

Date _____

Expt. Name _____

Expt. No. _____

Page No. _____

Experiment 9

Aim :-

Installation and exploring basic features of Hyper V

Theory :-

Hyper V network is a virtual system, the central mechanism of a hyper V network is a virtual switch. The hyper V switch is really modelling of a network adapter. It allows plumbing network traffic.

Procedure :-

i). Pre requirements and adjustments that we need in windows Server 2016,

a. go to procedure of virtual machine 2016

b. click visualise intel VT-X / EPT ANN

c. Now mark the number of processor as 4.

ii) click on edit virtual machine

iii) Now click on virtualize intel VT-X / EPT ANN and after marking number of processor as 4 power on VM.

Teacher's Signature: _____

Date _____

Expt. Name _____

Expt. No. _____

Page No. _____

- iv). Go to server manager
- v). Click on add role & select hyper v and then install
- vi) Restart the system
- vii). Go to server manager & select the hyper - v
- viii) Now you can see the features of hyper - v

* Learning outcome :-

- ① . Learnt about hyper v
- ② . Learnt about server manager.

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12/03/15

Teacher's Signature: _____

Date 12 - 5 - 23

Expt. Name _____

Expt. No. _____

Page No. _____

Experiment 10

* Aim:

Install active directory services in windows 2008 & install a new Forest by using the graphical user interface.

* Theory:

Active directory is responsible for storing information on computer, printers, user and network information managed this data and support providing network users and administration access to network resources.

* Requirements:

- Laptop / pc
- virtual machine
- windows server 2016

* Procedure:

(i) Go to server manager then click add roles

(ii) click next and select active directory domain services and install

(iii) Now click on active directory domain services.

(iv) click on the link "depromo.exe"

Teacher's Signature: _____

Date _____

Expt. Name _____

Expt. No. _____

Page No. _____

- (v). Go to control panel → home
- (vi). Now click on manager account
- (vii). Login to administration account and add password & log off
- (viii). Login as admin & then enter the depromo.exe click next 3 times.
- (ix). Select create a new Forest and then next.
- (x). Enter any name of the Forest, for example - (name.com)
- (xi). Now select the option set Forest functional level as windows server 2008 and click next.
- (xii). Now select the DNS server option and then click next then finish, then restart the system
- (xiii) Now go to server manager & go to roles & select active directory and then select (abc.com)

Teacher's Signature: _____

Date _____

Expt. Name _____

Expt. No. _____

Page No. _____

* Learning outcomes:

- How to create a new forest
- Operations of a new forest
- Active directory domain service

(8) 15/13

Teacher's Signature: _____

* Aim : To configure DHCP servers on a network with multiple VLANs

* Objective : Configure a DHCP server to assign IP to host, belonging to different VLAN dynamically.

* Theory :

DHCP is a client server protocol that can be used to automate the process of IP allocation to a host in a network. The DHCP client uses the DHCP protocol to acquire config. information from a DHCP server, about IP address, subnet mask, default gateway, DNS server address, etc. The DHCP process of assigning IP to a host involves 4 major steps → Discover, Offer, Request and Acknowledgement, which is also known as DORA process.

VLAN - Virtual Local Area Network is a virtualised connection that connects multiple devices and networks nodes from different LAN's into one logical network.

* components used : PCs, switches, multilayer switch, DHCP server, straight through and crossover cables.

Teacher's Signature: _____

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Steps :

1. Create the given topology of PCs, switches and one DHCP server.
2. Assign IP address to DHCP server with a network default address.
3. Create IP pools for the required VLANs to be created.
4. Add VLANs to multilayer switch
5. Add VLANs to multilayer switch
6. Create static routes for each VLAN distributing from switch and enable trunking in interfaces
7. Add VLAN to switches inside the VLAN and configure their port interfaces
8. Connect PC to switches as DHCP client and request the DHCP server for IP assignment.
9. PCs of different VLANs are assigned IP using DHCP configuration

Teacher's Signature: _____

Date _____ Expt. No. _____

Expt. Name _____

Page No. _____

- Learning outcomes :
- Learned about DHCP server configuration.
 - Learned about VLAN configuration and trunking.
 - Learned about client server architecture.

7/3/23

13/3/23

Teacher's Signature: _____

Date 23-3-23

Expt. Name _____

Page No. _____

Experiment - 4

* Aim :-

To implement and understand working of DNS

* Theory :-

DNS allows us to interact with other host on internet without having to remember long numeric IP addresses and instead uses domain names. So DNS is used to convert the domain name of the website to their numeric IP address.

Types of domain

(i) generic domain - .com, .edu, .org

(ii) country domain - .in, .uk, .ca

(iii) Inverse domain - IP to domain name mapping so DNS provide both the mapping.

