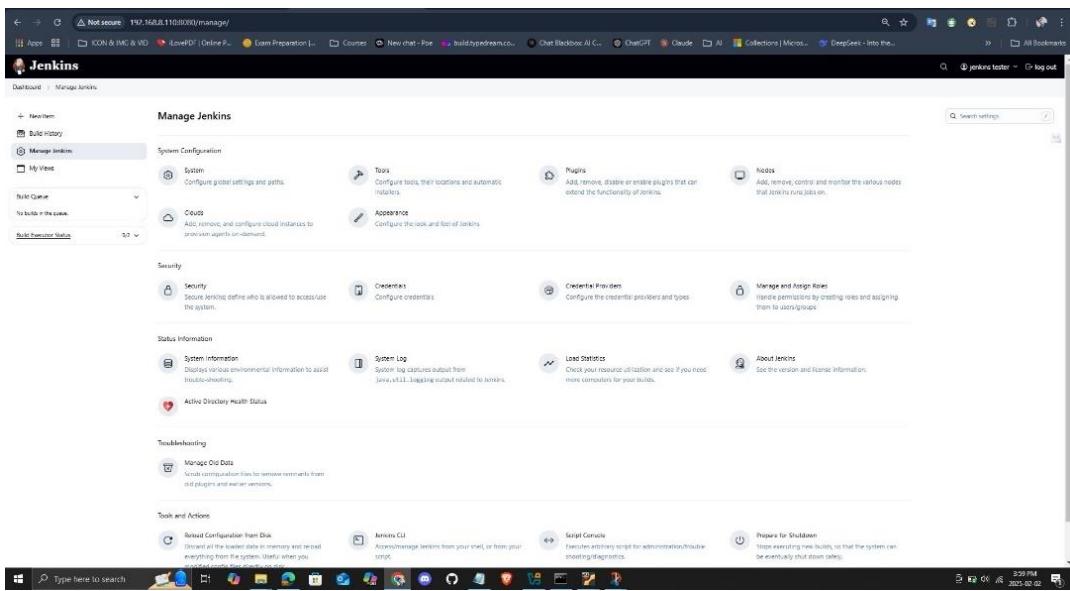
- Add admin and user roles and give permissions.



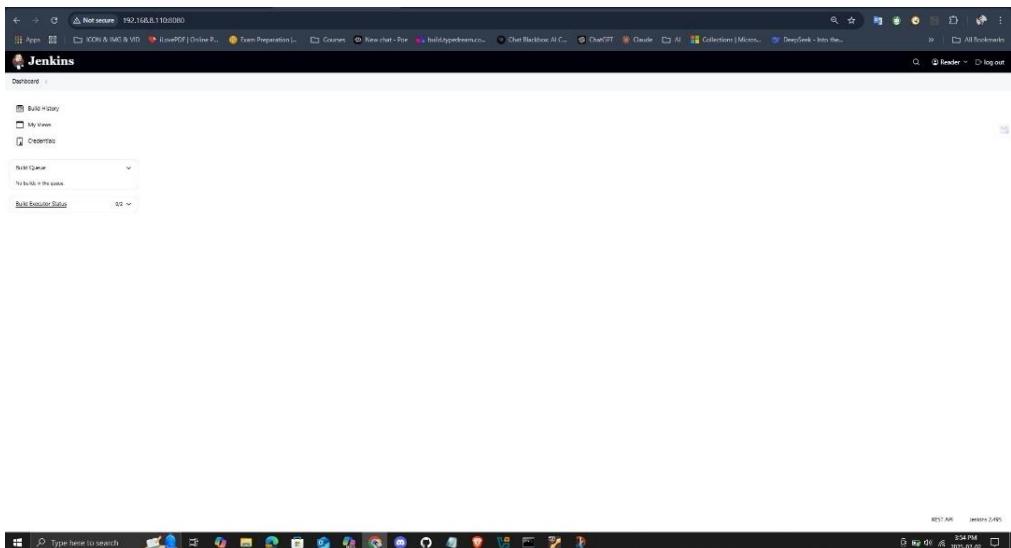
- Add user groups to Jenkins and assign the roles.



