WANG

Wang Systems Networking

VS Network Core (Standard Components) Software Bulletin

Release 8.21
Release 8.30

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VS Network Core (Standard Components) Software Bulletin

Release 8.21
Release 8.30

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WANG LABORATORIES, INC.
ONE INDUSTRIAL AVE., LOWELL, MA 01851 TEL. (617) 459-5000, TWX 710-343-6769, TELEX 94-7421

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PREFACE

This bulletin describes the changes for Release 8.21 and Release 8.30 of Wang Systems Networking (WSN) VS Network Core (Standard Components). These changes necessitate updates to the manuals that document WSN network configuration, control, and monitoring. This bulletin describes these updates. Chapters 2 and 5 describe the 8.30 changes while Chapters 3, 4, 6, and Appendix A describe the 8.21 changes. The bulletin is written for VS system administrators who are responsible for the operation of their systems within the context of a network and for individuals involved in network-wide planning, configuration, and administration.

Chapter 1 provides an overview of the changes for Release 8.21, and 8.30, and the corresponding changes to documentation.

Chapter 2 describes how to use the GENEDIT utility to configure the VS300 Multi-Line TC (MLTC) Controller for Release 8.30 of Network Core (Standard Components).

Chapter 3 describes all Release 8.21 enhancements to the WSN VS network configuration utility, WSNEDIT, with the exception of Store and Forward and default path routing support. It also describes the changes to the LOGCNTRL utility that is required to define the volume where CNS log files will reside.

Chapter 4 describes the WSNEDIT enhancements of Release 8.21 required for Store and Forward and default path routing support.

Chapter 5 describes Store and Forward polling and Store and Forward windows, new features of Release 8.30.

Chapter 6 describes Release 8.21 enhancements to the WSN network monitor, WSNMON.

Appendix A describes WSN Transport codes and WSNEDIT error messages.

Those who use this bulletin should have access to the following Wang publications:

- WSN VS Network Control and Monitoring Guide (715-0164)
- WSN VS Network Configuration Guide (715-0165)
- VS System Administrator's Reference (715-114-03)
- VS 3274 SNA System Administrator's Guide (800-1333)
- VS 3271 BSC Emulator User's Guide (800-1306D)
- VS WSN Package Distribution Service (Release 3.05) Software Release Notice (195-4764)
- DMF Network Management and Operations Guide (700-8752A)

CHAPTER 1
INTRODUCTION

1.1 OVERVIEW

This chapter is an overview of the technical and related documentation enhancements for Release 8.21 and Release 8.30 of WSN VS Network Core (Standard Components). Release 8.30 is required for VS systems with Release 7.10 of the VS Operating System (OS) installed; however, Release 8.30 may also run on VS systems with Release 6.40 of the VS OS installed. The following three Network Core utilities and two related manuals are affected, in addition to other enhancements:

Utility	Documentation
WSNEDIT	WSN VS Network Configuration Guide
LOGCNTRL	WSN VS Network Configuration Guide
WSNMON	WSN VS Network Control and Monitoring Guide

Even though portions of these manuals are affected, most of their content is still up-to-date and useful. The affected portions are listed in the manual whenever appropriate. The next two sections list Release 8.21 and 8.30 enhancements.

1.1.1 Summary of Release 8.21 Enhancements

The following 8.21 Release enhancements are described in Section 1.2:

- Store and Forward routing support
- CNS routing enhancements
- System definition enhancements
- General Transport definition enhancements
- Multipoint, Point-to-Point, X.25 Transport enhancements
- IDS tuning parameters
- X.25 subscription parameters
- Operator Log Messages
- Path trace
- LOGCNTRL support for Distributed Management Facility (DMF)
- Enhancements for parallel transport support
- 25V76 TC Device Adapter support for the VS65

1.1.2 Summary of Release 8.30 Enhancements

The following 8.30 Release enhancements are described in Section 1.3:

- VS300 Multi-Line TC (MLTC) Controller support
- VS300 Inboard CIU (911A) IOC support
- IDS parameters
- Service windows and polling support for Store and Forward
- VS Terminal Emulation (VSTE) support
- Parallel transport support for non-CNS file transfer sessions
- X.25 transport parameter enhancements
- WSN services enhancements

1.2 RELEASE 8.21 ENHANCEMENTS

This section summarizes Release 8.21 enhancements.

1.2.1 Store and Forward Routing Enhancements

Previous Store and Forward routing implementations provided the following capabilities:

- Direct routing of mail between systems in the same area without using the area distribution point

- Inter-area routing of mail between the originating system and the destination system's area distribution point. The originating system's distribution point is not used.

WSNEDIT and CNS in Release 8.21 provide support for Wang OFFICE Store and Forward routing. The Store and Forward routing implementation supported gives you more flexibility in configuring routes between Store and Forward systems. Release 8.21 supports logical paths between Store and Forward systems. This means that the Store and Forward application need only know other Store and Forward systems and distribution points, not the physical topology of the network.

The Manage Routing function of WSNEDIT has been changed to support the Store and Forward routing enhancements. Several routing screens have been added (refer to Chapter 3) and several existing routing screens have been modified. Because of these changes, the screens documented in Chapter 5 of the WSN VS Network Configuration Guide are no longer accurate. However, Chapter 5 still contains useful general information on CNS routing.

Chapter 3 of this bulletin describes Store and Forward routing enhancements and the new screens.

1.2.2 System Definition Enhancements

Systems that have Store and Forward installed must know the names of other Store and Forward systems in the network. Store and Forward systems require this information so that they know what systems are Store and Forward destinations and the systems that can store mail before it is forwarded to destinations. When systems are defined in the directory through the Manage Areas function of WSNEDIT, you must specify whether or not a system has Store and Forward installed.

The System Definition screen (see Figure 3-11 in the WSN VS Network Configuration Guide) has been modified to enable you to specify whether or not

- Store and Forward is installed on a system. This modification is described in Chapter 2.

- The WSN VS Terminal Emulation Service (i.e., Remote Logon) should use CNS on a particular system. Remote Logon on non-CNS systems (OIS, Alliance, 2200) never uses CNS.

1.2.3 CNS Routing Enhancements

For Release 8.21, CNS provides support for three new routing features:

- Default Path Routing
- Adjacent System Routing
- Relative Costs

These features, described in the next sections, are designed to simplify network configuration and improve network traffic flow.

Default Path Routing

The Default Path Routing Configuration function is designed to simplify routing configuration at end point systems and to reduce the number of routing records stored on a system. This function is available to all systems.

