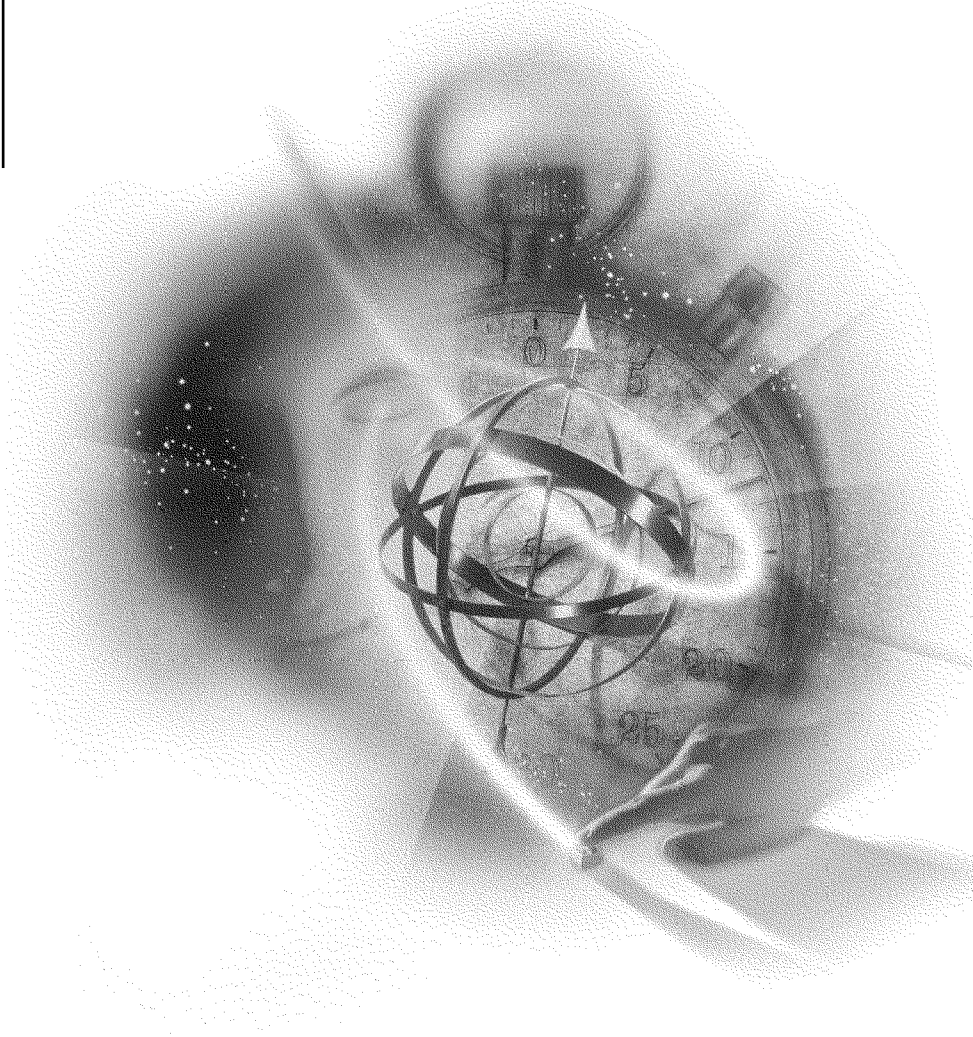


**Modems and DTR-Controlled Devices**



**Connectivity Services**

**Novell®**

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# About This Guide

This guide provides the information you need to configure and manage modems and DTR-controlled devices used with the Novell Internet Access Server 4.1 routing software. In addition to planning information, this guide provides troubleshooting tips, techniques, and tools, as well as the symptoms of and solutions to commonly occurring problems for modems and DTR-controlled devices used with Novell Internet Access Server 4.1.





# 1

## Planning

NetWare<sup>®</sup> Link/PPP<sup>™</sup> modem device management uses file-based scripts to specify the commands for modem initialization, connection dialing, answering, and termination.

Most of the modem device management settings you need to make are covered by the configuration procedures in *Setting Up* in the *NetWare Link/PPP* documentation.

This section provides information about modem and device selection.

### Configuration Decisions

The standard method used by NetWare Link/PPP to establish switched-circuit connections relies on AT command exchanges with the attached modem.

Some modems and communications equipment, however, do not support AT commands. These devices might support V.25bis dialing or DTR-controlled dialing.

If your modem supports V.25bis dialing, it will have faster dialing time than an AT modem. No modem script or type needs to be configured. The modem, however, might need to have switch settings changed or might need front panel configuration changes. Refer to the manufacturer's documentation for detailed information. The V.25bis dial mode uses the WAN call destination telephone number.

DTR-controlled devices generally require that you configure the remote system telephone number at the DSU or modem. These devices usually provide a limited amount of nonvolatile memory for telephone number storage. Once the remote system telephone number is configured, whenever the device's DTR signal changes from off to on, the device attempts to initiate

a call to the specified remote number. An on-to-off transmission of the DTR causes the device to terminate the connection.

