

How to configure NTP on V5.0A and Later

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1. How to configure NTP on V5.0A and Later

Applies to: TCP/IP Services for OpenVMS V5.0A and later

TCP/IP Services NTP software is an implementation of the NTP Version 4 specification.

2. Procedure

2.1 Enable the NTP Service

Run the TCP/IP Services configuration procedure:

```
$ @SYS$MANAGER:TCPIP$CONFIG.COM
```

Select:

```
3 - Server components
11 - NTP
1 - Enable service on this node
```

2.2 Configure the Time Zone

Configure the local time zone using the appropriate utility for your OpenVMS version:

```
$ @SYS$MANAGER:UTC$CONFIGURE_TDF.COM
```

or:

```
$ @SYS$STARTUP:UTC$TIME_SETUP.COM
```

This procedure defines the `SYS$TIMEZONE_DIFFERENTIAL` logical name, which NTP uses to determine the local offset from UTC. Ensure the configured offset matches your local time zone.

2.3 Create and Configure the NTP File

Create the configuration file from the template:

```
$ COPY SYS$SPECIFIC:[TCPIP$NTP]TCPIP$NTP.TEMPLATE -  
_ $ SYS$SPECIFIC:[TCPIP$NTP]TCPIP$NTP.CONF
```

Edit the TCPIP\$NTP.CONF to include the server or peers:

```
SYS$SPECIFIC:[TCPIP$NTP]TCPIP$NTP.CONF
```

Example:

```
peer 1.2.3.4  
server 1.2.3.5
```

Use fully qualified host names or IP addresses.

2.4 Define a Stratum Server (Optional)

Skip this step for client-only systems.

Add to TCPIP\$NTP.CONF:

```
server 127.127.1.0  
fudge 127.127.1.0 stratum 10
```

This configures the system as a local NTP server with stratum 10.

2.5 Synchronize the System Clock (Optional)

Skip this step for a free-running server.

Define TCP/IP command symbols:

```
$ @SYS$MANAGER:TCPIP$DEFINE_COMMANDS.COM
```

Synchronize the clock:

For TCP/IP V5.X

Run the NTPDATE command to initially synchronize the system clock with the NTP server:

```
$ NTPDATE
```

For TCP/IP V6.0 and later

Note

NTPDATE is deprecated and will be removed in a future release of VSI TCP/IP Services V6.0. To achieve equivalent functionality, use NTPD with the following command:

```
$ NTPD :== $TCPIP$NTP
$ NTPD "-G" -q
```

2.6 Restart and Verify NTP

Restart NTP with the following commands:

```
$ @SYS$STARTUP:TCPIP$NTP_SHUTDOWN.COM  
$ @SYS$STARTUP:TCPIP$NTP_STARTUP.COM
```

After startup, review the NTP log file:

```
SYS$SPECIFIC:[TCPIP$NTP]TCPIP$NTP.LOG
```

Check for synchronization messages and startup errors.

3. Troubleshooting

3.1 Diagnosing NTP Synchronization Issues

3.1.1 Checking Clock Synchronization

For TCP/IPv6

Use the following command to display the clock offset between the local system and the NTP server:

```
$ NTPQ -p

remote          refid          st t when poll reach delay  offset  jitter
=====
*ntpserver      10.10.111.141  4 u  888 1024   377 0.977 -109.92  18.960
```

A negative offset indicates that the local system clock is behind the NTP server, whereas a positive offset indicates that the local system clock is ahead of the NTP server.

For TCP/IPv4

Use the NTPTRACE command to compare the local clock to the server clock.

```
$ @SYS$MANAGER:TCPIP$DEFINE_COMMANDS.COM
$ NTPTRACE ntpserver
ntpserver: stratum 3, offset -8.521804, synch distance 5.79401
```

In this example, the server's stratum is set to 3. Offset shows a negative number, therefore, the server is requesting to subtract 8.521804 seconds from the clock.

If the difference between the local and the server's time is greater than 1000 seconds, NTP will fail to synchronize the clock with the server.

This can be seen in the TCPIP\$NTP.LOG:

```
time error 7214.419784 is way too large (set clock manually)
```

This indicates that the clock is off by 7214 seconds.

3.1.2 Verify Time Zone Offset

If synchronization fails due to a large time difference, verify that SYS\$TIMEZONE_DIFFERENTIAL is set correctly:

```
$ SHOW LOGICAL SYS$TIMEZONE_DIFFERENTIAL
"SYS$TIMEZONE_DIFFERENTIAL" = "-25200" (LNM$SYSTEM_TABLE)
```

3.1.3 Manually Synchronize the Clock

After verifying that the time zone offset is correct, manually synchronize the local system clock using the following commands:

For TCP/IPv6 use

```
$ @SYS$MANAGER:TCPIP$NTP_SHUTDOWN.COM
$ NTPD :== $TCPIP$NTP
$ NTPD "-G" -q
$ @SYS$MANAGER:TCPIP$NTP_STARTUP.COM
```

For TCP/IPv4 use

```
$ @SYS$MANAGER:TCPIP$NTP_SHUTDOWN.COM
$ NTPDATE server_ip_addr
$ @SYS$MANAGER:TCPIP$NTP_STARTUP.COM
```

Note

NTPDATE fails if TCPIP\$NTP is already running or UDP port 123 is in use.

3.1.4 Stratum Values

NTP can synchronize only with servers that have a stratum value below 15. If the selected NTP server has a stratum of 15 or higher, synchronization will fail. A client with a stratum of 16 or greater is considered unsynchronized.

3.1.5 Run NTP Interactively

Log messages may take several minutes to appear in TCPIP\$NTP.LOG. For immediate feedback, run NTP interactively and view messages directly on the terminal:

```
$ @SYS$MANAGER:TCPIP$NTP_SHUTDOWN.COM
$ RUN SYS$SYSTEM:TCPIP$NTP.EXE
```