The terms default path and end-point system have the following meaning:

- Default Path -- A path that is associated with a specific adjacent system where data transmitted from the originating system is routed to all nonadjacent destinations in the network to which paths have not been defined. When a default path is defined through WSNEDIT, only the specific adjacent system need be specified. The originating system knows only the specific adjacent system and that all data it transmits is routed by way of that system to nonadjacent destinations of which it has no routing knowledge. The originating system has only directory knowledge of nonadjacent destinations to which paths have not been defined; it knows only the area and system names and IDs of these destinations. The originating system knows only that these destinations exist somewhere in the network. Intermediate systems handle routing to these destinations based on information in their routing configurations.

- End-Point System -- A WSN system with CNS installed that has no routing knowledge of nonadjacent systems, except for one default path through a specified adjacent system. End-point systems transmit data to adjacent systems directly, but transmit data to nonadjacent systems by way of the adjacent system associated with the default path only.

Default path routing simplifies routing configuration at end-point systems. Administrators need only specify the default path, although they have the option to define paths to specific destinations. End-point systems may use only a default route to transmit data to nonadjacent destinations, though this is not required. They may also have specific routes defined to destination systems and areas. Intermediate systems or hops should have paths defined to some or all specific nonadjacent destinations.

In previous WSN releases, CNS selected paths in the following manner:

1. If the network address in a message's switching header indicates that the message is not for the local system, the CNS switching layer compares the network address with an associated routing record in the routing table.

2. There are two types of routing records: specific and general. A specific routing record is one associated with a specific destination system. CNS creates a specific routing record based on information entered through WSNEDIT. This information is entered when the administrator defines that a path to a destination system exists by way of an adjacent system. A general routing record is one associated with an area. CNS creates a general routing record based on information entered through WSNEDIT. This information is entered when the administrator defines that a path to all systems in a destination area exists by way of an adjacent system.

a. CNS first looks for a specific routing record. If one exists, CNS routes the message to the destination system by way of the associated adjacent system.

b. If no specific routing record exists, CNS looks for the general routing record. If one exists, CNS routes the message to the destination area by way of the associated adjacent system.

In Release 8.21, the CNS switching layer still checks for specific and general records as it did in previous WSN releases. However, CNS and WSNEDIT give the administrator a third routing configuration option, default path routing. When the CNS switching layer receives a message and finds no specific or general records associated with the network address in the switching header, the switching layer checks the routing table for a default record. This record indicates that a default path exists to all nonadjacent destinations in the network with no associated specific or general routing records. Routing to the specific destination is handled by the routing tables on other systems.

Adjacent System Routing

In previous WSN releases, CNS created specific routing records for adjacent systems only if they were in the same area. If two adjacent systems were in different areas, CNS would only create a general routing record for them. This did not pose a problem if a system in one area had only one adjacent system in another area. However, if a system in one area had more than one adjacent system in another area, it would not always transmit data to these adjacent systems directly. Data would sometimes reach these systems by way of alternate paths.

Data was not always transmitted to adjacent systems in other areas directly because of the way the CNS switching layer uses general routing records. General routing records simply specify that all systems (including adjacent systems) in a given area may be reached by way of a particular adjacent system. They do not indicate that a specific destination system in another area may be reached by way of a particular adjacent system. If a system in one area can reach systems in another area by way of more than one adjacent system in the other area, it has more than one path to the other area defined in its routing table -- one path for each adjacent system.

If one of the defined paths is designated as the preferred path, CNS attempts to transmit data to all systems in the other area by way of that path in most instances -- even to adjacent systems that are not associated with the preferred path. This means that data destined for adjacent systems that are not associated with the preferred path could take a roundabout route through several intermediate systems before reaching them.

When paths are configured with Release 8.21, CNS creates specific routing records for all adjacent systems, regardless of whether they are in the same area. This means that adjacent systems in different areas are defined as specific destination systems in each other's routing tables. Adjacent systems in different areas now send data directly to each other in all cases.

Adjacent system routing is transparent to the user. When you configure a path to an area through WSNEDIT, all systems in the area are selected and associated with an appropriate adjacent system. CNS creates the specific routing record for adjacent systems in destination areas, not the WSNEDIT user.

Network Design Implications of Default Path Routing

Adding a default routing record to an end-point system can cause no problems since these systems do not serve as intermediate nodes. Only one system adjacent to the end-point system can serve as the default path. The routing configurations on intermediate systems handle routing to specific destinations for end-point systems. End-point systems are the only systems that can make exclusive use of default paths to nonadjacent systems. Intermediate systems should have an appropriate combination of specific, general, and default routing records.

Add default routing records to intermediate systems with caution. The following rules are important when adding a default record to an intermediate system.

- Make sure that the intermediate system also has specific routing records defined to reach directly connected end-point systems. Adjacent end-point systems should not be defined as default paths, even though CNS and WSNEDIT permit it.

- Make sure that the adjacent system you specify as the default path has the necessary combination of specific, general, or default routing records in its routing configuration required to reach nonadjacent destinations accessible by way of that adjacent system.

- If an intermediate system is connected to several adjacent systems, only one adjacent system may be associated with the default path.

Sample Network with Configured Default Paths

This section describes a sample network with default paths. Refer to the sample network in Figure 1-1.

