

DESCRIPTION OF TYPICAL NETWORK SERVICES ON SERVERS

Before you start

Objectives: Familiarize yourself with the services such as File and Print, WWW, FTP, E-mail, Faxing, Remote Access, DHCP, DNS and WINS.

Prerequisites: no prerequisites.

Key terms: server, network, ip, address, access, print, workstation, dhcp, send, web, files, dns

File and Print Service

This is the most frequently used network service. It provides users with file storage and print management. Almost every network operating system will provide those services. File services enables us to create, save, open and modify files on the network file system. On the server we can configure huge amounts of storage space, and which can be redundant. This way we can allow users to save data to a centralized location. Instead of having user save data on the local hard drives, we have them save the data on our servers hard drives. This has some advantages. For example, users can access their files from different locations, or different computers on the network, because it is stored in a central location. Another advantage is that administrator can easily backup all that data on the server. Also, the data on the system can be easily share with other users on the network. Network security for the files and folders is also provided.

Print services enable us to print files over the network. We could connect a printer directly to server. When the print job is sent, it is sent to the server first. The server then manages those print jobs and forwards them to the print device. Print devices don't have to be connected to the server directly. Instead, they can be connected over the network. In this situation, we can send print jobs directly to the print device, or we can use the configuration in which we first send the print jobs to the server. Every network printer has a print server built in, but they're not as powerful as those on the server operating systems. By using print services on the server we can configure different rules and controls for printing. Also, the access to printers is easier.

Web Services

There are many different services that fit within the category of Web services. The first one is a Web server. The Web server is software that runs on our hardware server and serves web pages using the HTTP protocol. When we type in a URL in our browser, we access the Web server that holds files in HTML format, along with images and other types of files.

In addition to the Web server, we also have the FTP server. FTP is not so popular any more, but it is still useful in some situations. With FTP we configure some directory on the hard disk drive, and allow remote clients to connect to that directory over FTP protocol using an FTP client. That way remote clients can send files to the server or receive files from the server. This is often used when we're uploading or downloading files to and from a particular server. FTP is not used much anymore because the transfer of user names and passwords goes as clear text. This is dangerous because someone can read our credentials using the network sniffer when we connect to the FTP server.

Another popular web service is e-mail. With e-mail server we can send and receive messages over the network. When we set up an e-mail server, we actually set up a Mail Transfer Agent or MTA. When we configure the e-mail service on the server, it will accept

e-mail messages that come from the client on the workstation, and then forward those messages to the e-mail server where the recipient of the message has an account. The e-mail uploading is done with the protocol called the Simple Mail transfer Protocol (SMTP), and this protocol is also used to transfer the messages between MTAs. E-mail messages are downloaded to the local system using the Post Office Protocol 3 (POP3) or Internet Message Access Protocol (IMAP).

Fax Services

We can install a fax board (or multiple boards) on our server, and run a special service that would process faxes. The workstations on the network can use special fax software which can send the fax to the server, instead of sending the fax directly out on the phone line. The server then takes care of managing the fax jobs. This way we don't have to set up a phone line and a fax board on every workstation which needs faxing capabilities.

Remote Access Services

Sometimes we have to allow our user to access resources on our internal network while they are away (offsite). To do that we can set up a Remote Access Server (RAS). Through RAS we can connect to our internal network using different methods. One method includes setting up modems on RAS. This way users can call into our network over the phone line to the modem on our RAS. The RAS is configured to allow them access to our internal network. Another method is by using Virtual Private Network (VPN). In this method the Remote Access Server is connected to the Internet, and end-users connect over the Internet using a VPN, or Virtual Private Network connection to a Remote Access Server. Again, the RAS is configured to allow them access to the internal network.

DHCP Services

We can configure a DHCP server on our network. DHCP server can be implemented in different ways. It can be configured on our server operating system, it can be dedicated device which will run only that service. Also, many network switches have DHCP services built in. DHCP stands for Dynamic Host Configuration Protocol. Now, every computer on the TCP/IP network has to have an IP address assigned. Basically, there are two ways to assign an IP address to the host. We can do that manually by going to the every computer on our network and entering the IP address, subnet mask, default gateway address, and DNS server address. This is not a problem if we have a small number of computers on our network. But, it is a problem if we have many computers that we need to configure. Because of that we need a way to dynamically assign IP addresses whenever the system on our network comes up. For that we can use a DHCP server. When we power on some computer on the network, it will send a DHCP Discover message on the network. DHCP server is configured with a range of IP addresses that it can assign. When the DHCP server receives DHCP Discover message, it will take an available IP address from the range and send it to the workstation. This is called a DHCP Offer message. The workstation will then send back a message in which it will accept the offer. The DHCP server will then send a formal lease to the workstation. The lease lasts a certain amount of time. this amount of time. After that time expires, the workstation has to renew the lease. The lease time is typically few days, so it's not a problem.

DNS Services

As we now, our network devices are using IP and MAC addresses to communicate on the network. For users it is hard to remember numbers and letters in those addresses, especially for end-users. Instead of using addresses, we can use names for our devices, which are easier to remember. Now, when we use names, it doesn't mean that IP addresses are no longer used. Names are simply translated to IP addresses and the other way around. For that we need a DNS server. The DNS server has a database in which we can find names

associated with IP addresses. Those records are called A records or pointer records. So, when we enter some web address on our end workstation, our workstation actually doesn't know which IP address it has to go to. So, the workstation has to ask a DNS server for the IP address, and the DNS server will return it to the workstation. When the workstation gets the IP address associated with the domain name, it can access the wanted Web server. Whenever we enter a domain name on our workstation, the workstation asks the DNS server for the IP address.

WINS Services

Before we say anything about WINS, we have to know that it isn't implemented anymore. WINS was designed to do a similar thing as DNS. When working with NetBIOS networks, we need to be able to resolve NetBIOS names. For example, it was used to resolve computer names to IP addresses on our network. WINS also has a databases with NetBIOS names and associated IP addresses. Whenever a NetBIOS host boots up on the network, it tries to discover a WINS server. If it detects the WINS server, it will send it's name and the IP address to it. This way the WINS server will have names and IP addresses of all hosts on the network segment. Because of that, users on local workstations can access other computers on the network using their names.

Remember

Using a combination of server hardware and server software, we can configure different services on our network. File services enables us to open, create, modify, and save files on the network file system. Print services enables us to utilize printing over the network. Web server allows us to access web pages located on the server. FTP server allows us to send and receive files over the network. An e-mail server allows us to send and receive messages over the network. Fax services allow us to utilize fax services over the network. RAS allows us to connect to a network while we are are offsite. DHCP is used to dynamically assign an

IP address, a subnet mask, a default gateway address, and a DNS server address to a workstation. DNS associates an IP address with a domain name.

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