Some modems support both AT commands and V.25bis or DTR-controlled dialing. If you have such a choice, consider the following:

- ◆ V.25bis might be preferable because it has a faster dialing time and no modem script is required. Programming a modem for V.25bis might be difficult or very easy, depending on the modem. It is worth investigating if V.25bis is an option. Using the V.25bis dial mode, NetWare Link/PPP can dial using the WAN call destination telephone number. On-demand connections can use a single interface and modem to connect to multiple remote systems sequentially.
- ◆ Using the AT command mode, NetWare Link/PPP can initialize the modem automatically, based on the specified modem type, and dial using the WAN call destination telephone number. On-demand connections can use a single interface and modem to connect to multiple remote systems sequentially.
- ◆ Preprogramming a DTR-controlled device can be both time-consuming and inconvenient. DTR-controlled devices are limited to calling a single remote system.

# 2

## Setting Up

NetWare<sup>®</sup> Link/PPP<sup>™</sup> modem device management uses file-based scripts to specify the commands for modem initialization, connection dialing, answering, and termination.

Most of the modem device management settings you need to make are covered by the configuration procedures in *Setting Up* in the *NetWare Link/PPP* documentation.

This section provides information about modem and device selection, as well as additional configuration procedures that might be necessary for some modems and Data Terminal Ready (DTR) controlled devices.

### Configuring Modem Control Scripts for AT Dialing

The Novell<sup>®</sup> Internet Access Server 4.1 software provides modem scripts that support more than 130 modem types.

If you have an AT dialing modem that is on the list of supported modems, you do not need to do the additional configuration described in this section.

If you have an AT dialing modem that is not on the list of supported modems, you must use the WMDMMGR utility to create a modem script. Refer to *Setting Up* in the *NetWare Link/PPP* documentation for more information about creating a modem scripts and refer to “Using the WMDMMGR Utility” on page 19 for more information about using Wmdmmgr.

### Using CPECFG to Configure Modem and DCE Devices

CPECFG is a NetWare Loadable Module<sup>™</sup> (NLM<sup>™</sup>) file that can be used to configure modems and data circuit-terminating equipment (DCE), such as

DSU/CSUs, DTR-controlled dialers, and V.25bis dialers. You can perform the configuration from anywhere on the network by using RCONSOLE, XCONSOLE, or ACONSOLE in conjunction with CPECFG.

CPECFG communicates with modems and DCE devices through the existing serial port on the server or standalone router. It is a terminal emulator that uses the COM1 port. You use a standard modem cable to connect from the COM1 port to your modem or DSU/CSU. For more information about cable connections, refer to the manufacturer's instructions.

You can use CPECFG to perform the following tasks:

- ◆ Configure the COM port to match the characteristics of the modem or DCE device you want to program.
- ◆ Communicate directly with the modem or DCE device.
- ◆ Send a configuration file to your modem or DCE device. You can create a text file with the commands and have CPECFG send the file to your modem or DCE device.

## How to Use CPECFG to Configure Modems and DCE Devices

If you are configuring DTR-controlled dialing for a modem or DSU, the following requirements exist:

- ◆ The modem or DSU should hold the configuration for the automatic dialing of stored numbers in nonvolatile memory. With an asynchronous terminal in asynchronous mode, you can program the configuration for the modem offline using the front panel keypad, if available, or CPECFG.
- ◆ The modem or DSU should dial the stored number when the DTR off-to-on transition occurs, connect to the remote modem, and switch to synchronous mode. The modem or DSU should terminate the connection if DTR is turned off by the router.
- ◆ Both modems or DSUs should be programmed to establish the connection at the user-defined rate rather than at the asynchronous speed used to program the modem.
- ◆ The answering modem or DSU should be programmed to answer the call only if DTR is on. Even if the modem is turned on, the modem should ignore the call even if the router has not turned on DTR. The answering modem *should not* be enabled for DTR dialing; it should be programmed for Dialing Mode = None.

- ◆ After the modems or DSUs are programmed, both modems should be disabled from recognizing synchronous data as modem control commands. Do this by forcing the modem into *dumb* mode.

For more information, refer to the manufacturer's instructions. For a modem programming example, refer to Using Modem Description Files in the *NetWare Link/PPP* documentation.

To use CPECFG to configure a modem or DCE device, complete the following steps from the remote workstation or directly from the server or router console.

**WARNING:** If an incorrect interrupt value has been set for AIOCOMX, it can cause unpredictable and sometimes serious results. CPECFG uses only COM1, which generally uses interrupt 4. CPECFG automatically loads AIOCOMX. If you are prompted for an interrupt value by AIOCOMX, the prompt indicates that the correct interrupt is currently being used by another device. Halt the loading of AIOCOMX by pressing Esc. Then determine which device is using the interrupt and disable it.

- 1 Load CPECFG and perform one of the following configuration actions from the CPECFG menu:

**To configure the COM port, do the following:**

- ◆ Select Configure Async Port.
- ◆ Set the appropriate configuration for the device, as shown in the following table.
- ◆ To save the settings, press Esc and save your changes when prompted.

