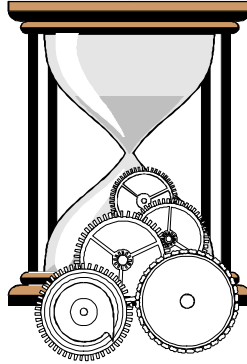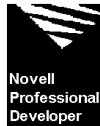# PROTIME

NetWare Fileserver Time Synchronisation Services
NetWare Loadable Module

Version 4.0

For NetWare Versions 3.x and 4.x

Manual Revision :   October, 1997

Novell
Professional
Developer

yes
It runs with
NetWare

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PROTIME
Fileserver Time Synchroniser

Introduction

PROTIME is a file server application designed to ensure that a NetWare v4.x or v3.x file server has its clock synchronised with Telstra Australia's digital clock service. Telstra provides a digital clock service similar to the NIST atomic clock service in the United States Of America. This service is available in most capital cities for the cost of a local call and it is freely accessible to the public.

File server time synchronisation is normally used for the following reasons:

- When a work station logs into a server, it by default has its local time updated to the time on the file server. If the file server's time is not correct the work stations becomes incorrect, file access records and directory listings reflect the inaccuracy. All applications that use the local computers clock will also have the incorrect time.

- Time synchronisation is critical on NetWare v4.x networks. Novell's X.500 based network wide database "NetWare Directory Services" (NDS) time stamps all database transactions. Problems may arise with file server NDS database synchronisation if a file server time is not correct.

- Numerous other network applications require accurate time on the file server and work stations some examples are order entry systems, reservation applications, Lotus Notes, fax gateways, diary and scheduling software and so on.

At the time of publication only Telstra Australia's service was tested, however it is likely that it will function for other digital dialup services in other parts of the world.

Telstra's service provides a 1200BPS dial-up facility in each state of Australia. This service reflects the local time for each state taking into account day-light savings and other local time factors. PROTIME will synchronise the file server clock with the time given to it by the Telstra clock. PROTIME does not perform any manipulation of the time received unless specified to do so.

PROTIME may be used in time-zones and countries that are not necessarily within any Australian time zone. PROTIME can be used to attach into Telstra Australia's clock via a long distance or international call and perform time addition or subtraction on the time provided. In this way many South East Asian and New Zealand fileservers can enjoy the benefits of synchronised local time without having to have a service provided within their country.

Configuration

PROTIME was originally designed for NetWare v4.0 to provide a NetWare Directory Services network with accurate timing. Often a file server's hardware clock may become inaccurate or two or more servers may disagree about what the time actually is. In order to determine the most accurate time, NetWare NDS provides a mechanism for multiple file servers to negotiate and therefore work out a synchronised network time. NetWare v4.x servers can be defined as reference servers, primary servers or secondary servers. Multiple primary servers negotiate the time amongst themselves, secondary servers just accept the time of the primary servers and reference servers act as a reference point for the network providing definite timing. With this type of structure and the fact that NetWare v4.x servers are installed with the servers local time co-ordinate a single reference server can be used for a country-wide network that spans multiple geographic time zones.

PROTIME is also supported on NetWare v3.x fileservers and can provide clocking to single or multiple NetWare v3.x servers throughout a single time domain only. The PROTIME distribution diskette contains a program known as PROREMOTE which enables v3.x fileservers to communicate with a central PROTIME server and update the remote servers clock without the requirement for an additional modem.

NetWare v4.x and NetWare v3.1x (General)

PROTIME is loaded like most third party NetWare Loadable Modules (NLM) either from the console or from the AUTOEXEC.NCF start-up file. PROTIME.NLM and PROTIME.INI should be copied to the SYS:SYSTEM directory. A CCITT v22 and Hayes compatible modem should be attached to the file servers serial COM1 port (refer to AIO_BOARD and AIO_PORT configuration parameters if COM1 is not suitable).

From the file server console, time synchronisation can be activated by typing

```
LOAD AIO
LOAD AIOCOMX
LOAD PROTIME <parameters>
```

Note: The distribution diskette contains PROSTART.NCF with these commands pre-entered.

AIO.NLM is Novells asynchronous device driver manager and is responsible for the managing the registration of AIO devices like AIOCOMX. AIOCOMX is Novells serial port device driver that enables applications to use the file servers serial ports with the AIO specification. These two NLMs are required or PROTIME will not be able to communicate with the hardware. They must be loaded before PROTIME is loaded.

PROTIME uses three files in the SYS:SYSTEM directory :
1. PROTIME.NLM is the NetWare Loadable Module containing the program code.
2.* PROTIME.INI contains the setup strings refer to the PROTIME configuration section for specific file server and modem setups.
3.* PROTIME.LOG is an optional text log file of events that PROTIME encounters during operation.
(*) may be changed from default by using the configuration options.

NetWare v4.x Specific

Reference Servers

Primary Servers

Secondary Servers
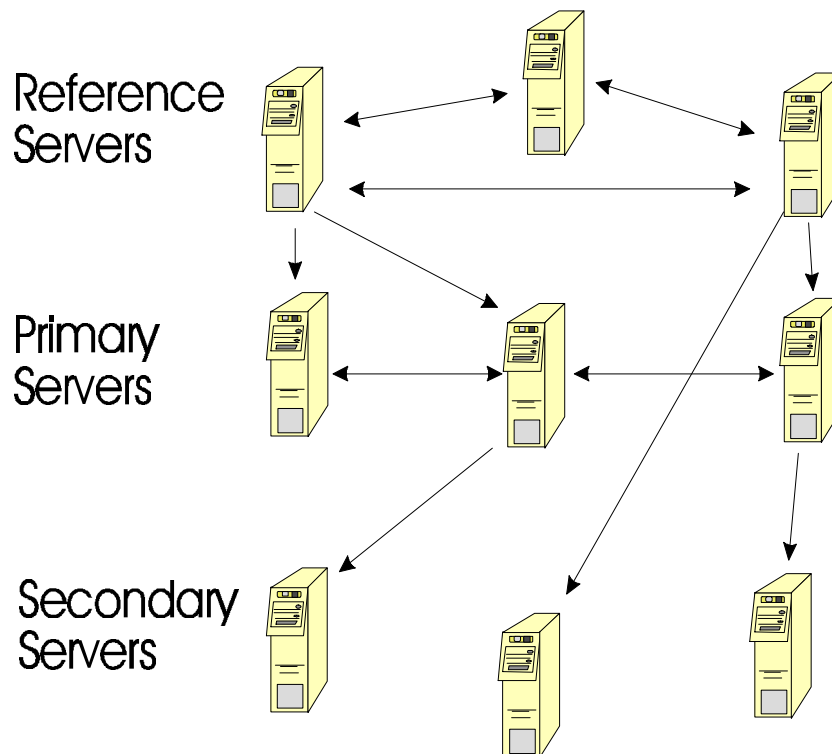
PROTIME may be used on single or multiple NetWare v4.x reference servers to provide Network wide clocking. It is extremely important that all file servers have the time zone (hours in front/behind UTC time) set correctly. If this is not set correctly Novells NetWare v4.x time synchronisation application will incorrectly set some file servers with incorrect times for the local region. NOTE: This would happen with or without PROTIME.