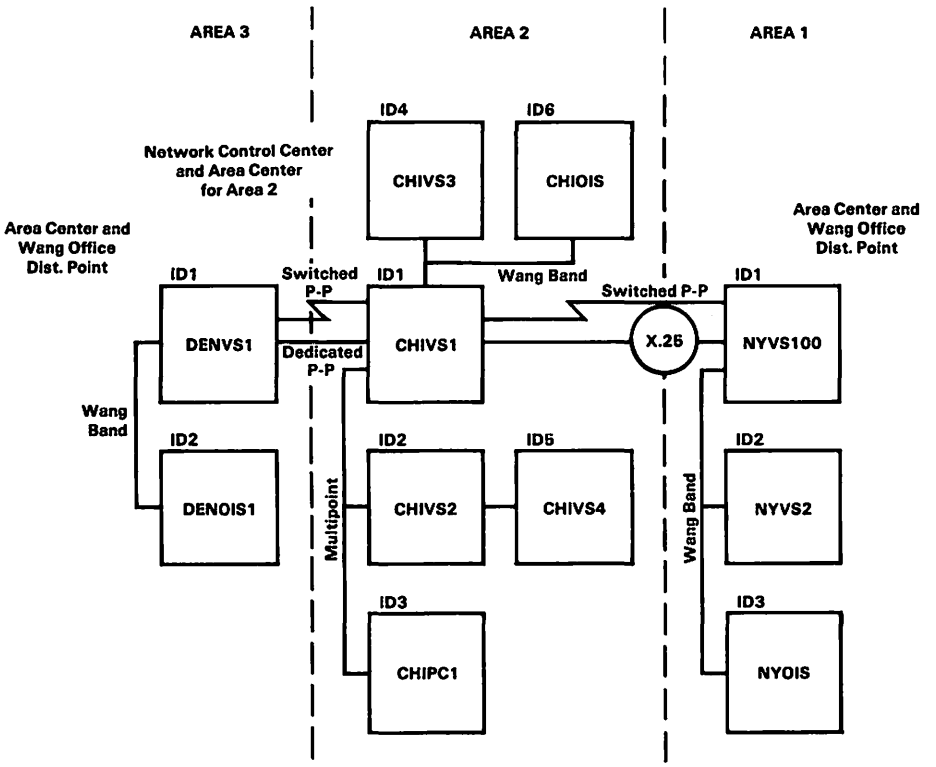

Figure 1-1. Sample Network

If you choose to configure a default path in the routing configuration of an end-point CNS system such as NYVS2, run WSNEDIT on NYVS2 or create the configuration file at another system and transfer it to NYVS2 and associate the appropriate adjacent system with the default path. In the case of NYVS2, the appropriate adjacent system is NYVS100.

The default routing record specifies that all data originating from NYVS2 that is destined for nonadjacent systems will be routed by way of NYVS100. NYVS2 needs only the default routing record, not general or specific routing records, to route data to nonadjacent systems.

If you choose to define a default path for an intermediate system such as CHIVS1, run WSNEDIT on CHIVS1 or create a configuration file at another system and transfer it to CHIVS1. You have the option of specifying either NYVS100 or DENVS1 as the adjacent system associated with the default path. NYVS100 should be specified as the default path since no nonadjacent CNS systems are reached by way of DENVS1. CHIVS1's routing configuration should have specific records defined for all directly connected end-point systems such as CHIPC1. It should also have a routing record defined for the adjacent intermediate system (DENVS1) that is not associated with the default path.

Make sure that the adjacent system associated with the default path has the necessary combination of specific, general or default records required to reach other systems. For example, the CHIVS1 administrator should check the routing configuration of NYVS100 to verify through WSNEDIT that NYVS100's routing configuration has the necessary routing record required to route data to NYVS2.

When to Use Default Path Routing

The main purposes of default path routing are to simplify routing configuration (at end-point systems especially) and to reduce the number of network routing records stored on a system. Reducing the number of network routing records stored on a particular system especially benefits low-end VS systems (e.g, VS15) and PC systems. The following guidelines suggest when you should use the default path routing option:

- Use the default path option when creating the routing configuration for end-point systems. Since low-end systems are usually end-points, the default path option simplifies configuration and significantly reduces the number of routing records that need to be stored.

- If an intermediate system routes data to most nonadjacent destinations in the network by way of a specific adjacent system, you should specify that adjacent system as the default path. For example, NYVS100 can reach all the nonadjacent destinations in the network by way of CHIVS1 only. Thus, NYVS100 needs only a default path by way of CHIVS1 to reach the nonadjacent systems. NYVS100 need not have general routing records defined for Areas 2 and 3. However, you should make sure that CHIVS1 has the appropriate routing knowledge required to reach systems in Areas 2 and 3.

Network Design Implications of Adjacent System Routing

Adjacent system routing can cause network design problems only when two paths, a preferred path and an alternate path, are configured between a local system and destinations. See the alternate path configuration in Figure 1-2.

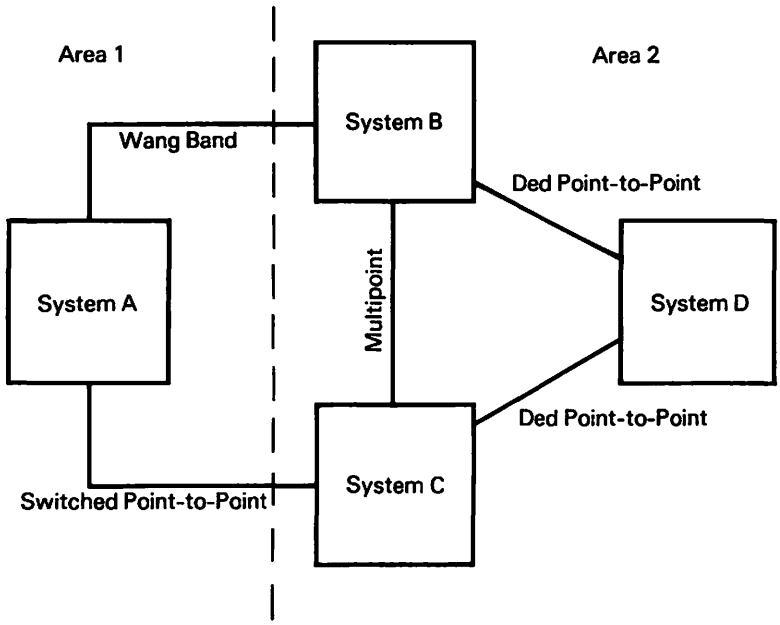

Figure 1-2. Sample Alternate Path Configuration

In the sample alternate path configuration, System A can reach System D by way of System B and System C. The path by way of System B is the preferred path because the Wang Band transport that connects it with System A supports a higher line speed than the switched Point-to-Point transport connecting Systems A and System C. Thus, System B is associated with a higher path cost than System C.

Use the following guidelines when you configure inter-area routing:

- The path cost assigned to the preferred path should be less than the base cost assigned to the transport that connects the local system and the adjacent system associated with the alternate path. If you do not take this precaution, CNS may attempt to favor the alternate path under certain conditions.

For example, the path cost assigned to the path by way of System B in Figure 1-2 should be less than the base cost assigned to the switched Point-to-Point transport. Remember that the path cost assigned to the path by way of System B must also be less than the path cost assigned to the path by way of System C.

- For any alternate path configuration, assign path costs according to the following rule:

  Path Cost = Sum of Base Costs along the Path

  For example, the path cost assigned to System B would be equal to the sum of the Wang Band base cost and the dedicated Point-to-Point base cost. The path cost assigned to System C would be the sum of the switched Point-to-Point base cost and the dedicated Point-to-Point base cost. Since the Wang Band base cost is lower than the switched Point-to-Point base cost and the dedicated Point-to-Point base costs are equal, the path cost assigned to System B is lower than the one assigned to System C. This routing scheme should work well, assuming that the base costs are configured according to the transport efficiency guidelines in Table 4-1 of the WSN VS Network Configuration Guide and the guidelines described in this section.