Parameter	Range	Default
Baud Rate	300, 1,200, 2,400, 4,800, 9,600, 19,200	Maximum supported by UART, as discovered by AIOCOMX. (AIOCOMX is automatically loaded when CPECFG loads.)
Word Length (bits)	5, 6, 7, 8	8
Parity	Even, Mark, None, Odd, Space	None
Stop Bits	1, 1.5, 2	1

Parameter	Range	Default
Flow	Hardware, X-On/X-Off, Both, None	X-On/X-Off
VT100* Emulation	Off, On	On

**To communicate with the modem or DCE device directly, do the following:**

- ◆ Select CPE Communications Screen.

In this mode, CPECFG is acting as an asynchronous terminal. You can configure and monitor your modem or DCE device remotely through this connection, and enter any commands that you can use from the local modem or DCE device console. For example, you can enter the command that will set your V.25bis dialer to V.25bis dialing mode. For the appropriate commands for your modem or DCE device, refer to the manufacturer's instructions.

- ◆ Press Shift+F10 to exit the CPE Communications screen and return to the CPECFG menu.

**To upload a configuration file to the device, do the following:**

- ◆ Create a file using a text editor, then type in the commands you want to send to CPE.
- ◆ From the CPECFG main menu, select Upload Command File.
- ◆ Enter the path and name of the text file you created.
- ◆ After you review the results of the command file sent back from CPE, press Enter to return to the main menu.

**2** Press Esc to exit CPECFG.

## Configuring the Asynchronous Control Character Map

You can specify the configured value of the Asynchronous Control Character Map (ACCM) that is proposed to the remote Point-to-Point Protocol (PPP) peer during PPP negotiation. By default, the following control values are mapped:

- ◆ 0x11 or Ctrl-Q (DC1 [device control number 1])

- ◆ 0x13 or Ctrl-S (DC3 [device control number 3])

Modify the ACCM to meet the inband control character requirements of the asynchronous DCE devices, such as modems. The ACCM specifies the ASCII control characters in the remote PPP peer's transmit data stream that are translated to transparent character sequences to ensure that they are passed by the local DCE device.

If certain ASCII control characters have special meaning to the modems or other DCE devices being used, use the ACCM to force the control characters to map to transparent, two-character sequences.

The ACCM is for asynchronous interfaces only and has no effect for synchronous interfaces.

To configure the ACC map, complete the following steps:

- 1** Load NIASCFG, then select the following parameter path:

Select Configure NIAS > Protocols and Routing > Network Interfaces

- 2** Scroll to a configured PPP interface, then select it.

The PPP Network Interface Configuration menu is displayed.

- 3** Select Negotiation Options.

The PPP Negotiation Options menu is displayed.

- 4** Select Asynchronous Control Character Map.

The Async Control Character Map Configuration menu is displayed.

- 5** Select a specific control character.

- 6** Select Enabled or Disabled from the pop-up menu.

If you select Enabled, the ACC map forces that control character to map to a transparent, two-character sequence that has a meaning to the modem or DCE device.

- 7** Press Esc to return to the Internetworking Configuration menu; save your changes when prompted.

- 8** If you want these changes to take effect immediately, select Reinitialize System.

If you want to configure other parameters, do so now, then reinitialize the system when you are finished.

# Configuring Additional Modem/DCE Parameters

Setting Up in the *NetWare Link/PPP* documentation describes how to configure the following modem/DCE parameters:

- ♦ **Dialing Mode** —The method of modem device management used to initiate outbound connections on a dial-up network: AT commands, DTR-controlled, V.25bis, or None.
- ♦ **Interface Speed** —The internally generated interface speed to use for the device management commands when the dialing mode is AT Commands and the framing type is Sync. (This is the speed at which the AT commands in the modem scripts are sent to the modem, not the speed at which the modem connection is established.)

You can also modify the following modem/DCE parameters:

- ♦ **Initialization Override Delay** —The delay, in seconds, between output of each consecutive initialization string. This delay gives the modem or DCE device a chance to respond to an initialization string before the next string is sent. NetWare Link/PPP device management does not act on device responses to user-specified initialization strings, but does allow time for responses.

Adjust this parameter only if you are using multiple override strings and you have determined that the modem is responding slower than the override strings that are being issued.

- ♦ **Initialization Strings** —Up to five strings, each of which specifies an initialization override string that is sent to the modem or DCE device after the standard script initialization sequence has been completed.

You can use the initialization override strings to modify modem settings after initialization. This lets you enable optional modem functionality. For example, the initialization string ATM0 turns off the modem speaker.

## How to Configure Additional Modem/DCE Parameters

To configure initialization override delay or initialization strings, complete the following steps:

- 1** Load NIASCFG, then select the following parameter path:

Select Configure NIAS > Protocols and Routing > Network Interfaces

- 2** Scroll to a configured PPP interface, then select it.

The PPP Network Interface Configuration menu is displayed.



### 3 Select Modem/DCE Options.

The PPP Modem/DCE Device Options menu is displayed.