Once you have a single reference or reference server configured, all NetWare v4.x file servers should show their correct time no matter which geographic time domain they are in. It should be noted that due to the method employed by the NetWare TIMESYNC.NLM, servers whose time is significantly incorrect may take some time to be network synchronised.

The NetWare file servers compensate for slow communication links by testing link trip times, in this way remote file server's calculate the correct time from the time zone information of each file server.

NetWare v4.x's TIMESYNC.NLM is used to synchronise the fileservers time with the network. It is important to observe the following configuration parameters when installing PROTIME to provide network wide clocking and date synchronisation.
TIMESYNC.NLM uses a text configuration file "SYS:SYSTEM\TIMESYNC.CFG" to obtain its setup from.

TIMESYNC.CFG for a NetWare v4.x Reference file server **with PROTIME loaded**.

```
    # Configuration Parameters from server PCOM_01

    Configured Sources =    OFF
    Directory Tree Mode =    OFF
    Hardware Clock =    OFF
    Polling Count =    3
```

```
Polling Interval =    600
Service Advertising =    ON
Synchronization Radius =    2000
Type =    REFERENCE

# Configured time source list from server PCOM_01
```

TIMESYNC.CFG for a NetWare v4.x Secondary file server **without PROTIME loaded**.

```
# Configuration Parameters from server PCOM_02

Configured Sources =    OFF
Directory Tree Mode =    OFF
Hardware Clock =    OFF
Polling Count =    3
Polling Interval =    600
Service Advertising =    ON
Synchronization Radius =    2000
Type =    SECONDARY

# Configured time source list from server PCOM_02
```

These sample configuration files highlight the important options in verbose format. The timesync commands specified in these files may also be shortened - refer to NetWare v4.x electronic manual or the Time Synchronisation section of the NetWare v4.x Architecture guide for further commands and information on Timesync.cfg.

Novell's NetWare v4.x Timesync Netware Loadable Module is responsible for maintaining the network time according to the accurate time provided to it by the single or multiple PROTIME servers. Novell have designed the NetWare v4.x timesync process to synchronise fileservers on a gradual basis by adjusting the tick rate of each file server until it synchronised with the network. This may mean that it can take a number of hours for a server with a time that is a long way off the true time to become "network synchronised".

This manual details the use and configuration of PROTIME and PROREMOTE. For a more thorough description of the advanced features of the built-in NetWare v4.x time synchronisation application refer to Novell's November 1993 edition of their "Application Notes" which is titled "Time Synchronisation in NetWare 4.x". This document discusses in detail the importance of network accurate time and the more advanced features of their product.

NetWare v3.x Specific - PROTIME and PROREMOTE

NetWare v3.1x does not natively support multiple file server time synchronisation. PROREMOTE has been designed to additionally provide NetWare v3.x servers with this capability. PROREMOTE is a NetWare Loadable Module that is loaded on each remote file server within the same geographic time domain as the PROTIME master server. PROREMOTE communicates with PROTIME and adjusts the remote file server date and time with that of the master PROTIME Time Server.

Atomic Clock

Time Extracted From
Atomic Clock

Protime Time Service
NetWare v3 or v4

10:00am   10:00am   10:00am   10:00am

NetWare v3.x
With ProRemote
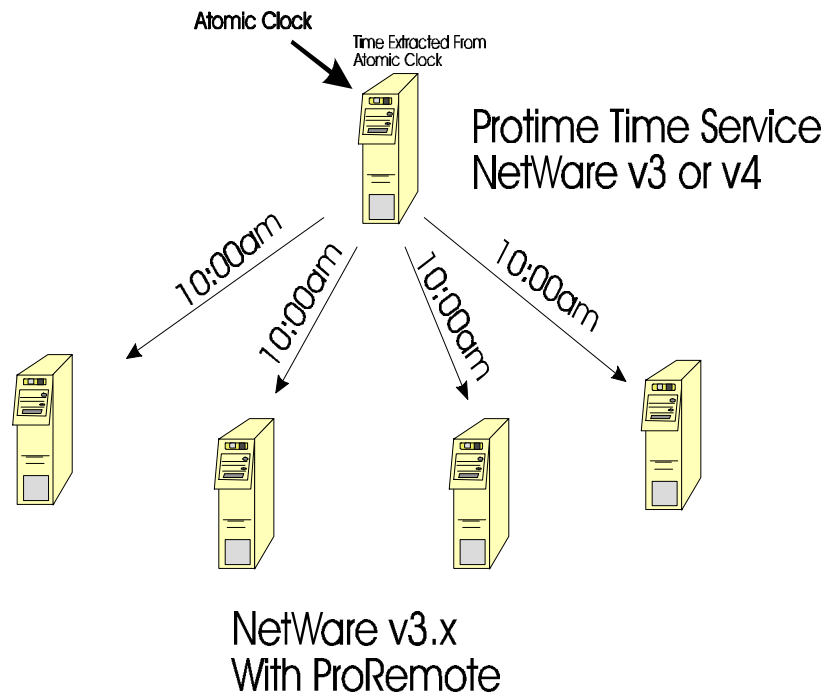
PROREMOTE is loaded on each remote v3.x file server in the following manner :

```
LOAD PROREMOT <optional parameters>
```

For optional parameters, refer to the PROTIME Configuration Options section below.

PROREMOTE is NOT required for NetWare v4.x fileservers as NetWare v4.x already provides inbuilt time synchronisation amongst fileservers.

If you intend to use multiple PROTIME time servers to provide network time redundancy or multiple domain support, PROREMOTE will by default connect to the first PROTIME server that matches PROTIME_*. It may be likely that if multiple PROTIME servers are present PROREMOTE may connect to an unintended PROTIME time server. This can be simply overcome by changing the PROREMOTE search name from the default of "PROTIME_*" to a specific name or a different group name eg "PROTIME_FS1" or "MELB_*". Additionally the PROTIME server name may also be changed from the default of "PROTIME_<fileserver name>" to any other name.

