



# Install and Configure DNS Server For Windows NT 4.0

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## Introduction

This document deals with installing and configuring DNS services on Microsoft Windows NT 4.0 Server. After completing this guide, you will be able to install, configure and administer a Windows NT DNS name server. Figure 1.0 represents a simple example of a DNS server on a flat local area network (LAN).

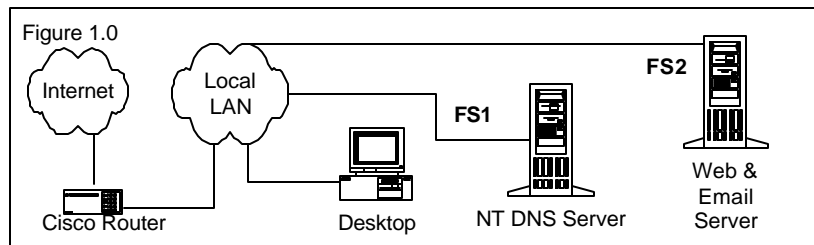


Figure 1

## Background

A white paper on DNS Services describes the terms and concepts used in this document. Before continuing, please refer to:

<http://www.more.net/technical/netserv/tcpip/dns.pdf>

**Note:** To register a public domain name, MOREnet customers should send a request to:

[register@more.net](mailto:register@more.net)

For more information see:

<http://www.more.net/services/managed/dns/index.html>

## Window NT 4.0 Prerequisites

- Windows NT 4.0 Server with a minimum of service pack 4 installed.
- Network connection to the Internet running the TCP/IP protocol. (To install and configure TCP/IP, refer to:  
<http://support.microsoft.com/support/search/c.asp>  
Key phrases search “Install the TCP/IP Protocol”
- Windows NT 4.0 Server installation CD-ROM.
- This installation takes up less than 1 MB of disk space on your server.

## DNS Worksheet

Fill out the following form to record the information about devices and addresses on your local network. You will need this information to complete the installation and configuration of your DNS server.

### Network Configuration Form

1. Fill in your registered domain name. We will use this domain name for the configuration of your local IP addresses. This name can be the same name you registered with your ISP.

Domain Name	Ex: abc.k12.mo.us
Your Domain Name	

2. Fill in the DNS server's search order for the workstations that you want to use. Enter the IP address of this server as the primary DNS server followed by the secondary and tertiary DNS servers on your LAN. The secondary and tertiary servers may be the primary and secondary DNS servers provided by MOREnet. To locate the DNS Servers for your region see:

<http://www.more.net/technical/netserv/tcpip/dnslocate.html>

Primary		← Address of your DNS server
Secondary	<b>150.199.1.10</b>	← MOREnet DNS server
Tertiary	<b>150.199.8.1</b>	← MOREnet DNS server

- Use this table to record the DNS name for your local or internal IP addresses. (These DNS names are not registered on the Internet and can only be seen on your local network.)

Local IP Address		DNS Name	Record	Device Description
<i>Ex</i>	10.0.0.254	FS1.abc.k12.mo.us	A	NIC card of this server
<i>Ex</i>	10.0.0.253	FS2.abc.k12.mo.us	A	FS2 Internal Web Server
<i>Ex</i>	10.0.0.253	www.abc.k12.mo.us	C	FS2 Alias for FS2.abc.k12.mo.us
<i>Ex</i>	10.0.0.253	Mail.abc.k12.mo.us	MX	FS2 Mail Exchange abc.k12.mo.us
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
...				

## Install DNS Server

From the NT server console, perform the following tasks to add the DNS server service. You will need the Windows NT Server installation CD.

From the server desktop:

- Logon to the Windows NT server as Administrator.
- Place your NT system CD in the server CD-ROM.
- Close the Server install screen if it automatically pops up.
- Right click on **Network Neighborhood**, then select **Properties**.
- Select the **Services Tab** then select the **Add** button.
- Select **Microsoft DNS Server**.

7. At the NT Setup dialog box enter the drive letter of your CD-ROM followed by the i386 directory, for example: **F:\i386**
8. Select **continue**, and the required service files will be copied to your server.
9. Select **Close** at the *Network window*. Your network setting will update your bindings.
10. When asked to down and restart your server, choose **Yes**.
11. When the server restarts, login as Administrator and reapply the latest service pack and restart you server again.
12. Continue to Configure DNS Server.