### 4 Do either, or both, of the following:

#### To set the initiation override delay, do the following:

- ◆ Select Initialization Override Delay.
- ◆ Enter a value, in seconds, then press Enter.
- ◆ Save the configuration.

Press Esc to return to the Internetworking Configuration menu; save your changes when prompted.

If you want these changes to take effect immediately, select Reinitialize System.

If you want to configure other parameters, do so now and reinitialize the system when you are finished.

#### To specify initialization strings, do the following:

- ◆ Select Initialization Strings.
- ◆ Enter up to five initialization strings, one per line, each followed by Enter.
- ◆ Save the configuration.

Press Esc to return to the Internetworking Configuration menu; save your changes when prompted.

If you want these changes to take effect immediately, select Reinitialize System.

If you want to configure other parameters, do so now and reinitialize the system when you are finished.

## Where to Go from Here

For information about creating a modem login script or modifying an existing modem login script, refer to Using Modem Description Files in the *NetWare Link/PPP* documentation.



# 3

## Managing

This section describes the diagnostic utilities used to manage modems and DTR-controlled devices used with the Novell<sup>®</sup> Internet Access Server 4.1 software. These utilities enable you to manage, optimize, and troubleshoot WAN communications equipment.

### Using the WMDMMGR Utility

WMDMMGR is a windows-based modem script editing tool used to create and modify modem descriptions and PPP login scripts used with Novell Internet Access Server 4.1. If you need additional information, you can obtain detailed context-sensitive online help for WMDMMGR by pressing the F1 key.

After installing Novell Internet Access Server 4.1, the WMDMMGR utility and message files are located in the SYS:SYSTEM\UTILS directory. Files containing modem descriptions and login scripts are located in the SYS:SYSTEM directory.

Modem descriptions, saved in files with .MDC extensions, define the commands and capabilities of a modem. By using modem description files, Novell Internet Access Server 4.1 components offer modem independence to applications and users, enabling support for new modems without waiting for a new version of the software.

The Novell Internet Access Server 4.1 components execute scripts in the modem description files to perform modem operations as the application requires. Neither the modem control components nor the software products are specific to any one modem or set of modems. Any details specific to modems are contained in the modem description files.

Login scripts, saved in files with .LSC extensions, are PPP login scripts customized to match the sequences expected by online service providers.

This topic contains the following sections:

- ◆ Launching WMDMMGR
- ◆ Existing Modem Description Files
- ◆ Creating a Modem Description File
- ◆ Modifying a Modem Description
- ◆ Creating a PPP Login Script
- ◆ Modifying a PPP Login Script
- ◆ Installing a Modem Description or PPP Login Script
- ◆ Deleting Modem Descriptions or Modem Description Files
- ◆ Deleting Login Scripts

## Launching WMDMMGR

To use WMDMMGR, start your Windows\* 3.1 or Windows 95\* operating system and follow these steps:

- 1** Log in to Novell Directory Services™.
- 2** Map a network drive to the SYS: volume.
- 3** Change directory to SYS:SYSTEM\UTILS.

Novell recommends that you copy the WMDMMGR.EXE file and the MDC files to your workstation and launch WMDMMGR there.

- 4** Double-click the WMDMMGR.EXE icon.

WMDMMGR is launched and the File Open window is displayed.

- 5** Select the drive mapped to the SYS: volume and select the SYSTEM directory.

All available modem script files are displayed in the File Name column. Change the List Files of Type field to Login Script Files to see a list of existing login script files.

## Existing Modem Description Files

Novell Internet Access Server 4.1 has three modem description files created by Novell Labs™ and installed in the SYS:SYSTEM directory. These three

modem description files define over 400 modems. Table 1 lists the modem description files provided with Novell Internet Access Server 4.1.

**Table 1 Existing Modem Description Files**

Modem Description File	Contains Modem Scripts
NIASCERT.MDC	that are certified by Novell Labs
NIASMDM1.MDC	for modems named from A-L
NIASMDM2.MDC	for modems named from M-Z

If the modem you have is not already defined in one of these files, you will need to create a new modem description. If your modem is defined but the description does not work, refer to *Modifying a Modem Description* to make the appropriate changes.

## Compatibility Issues When Upgrading

If you have upgraded to Novell Internet Access Server 4.1 from the 4.0 release, NetWare MultiProtocol Router™ 3.1 software, or NetWare Connect™ 2.0 software, you might find that the modem you were using is not defined in the modem scripts for Novell Internet Access Server 4.1. If this happens, consider one of the following solutions:

- ◆ Continue using the *older version*. Novell Internet Access Server 4.1 supports the older scripts. You should not have problems unless the modem is not analog or the description file has other modems with the same name as modems in the Novell Internet Access Server 4.1 MDC files.
- ◆ If the modem is not an analog modem, use WMDMMGR to set the modem's Link Type to the correct value. (For example, an ISDN terminal adapter link type should be ISDN-Async.)
- ◆ If the modem is defined in a file that contains other modems, one or more of which is already defined in NIASMDM1.MDC, NIASMDM2.MDC, or NIASCERT.MDC, use WMDMMGR to delete the duplicate modems from the file before using the file in Novell Internet Access Server 4.1.