MELB_FS2

MELB_FS1

SYD_FS2

SYD_FS2

PROREMOTE
Using MELB_*

PROREMOTE
Using SYD_*

Melbourne

Sydney
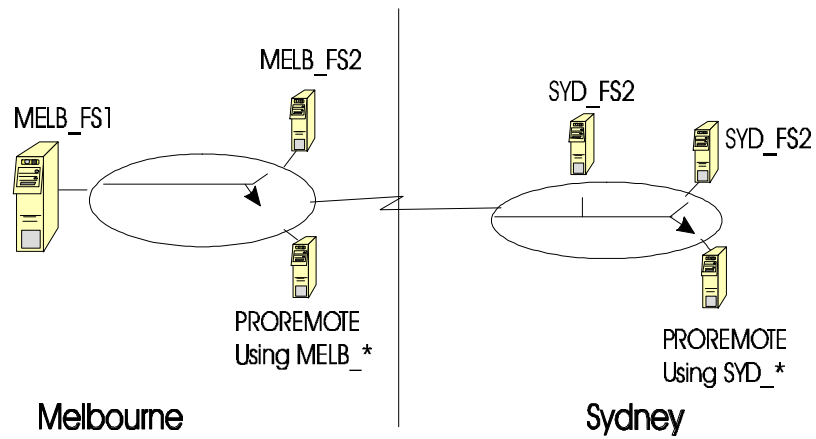
It is often useful to establish specific groups of PROTIME servers as in the above example. If any of the PROTIME servers in each group failed, the PROREMOTE machine would begin requesting time from any other servers within the group. Groups are not limited to distance or any number of servers, and having groups that span multiple sites is also an option.

Sample Configurations
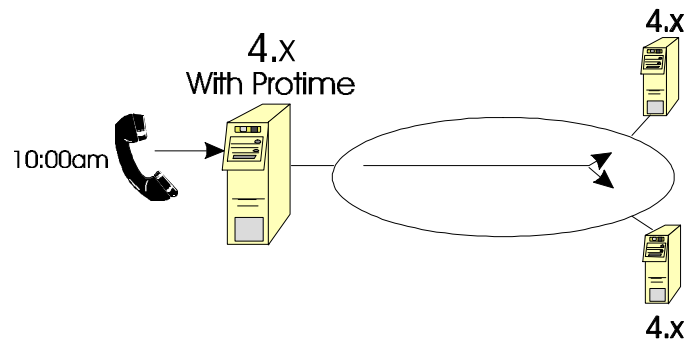
PROTIME in its basic configuration synchronises the clock of a NetWare v4.x single reference file server which in turn through Novell Timesync program updates the other NetWare v4.x fileservers clocks. This provides accurate timing to the entire network.

_____
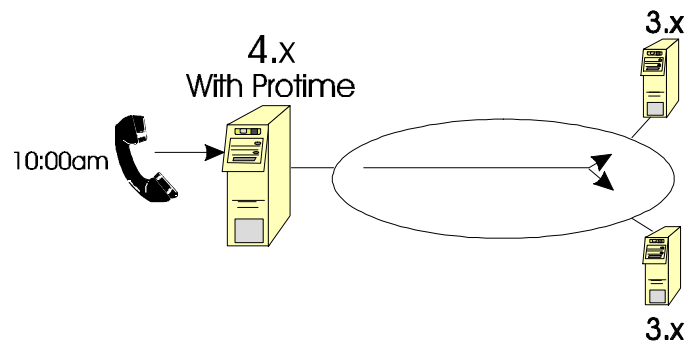
PROTIME has the option of updating both NetWare v4.x fileservers and v3.x fileservers simultaneously. When PROTIME is used with PROREMOTE on the NetWare v3.x fileservers, PROTIME is able to accurately synchronise the 3.x fileservers clocks. PROTIME must be started with the /3 parameter to allow NetWare v3.x fileservers to attach to it.

_____
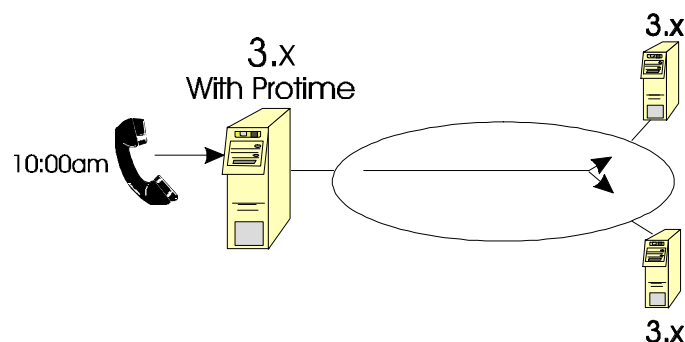
PROTIME is not dependant on NetWare v4.x and may be configured in a purely NetWare v3.x network. PROTIME must be started with the /3 parameter to allow external NetWare v3.x fileservers to gather time information however it is not required if only the PROTIME servers clock is required to be updated.

_____
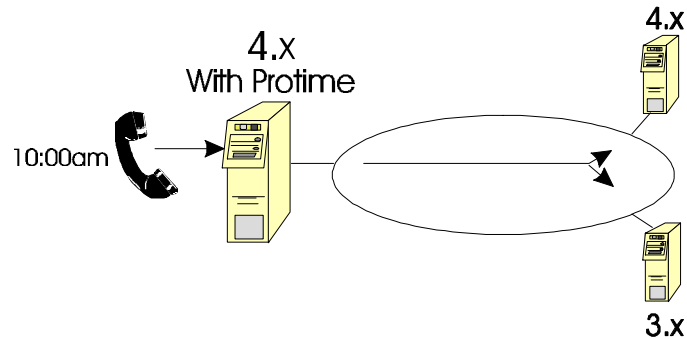
PROTIME can be used in a mixed environment to provide clocking to the NetWare v4.x network while simultaneously providing clocking to NetWare v3.x fileserver's with PROREMOTE loaded. Please note that no additional programs are required to be loaded on the remote NetWare v4.x fileservers as they have the Novell timesync application built in which synchronises them with the reference server that is running PROTIME.

_____
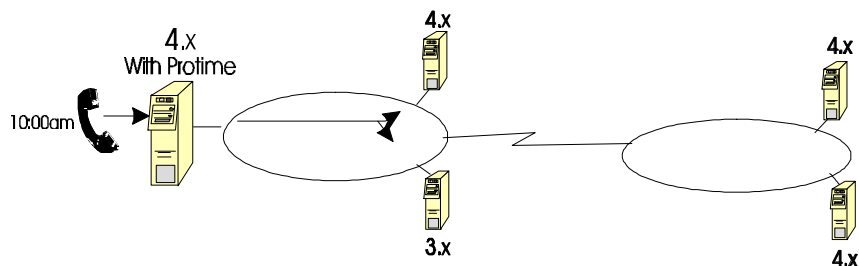
PROTIME works equally as well across a geographic wide area network within the same time domain, with a mixture of file server types.