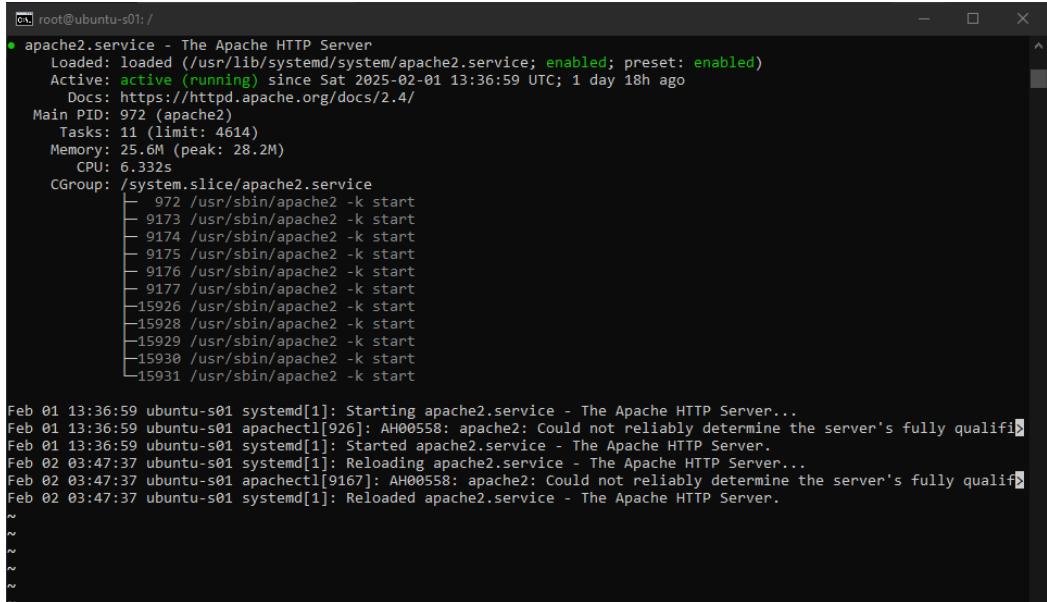
- Jenkins Admin user Account – (Username: jenkins tester)



- Jenkins normal user Account – (Username: Reader)



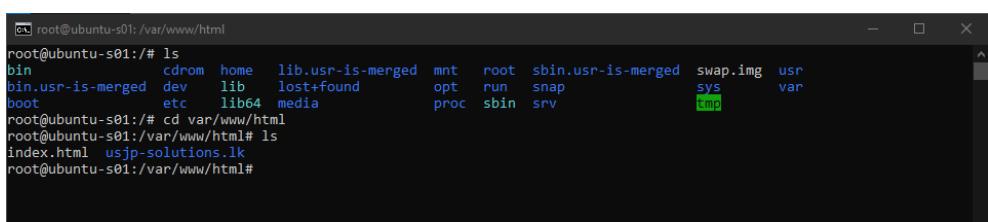
- Webhosting with DNS setup
 - What we do: Install Apache, deploy website files, and configure a DNS entry for www.usjp-solutions.lk to ensure the company website is publicly accessible via a domain name.
- Apache Web Server Deployment



```
root@ubuntu-s01: / 
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
   Active: active (running) since Sat 2025-02-01 13:36:59 UTC; 1 day 18h ago
     Docs: https://httpd.apache.org/docs/2.4/
      Main PID: 972 (apache2)
        Tasks: 11 (limit: 4614)
       Memory: 25.6M (peak: 28.2M)
          CPU: 6.332s
         CGroup: /system.slice/apache2.service
             └─ 972 /usr/sbin/apache2 -k start
                 ├─ 9173 /usr/sbin/apache2 -k start
                 ├─ 9174 /usr/sbin/apache2 -k start
                 ├─ 9175 /usr/sbin/apache2 -k start
                 ├─ 9176 /usr/sbin/apache2 -k start
                 ├─ 9177 /usr/sbin/apache2 -k start
                 ├─ 15926 /usr/sbin/apache2 -k start
                 ├─ 15928 /usr/sbin/apache2 -k start
                 ├─ 15929 /usr/sbin/apache2 -k start
                 ├─ 15930 /usr/sbin/apache2 -k start
                 └─ 15931 /usr/sbin/apache2 -k start

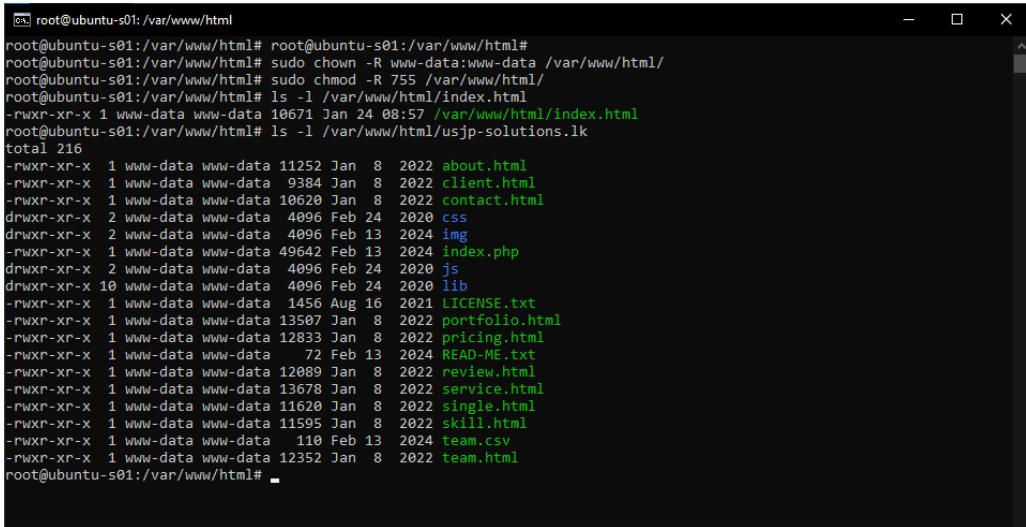
Feb 01 13:36:59 ubuntu-s01 systemd[1]: Starting apache2.service - The Apache HTTP Server...
Feb 01 13:36:59 ubuntu-s01 apachectl[926]: AH00558: apache2: Could not reliably determine the server's fully qualified name, using localhost for Port 80
Feb 01 13:36:59 ubuntu-s01 systemd[1]: Started apache2.service - The Apache HTTP Server.
Feb 02 03:47:37 ubuntu-s01 systemd[1]: Reloading apache2.service - The Apache HTTP Server...
Feb 02 03:47:37 ubuntu-s01 apachectl[9167]: AH00558: apache2: Could not reliably determine the server's fully qualified name, using localhost for Port 80
Feb 02 03:47:37 ubuntu-s01 systemd[1]: Reloaded apache2.service - The Apache HTTP Server.
~
~
~
~
~
```