## Configure DNS Server

To configure the DNS server service, use the DNS Manager utility to manage all of your DNS servers from one central location. From the NT server's DNS Manager utility, add a server where the DNS server services will reside.

1. To open the DNS Manager utility, click the **Start button**, click **Programs** then **Administrative Tools (common)**, and select DNS Manager.
2. Select **DNS** from the menu bar, and choose **New Server**.
3. At the dialog box, enter the IP address of this DNS server (for example, **10.0.0.254**) then click **OK**.
4. Select **DNS** from the menu bar and choose **Update Server Data Files**.

## Create a Forward Lookup Zone

At the main menu of the DNS Manager create a forward lookup zone for resolving names to addresses.

1. Right-click the new server address (for example, **10.0.0.254**) under the Server List and select **New Zone**.
2. Select **Primary** and click **Next**.
3. Accept the default Zone Name (if present) or enter a name like **abc.k12.mo.us** For more information on naming convention see:

<http://www.more.net/services/managed/dns/index.html>

4. Press the TAB key to auto-fill the name of the Zone File. (Results: `abc.k12.mo.us.dns`).
5. Select **Next** and read the text message, then click **Finish** to create the new zone. You will see the new records created for this zone in the zone information pane on your right.
6. Select **DNS** from the menu bar and choose **Update Server Data Files**.
7. Continue to create a Reverse Lookup Zone for this network address.

### Create a Reverse Lookup Zone

At the main menu of the DNS Manager you need to create a reverse lookup zone for resolving addresses to names.

1. Right-click the new *server address* under Server List and select **New Zone**.
2. Select **Primary** and click **Next**.

*Note: This next step is important and must follow a specified syntax!*

3. When prompted to enter the Zone Name you must enter a name that is derived from the IP **NETWORK** address. Drop the last octet of your IP address range and apply it to the formula below. It is imperative that you enter your octets in reverse order followed by `.in-addr.arpa`.

For example: If your network address number is **10.9.8.0/24** (similar to a class c, then your reverse zone is: **8.9.10.in-addr.arpa**. More examples below:

Formula: (Drop last octet, reverse the remaining octet order, append `.in-addr.arpa`)

Network address	Bits	Subnetwork Mask	Usable hosts	REVERSE ZONE NAME
<b>10.0.0.0</b>	/24	255.255.255.0	254	<b>0.0.10.in-addr.arpa</b>
<b>192.168.1.0</b>	/24	255.255.255.0	254	<b>1.168.192.in-addr.arpa</b>
<b>204.67.14.128</b>	/25	255.255.255.128	126	<b>14.67.204.in-addr.arpa</b>
<b>168.166.0.0</b>	/16	255.255.0.0	65,023	<b>166.168.in-addr.arpa</b>
<b>150.199.2.32</b>	/27	255.255.255.224	30	<b>2.199.150.in-addr.arpa</b>

4. Enter the appropriate *Zone Name* (in our example it will be **0.0.10.in-addr.arpa**), press the TAB key to auto-fill the name of the Zone File. (Results: **0.0.10.in-addr.arpa.dns**).
5. Select **Next** and read the text message, then click **Finish** to create the new zone. Select **DNS** from the menu bar and choose **Update Server Data Files**.

## Create an AName Record (Host name)

Add a new host name for a device using DNS Manager and verify the data is updated under the forward and reverse lookup zones.

1. Open DNS Manager, highlight the forward lookup zone `abc.k12.mo.us`
2. Select **DNS** from the menu bar and choose **New Host**.
3. Put a check mark in the **Create Associated PTR Record** box.
4. Enter a name for the device like **FS** then press TAB.
5. Enter the IP address of the FS2 server, for example, **10.0.0.253**, and select **Add Host**.
6. Select **Done** to complete this task.
7. Put these changes into effect by selecting **DNS** from the menu bar and choosing **Update Server Data Files**.
8. From the menu bar select **View** then **Refresh** to update your display.