_____
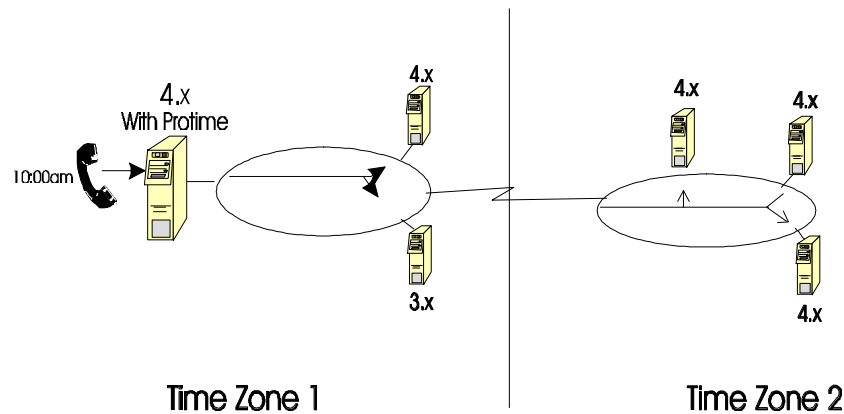
NetWare v4.x natively provides support for time updates across multiple time zones. When PROTIME is loaded, any reference server within the network can be used to provide accurate network timing for the entire geographically dispersed network without the requirement to purchase multiple copies of PROTIME for each time zone. It is important that the NetWare v4.x fileservers time co-ordinates are set correctly.

PROREMOTE for NetWare v3.x currently does not have support for multiple time zones. But can provide clocking within individual time zones independent of coverage. For a multi-time zone NetWare v3.x network (not Netware v4.x), a single copy of PROTIME is required for each zone where time synchronisation is required.

_____
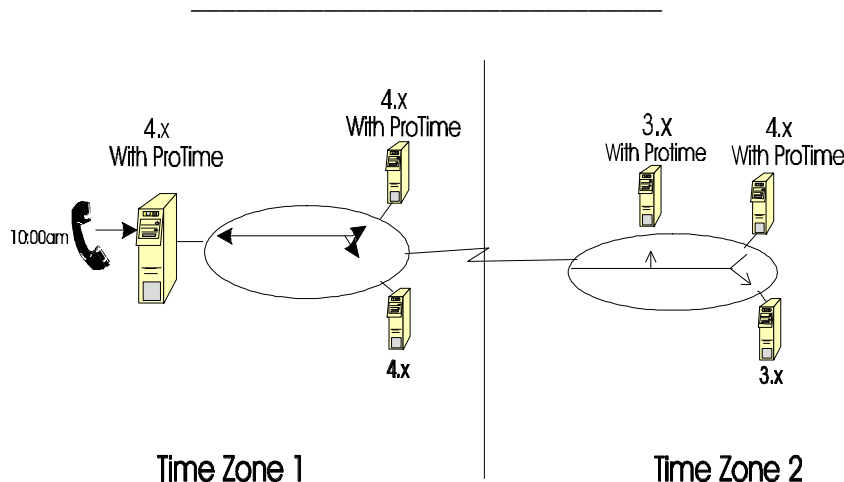
Network time redundancy is provided through the use of multiple PROTIME time servers. The NetWare v4.x timesync process and PROREMOTE remote servers are capable of obtaining accurate from more than one source. In the event of a PROTIME server failing, PROREMOTE will connect to any other PROTIME server that matches its search name ie if the PROREMOTE server search name was the default of "PROTIME*" PROREMOTE would attach to the first time server that matched this name. For this reason when multiple PROTIME servers are used in a NetWare v3.x environment the location and names should be changed from the default.

_____

PROTIME Parameters

PROTIME provides two methods of specifying needed parameters. The first is via the command-line and the second is through a text configuration file. If command-line parameters conflict with config file entries, command-line options have precedence.

Command line parameters

Over-ride modem check at start-up

/O   Default: Modem Checking ON

This parameter will instruct PROTIME to ignore the fact that NO modem is attached to the AIO port specified in the configuration at start-up. By default this option is turned on, this will cause PROTIME to report immediately on start-up that no modem could be found. PROTIME will exit if no modem is found unless the /O parameter is specified.
Once you are happy with your configuration it is suggested that this parameter be added to the PROTIME command-line. This will enable PROTIME to load after a file server reboot even if no modem is present. This is useful if remote PROREMOTE servers use this server (and have no backup PROTIME server) for time updates.

Number of days between dialup synchronisation

/D<days>   Default: 1

Days is in 24 hour periods and may be between 1 and 7. This value specifies when PROTIME will attempt to dial into Telstra and synchronise the file servers clock. The recommended value is between 1 and 7 days.

The amount of time allowed for the modem to attach to the Telstra computer

/T<seconds>   Default: 60

This time may need to be adjusted if it takes more than 40 seconds for your modem to connect to the digital clock. This time is measured from when PROTIME sends the phone number to the modem and is indicated by dots moving across the PROTIME screen.

Do NOT use the PROTIME.INI text configuration file for dialling options

/F

PROTIME allows all command line and additional modem configuration options to be entered into a text configuration file. For all valid combinations and keywords refer to chapter below on text configuration file. Please note that PROTIME will use the text configuration file unless this option is specified.

Dialup telephone number

> /P<phone number>

This phone number is the number of the digital clock service. This phone number should contain all prefixes for dialling out through PABX's and STD codes. eg "/P0,6001641" to access the Melbourne telephone number through a PABX that requires "0," to gain an outside line (quotes are not used on command line).

Starting PROREMOTE NetWare v3.x Time Service

> /3

When PROTIME detects this option it begins broadcasting NetWare Service Packets (SAP) so that PROREMOTE fileservers may locate it and update their time. If do NOT wish to have NetWare v3.x fileservers update their clocks with this timeserver, then do not add this command-line option.

PROREMOTE Service Name

> /N<service name>

PROTIME will use the string specified as the PROTIME Time Service name. This parameter should rarely require changing as by default the time service name is PROTIME_<file server name> and therefore should be unique. If however you wish to setup multiple PROTIME servers and swap PROREMOTE machines dynamically between servers then this could be accomplished using this method.