* Procedure :-

* Connect the PCs, switches & server wise with the help of automatic wires

2. Select the server & turn on DHCP service & add pool name, Default gateway as 192.168.1.12 & starting IP as 192.168.1.10.

Teacher's Signature: _____

Date _____

Expt. No. _____

Expt. Name _____

Page No. _____

3. Similarly we will go to DNS section in services and turn it on
4. Then add all the records of PCs & add the name of the website and its address → 192.168.1.250
5. Now go to HTTP and edit the files or add a website and save
6. Now go to each PC & check if automatic allocation of PC's is done or not.

* Output :-

1. Click on any PC & open web browser
2. Enter the name given to domain we will get the website we're looking for
3. Now go to command prompt & ping any PC's the domain names given to the PC are 'A, B, C, D, E, F'.
cox ping a, ping b etc.
4. we can also ping the website and it would automatically ping all the PC's that are there in the connection

Teacher's Signature: _____

Date _____

Expt. No. _____

Expt. Name _____

Page No. _____

5. Since the website can be accessed through any PC & PC's are connected over the network through DNS, we have a working connection.

* Learning outcomes :-

1. Learnt about DNS addressing
2. Learnt about how to map ip to a domain name
3. Learnt different types of domain and working of DNS.

Teacher's Signature: _____

Experiment 6

* Aim:

Add and configure server roles of DHCP and DNS

* Prerequisite :

- ★ PC
- ★ Internet connection
- ★ Windows 2008 installed
- ★ Virtual machines
(VMware or Virtual Box)

* Objective :

Learn to add and configure server roles like DHCP and DNS on Microsoft Server 2016 / 08

* Apparatus :

PC with Windows 2016 installed on virtual box

* Steps of the experiment :

① Start the virtual machine

② Open the Windows server installed in last experiment

Teacher's Signature: _____

Date _____

Expt. No. _____

Expt. Name _____

Page No. _____

③ open server manager

④ click on roles

⑤ click on add roles

⑥ A new dialogue box will open in which click next

⑦ In the server roles in left panel, add DHCP server and DNS server roles from role options

⑧ click next > Next > next

⑨ In specify IPv4 and server setting dialogue box add a parent domain and IPv4 address 192.168.94.2

⑩ click Next > Next

⑪ In add or edit DHCP scopes, click on add

⑫ In add scope, enter
Scope name = RRR

Starting IP = 192.168.34.1

Ending IP = 192.168.34.50

Teacher's Signature: _____

Date _____

Expt. No. _____

Expt. Name _____

Page No. _____

⑬ click OK

⑭ click Next > Next

⑮ click install

The DHCP and DNS server roles will be installed by the server manager.

* Observation :

DHCP and DNS server roles were successfully installed

* Learning Outcomes :

- ①. virtual machine knowledge
- ② Learned about windows server.
- ③. DHCP and DNS server role

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24/1/23

Teacher's Signature: _____

Date 2-5-23

Expt. No. 8

Expt. Name _____

Page No. _____

Experiment 8

* Aim :-

Add and remove features in windows server

* Pre requisite :-

Laptop / PC

Windows server 2016

* Procedure :-

1. ① Open Server Manager, on menu click add roles and features
- ② Verify that destination server & network environment are prepared for role and feature, click next
- ③ Select installation type (role based or feature based)
- ④ Select destination server
- ⑤ Select feature / role you want to install, Review selected role / feature
- ⑥ Installation page will show progress, result and message

Teacher's Signature: _____

Date _____

Expt. No. _____

Expt. Name _____

Page No. _____

2. To remove role and feature by using remove role and feature wizard

① Open server manager, on manage tab click on remove roles & features.

② Select destination server page. Select roles, role services you want to remove, wizard automatically prompts you to remove.

③ On the confirm removal selection page, review it. If you are ready to remove the roles that you want to remove.

④ After click remove, the remove progress page displays removal progress, result or messages such as warning, failures etc.

* Result:

Add roles / features & remove roles / features in window server has been implemented.

* Learning outcomes:

1. Learnt about roles and features
2. Learnt how to add roles and features
3. Learnt how to remove roles and features

Teacher's Signature:

⑥ 20/13

Date 20 - 2 - 23

Expt. No. _____

Expt. Name _____

Page No. _____

- * Aim :- To implement dynamic routing using RIP (Routing Internet Protocol)
- * Apparatus Required :- PC, terminal, cisco packet tracer.
- * Theory :- Hub is a networking connector that aids in connecting multiple devices to a single network. It works in the first layer in network model.