Transport Selection Enhancements for Release 8.21

You can configure multiple transports between two adjacent systems in order to balance network traffic between them. In previous WSN releases, the transport with the lower total cost was selected to transmit messages. (Refer to Chapter 1 of the WSN VS Network Configuration Guide for a description of how CNS selected transports in previous WSN releases.)

Total cost did not always accurately reflect the volume of traffic between two adjacent systems. It simply reflected the total number of messages in a particular transport queue for a all systems on the transport. It did not reflect the number of messages in the individual sections of the queue allocated for specific adjacent systems. The messages could be received from or destined for any number of systems on the transport.

Total cost did not accurately reflect the volume of traffic between two adjacent systems in the following situations:

- Two systems on a Wang Band transport when more than two systems share the transport. The total cost associated with the Wang Band transport on systems in this configuration reflected the volume of traffic between the local system and all the other systems on the transport. It did not reflect the volume of traffic between the local system and a specific adjacent system on the transport.

- Two systems on an X.25 transport when more than two systems share the transport. Total cost functioned the same way for both Wang Band and X.25.

- Traffic between a Multipoint primary and a particular secondary if more than one secondary is on the transport. In this case, only the secondary's total cost is accurate. Remember that only the primary system is adjacent to secondaries on a Multipoint transport. Secondary systems are not adjacent to each other. Thus, the primary's total cost for the Multipoint transport reflected the volume of traffic between the primary and all the secondaries. It did not accurately reflect the volume of traffic between the primary and a specific secondary.

To accurately reflect traffic volume, CNS now calculates a relative cost for each part of a transport queue allocated to an adjacent system. For example, in Figure 1-1 two transports connect NYVS100 and CHIVS1. NYVS100 has part of its switched Point-to-Point transport queue allocated for messages received from and destined for CHIVS1. NYVS100 also has part of its X.25 transport queue allocated for messages received from and destined for CHIVS1. A relative cost is calculated for each of these transport queue partitions. CNS selects the transport with the lowest relative cost.

Relative cost is equal to the following formula:

```
  Base Cost
+ Congestion Level Factor
- Connection Bias
  Relative Cost
```

Base cost is an initial cost value associated with a transport through WSNEDIT that is used to prioritize transports in a load-balancing configuration. Connection bias is a value that enables CNS to favor the use of a transport that has already established a connection. Refer to the WSN VS Network Configuration Guide for more information on base cost and connection bias.

NOTE

For Release 8.21, connection bias is not a fixed value of 2 as described in Chapter 1 of the WSN VS Network Configuration Guide. WSNEDIT now enables you to enter and modify connection bias values for a transport. Refer to Chapter 3 of this bulletin for instructions on how to enter and modify connection bias values for transport.

The congestion level factor reflects the number of messages in the part of the transport queue allocated to a specific adjacent system. It accurately reflects the volume of traffic between adjacent systems across a transport.

Congestion levels determine the number of messages that can accumulate in the part of a transport queue allocated for a specific adjacent system before a factor is added to the base cost. There are four congestion levels: Level 1, Level 2, Level 3 and Level 4. Each level is associated with a number of messages that can accumulate in the part of the queue allocated for a specific adjacent system. Once the level is reached or exceeded, a congestion level factor of one is added to the base cost.

The number of messages is greater for each succeeding level. For example, the number of messages associated with Level 2 is more than the number associated with Level 1; the number associated with Level 3 is greater than the number associated with Level 2 and so on.

For example, if the number of messages associated with Level 1 is 2 and 2 messages are in the part of the queue allocated for a specific adjacent system, CNS adds a congestion level factor of one to the base cost. If the number of messages associated with Level 2 is 4 and 2 more messages reach the queue before the other 2 are sent (totaling 4 messages in the part of the queue allocated for a specific adjacent system), 1 is again added to the base cost and so on up to Level 4.

WSNEDIT now enables you to associate a specific number of messages with each congestion level. Refer to Chapter 3 for instructions on how to use WSNEDIT to associate message numbers with congestion levels.

Remember that relative cost is a dynamic value that changes based on traffic volume. This enables CNS to select the least congested transport to a given adjacent system.

Relative cost, connection bias, and congestion level factors can be monitored on-line through the Control/Monitor Routing function in WSNMON. The Transports to Adjacent Systems menu (see Figure 5-5 in the WSN VS Network Control and Monitoring Guide) has been enhanced to provide this on-line monitoring feature. The new menu is described in Chapter 6 of this bulletin.

1.2.4 General Transport Definition Enhancements

WSNEDIT now enables you to enter parameters that CNS uses to balance message loading when more than one transport is configured between two adjacent systems. The General Transport Definition screen (see Figure 4-3 in the WSN VS Network Configuration Guide) has been modified to enable you to enter these parameters. The new screen and the message loading parameters are described in Chapter 3.

1.2.5 Multipoint, Point-to-Point, and X.25 Transport Enhancements

The WSN Multipoint, Point-to-Point, and X.25 transports now support a line speed of 56,000 bps. The following screens have been modified to support this line speed:

- First Point-to-Point Transport Definition screen of WSNEDIT -- The old screen appears in Figure 4-9 in the WSN VS Network Configuration Guide. The new screen is described in Chapter 3 of this bulletin.
- Multipoint Transport Definition screen of WSNEDIT -- The old screen appears in Figure 4-6 in the WSN VS Network Configuration Guide. The new screen is described in Chapter 3 of this bulletin.
- X.25 Transport Definition screen of WSNEDIT -- The old screen appears in Figure 4-19 in the WSN VS Network Configuration Guide. The new screen is described in Chapter 3 of this bulletin.

1.2.6 IDS Tuning Parameters

WSNEDIT now enables you to enter tuning parameters for Information Distribution System (IDS), Bisync (BSC), and Systems Network Architecture (SNA) transports. These parameters are designed to give you some control over IDS operation.

Two WSNEDIT screens have been modified to support these parameters: the first IDS 3271 Transport Definition screen (see Figure 4-15 in the WSN VS Network Configuration Guide) and the first IDS 3274 SNA Transport Definition screen (see Figure 4-17 in the WSN VS Network Configuration Guide). The modifications are described in Chapter 3 of this bulletin.

1.2.7 X.25 Subscription Parameters and Other Enhancements

The WSN X.25 General Access Interface (GAI) Service requires several X.25 subscription parameters. These parameters are based on the contract between your company and the Public Service Data Network (PSDN). You enter these parameters only if the WSN X.25 GAI Service is installed on your system.