**NOTE:** During Novell Internet Access Server 4.1 installation, modem description files for Novell Internet Access Server 4.0 and versions of MultiProtocol Router are backed up to the SYS:SYSTEMBACKUP directory. Modem description files for NetWare

Connect 2.0 are left in to SYS:SYSTEMAIO. Novell Internet Access Server 4.1 uses the modem description files in SYS:SYSTEM.

## Creating a Modem Description File

WMDMMGR enables you to create modem descriptions and to customize the modem descriptions to match the behavior of your modem. To create a modem description, launch WMDMMGR and follow these steps:

**NOTE:** Make sure you have the operation manual for your modem available for reference.

- 1 Select New from the File menu.

WMDMMGR opens the New dialog box and prompts you to choose Modem Script or Login Script.

- 2 Select Modem Script.

WMDMMGR opens the List of Modems dialog box. You can now enter the optional file version and manufacturer/copyright information.

- 3 Click Add.

WMDMMGR opens the Modem Description dialog box. Many of the fields that appear are set with default values that might or might not be appropriate for the modem you are defining. Refer to your modem manual to obtain the correct values and commands for each modem feature.

- 4 Make entries for the modem being defined.

Enter the name of the modem being defined in the Name field. Enter the appropriate values for Default, Maximum, and Fixed rates. Check the Single Fixed Rate box if the modem being defined can only use the rate specified in the Fixed Rate field when using the Fixed DTE Rate feature. Specify the Output Delay and Link Type.

**NOTE:** For ISDN terminal adapters (TA), make sure you use the configuration program that comes with the TA before using it in Novell Internet Access Server 4.1. It might be necessary to configure the service profile identification number (SPID) or D-channel protocol as specified by your ISDN service provider.

- 5 Click Initialization to edit the list of operations for initializing the modem.

The initialization disables all features shown in the dialog box (autoanswer, compression, etc.). When an application uses the modem, the features that are requested are enabled using the individual scripts defined for the feature. Refer to the modem's operation manual for information about disabling each of the features shown on the dialog box.

- 6** Click Hang-up to edit the list of operations for hanging up a call.
- 7** Click other Control Strings group buttons to edit the list of operations and enable the feature named by the button.
- 8** Click Responses to bring up the dialog box to edit the responses generated by this modem.
- 9** Click OK to save changes to this modem script entry.  
The List of Modems dialog box is displayed.
- 10** Select either File > Save or File > Save Copy As to save changes to this modem description file.

To make the newly created modem description available to the Novell Internet Access Server 4.1 software, refer to “Installing a Modem Description or PPP Login Script.”

## Modifying a Modem Description

WMDMMGR enables you to customize the modem descriptions to match the behavior of your modem.

**NOTE:** By default, the modem description files installed by Novell Internet Access Server 4.1 are read-only. Before modifying a file, copy it to a local drive and modify it there to eliminate any effect on the server.

To modify a modem description, launch WMDMMGR and follow these steps:

- 1** Select File > Open from the WMDMMGR main window to select a modem description.
- 2** Select the name of the modem that you want to modify from the List of Modems dialog box and click Modify.

You can double-click the modem name instead of clicking the Modify button.

**NOTE:** For ISDN terminal adapters, make sure you use the configuration program that comes with the TA before using it in Novell Internet Access Server 4.1. It may be necessary to configure the SPID or D-channel protocol as specified by your ISDN service provider.

- 3** Enter a new name for the modem being defined in the Name field.  
By entering a new name, you retain the original modem description.
- 4** Change the Default, Maximum, and Fixed rates as required for this modem type.

- 5** Check the Single Fixed Rate box if this modem can only use the rate that is specified in the Fixed Rate Field when using the Fixed DTE Rate feature.
- 6** Modify the Output Delay and Link Type fields as required for this modem type.
- 7** Click Control Strings group buttons to edit the list of operations and enable the feature associated with each button.  
**IMPORTANT:** Be sure to verify the output strings in the script with the modem specification provided in the modem manual.
- 8** Click Responses to bring up the dialog box for editing the responses generated by this modem.
- 9** Click OK to save changes to this modem script entry.  
WMDMRGR displays the List of Modems dialog box.
- 10** Choose File > Save or File > Save Copy As to save the changes to this modem description file.

To make the newly created modem description available to the Novell Internet Access Server 4.1 software, refer to “Installing a Modem Description or PPP Login Script” on page 29 and perform the steps described.

## Modem Responses

Response strings in modem descriptions enable recognition and interpretation of data sent from the modem. This recognition and interpretation informs the modem control software of the success or failure of a command and enables modem control to detect a call's arrival.

Because responses generated by modems differ, the modem description must supply sufficient information to enable modem control to recognize the modem responses. Response strings contain one or more pairs of substrings. The first substring of the pair, the modem response, gives the input string to be recognized. The second substring of the pair represents the meaning of the string.

Because of the complex responses found in newer modems, it is sometimes necessary to perform multistage matching of modem response strings.

