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Microsoft Networking

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Overview

Some important Network Services of Windows 2000

- Domain name system (DNS)
- Dynamic Host Configuration Protocol (DHCP)
- Dynamic DNS (DDNS)



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Domain Name System DNS

DNS- Overview

- Define DNS
- DNS Installation
- Zone creation
 - » Forward
 - » Reverse
- Test DNS
- Zone transfer

Define DNS

- DNS is Domain Name System
 - » pc.ccse.kfupm.edu.sa is a domain name
- DNS is primary method for Name Resolution
 - » ccse-nucleus -> 196.1.67.234
- DNS works as TCP/IP based service in W2000

Installation

- Pre-Requisites for installation
 - » Assign a static IP address to the machine
 - » Configure the DNS settings for TCP/IP
- Installation can be done during W2000 setup or after the setup

Installation (Contd ..)

- Go to Add/Remove Programs in control panel
- Click Add/Remove Windows Components
- Click Networking Services/Details
- Select DNS to install the service

- Configure the DNS through Administrative tools

Installation (Contd ..)

- Follow these steps to confirm the installation
 - » Go to Settings/Control Panel/Administrative Tools/Services
 - » Check the DNS server service

 - » Go to Systemroot\system32\dns folder
 - » This folder should contain
 - . mssc.dns
 - . cache.dns
 - . boot

Define Zone

- A zone is a portion of your name resolution DB
- Forward lookup zone
 - » Resolves hostnames to IP addresses
 - » ccse-funny -> 196.1.66.55 (ping command)
- Reverse lookup zone
 - » Resolves IP addresses to hostnames
 - » 196.1.66.55 -> ccse-funny (nbtstat command)

Forward Zone

- Open DNS manager
- Configure the server(server = computer name)
- Specify the zone type
 - » Primary
- Specify the zone name
 - » mssc.kfupm.com
- Specify the zone file name
 - » mssc.kfupm.com.dns

Reverse Zone

- Open DNS manager
- Configure the server(server = computer name)
- Specify the zone type
 - » Primary
- Specify the network id
 - » 196.1.66

Test DNS

- DNS Console Monitor
 - » Self test
 - » Recursive test
- Nslookup
 - » Nslookup %DNS computer name+
 - » Specify the ip address or host name to be resolved

Zone transfer

- Master server
 - » Maintains the complete database
 - » Updates are done to this zone
- Secondary server
 - » Receives the database from the master
 - » Useful in terms of less maintenance
- Types of zone transfer
 - » Full transfer
 - » Incremental transfer

Zone transfer

- Transfer properties
 - » Serial Number
 - . Tracks update to zone db
 - » Refresh, Retry, expire intervals
 - . Update request intervals



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Dynamic Host Configuration Protocol DHCP

DHCP

- Dynamic host configuration protocol
- Used for dynamic configuration of essential network parameters e.G. TCP/IP parameters
 - » TCP/IP parameters: IP address, DNS address, WINS address etc.
- DHCP clients request DHCP servers for network parameters using DHCP protocol

Why DHCP ?

- Large networks constitute of many hosts. Therefore configuring network parameters on all hosts is a time-consuming task.
- Network may have a small pool of addresses & lot of computers. Reuse of IP addresses is possible because only a few hosts are expected to use their IP address at a given time.
- Network restructuring may result in change of host subnets, thereby necessitating change in network parameters.
- Networks may have mobile computers.

Without DHCP, network parameters would need to be.
Configured manually.

DHCP Operation

Client.

- Client must be configured to use DHCP.
- Client broadcasts request for network parameters.
- Client gets network parameters from the DHCP server for specified lease times.

Server.

- Maintains database of network parameters for different machines or groups of machines (called scopes).
- Manages lease times for all machines.

DHCP Lease Times

- Lease period
 - » Amount of time a client can hold network parameters assigned by the DHCP server
 - » When this time expires client surrenders its IP address
- Renewal period
 - » = 0.5 x lease period
 - » On expiry, host starts trying to renew its lease

IP Address Management

DHCP server uses three methods for IP address:

- Static allocation
 - » IP address is tied to MAC address of client
- Automatic allocation
 - » DHCP server assigns an IP address with an infinite lease period
- Dynamic allocation
 - » IP address assigned on a temporary basis (for lease period)
 - » Revokes the client on expiry of the lease
 - » Client can request for renewal or another IP address at end of lease period

Useful in an environments where temporary connections are
Required or when IP addresses are scarce

Configuring DHCP Scopes

- Each subnet may be configured as a scope.
 - » A scope is a grouping of DHCP clients.
 - » All network parameters for computers of a given scope are the same.
 - » A scope may be assigned a pool of IP addresses.
 - » Scopes allow exclusion ranges within the scope.

DHCP Installation

- Control Panel
- Add/Remove Programs
- Add/Remove Windows components
- Networking Services/Details
- Select DHCP
- Click on OK. This will complete the installation

Configure a Scope

- Requirements

- » Scope Name (66 Network Segment)
- » IP Address Range (196.1.66.0 to 196.1.66.254)
- » Unique subnet mask (255.255.255.0)
- » IP Addresses exclusion list
- » Lease duration (4 Hours)
- » DHCP options
 - . DNS servers
 - . WINS servers
 - . Gateway address

Configure Scope

- Open DHCP console
- Right click on server & select New scope
- Specify all the previously mentioned options
- Activate the scope



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Dynamic DNS DDNS

Dynamic DNS

- Why Dynamic DNS
- Dynamic DNS
 - » Need for DDNS
 - » Update Protocol
 - » Definitions
 - » DDNS operation
- DDNS Advantages

Why Dynamic DNS

- Designed to overcome weakness of Conventional DNS (C-DNS).
- C-DNS needs manual update of host information.
- Manual update takes lot of time even in small networks.
- C-DNS does not integrate with DHCP.
- C-DNS stores stale records.

DNS

- DNS client locates the server for information update
- Sends a message to register with DNS
- If registration exists re-register

DDNS Operation

- DNS dynamic updates are generated by the DHCP service at the client machine
- Functionality at both the client side & the DHCP server

DDNS Operation (Contd.)

DHCP client . At bootup

- Client proposes to update the A resource record
- DHCP Server updates the A & PTR record

DHCP client . At shutdown or IP release

- DHCP server removes PTR R
- Removes A Record if configured for that

DDNS Advantages

- Helps in automation of DNS updates for new hosts
- Obsolete information is not entertained
- Allows frequent changes in IP addresses



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Dynamic DNS Demo