WSNEDIT enables you to enter these subscription parameters. One old WSNEDIT screen has been modified, the X.25 Transport Definition screen (see Figure 4-19 in the WSN VS Network Configuration Guide). One new screen has been added. The changes to the old screen and the new screen are described in Chapter 3.

1.2.8 Operator Log Messages

WSNMON in Release 8.21 features an operator log message function that enables you to enter a log message in the log file. This message is then displayed on the WSNMON main menu (refer to Figure 1-1 in the WSN VS Network Control and Monitoring Guide). This function is useful for recording network events and your own observations on network activity. The operator log message function is described in Chapter 6 of this bulletin.

1.2.9 Path Trace

The path trace function is a diagnostic and performance tool that enables WSNMON to request information on the current path from the local system to a specified remote system and back. Information on transports and systems along the path is obtained when the user submits a path trace through WSNMON and the VS sends a path trace message to the remote system. This message is then routed back to the VS.

The WSNMON Diagnostics screen has been modified to enable you to access the path trace function (refer to Figure 7-1 in the WSN VS Network Control and Monitoring Guide). The new Diagnostics screen and the path trace function are described in Chapter 6 of this bulletin.

1.2.10 LOGCNTRL Support for Distributed Management Facility (DMF)

The LOGCNTRL utility enables you to specify the volume where CNS log files reside. This utility has been changed to also enable you to specify certain parameters that DMF requires. The old LOGCNTRL utility was described in Chapter 1 in the WSN VS Network Configuration Guide. The changes to the utility are described in Chapter 3 of this bulletin.

1.2.11 Enhancements for Parallel Transport Support

You can configure multiple WSN transports between two systems in both CNS and non-CNS environments. Multiple transports between two systems are referred to as parallel transports. Release 8.21 supports the following Parallel transport features:

- When multiple switched transports (e.g., switched Point-to-Point) connect two systems, incoming CNS calls on any nonbusy line are accepted and a session is established. Outgoing CNS calls that are initiated at the same time are accepted on any remaining nonbusy line.

- Inbound remote logons are accepted on any nonbusy switched transport and on any other transport.

- The Control Communications Systems screen (see Figure 9-2 in the WSN VS Network Control and Monitoring Guide) shows remote logons only allowed from the remote system to the local system via the last transport on which the remote system is designated through WSNEDIT. Release 8.21 invalidates this screen. The Control Communications Systems function of the VS operational control facility enables and inhibits VS Terminal Emulation (i.e., remote logon) service from a remote system on all transports connecting it to the local system. Logons are allowed or inhibited when the local system operator submits an allow or inhibit command.

  For example, two transports, Transport A and Transport B, connect the local system and a remote system. Transport A is the first transport created and the remote system is designated as being on Transport A. Then Transport B is created and the remote system is designated as being on Transport B. Thus, Transport B is the last transport on which the remote system is designated.

- Outbound remote logon sessions always attempt to use the last transport on which the remote system is designated through WSNEDIT (i.e., the one shown on the VS operator's console). This attempt is made even when the last transport is busy and other transports have been configured.

- Outbound non-CNS file transfer sessions always attempt to use the last transport on which the remote system is designated. This attempt is made even if the last transport is busy and other transports that connect the local and remote systems are not. A user can remotely log on and queue VS print files in the file transfer queue for transmission to the user's local system; however, these files may not be returnable while the user is logged on to the remote system. This happens because file transfer may be attempting to use the last transport and that line is busy. When the user terminates the remote logon session, the user may be notified to receive the print files on a different VS line. This line is the one that belongs to the last configured transport.

- In Release 8.21, file transfer inbound sessions on the last transport work correctly, but file transfer inbound sessions on other connected transports are not accepted. This means that an incoming file transfer session that is sent to parallel transports in a load balancing configuration is not cleanly refused with a busy signal when it cannot be accepted. However, it may be accepted and charged before it is refused because it does not come in on the last transport.

- For Release 8.30, when multiple transports connect two systems, incoming File Transfer calls on any of the transports are accepted and a session is established. However, this is not true of outbound File Transfer sessions. Outbound File Transfer sessions always use the last transport. The other transports will not ever be used for outbound File Transfer sessions.

1.2.12 Path Cost Modification

The WSNMON Control/Monitor Routes function now enables you to modify path costs on-line. In previous WSN releases, only base costs and inactivity timeout could be modified on-line. Path cost modification is described in Chapter 6.

1.2.13 25V76 TC Device Adapter

Release 8.21 supports configuring a VS65 on 25V76 TC Device Adapter. The device is defined through GENEDIT. If you are configuring a 25V76 TC Device Adapter on a VS15, 25, 45, or 65, type in TC4 next to each device number you wish to assign to the 25V76 while running GENEDIT. The TC4 is described as "BATCH TC." The 25V76 supports the following WSN transports:

- Point-to-Point
- Multipoint
- X.25

1.3 RELEASE 8.30 ENHANCEMENTS

This section summarizes Release 8.30 enhancements.

1.3.1 VS300 Multi-Line TC (MLTC) Controller

The VS300 Multi-Line TC (MLTC) Controller is a hardware option that provides up to 16 communications lines. For Release 8.30, each VS300 MLTC line can support a WSN synchronous Point-to-Point transport.

Chapter 2 describes how to use GENEDIT to configure the VS300 MLTC.

1.3.2 VS300 Inboard CIU (911A) IOC

The VS300 Inboard CIU, with the appropriate microcode, enables a VS300 user to communicate via a WSN Wang Band link to VS, OIS, and Alliance systems. The inboard CIU supports all standard WSN services (e.g., File Transfer, and VS Terminal Emulation). The only operational difference from the outboard CIU is that you can configure up to 64 VS logical devices on the inboard CIU, while the outboard CIU is limited to 24 devices.

You use GENEDIT to configure the inboard CIU as a "911A INBOARD CIU" with up to 64 device numbers on it (refer to Chapter 2). Remember that one device number is used for the control path between the Inboard CIU and the CPU and the other device numbers are used to support virtual circuits between systems. Run WSNEDIT to configure the following network parameters:

- A transport corresponding to the physical medium (Wang Band) associated with the inboard CIU
- Systems that can be reached via the transport and their cable addresses on the Wang Band

1.3.3 IDS Parameters

The General Transport Definition screens for the IDS BSC and IDS SNA transports (see Figure 3-7) have been changed. These screens do not display the DLP address and range assignments because these parameters are configured when the Master Control Program (MCP) is configured. Configuring the MCP is described in the VS 3274 SNA Administrator's Guide and VS 3271 BSC Emulator User's Guide.