For example, when using negotiation progress monitoring to capture added information about connections, the Protocol response can be received. The first stage of recognition would identify the input as the Protocol message. The



second stage of recognition identifies the particular substrings that may be present in this message. Up to four stages of recognition are allowed.

Modem control accumulates ASCII characters received from a modem until a carriage return character (hexadecimal D or decimal 13) is received. All other control characters are ignored. The accumulated string is then compared to the match strings in the Responses keyword string. When a match is found, the meaning is interpreted and the appropriate action is taken.

## Editing Modem Responses

The Modem Responses dialog box displays the list of modem responses configured for each modem. Each line in the table describes one modem response. To view the responses for a modem, follow these steps:

**1** Launch WMDMMGR.

Double-click the WMDMMGR icon or select Run and designate the path to the WMDMMGR.EXE file.

**2** Select the modem description file (.MDC) that contains the modem you want to modify.

**3** Select the modem description and click Modify.

The modem description dialog box is displayed. The Responses button is displayed in the bottom right corner of this window.

**4** Click Responses.

The Responses dialog box is displayed, listing all of the currently defined responses for the selected modem.

The left-most column, Modem Responses, contains characters sent by the modem to the DTE. When modem control monitors modem responses, it collects characters received until it receives a carriage return. It then compares the input string with all match strings.

**NOTE:** The input string is not case-sensitive, and the compare operations occur in the order they are listed.

Only the initial characters of a response must match the match string. For example, the match string ERR matches response strings for both ERROR and ERRONEOUS, but not ERASE. This makes the order in which the match strings occur important.

The rest of the columns on this window are known as *meanings strings* and convey status, transfer rate, features, and match chaining. These columns define what the recognized response means to modem control, such as

- ◆ Connection success, failure, or some intermediate indication
- ◆ Recognition of certain optional connection features
- ◆ Indication of transfer rates

### **Adding a New Modem Response**

To add a new response for a modem, go to that modem's Responses window, decide where to place the new response in the list of currently defined responses, and follow these steps:

- 1** Click a response either in front of or after the location where you want to place the new response, and click Add before... or Add after...

The Modem Response Meaning window is displayed.

- 2** In the Response field, enter a string of ASCII characters that represent the expected modem response.
- 3** In the Status field, select a status that the expected modem response should convey to modem control.
- 4** In the Rate field, select a transfer rate if applicable for this response.
- 5** In the Feature field, select a feature to associate with this connection, if applicable.
- 6** Click OK to save the new modem response.

### **Modifying a Modem Response**

To modify a response for a modem, go to that modem's Responses window, select the response to modify, and double-click that entry. The Modem Response Meaning window is displayed, enabling you to modify the response. Click OK to save your changes, or click Cancel to abandon.

### **Deleting a Modem Response**

To delete a response for a modem, go to that modem's Responses window, select the response to delete, and click the Delete button.

## Creating a PPP Login Script

WMDMMGR enables you to create customized PPP login scripts to match the sequences expected by online service providers. Login script files can contain one or more login scripts. You can have a different login script for each service provider you use. Novell Internet Access Server 4.1 has a sample login script file, ISPLOGIN.LSC, installed in the SYS:SYSTEM directory. You can modify the scripts contained in that file or create a new login scripts file.

**IMPORTANT:** Ensure that you have a sequence of interactions for communicating with the online service provider. This information might be available from your the online service provider or you may gather this information by using a workstation terminal program or dialer software to call the online service provider and capture the input and output sequences.

To create a new login script file, launch WMDMMGR and follow these steps:

- 1 Select File > New > Login Script.

WMDMMGR opens the List of PPP Login Scripts dialog box. You can enter optional file version information.

- 2 Click Add.

WMDMMGR displays the Sample Login Script dialog box. When a new script is created, some fields are seeded with default values that might or might not be appropriate for the script you are defining. Refer to the online service provider for information relevant to your setup.

- 3 Enter the name of the login script being defined in the Name field.
- 4 Enter the prompts for the substitution tags that will be used in the script in the fields in the Prompts group. Clear any prompts that will not be used.
- 5 Click Configure to configure the operations that make up the script.

WMDMMGR displays the Script Operations list.

- 6 Add and delete operations from the list of operations as required by the online service provider. Click OK.

When adding operations to the list, be sure to consider any timing parameters required by the online service provider. For example, a service provider may require a delay after receiving a response.

- 7 Click OK to save the changes to the current script entry and return to the List of PPP Login Scripts dialog box.

- 8 Select File> Save or File > Save Copy As to save the changes to this login script.

To make the newly created login script available to the Novell Internet Access Server 4.1 software, refer to “Installing a Modem Description or PPP Login Script” on page 29 and perform the steps described. An example of a PPP login script follows.

Operation	Time	Value
Pause	20	
Output		`M`J
Wait for Input	50	ISP login:
Pause	20	
Output		[1] `M`J
Wait for Input	50	password:
Pause	20	
Output		[2] `M`J
Pause	20	
Output		`M`J

## Modifying a PPP Login Script

WMDMMGR enables you to modify customized PPP login scripts to match the sequences expected by online service providers. Login script files can contain one or more login scripts. You can have a different login script for each service provider you use. Novell Internet Access Server 4.1 has a sample login script file, ISPLUGIN.LSC, installed in the SYS:SYSTEM directory. You can modify the scripts contained in that file or create a new login scripts file.