PROREMOTE Parameters

The number of minutes before polling the PROTIME Time Server

> /P<number>

The figure represents the time PROREMOTE waits in between synchronisation checks with the PROTIME Time Server.

PROTIME service name to connect to.

> /N<PROTIME service name>

If the PROTIME service name is changed from the default of PROTIME_<PROTIME host file server name>, you will be required to enter the new name for PROREMOTE to find the remote time server. The "*" wildcard is accepted as a valid option just like the default option of "PROTIME_*". The default option built into PROREMOTE will cause it to find the first Time Server that begins with PROTIME_. If multiple PROTIME servers exist on the network the parameter may be changed to specify which service this server is to update its time from. If the PROTIME host fileservers name is "FS1" then the PROTIME service name will be "PROTIME_FS1" by default.

Debug Mode

> /Z

This option may be used with PROREMOTE to analyse the communication between it and the PROTIME file server. This is an advanced option and should not be used for normal operation of PROREMOTE.

External Configuration File

<u>If /F is specified on the command line, then the configuration file is NOT processed and only command-line and default options are used.</u>

MODEM_INIT=
Default: ATZ
Modem initialise strings that are sent to the modem to ensure it is ready for normal operation.

MODEM_HANGUP=
Default: ATH0
Command issued to modem after +++ to hang it up.

MODEM_CONNECT=
Default: CONNECT
String returned from Modem when it connects to a remote device

MODEM_DIALPREFIX=
Default: ATDT
This is a dial prefix which precedes the telephone number and is used to obtain outside lines etc on PABX's and other devices. The default is set for tone dialling, to use a pulse (decadic) dial phone you may use ATDP.

MODEM_BUSY=
Default: BUSY
This is the string returned to the computer if the remote telephone is engaged.

MODEM_NOCARRIER=
Default: NO CARRIER
When the carrier is lost or the remote telephone is answered but no connection is made.

MODEM_NOANSWER=
Default: NO ANSWER
The string returned if the remote telephone is not answered.

MODEM_NODIALTONE=
Default: NO DIALTONE
If no dial tone is returned when the modem picks up the line this is the string that is returned to the computer.

MODEM_SPEEDSTRING=
Default: ATB6
This is the speed string of the connecting service and is normally associated with the connect parameter. The default speed string tells the Hayes modem to use only v22 as the connection method. Some of the Telstra modems will respond with v22bis which will cause PROTIME to never receive the data from the digital clock.

MODEM_PHONENUMBER=
Default: 6001641
The telephone number that is dialled to attach to the remote digital clock service.

MODEM_DAYSBETWEENUPDATE=
Default: 1
The number of 24 hour periods between dialup connection and synchronisation with the digital clock.

MODEM_DIALDELAY=
Default: 60
This time may need to be adjusted if it takes more than 60 seconds for your modem to connect to the digital clock. This time is measured from when PROTIME sends the phone number to the modem and is indicated by dots moving across the PROTIME screen. This is equivalent to the /D command line option.

MODEM_WAITTIME=
Default: 2000
(2s measured in milli-seconds)
Slower modems may require a longer time to accept modem commands. This parameters tells PROTIME to wait for the nominated period before failing a specific modem command. Generally the default time should be appropriate.

TIMESERVER_NAME=
Default: PROTIME_<fileserver Name>
Generally this parameter should not be changed. However there might be a requirement to setup various PROREMOTE servers to communicate with different boxes of a specific name. If this parameter is changed ensure that the PROREMOT.NLM destination SAP name is also updated.

TIMESERVER_START
Default: Not active
This is equivalent to the /3 parameter and will activate the remote Time Synchronisation support for PROREMOTE clients. Unless this parameter (or /3) is implemented, PROREMOTE clients will NOT be able to connect as PROTIME will not advertise the service.

LOGFILE_NO
Default: Enabled
By specifying this option in the configuration file will cause PROTIME NOT to write out error messages to the default or specified log file. The log file entries are in text.

LOG_FILENAME=
Default: SYS:SYSTEM\PROTIME.LOG
If you wish to override the default log filename with one of your own you would use this parameter.

AIO_BOARD=
Default: 0
This important parameter tells PROTIME which asynchronous board your modem is attached to. By default if you load AIOCOMX directly after the AIO.NLM file, COM1 will become Board 0, Port 0 and COM2 will become Board 1, Port 0. If you are using other board types then you may have to specify which board number PROTIME should attach to. This number can normally be obtained from the information presented by the AIO device driver (eg AIOCOMX) when it starts up. Note: That if you change the load order of the AIO device drivers, the board numbers will also change.

AIO_PORT=
Default: 0
AIO port number is related to the AIO board. Each AIO board may have multiple boards on one card. By using this parameter you can tell PROTIME to specifically use one port on a board.

AIO_TYPE=

Default: AIO_COMX

This parameter will rarely require changing but is included if you are using an AIO compatible asynchronous board that does not support the AIO_COMX type. When an AIO board registers with the NetWare server it nominates a board type. This is the value entered here and may only be available from the board manufacturer or from the Novell Labs certification report. By default this option is set to AIO_COMX.

ALLOWEDTIMEDEVIATION=

Default: 0

Protime enables the administrator to set a -/+ time radius in seconds which is used to control the time update process. Once a time has been obtained from the time source, if the time change to the local server is more than +/- the seconds specified then the update will not be performed. Protime will always update the local time irrespective of the difference between the time source and fileserver is 0 is specified.

CALLHOUR=

Default: not active

Protime can be configured to call the time source at specified hour of the day or night. This parameter is a numeric value between 0 and 23 which represents the hour of the day in with Protime should establish a connection. By default, this option is not active and Protime will attempt to connect according to the MODEM_DAYSBETWEENUPDATE parameter.

Modem specific PROTIME.INI files

The following statements should be used in your PROTIME.ini file if you intend to use any of these modems.

Dataplex 296

    MODEM_SPEEDSTRING=AT&A0F4

Dataplex 596

    MODEM_SPEEDSTRING=AT$MB1

Netcomm (all models)

    MODEM_INIT=AT&F

NOTE:
Modem specific parameter sections are included in with the shipping PROTIME.ini configuration file but are COMMENTED OUT. To activate a particular modem configuration, uncomment the section for your particular modem and restart PROTIME.NLM. Ensure that you recomment any other modem section that are not to be used by this new modem configuration.

eg
```
# DATAPLEX 296 Configuration section
#MODEM_SPEEDSTRING=AT&A0F4
```

becomes

```
# DATAPLEX 296 Configuration section
MODEM_SPEEDSTRING=AT&A0F4
```

Dial-up access telephone numbers

Telstra presently only provides a 1200bps dialup connection to the digital clock, your modem must be CCITT v22 and Hayes compliant.