- Deploy Website Files
 - Copy website files to Apache's web directory



```
root@ubuntu-s01:/var/www/html
root@ubuntu-s01: # ls
bin          cdrom  home  lib usr-is-merged  mnt  root  sbin usr-is-merged  swap.img  usr
bin usr-is-merged  dev    lib   lost+found    opt  run  snap           sys    var
boot         etc    lib64  media          proc  sbin  srv           tmp
root@ubuntu-s01: # cd var/www/html
root@ubuntu-s01:/var/www/html# ls
index.html  usjp-solutions.lk
root@ubuntu-s01:/var/www/html#
```

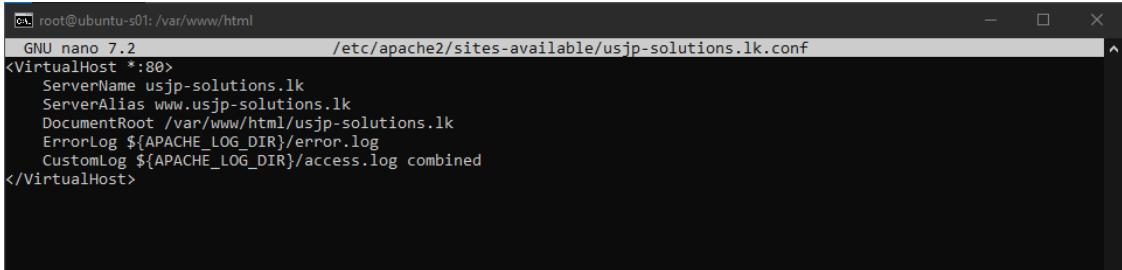
- Give proper permissions



```
root@ubuntu-s01:/var/www/html#
root@ubuntu-s01:/var/www/html# root@ubuntu-s01:/var/www/html#
root@ubuntu-s01:/var/www/html# sudo chmod -R 755 /var/www/html/
root@ubuntu-s01:/var/www/html# ls -l /var/www/html/index.html
-rw-r--r-- 1 www-data www-data 10671 Jan 24 08:57 /var/www/html/index.html
root@ubuntu-s01:/var/www/html# ls -l /var/www/html/usjp-solutions.lk
total 216
-rwxr--r-x 1 www-data www-data 11252 Jan 8 2022 about.html
-rwxr--r-x 1 www-data www-data 9384 Jan 8 2022 client.html
-rwxr--r-x 1 www-data www-data 10620 Jan 8 2022 contact.html
drwxr--r-x 2 www-data www-data 4096 Feb 24 2020 css
drwxr--r-x 2 www-data www-data 4096 Feb 13 2024 img
-rwxr--r-x 1 www-data www-data 49642 Feb 13 2024 index.php
drwxr--r-x 2 www-data www-data 4096 Feb 24 2020 js
drwxr--r-x 10 www-data www-data 4096 Feb 24 2020 lib
-rwxr--r-x 1 www-data www-data 1456 Aug 16 2021 LICENSE.txt
-rwxr--r-x 1 www-data www-data 13507 Jan 8 2022 portfolio.html
-rwxr--r-x 1 www-data www-data 12833 Jan 8 2022 pricing.html
-rwxr--r-x 1 www-data www-data 72 Feb 13 2024 READ-ME.txt
-rwxr--r-x 1 www-data www-data 12089 Jan 8 2022 review.html
-rwxr--r-x 1 www-data www-data 13678 Jan 8 2022 service.html
-rwxr--r-x 1 www-data www-data 11620 Jan 8 2022 single.html
-rwxr--r-x 1 www-data www-data 11595 Jan 8 2022 skill.html
-rwxr--r-x 1 www-data www-data 110 Feb 13 2024 team.csv
-rwxr--r-x 1 www-data www-data 12352 Jan 8 2022 team.html
root@ubuntu-s01:/var/www/html#
```