***Note:** You should see two new "A" records created, one under the forward lookup zone and one under the reverse lookup zone. If a new record was not created in the reverse lookup zone, check your syntax on that zone.*

To make corrections:

- Remove an item by right-clicking the reverse zone name and choose **delete**.
- Re-add it by repeating the sections Create a Reverse Lookup Zone and Add a New Host.

You have completed setting up your DNS server zones and adding a domain name record that will allow reverse lookup. Test your DNS server by referring to either the section on Verify a DNS entry using Nslookup or Verify your DNS connectivity from a workstation.

## Create a CName Record (WWW)

A canonical name record is an alias name record for an AName record. Use the DNS manager utility to create this record.

1. From the DNS Manager utility, **right-click** your forward lookup zone `abc.k12.mo.us`, and select **New Record**.
2. In the New Resource Record window under Record Type select **CNAME Record**.
3. At the Alias Name dialog box and enter an alternate name for `FS2.abc.k12.mo.us` (for example, `www`)
4. In the For Host DNS Name field enter the AName of the server, `FS2.abc.k12.mo.us` (This field must include the fully-qualified domain name of the originating host).
5. Click OK, then select **DNS / Update Server Data Files**.

## Create an MX Record (Mail)

Create a domain name record for a local mail server by creating a Mail eXchange (MX) record. The MX record is used by the mail transport protocol (SMTP) to recognize a mail server for a domain. If you do not have an AName record created for this device, create one using the steps detailed above.

1. Open the DNS Manager utility.
2. Right-click the forward lookup zone `abc.k12.mo.us` under the **Server List** and select **New Record**.
3. In the New Resource Record window under Record Type select **MX Record**.
4. In the **Host Name Optional**.

*Note:* The *Host Name (Optional)* field is used for the host name of the mail server. If you want users to be able to send mail to your domain using the format `user@abc.k12.mo.us`, then leave the Host Name field blank. (In this exercise we will add the name `mail.abc.k12.mo.us`).

5. In the Host Name Field Optional, enter **mail**.
6. Select the Mail Exchange Server DNS Name field and enter the ANAME of the server followed by a period, that is, `FS2.abc.k12.mo.us`.

**Note:** There must be a trailing dot, ".", after the Mail Exchange Server's DNS Name and there must be an ANAME record already created for this server.

7. Select the Preference Number field and enter **0** if this is the primary DNS server.

**Note:** A valid range is from 0 to 65535. Multiple mail servers' MX records should have different priority settings like 0,10,20,30, where 0 holds the highest priority. This setting protects against mail loop back problems and provides multiple servers a chain of command in sending and receiving mail.

8. Click OK, then select **DNS / Update Server Data Files**.
9. Confirm the MX record is working using the NSLOOKUP utility. (See the section Verify the MX record using NSLOOKUP).

## Verify a DNS Entry With Nslookup

The following example uses the Windows NT command line (DOS prompt) NSLOOKUP utility. Other similar utilities such as Netlab or WS32Ping are available for Windows 95/98 that can achieve the same functionality.

1. From a Window NT workstation, open a Command prompt window.
2. Select **Start, Programs**, then **Command Prompt**.
3. At the prompt enter **nslookup**, then press **ENTER**.
4. The default server is displayed followed by the nslookup mode prompt **>**.
5. Change the server to query local DNS server's IP address by entering **SERVER 10.0.0.254**.

**Note:** If your local DNS server's address is **10.0.0.254**, then it will look like this:

```
Command Prompt
> SERVER 10.0.0.254
Default Server: [10.0.0.254]
Address: 10.0.0.254
>
```

6. Verify a DNS name of an IP address by entering **10.0.0.253** and see the results:

```
Command Prompt
> 10.0.0.254
Server: [10.0.0.254]
Address: 10.0.0.254

Name: FS1.ABC.k12.mo.us
Address: 10.0.0.254
```

7. Verify an IP address resolves to a DNS name by entering **fs5.abc.k12.mo.us**.

```
Command Prompt
> fs1.abc.k12.mo.us
Server: [10.0.0.254]
Address: 10.0.0.254

Name: FS1.ABC.k12.mo.us
Address: 10.0.0.254
```

8. If you do not resolve a name correctly, refer the section *Modify a DNS database* to make changes to your resource records.