City	Telephone number
Adelaide	(08) 8410-0143
Brisbane	(07) 3221-7033
Canberra	(02) 9267-4648
Darwin	(08) 8941-3423
Hobart	(03) 6224-1905
Melbourne	(03) 9600-1641
Perth	(08) 9221-5457
Sydney	(02) 9267-4648

(*) At time of publication a Canberra dialup number was not available. The Sydney or Melbourne phones numbers are suitable.

If a suitable telephone number is not provided above, please contact Telstra Australia for your nearest connection to the Telstra Digital Clock.

System software and hardware requirements

Operating System

NetWare v3.10 and above
NetWare v4.0 and above

Memory

64k of file server RAM

Communications

Hayes compatible modem compatible with v22 (1200bps)

This product has been tested with the following modems and should work with most Hayes and CCITT v22 compatible modems.

Netcomm 1234SA
Netcomm 123
Netcomm 1234
Netcomm M7F
Netcomm Pocket Rocket
Dataplex 496
Dataplex 596
Dataplex 296
Hayes 9600
Banksia 14.4F
Maestro Executive and Companion

Messages

PROTIME produces messages to indicate various error or informational conditions. These messages are listed below :

PROTIME Screen Messages

Communication Socket Is Already Open

This message indicates that another application on the fileserver is using the communication socket that PROTIME is attempting to use for PROREMOTE support. There are two courses of action that you may take :

1.   Change the socket number PROTIME and PROREMOTE use to communicate. This change must be made at both the PROTIME and PROREMOTE and the new socket number must match each other.

2.   Identify the other application which is using the socket by unloading the third-party NLMs from the fileserver console until PROTIME does not report the error message.

Configuration Parameters Not Correct. No Phone number has been entered

A phone number has not been supplied either on the command using the /P option or in the PROTIME configuration file.

An example to dial the Melbourne Telstra hub would be

1.   LOAD PROTIME /P6001641
2.   or   [PROTIME.INI]
               MODEM_PHONENUMBER=6001641
               ...

Connected to port <number> on AIO board <number>

This is an informational message which indicates which of the asynchronous AIO boards and port that PROTIME has attached to. The AIO board number displayed will vary when multiple AIO board drivers are loaded in different orders. If only the fileserver serial port driver is loaded (AIOCOMX) then COM1 will be displayed as board 0, port 0 and COM2 will be displayed as board 1, port 0.

Couldn't find a Hayes modem, ensure modem responds to   **AT<ret>OK**

This message is a result of PROTIME being unable to identify or locate the modem attached to the board or port number specified.

PROTIME tests for a modem by issuing the Hayes "AT" modem command and expects the modem to return a positive acknowledgment "OK". If the modem fails to return this string PROTIME displays the above message.

This message is fatal to the continuation of PROTIME, only at PROTIME startup. If the modem was removed from the fileserver or failed at a later stage; PROTIME will display the error message, but continue to test for the modem until it is replaced. If the modem is replaced PROTIME will continue as normal and dial the Telstra time service.

If PROTIME connects to an AIO board or AIO port that does not have a modem attached, PROTIME will display the above error message. PROTIME displays the board and port it attaches to at startup. Additionally most AIO board drivers display the board and ports that they have registered with the AIO device controller (AIO.NLM). An example of this is the Novell AIOCOMX serial driver which displays the board and port configuration at startup of each of the serial communication ports registered. Typically if no other AIO drivers are loaded (apart from AIOCOMX.NLM) COM1 would be board 0, port 0 and COM2 would be board 1, port 0.

Also: MODEM_BOARD, MODEM_PORT configuration   options

INCORRECT FILESERVER VERSION

> PROTIME requires a NetWare v3.x or v4.x fileserver to operate. If you are using a version other than this, please contact you reseller or Protocom Development Systems for an updated version.

No AIO communications driver loaded

> This message is displayed if PROTIME cannot find an appropriate serial type AIO board driver that has been registered with the AIO device manager (AIO.NLM). An example of this driver is the AIOCOMX.NLM which provides access to the fileservers serial ports for based AIO applications.

> Ensure that the AIOCOMX or other suitable driver has been loaded and did not fail on startup.

> If you are using an AIO driver other than AIOCOMX and the problem persists use AIOCOMX to verify a working configuration and notify your distributor of the AIO board that PROTIME has been unable to connect to.

No AIO driver port available

> An appropriate AIO board was located (like AIOCOMX.NLM) however no available or compatible communications port was located.

> If you believe that the all ports are not in use, unload the AIO driver and reload it taking note of any port or board information supplied. *This will clear all connections using the ports controlled by the controller.* If you are using an AIO driver other than AIOCOMX and the problem persists use AIOCOMX to verify a working configuration and notify your distributor of the AIO board that PROTIME has been unable to connect to.

Modem has not responded to initialise strings - retrying

> PROTIME has not received the expect responses from the modem after it has issued the default or MODEM_INIT strings as specified in the configuration file.

> Check your modem setup strings and that your modem responds with the text string "OK".
> If in doubt contact your modem reseller or refer to the generic Hayes modem commands listed in an appendix of this manual.

> Also: Modem_Init configuration options

System update complete, waiting for <polling days> before next call

> This is an informational message which indicates that a connection to the Telstra digital clock service was successful and that the fileserver time was updated.

Source time is outside limits xx/xx/xx hh:mm:ss

> This message indicates that the time provided from the Telstra time source is outside the allowed limit set by the ALLOWEDTIMEDEVIATION parameter. The time of the fileserver was NOT updated.

! TIME NOT UPDATED ! - waiting for <polling days> before next call.

> This is an informational message which indicates that the time received from the Telstra time source was outside of the allowed limit (see ALLOWEDTIMEDEVIATION). When this condition occurs, Protime waits for the number polling days before trying again.

PROREMOTE Is Running

> The PROTIME server cannot be executed on the same fileserver as a PROREMOTE client. If you intend this machine to be a PROTIME server, unload PROREMOTE.

Updated system time with xx/xx/xx   xx:xx:xx

> This is an informational messages which remains displayed on the screen until the next successful update. It displays the time that PROTIME has received from Telstra and has also updated the fileserver clock.

Waiting 60 seconds for next redial attempt.
 PROTIME has been unable to attach to the remote Telstra Clock service because of either a busy line or a modem error condition. The log file will enable you to determine the events which have led to the redial attempt. PROTIME retries every 60 seconds until a connection is made to the Telstra clock and then sleeps for the specified period of time (poll days).