Switch is a device that has the ability to link multiple devices together as one computer network. It works on the basis of MAC address and comes under second layer in network model.

Router is a device for connecting two or more packet switched devices and networks. It supports in handling the traffic b/w networks by dispatching data packets & used to save internet connection.

Dynamic Routing called adaptive routing is a process where a ~~router~~ can be forwarded data via a ~~different~~ route for a given destination based on the communication circuit within a system.

Teacher's Signature: _____

Date _____

Expt. No. _____

Expt. Name _____

Page No. _____

* Steps to be done :-

1. open cisco packet tracer
2. Take four 1841 routers and connect them in a rectangle structure with diagonal connection b/w routers 1 and 4 with serial connection.
3. connect switch with routers (one switch for one router).
4. connect 2 PCs and 1 server to switch (case to be considered for each switch)
5. provide serial IP to each router with necessary TP for internetwork communication.
6. Now assign IP to giga ethernet for networking in some network
7. Now configure server with IP (to be same range as routers) and switch on DHCP services with default gateway IP as router, DNS address same as server
8. Now configure each PC with IP option as dynamic instead of static (for each network)

* Observations :-

1. DHCP server helps in assigning IP to all PCs (Dynamic selected) within the network

Teacher's Signature: _____

Date _____

Expt. No. _____

Expt. Name _____

Page No. _____

2. Router act as default gateway and is responsible to send packets of its network to the devices of other networks.
3. Routers to be connected with serial port (WIC-1I) and that need to connect (Installed on router) through serial cable.

* Learning outcomes :-

1. How to configure network to network transmit packet to other networks.
2. How to implement dynamic routing.
3. I learned about Routing Internet Protocol

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Teacher's Signature: _____

Expt. Name _____

Page No. _____

- * Aim :- To make a complex network and apply EIGRP and OSPF routing protocol
- * Apparatus :- PC, terminal, cisco packet tracer

* Theory :-

Routing protocols are used to automatically and dynamically exchange information b/w routers.

Two of the most protocols are

- 1) EIGRP
- 2) OSPF

EIGRP - Enhanced interior gateway routing protocol

It shares the information from one router to neighbour router if they exist in the same region. It is a hybrid protocol as it uses both distance vector routing & link state routing protocol.

Teacher's Signature: _____

Date _____

Expt. No. _____

Expt. Name _____

Page No. _____

OSPF → open shortest path first

It is a protocol which is used to find the best path for packets.
It uses link state routing only

* Steps :-

- 1). Prepare a network and connect a cable that is similar to the one in topological diagram.
- 2). Connect the router with each other and fill the serial activation number to link routers

Setting up OSPF routing algorithm protocol

- 3) Start with router 1 and open CLT terminal and enter the commands

Router > en

Router# conf terminal

Router (config)# router ospf 1

Router(config-router)# network 10.0.0.0

0.255.255.255 area 0

same command with IPs 11.0.0.0,
12.0.0.0, 13.0.0.0

Teacher's Signature: _____

2) similarly setup all the routers with different OSPF IPs but under same area code which is area 0.

Router config - routes)# network To address wildcard mask area

3) OSPF network are setup for the topology. Try sending messages from different routers and test the network.

setting up EIGRP routing protocol

1) Start with router 1 and open CLI command and enter the commands :-

Router > on

Router # conf terminal

Router (config) # router eigrp 1

Router (config - router) # network 10.0.0.0

Router (config - router) # network 11.0.0.0

Router (config - router) # network 12.0.0.0

Router (config - router) # network 13.0.0.0

2) similarly setup all the routers with sum EIGRP ID

Date _____

Expt. No. _____

Expt. Name _____

Page No. _____

Router (config-router) # network IP address

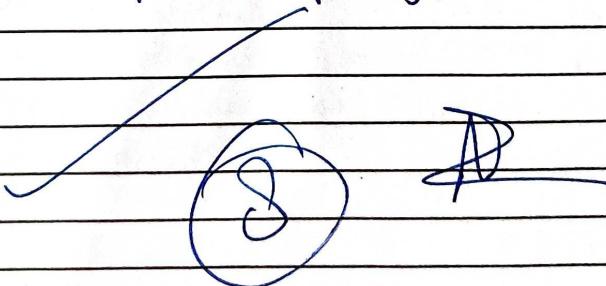
- 2). EIGRP network is setup for the topology.
- 4). Try sending message from different routers and test the network.

* Observation :-

All the router to router connection are successfully attained.

* Learning outcomes :-

1. Learned about different dynamic routing protocols
2. Difference b/w EIGRP and OSPF
3. Information of EIGRP and OSPF on a complex topology



Teacher's Signature: _____