**NOTE:** By default, the login description files installed by Novell Internet Access Server 4.1 are read-only. Before modifying a file, copy it to a local drive and modify it there to eliminate any effect on server operations.

**IMPORTANT:** Ensure that you have a sequence of interactions for communicating with the online service provider. This information might be available from your the online service provider or you can gather this information by using a workstation terminal program or dialer software to call the online service provider and capture the input and output sequences.

**IMPORTANT:** If you have previously installed Novell Internet Access Server 4.0 or MultiProtocol Router 3.1 and used login scripts, they are backed up to the SYS:SYSTEM\BACKUP directory during the installation of Novell Internet Access Server 4.1. You must upgrade the scripts to 4.1 format using WMDMMGR before using them. WMDMMGR might request additional configuration information before the scripts can be saved in 4.1 format.

To modify a login script file, launch WMDMMGR and follow these steps:

- 1 Select File > Open.

- 2** Change the List Files of Type field to Login Scripts (.LSC).
- 3** Select the login script file that you want to modify and click OK.
- 4** Select the login script within the login script file and click Modify.
- 5** Make selected changes to the parameters listed in the Login Script Parameter Prompts window.
- 6** Click Configure to configure the operations that make up the script. WMDMMGR displays the Script Operations list.
- 7** Add and delete operations from the list of operations as required by the online service provider. Click OK.  
  
When adding operations to the list, be sure to consider any timing parameters required by the online service provider. For example, a service provider may require a delay after receiving a response.
- 8** Click OK to save the changes to the current script entry and return to the List of PPP Login Scripts dialog box.
- 9** Select File > Save to save changes to this login script or File > Save Copy As to save this file as a new login script file.

To make the modified login script available to the Novell Internet Access Server 4.1 software, refer to *Installing a Modem Description or PPP Login Script* and perform the steps described.

## Installing a Modem Description or PPP Login Script

To install a new or modified modem description or login script, copy the file containing it to the SYS:SYSTEM directory of the Novell Internet Access Server. You should not use duplicate names for modem descriptions or login scripts within the modem description (.MDC) or login script (.LSC) files. If modem scripts have duplicate names, the software checks for the Novell Labs certification and script version number to decide which to use. However, if login scripts have duplicate names, an error is reported.

If you modified a file to create a new file, remove any old copies of the file so that there are no script duplications.

After you copy the files into SYS:SYSTEM, enter **reinitialize system** from the NetWare server console. This command causes the Novell Internet Access Server 4.1 software to reload the modem descriptions and login scripts.

**NOTE:** Because the reinitialize system command affects other software components such as protocol stacks and LAN/WAN boards on the server, you might want to wait until the system is not in heavy use before issuing the command.

## Deleting Modem Descriptions or Modem Description Files

Use the Delete button from the List of Modems dialog box to delete unwanted modem description entries. Use the DOS command DEL or Window File Manager to delete unwanted modem description files.

## Deleting Login Scripts

Use the Delete button from the List of PPP Login Scripts dialog box to delete unwanted PPP login script entries. Use the DOS command DEL or Window File Manager to delete unwanted login description files.

## Monitoring Communications Equipment

Monitoring your communications equipment can help you identify the source of some common problems with your local modem or data circuit-terminating equipment (DCE) device, including the following:

- ◆ The modem or DCE does not answer incoming calls.
- ◆ The modem or DCE does not initiate outgoing calls.
- ◆ The modem or DCE initiates outgoing calls but does not successfully connect.

If the modem or DCE device cannot answer an incoming call or cannot initiate an outgoing call, you might need to reset it. Before resetting the device, check the following information:

- ◆ If the modem cannot answer incoming calls, check the AA (Auto Answer) light on your device. If it is off, reset the modem by using PPPCON or cycling the power.
- ◆ If the modem cannot answer incoming calls or initiate outgoing calls, use PPPTRACE to capture and decode modem or DCE device dialogs. Look at the send and receive exchanges to determine whether it is responding to the command properly (see the next section, “Capturing Modem/DCE Device Dialogs” on page 31 ). If the modem does not respond properly, reset it by using PPPCON or cycling the power.