ERROR: **Not enough short term memory to alloc comms buffers**
 This critical error will cause PROTIME to cleanup and stop operation. It indicates that PROTIME has not been able to allocate the required memory from the NetWare fileserver kernel. To correct the problem, unload unneeded NetWare Loadable Modules or add additional memory to the fileserver.

ERROR: **Unable to locate AIO board <number> or port   <number>**
 PROTIME could not find the board or port specified in the PROTIME.ini file or the default board and port. Ensure that you have specified the correct board number as registered with the AIO driver (AIO.NLM). An example would be to load AIOCOMX.NLM directly after loading AIO.NLM. If the fileservers COM1/COM2 ports where available for use, COM1 would become board 0, port 1 and COM2 would become board 1, port 0.

ERROR: **An error occurred during time/date update**
 This error occurs after a valid time packet has been received from the Telstra clock. It indicates that the NetWare Fileserver has rejected PROTIMEs attempt to update the system clock of the fileserver. If the problem persists ensure you have the latest version of CLIB.NLM installed.

ERROR: **Modem not found, ensure it is powered on**
 This error is displayed by PROTIME when it is unable to reset the attached modem. This message will only occur after PROTIME had previously found the modem. PROTIME is designed so that in the event the modem is removed from the fileserver for a period of time, by simply replacing the modem on the same serial port will enable PROTIME to reset the modem and continue without administrator intervention.

ERROR: **Modem Connected at wrong speed**
 This error message indicates that the modem has connected to the Telstra clock at a speed other than 1200BPS v22. The Telstra digital clock service does not currently support dialup speeds of anything other than the speed specified. This generally indicates that the modem configuration strings are incorrect. Examples of appropriate PROTIME.INI file parameters are specified in *"Modem Specific PROTIME.ini files"*
 Additionally if the MODEM_SPEEDSTRING parameter is incorrect then this message will also be displayed. An example of this is if you modem does not return the text "CONNECT 1200" (exactly) when a connection is made, then the default PROTIME options will interpret it as having connected at the wrong speed.

ERROR: **Modem returned an ERROR response**
 The modem has returned a response that matches the MODEM_ERROR parameter (by default this is "ERROR"). This indicates that one of the commands issued to the modem is not valid. Typically this is caused by a bad configuration parameter in the PROTIME.ini file or a bad default parameter. Consult with your modem manual to ensure that the commands in the PROTIME.ini and defaults (list in "External Configuration Options") are acceptable to the modem.

ERROR: **Sending Data - Sent xx of xx**
 If the AIO device driver (ie AIOCOMX) is unable to accept all of the data that PROTIME is issuing to it, PROTIME will display this error message and send the remainder on the next pass. If the problem persists and the AIO device driver supports changing the buffer size;the buffer size of the driver should be increased until the message is no longer displayed.

ERROR: **The AIO driver is reporting data errors**
 The AIO device driver has reported that transmission or reception data errors have occur for data received through the serial port. This message is informational as PROTIME will ignore any data which does not

conform to the Telstra clock format. If PROTIME is unable to extract the information before the modem is hung up, PROTIME will retry within 60 seconds to dial the Telstra clock.

ERROR: NO CARRIER found

PROTIME has detected the NO CARRIER string from the modem. This indicates the connection may have been lost due to a modem communications failure with the remote Telstra modem.

ERROR: Modem has returned NO DIALTONE message

The modem has returned a string which matches the No DialTone parameter as specified in the configuration file. This message indicates that the telephone cable may not be attached to the modem or that the modem is incompatible with the telephone system.

WARNING: Modem may still be connected to host-Resetting

If PROTIME believes the carrier is still active and a communication session is still in progress, PROTIME will attempt to end the current session and re-establish a known session with the Telstra Digital Clock.

WARNING: Reading data from AIO port

This informational message indicates that the AIO device driver has returned an error to PROTIME, when PROTIME attempted to read data from the AIO ports communication stream.

WARNING: Unable to set the DTR/RTS of the AIO port

This informational error is displayed by PROTIME when it is unable to correctly raise or drop the Data Terminal Ready (DTR) or Ready to Send (RTS) control lines of the serial port it has attached to. This condition will not prevent PROTIME from continuing, however your modem or AIO port may not correctly respond to PROTIMEs existence tests at a later date and therefore may cause other systematic errors to occur at a future point.

WARNING: Unable to open file <config filename> Default and command-line will be used

PROTIME has been unable to open the default or specified configuration. This may be due to:

      1. The file does not exist
      2. The file is currently open by another process
      3. The file is currently open by a workstation user.
      4. The text file has been corrupted.

WAITING: Phone line is BUSY

The modem has reported to PROTIME that the remote telephone number is currently engaged. PROTIME will automatically wait for 60 seconds and then retry.

WAITING: Remote modem did not answer

PROTIME has detected the No Answer configuration string being returned from the modem. This indicates that the Telstra Digital Clocks modem did not pick up the telephone line and may therefore be done. PROTIME will continue to retry until a connection is made.

Console Messages

PROTIME: Fatal error, unable to determine revision of NetWare   OS.
PROTIME has been unable to identify the fileserver revision. This will cause PROTIME to terminate. Contact technical support or your distributor for further information.

PROTIME: unable to create or update log file
PROTIME has been unable to open or create the logfile used to record events PROTIME encounters. Please ensure that the filename of the same name as PROTIME.LOG (or name specified in configuration) is not marked as read-only, open by another user or by another NLM such as EDIT.

PROTIME: <setup string> string too long, default used
When PROTIME first loads it extracts the information from the specified or default configuration file. If any of the parameters exceed the maximum length, PROTIME displays this message and if possible uses the default built into PROTIME. The default options are listed in the configuration file section of this manual. The maximum length for most parameters is 40 or 20 characters depending upon the option.

PROTIME: Timeserver name <PROTIME server name> is being   used elsewhere
When the PROTIME server is used as a time service for across the LAN updates of NetWare v3.x fileservers, a SAP name must be allocated to it. If the SAP name used is in use elsewhere, this message is displayed. The name must be changed to a unique name and then PROTIME restarted. By default the SAP name is PROTIME_<fileserver name>. This should rarely require changing.

If the PROTIME name is changed from the default, the PROREMOTE name should also be changed or else PROREMOTE will not find PROTIME.

PROTIME: Fatal error, unable to start Timeserver requester   thread
If PROTIME is unable to spawn a new process to service the PROREMOTE requests, PROTIME will stop. If this error persists, unload any required NetWare Loadable Modules and check the fileserver memory availability.

PROREMOTE support can be disabled from PROTIME by not activating PROTIME with the Time Server Configuration option or the /3 command line parameter.