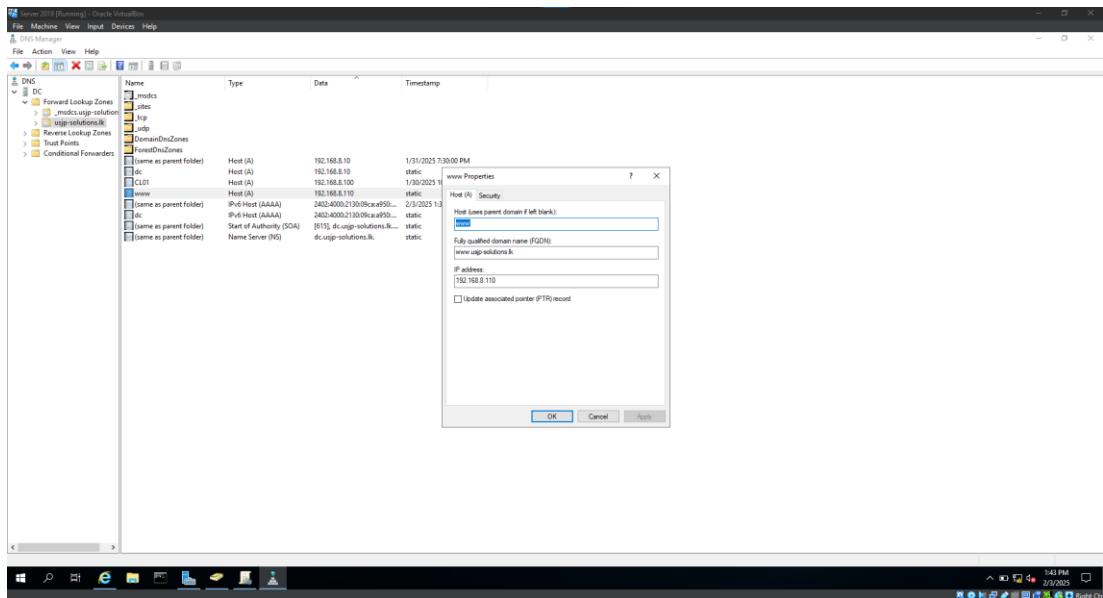
- Configure Apache Virtual Host

- `sudo nano /etc/apache2/sites-available/usjp-solutions.lk.conf`

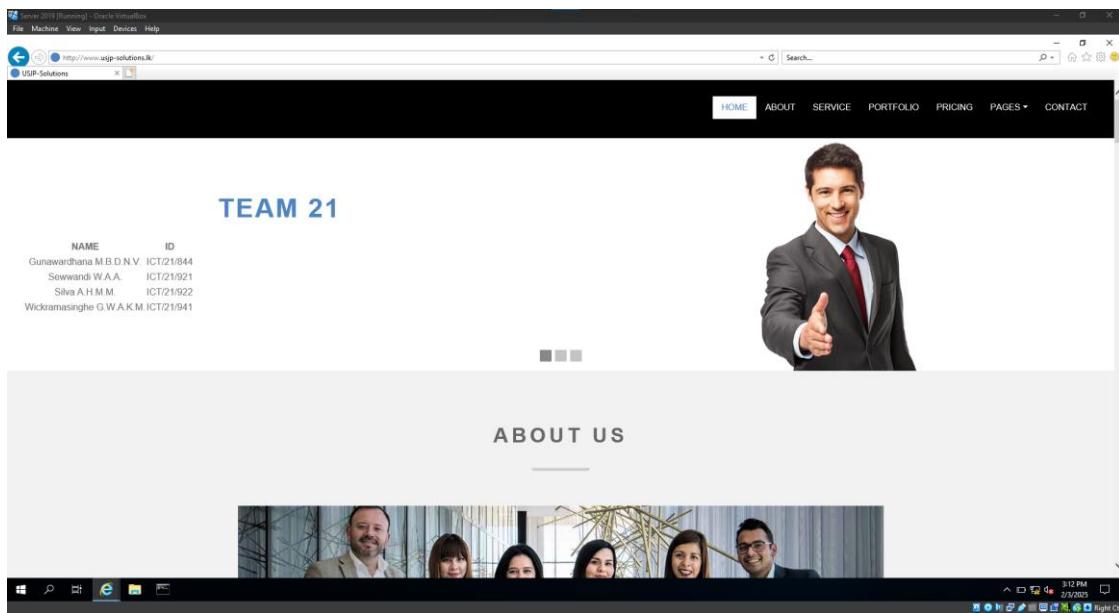


```
root@ubuntu-s01:/var/www/html#
GNU nano 7.2          /etc/apache2/sites-available/usjp-solutions.lk.conf
<VirtualHost *:80>
    ServerName usjp-solutions.lk
    ServerAlias www.usjp-solutions.lk
    DocumentRoot /var/www/html/usjp-solutions.lk
    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined
</VirtualHost>
```

- Configure DNS Entry
 - DNS Manager with A record for www.usjp-solutions.lk
 - DNS entry added to resolve the website domain.



- The company website is accessible using www.usjp-solutions.lk

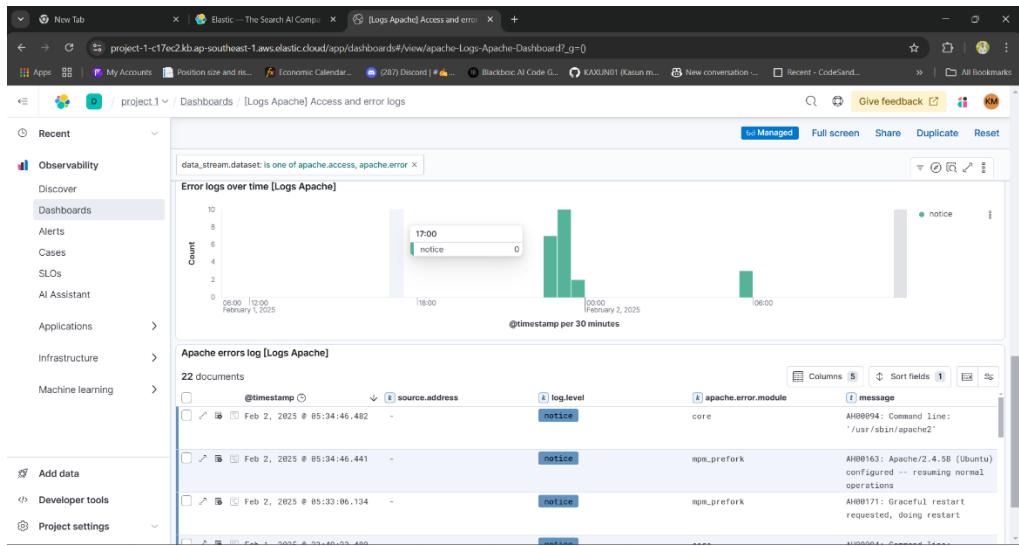


- [Elastic Search Log shipping](#)
- Install Elasticsearch on Ubuntu.

The image contains two screenshots of a web browser window. The top screenshot shows the 'Welcome to Elastic' login page at 192.168.200.4:5601/login. It features a logo, a 'Welcome to Elastic' heading, and a login form with fields for 'Username' (set to 'elastic') and 'Password' (obscured). A 'Log in' button is at the bottom. The bottom screenshot shows the 'Home - elastic' page at 192.168.200.4:5601/app/home/. It has a header with the 'elastic' logo and a search bar. Below the header, there's a message about usage collection and a 'Dismiss' button. The main content area is titled 'Welcome home' and displays four cards: 'Elasticsearch' (yellow), 'Observability' (pink), 'Security' (teal), and 'Analytics' (blue).

Home page

- Verify logs in Kibana dashboard.



Conclusion

- Successfully implemented all required IT infrastructure components.
- Configurations meet business needs for secure authentication, monitoring, and CI/CD.
- Future improvements include scalability and security enhancements.