If the modem or DCE device can initiate an outgoing call but cannot connect, you might need to change the settings or the hardware. To determine your course of action, check the following information:

- ◆ Use PPPTRACE to capture and decode modem or DCE device dialogs. Look at the dial command to determine whether the correct phone number for the remote modem was used. If the number is incorrect, use NIASCFG to change the number.
- ◆ Use MONITOR to look at the serial signals. If data set ready (DSR) or data carrier detect (DCD) are off, the modem cannot connect. Check the cable between the router and the modem. If the cable is properly connected, try another modem. If this does not resolve the problem, enable the Simulate DSR On parameter. Load NIASCFG and follow this path:

Select Configure NIAS > Protocols and Routing > Network Interfaces > Physical Options

This topic contains the following sections:

- ◆ Capturing Modem/DCE Device Dialogs
- ◆ Viewing Modem/DCE Serial Signals
- ◆ Resetting a Modem or DCE Device

## Capturing Modem/DCE Device Dialogs

To capture and decode modem or DCE device dialogs, load PPPTRACE and complete the following steps:

- 1** From the Available Options window, select Configuration.
- 2** Select Capture Device.  
Select whether you want to capture the data to RAM or to Disk. If you select Disk, specify the filename in the Disk Filename field.
- 3** Press Esc to go back to the Available Options window.
- 4** Select Real-Time Monitor to view and capture the modem or DCE device dialog.  
The Real-Time Monitor window appears.
- 5** Press F7 to begin capturing the modem or DCE device dialog.  
Press F7 when you want to end the capture.

You can also use the following keys:

F2 —Displays the statistics for the next interface.

F5 —Toggles the display between Hex and ASCII.

F6 —Enables you to freeze and resume the continuous display of data.

F8 —Goes to the next interface.

F9 —Returns to the preceding interface.

**6** Establish the call.

If you are testing outgoing calls, use `CALLMGR` on the local router to initiate the call. If you are testing incoming calls, use `CALLMGR` on the remote router to initiate the call.

**7** Press F7 to stop the capture when the desired data has been sent.

**8** Press Esc to return to the PPPTRACE menu.

**9** Select Playback to view the captured data at your convenience.

You can expect to see the response OK or an echoed command for each initialization string sent to the modem. If the modem does not respond, check the power and cable connections.

Figure 1 shows a sample modem dialog.



Figure 1 Real-Time Monitor Capturing a Modem Dialog

Real-Time Monitor [I/F Name=DNLTEST_2]				
Dir	Time	Size	PPP Data	[PPP Decode, Co]
Snd	10:46:55.6	10	+++ATE1H0	[cr]
Rcv	10:46:55.7	6	[cr][lf]OK	[cr][lf]
Snd	10:46:57.5	1	[cr]	
Snd	10:46:58.0	5	AT&F	[cr]
Rcv	10:46:58.1	8	[cr]AT&F	[cr][cr][lf]
Rcv	10:46:58.1	4	OK	[cr][lf]
Snd	10:46:59.9	15	ATE0N1Q0V1W1X4	[cr]
Rcv	10:47:00.0	17	ATE0N1Q0V1W1X4	[cr][cr][lf]
Rcv	10:47:00.0	4	OK	[cr][lf]
Snd	10:47:01.1	18	AT&C1&D2&K0&Q5%CO	[cr]

## Viewing Modem/DCE Serial Signals

To monitor the serial interface signals raised by the modem or the DCE device, load MONITOR and follow this path:

Select LAN/WAN Information > interface you want to view

Under the specific board's statistics section, look for serial interface signals such as DTR, DSR, RTS, CTS, and DCD (1=on, 0=off).

## Resetting a Modem or DCE Device

To reset the modem or DCE device, load PPPCON and follow this path:

Select PPP Interfaces > interface you want to view > PPP Reset Modem > Reset Modem

The following information is displayed on the PPP Reset Modem window:

- ◆ Interface Name—Symbolic name used by the LSL to refer to this interface.
- ◆ Interface—Interface index used by SNMP to refer to this interface. This is the same as the board number assigned by the LSL to this interface.
- ◆ Reset Modem Results—Displays None if the test has not been run, Success if the modem reset correctly, Failure if the modem did not reset correctly, and In Progress if the test is in progress.
- ◆ Reset Modem—Pressing Enter on this field resets the modem or DCE device.

# 4 Troubleshooting

This section contains troubleshooting information for modems and DTR-controlled devices.

## Remote Management of Communication Devices

CPECFG (Customer Premises Equipment Configuration), a NetWare Loadable Module™ (NLM™) utility installed on your router or server, provides expanded control of your data circuit-terminating equipment (DTE). You can now control customer premises equipment (if a supervisor port exists on the communications equipment) from any workstation on your internetwork through RCONSOLE, ACONSOLE, or VT100\* XCONSOLE. This feature allows you to configure, control, and troubleshoot the DCE remotely from any workstation on the internetwork. A standard null modem cable is used from the router's serial port to the supervisory port or terminal on the DCE. Refer to the documentation provided with the DCE for more information.

## DSU/CSU Issues

Observe the following guidelines when using a DSU/CSU.

- ◆ Always make sure that only one source supplies the transmit and receive clocks on the line. Either the DCE (such as a modem or DSU/CSU) or the DTE (the WAN interface board) on one side of the link should supply the transmit and receive clocks.
- ◆ If your clocking is being provided by either the DSU/CSU or telco, make sure the Interface Speed option is set to External in NIASCFG (parameter path: Select Configure NIAS > Protocols and Routing > Network Interfaces > a specific interface). Do not set this option to reflect the speed

of the line; this setting would be incorrect. Selecting an interface speed initializes the clocks built into the WAN board and confuses the DSU/CSU. The built-in clocks are commonly used for back-to-back testing.

# A

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