1.3.4 Store and Forward Service Windows and Polling

Release 8.30 enables you to configure service windows through WSNEDIT that can control the distribution of mail from a local system to remote systems on the network. A service window is a time interval for each day of the week when an application on a local VS, such as Wang OFFICE, can initiate a session with a peer application on a remote VS.

In previous releases of Store and Forward, the system administrator configured one set of windows that applied to all destination systems on the network. When a window opened, the local system attempted to establish a session with the remote system only if the local system had one or more packages that it wanted to send to the remote system. If the local system could not establish a session with the remote system, the packages could not be sent.

With Release 8.30, you can configure a separate set of windows for each destination on the network. Windows enable a system to establish a session to send packages or to query (poll) another system whether it wants to establish a session to move packages or both. Polling, an optional feature, enables a VS system to establish a session with a remote system. If the remote wants to send packages to the local system, the session can be turned around so the local system can receive packages.

Service windows support the following features:

- A service window defined for each day of the week.
- A day divided into 24 hours with each hour subdivided into four 15-minute intervals when a window can be open.
- A window definition that includes four priority levels (Immediate, High, Medium, and Low) that correspond to the priority levels of user created packages (mail) and the option of postponing Immediate priority.

Chapter 5 describes how polling operates and explains how to configure service windows.

1.3.5 VS Terminal Emulation (VSTE) Support

The VS Terminal Emulation (VSTE) service enables you to log on to another VS in the network. Once you are logged on, you can run any program or procedure that does not require microcode to be moved from the remote VS to your workstation. For example, you can run Wang OFFICE and PACE, but not WP.

If both your VS and the remote VS are running Release 7.10 (or greater), of the VS Operating System, and your system is running NETCORE 8.30, you can log on to the remote system when there are up to four intermediate system between your system and the remote system.

Thus, you can now share the VSTE service with a nonadjacent VS system. You define a nonadjacent VS as sharing VSTE with your VS through the Manage Services function. Only your VS and the VS you log on to are required to have Release 7.10 OS and NETCORE 8.30 running. The intermediate systems may have Release 6.40 OS and WSN Release 8.21 running.

With Release 7.10 of the OS, a VS system administrator can modify a user record so that a user automatically attaches to a remote system when the user logs on.

To modify a user record for automatic logon to a remote system, run the SECURITY program. Enter the name of the remote system in the Remote System Name for Auto Remote Logon field of the the User Record screen (see Figure 1-2 of the VS System Administrator's Reference).

If you use this feature to create an automatic logon, you must make the user a Security Administrator on your system. Disable the HELP key to prevent the user from accessing your (local) system as a Security Administrator.

With Release 8.30, VSTE can be used from a VS procedure. If you want to use VSTE from a procedure, you must specify this when you install VSTE.

Example of a procedure using VSTE (RLOGON):

```
Label: run RLOGON in @SYSTEM@ on IPLVOL
       ENTER SYSNAME
       User ID = ANK, Password = ETHAN, System = VS100
       Return Code = LABEL
```

NOTE

The name of the remote system that is entered in SECURITY must correspond exactly to the name entered in a network directory file that the system or network administrator creates on the VS.

Each user who logs on to a remote system must have the same user ID, password, and alias (if aliases are used) on both the remote and local systems. If an 8-character alias is used on the local system, the remote system must be configured (using GENEDIT) to accept an 8-character ID. Other security options can vary from system to system.

1.3.6 Configure Multihop VSTE

The new Multihop VSTE capability requires that you create a list of nonadjacent systems that may log on to your system. To create this list, perform the following steps:

1. Press PF7 (Manage Services) on the WSNEDIT main menu. The Edit Service Definition menu appears. Refer to Figure 6-1 in the WSN VS Network Configuration Guide.

2. Use the space bar to position the cursor next to the LOGON selection and press ENTER. The Edit Systems for Logon Service menu appears. Refer to Figure 6-5 in the WSN VS Network Configuration Guide.

3. Press PF10. The Review Systems for Logon Service menu appears. Refer to Figure 6-6 in the WSN VS Network Configuration Guide.

4. Press PF9 (Modify). The Review Systems for Logon Service menu appears in modify mode.

   The Review Systems for Logon service screen lists every system in the network that is equipped with CNS, and those systems that are adjacent. Notice that the Key field for every adjacent system contains an X. This is because all adjacent systems automatically support remote logon from the target system. (The X will not appear in the Key field for an adjacent system if you delete the logon service from that system.)

5. Add an X in the Key field for every nonadjacent system that you want to be able to log on to your system.

6. Press ENTER to save the changes.

1.3.7 Review Multihop VSTE

To display nonadjacent systems that may log on to your system, perform the following steps:

1. With the VS Command Processor displayed, press PF8 (Manage COMMUNICATIONS). The Display Communications menu appears.

2. Press PF5 (Communication LINKS). The Display Communication Links screen appears. Refer to Figure 1-3.

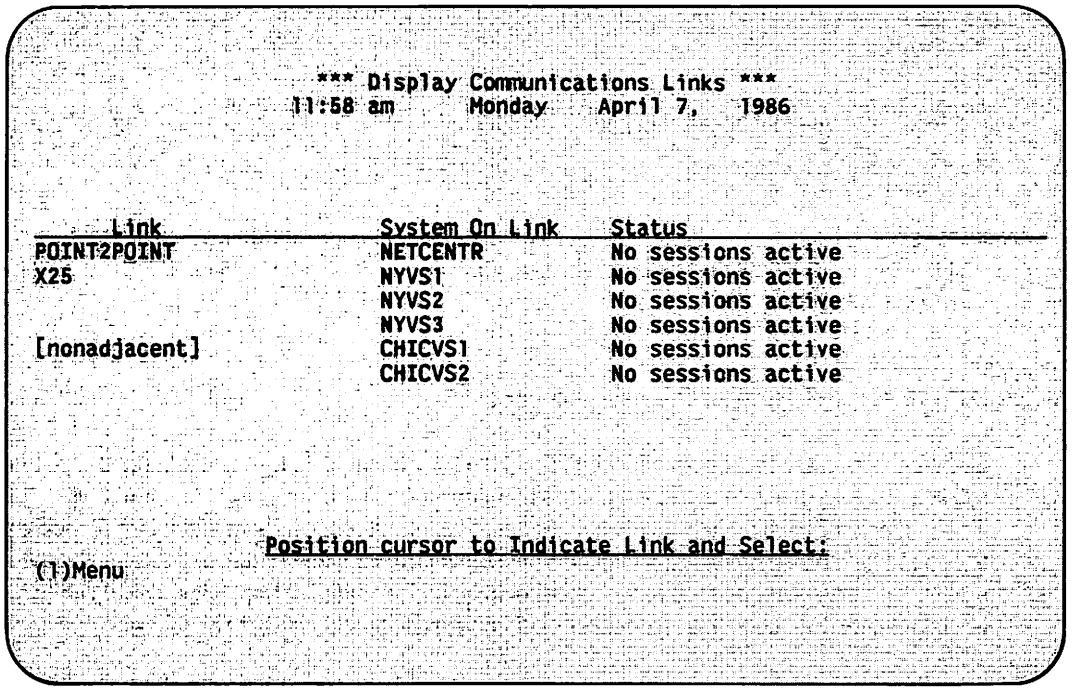

Figure 1-3. Display Communications Links Screen

The Display Communication Links screen lists all the links that are defined on the target system and the systems that are connected to the target system by those links. Nonadjacent systems that may logon to the target system or have file transfer privileges to the target system are listed with the name [nonadjacent] in the Link field.