Appendix A: Hayes Command Set

This appendix contains a sub-set of the Hayes command set that may be relevant when configuring your modem to communicate at 1200bps with Telstra's digital clock service. This is by no means a complete listing of available commands. Please refer to your modems manual for a complete listing of commands supported by your particular brand of modem.

Command: A/

> Sending an A∕ to the modem will tell the modem to repeat the last command it received.

Command: AT

> The AT command is short for Attention and is usually used to send commands to the modem.

Command: B

> The ATB<n> command sets the modem's compatibility mode. The parameter may vary greatly between modems but typically ATB0 will set CCITT v22 and v22bis compatibility and the command ATB1 will set Bell 103 and 212A compatibility. Most Netcomm modems also support ATB6 which instructs the modem to only use v22 compatibility. For more information on the options supported by your modem please consult the "Command" section of the modem manual.

Command: D

ATD instructs the modem to dial the number that follows one or more of the following characters.

> 0 through 9, # and *   Dial the indicated number
> P   Use pulse dialing
> R   This character is used at the end of phone number and
>   instruct the modem to issue answer tones instead of
> originate tones.
> T   Use touch tone dialing
> W   Wait for a second dial-tone
> @   Wait for one or more rings and five seconds of silence.
> ,   Pause
> !   Flash
> ;   Return to command mode after dialling.

Command: DS=n

> The ATDT=n dials one of the four telephone numbers that have been stored in the modem's NRAM. Where n is the number of the memory slot to get the number phone.

Command: E

> The ATE command tells the modem whether or not to echo commands back to the computer which have been sent to it. The ATE0 command tells the modem not to echo and ATE1 instructs the modem to echo.

Command: H

The ATH command instructs the modem to go on or off the hook. The ATH0 will cause the modem to hang-up, and the ATH1 will cause the modem to pickup the line.

Command: L

The ATL command is used to adjust the modem's speaker volume as follows:

ATL0   Low Volume
ATL1   Medium Volume
ATL3   High Volume

Command: M

The ATM command controls the modem's speakers characteristics in the following manner :

ATM0   Speaker is always off
ATM1   Speaker is always on until carrier is detected
ATM2   Speaker is always on
ATM3   Speaker is turned on after dialling is complete and is turned off
again once carrier is detected.

Command: O

The ATO command is used to put the modem back to online mode after it has been in command mode.

Command: Q

The ATQ command tells the modem whether or not it is to send responses to commands that are sent to it. Sending ATQ0 to the modem will enable modem responses and sending ATQ1 will disable modem responses.

Command: Sr?

The ATSr? command is used to display the contents of a specific modem register. The modem stores configuration options in various registers as listed below.

Command: Sr=n

The ATSr=n command is used to set one of the modems registers. The "r" specifies the register and the "n" the value to set the register. For a complete list of registers used in you modem consult your modem hand-book. The most common registers across modems are :

S0   The number of rings the modem is to answer the phone   on. Setting this register to 0 will disable auto-answer.
S1   This register holds the number of rings detected and is   reset between calls or when 8 seconds of silence has   elapsed.
S2   The escape character. This value is typically 43 and   should not be changed or PROTIME may be unable to   correctly hang-up the modem.
S3   The carriage return character should not be changed   from the default of 13.
S4   The line feed character by default is set to 10 and   should not be changed.
S5   The backspace character. Default value is 8.
S6   The number of seconds the modem is to wait for dial   tone.
S7   The number of seconds after dialing the modem is to   wait for a carrier to be established before returning to   command mode.

S8   The number of seconds the modem pauses when it   receives the ","
pause character.

S9   This register specifies tenths of a second how long   carrier must be
established before the modem   recognises that a carrier has indeed been
                established.

S10   The number of tenths of a second before the modem   recognises that
carrier has been lost.

S11   This register specifies the number of milliseconds the   modem is to delay
between sending dial tones on a   touch tone telephone.

S12   This register specifies the number of 1/50ths of a   second the modem is to
wait both before and after an   escape sequence to recognise it as a true escape
                sequence.

Command: V

> The ATV command instructs the modem what sort of responses to return to the computer.
> PROTIME requires that the modem be configured to return textual responses and not numeric.
> Textual is normally the default. The ATV1 command returns verbose textual responses, ATV0
> returns numeric responses.

Command: Y

> The ATY command tells the modem how it is to deal with a break condition. Sending the modem
> an ATY0 will cause the modem to ignore a break and sending the modem an ATY1 will cause the
> modem to send a four second break before disconnecting.

Command: Z

> The ATZ command instructs the modem to reconfigure itself to a previously saved configuration
> store in the modems NRAM.

Command: &C

> The AT&C command tells the modem how to handle the DCD control line. Sending an AT&C0 to
> the modem instructs the modem to always assert the DCD line and sending an AT&C1 to the
> modem instructs the modem to only assert the DCD line when carrier is actually present.

Command: &D

> The AT&D0 command instructs the modem to ignore the DTR line, sending an AT&D1 tells the
> modem to return to the command mode when the DTR line goes from an on to off state. sending
> an AT&D2 to the modem will cause it to disconnect and return to the command mode when the
> DTR line goes from an on to an off state.

Command: &F

> The AT&F command tells the modem to reset it current configuration to the original factory
> default.

Command: &G

> The AT&G command forces the modem to use a specific guard tone. Sending an AT&G0 to the
> modem disables the guard tone, sending an AT&G1 to the modem enables a 550Hz guard tone and
> sending an AT&G2 enables a 1800Hz guard tone.

Command: &M

> The AT&M command sets the modem for either asynchronous operation or synchronous
> operation. The Telstra Digital dialup service requires that the modem is set for asynchronous.
> Asynchronous is default on almost every modem.

Command: &R

The AT&R command tells the modem how it is to deal with the RTS/CTS lines. Sending an AT&R0 to the modem tells it to assert CTS whenever the RTS line is asserted and sending an AT&R1 to the modem tells it to ignore RTS.

Command: &V

AT&V tells the modem to display its current configuration.

Command: &W

The AT&W instructs the modem to save it current configuration into NRAM.

Command: &Zn=

The AT&Zn= command is used to store a telephone number in the NRAM of the modem. Where n is the NRAM slot and the telephone number follows the =.

Appendix B: Customer Service and Technical Support

Contact Details

Voice

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Technical Support

Technical support is available using the following methods :-

CompuServe

Mail your technical support questions to 100033,3202.

Internet

Mail your technical support questions to support@serversystems.com or
100033.3202@compuserve.com

WWW

http://www.serversystems.com

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