## Verify an MX Record With Nslookup

1. From a Windows NT workstation select **Start, Run, NSLOOKUP**, then press **ENTER**.
2. Check your new domain name using the NSLOOKUP utility with the **MX OPTION** turned on like the following.
3. At the NSLOOKUP prompt **>**, enter **server 10.0.0.254**.

4. At the > prompt, enter **set querytype=mx**.

```
Command Prompt
> SERVER 10.0.0.254
Default Server: [10.0.0.254]
Address: 10.0.0.254

> set querytype=mx

> mail.abc.k12.mo.us
Server: [10.0.0.254]
Address: 10.0.0.254

mail.abc.k12.mo.us      MX preference = 0, mail exchanger = fs3.ABC.k12.mo.us
abc.k12.mo.us          nameserver = FS5.ABC.k12.mo.us
fs3.ABC.k12.mo.us      internet address = 207.160.135.188
FS5.ABC.k12.mo.us      internet address = 207.160.135.186
>
```

## Configure a Windows DNS client

This section describes how to add and remove DNS servers on a workstation. You can also use a workstation to verify that a DNS server is resolving IP address to host name by removing all of the secondary and tertiary DNS server names leaving only the one you wish to test.

***Note:** If you are using DHCP services on your network, set your workstation for a static IP assignment for this exercise in verifying a DNS server.*

From a Windows 95/98/NT workstation:

1. Click **Start, Settings, then Control Panel**.
2. Open the **Network Icon**.
3. Select the **Protocol or Configuration tab** and highlight **TCP/IP Protocol**.
4. Select **Properties**.
5. Select the **DNS tab** to configure your DNS settings.
6. To manipulate your DNS server entries use the Add and Remove buttons in the DNS Service Search Order section.

*Note: It is important to remember that the workstation will search from the top down, so the DNS server you just installed must be on top of the other two DNS servers' entries.*

7. Add your new local DNS server to the list and make the necessary modifications so your local DNS server is the primary server, and your secondary and tertiary are the backup DNS servers on your network. (See your ISP for the DNS servers closest to you. For MOREnet customers, use 150.199.1.10 as the secondary and 128.206.2.252 as the tertiary).
8. Exit, save changes, then restart your workstation.
9. Test your local DNS server for the new addresses you added in the Test your DNS Server section.

## Test Your DNS Server

From a workstation configured with the local DNS server as the primary DNS server, try the following commands to verify from a workstation that the DNS server is resolving address to name resolution.

1. From your workstation, open a command line or MS-DOS window.
2. At the command line enter `PING 10.0.0.254` then press ENTER.
3. Look for Reply from 10.0.0.254 bytes=32.... to verify you are successful.
4. At the command line enter `PING FS1.ABC.K12.MO.US` then press ENTER.
5. Look for a reply from 10.0.0.254.
6. This tells you that you can ping the DNS name and the IP address of a host.

## Administer the DNS server

### Start and Stop Your DNS Server Service

Start and stop DNS services on your server by selecting the Services icon under the Control Panel directory. From the desktop of the server complete the following.

1. Click **Start**, select **Settings**.
2. Click **Control Panel**, then double-click the **Services** icon.
3. Scroll down and highlight **Microsoft DNS Server**.

4. Choose the **Stop button** on the right to stop the service.
5. Choose the **Start button** on the right to start the service.

**Note:** You can also choose the alternative selections to pause or change the startup behavior of this service.

An alternative way to start and stop the DNS server service is from a Command Prompt. The following commands are entered from a command prompt.

- **NET STOP DNS**
- **NET START DNS**

### **Modify a DNS Database**

Edit, add and remove domain names from your DNS database from the DNS Manager.

1. Under the **Server List** in DNS Manager, select the DNS server that contains the resource record you wish to modify.
2. Expand the directory tree by **double-clicking a leaf folder** until you locate the record you want to modify.
3. The records will appear in the right hand window. Use the following commands to modify your database using this utility.
  - **Right-click the record** and select **properties** to edit a record's properties.
  - **Double-click the record** to bring up the modify button.
  - **Right-click off a record** to add a new host.
  - **Right-click the record** and select **delete** to remove a host.
4. Make sure the **Update Associated PTR Record** box is checked to update associated records or you will have to also modify the PTR record in the reverse lookup zone.