1.3.8 Parallel Transport Support for non-CNS File Transfer Sessions

You can configure multiple WSN transports between two systems in non-CNS environments. Multiple transports between two systems are referred to as parallel transports. Release 8.30 supports the following parallel transport feature for non-CNS sessions:

- File transfer inbound sessions are accepted on any transport and file transfer outbound sessions work correctly on the last configured transport only.

1.3.9 X.25 Transport Parameters

Release 8.30 changes the following parameters on X.25 related WSNEDIT screens:

- Maximum Virtual Circuits -- The range of maximum virtual circuits, which was [1 thru 64] on the New X.25 Transport Definition screen (see Figure 3-12), is now [1 thru 24].

- Frame Window -- The range of frame window, which was [1 thru 7] on the New X.25 Subscription Parameters screen (see Figure 3-13), is now [2 thru 7].

1.3.10 WSN File Definition Enhancements

Before you exit from WSNEDIT, you must specify the output file to store transport, routing, and service information. (Refer to section 6.4, Specifying the Output File, of the WSN VS Network Configuration Guide). You press PF16 from the WSNEDIT main menu (see Figure 3-1) to specify the output file. Release 8.30 includes the following enhancements to the process of creating an output file:

- The Output File screen (see Figure 6-7 in the WSN VS Configuration Guide) may display the following message to complete the output operation:

  WARNING

  Changes to the file will not be saved. Press ENTER to save the changes.

- Displays a message when the output operation is successful.

- Includes a new PF key (PF1 Edit new file) that appears on the Output File screen (see Figure 6-7 in the WSN VS Network Configuration Guide). Press PF1 after you have saved or replaced the Configuration file to create a new configuration file or edit the active or replaced configuration file. When you press PF1, the WSNEDIT main menu appears (see Figure 3-1).

CHAPTER 2
HARDWARE CONFIGURATION ENHANCEMENTS FOR RELEASE 8.30

2.1 INTRODUCTION

This chapter describes how to use the GENEDIT utility to configure the VS300 Multi-Line TC (MLTC) Controller and the Inboard Cable Interface Unit (CIU) for Release 8.30 of Network Core. It also describes how to configure a VS 6550 Inboard Telecommunications Processor for the VS85, the VS100, and the VS300. The configuration procedure for the MLTC, the Inboard CIU, and the 6550 is similar to the procedures that you follow to configure other Data Link Processors (DLPs) for communications. Refer to Chapter 2 of the WSN VS Network Configuration Guide for descriptions of these DLPs and the VS System Administrator's Reference for a complete description of GENEDIT.

2.2 MLTC CONFIGURATION INSTRUCTIONS

Perform the following steps to add the MLTC to the GENEDIT configuration file:

1. Run GENEDIT and access the GENEDIT main menu (refer to Figure 2-1 of the WSN VS Network Configuration Guide).

2. Press PF3 (Examine/Modify the IOC and device configurations). The VS300 IOCs screen appears. A sample screen is shown in Figure 2-1. The sample screen displays the WangNet Controller IOC (23V97W) and the large disk IOC (23V98) as the minimum configuration defaults for the VS300.

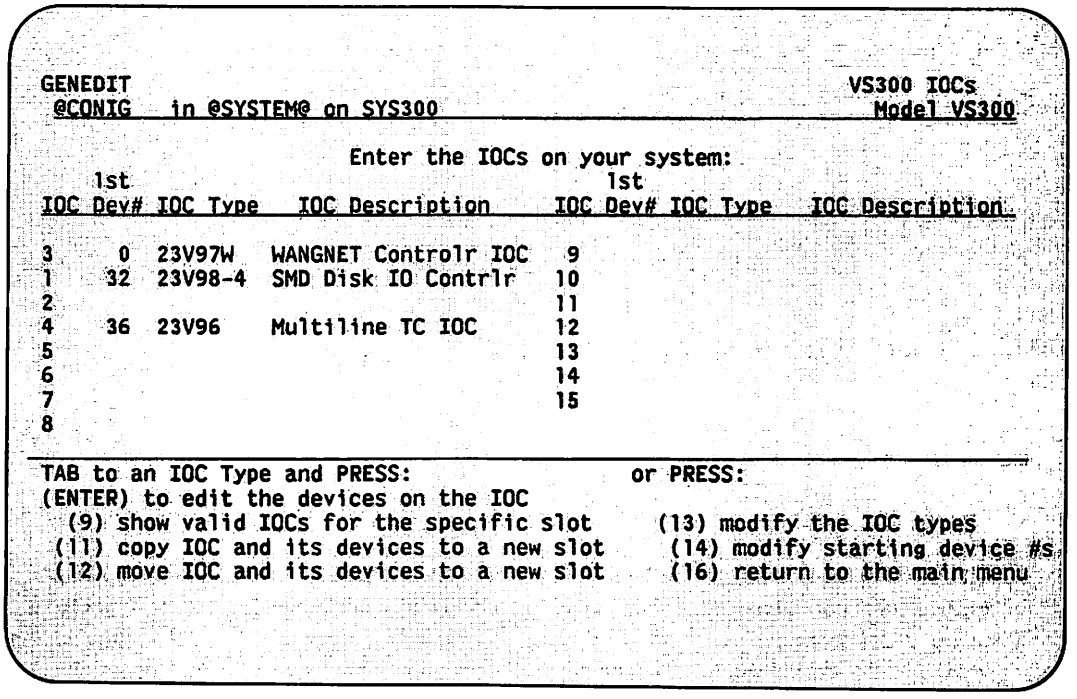

Figure 2-1. VS300 IOCs Screen

3. Press PF13 (modify the IOC types) to add the MLTC to the list of IOC types or move the cursor to the slot where you want to place the MLTC and press PF9. The screen appears in modify mode. The MLTC must be added to a slot that allows 64 devices.

4. Type 23V96 in the IOC Type field and press ENTER. The IOC Description for the MLTC is added to the screen. The VS300 IOCs screen shows that the MLTC has been entered at slot 4 where the first device number is 36.

   After you add the MLTC to the list of IOCs, you need to select the dependent devices, assign a set of device numbers and ports associated with the MLTC.

5. Position the cursor at 23V96 (the MLTC) and press ENTER. The Devices on TC IOC screen appears, as shown in Figure 2-2.

   The MLTC has 16 ports and each port has 4 device numbers. (A virtual circuit can be mapped to each device.) Therefore, 64 devices can appear on this screen, beginning with the first device number of 36. Next/Previous functions (PF4 and PF5) are enabled.

NOTE

A MLTC can support up to 64 devices mapped in any fashion to the 16 lines. However, the present WSN limitation is 24 devices (virtual circuits) per line.

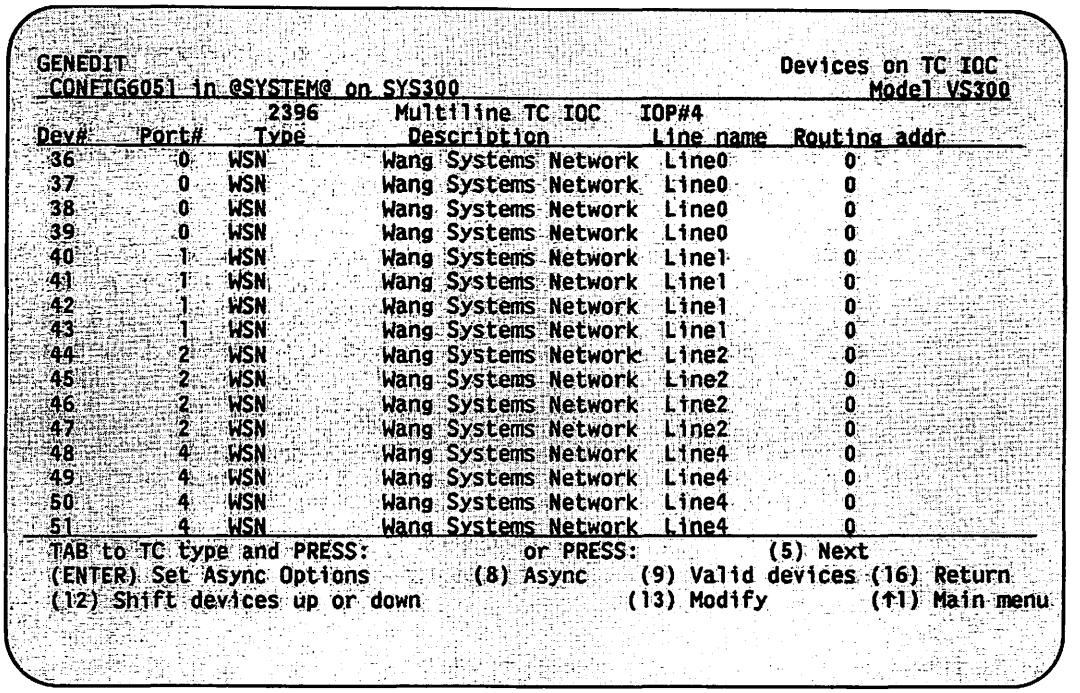

Figure 2-2. Devices on TC IOC Screen

6. For each device that you are defining (up to 64 devices), enter the following information:

   Port# -- The first device number (36) coincides with the first port (Port# 0).

   Port number 3 is reserved for RS366 connector and supports auto-dial.

   Type -- WSN.

   Description -- Wang Systems Networking.

Line name -- An optional field, but it is helpful to enter the Transport Name (link name) that you enter in the Transport Name field of the General Transport Definition screen of WSNEDIT (see Figure 3-7).

Routing addr -- This field is not used.

7. Exit from GENEDIT and save the configuration file that you have created.

8. IPL the VS300 with the configuration file (COMMFILE = 'filename').

9. Run WSNEDIT and display the General Transport Definition screen (see Figure 3-7) and enter information for each line of the MLTC that runs a WSN Point-to-Point transport.

   Remember that the lowest device number on the IOC (36 in Figure 2-2) is the IOC base address. Combine the IOC base address and the port number, converted to a letter, to assign a device name that you enter in the DLP Address field of the General Transport Definition screen (see Figure 3-7). For example, the device name of device number 36 connected to port 0 is 036A. Refer to Section 2.4 of the WSN VS Network Configuration Guide for a description of the procedure that converts port numbers into letters.

   You are not required to supply any additional information in WSNEDIT when a MLTC is configured.

2.3 INBOARD CIU CONFIGURATION INSTRUCTIONS

Perform the following steps to add the Inboard CIU to the GENEDIT configuration file:

1. Display the VS300 IOCs screen (see Figure 2-1).

2. Press PF13 (modify the IOC types) to add the Inboard CIU to the list of IOC types or move the cursor to the slot where you want to place the Inboard CIU and Press PF9. The screen appears in modify mode. The Inboard CIU must be added to a slot that has 64 devices.

3. Type 23V79 in the IOC Type field and press ENTER. The IOC Description is added to the screen.

   After you add the Inboard CIU to the list of IMCs, you must select the dependent devices and assign device numbers associated with the Inboard CIU.

4. Position the cursor at 23V79 (the Inboard CIU) and press ENTER. A screen appears that enables you to assign up to 64 device numbers to the Inboard CIU.

   Total device numbers for the entire VS300 may not exceed 256. Remember that one device number is used for the control path between the Inboard CIU and the CPU and the other device numbers are used to support virtual circuits. In addition, each remote logon (defined on the System Options screen) uses a device number. Be sure to account for these reserved device numbers when you are defining how many devices will be supported by the Inboard CIU.

5. Specify the appropriate number of device numbers and press ENTER. This action displays your entry.

   The Inboard CIU is always assigned to port #0. Therefore the DLP address for an Inboard CIU is always the lowest device number on the CIU (the IOC base address) followed by an A. For example, if the lowest device number on the Inboard CIU IOC is 100, the DLP address for the IOC is 100A. The DLP Address is a required field that appears on the General Transport Definition screen (see Figure 3-7).

2.4 VS 6550 CONFIGURATION

The VS 6550 has 128K of memory and performs the same functions as a VS-TC1. It may be mounted in a VS Large Cable Concentrator for use with VS85, VS100 and VS300 systems or on the back panel of a VS300. The 6550 is configured through GENEDIT the same way that a VS-TC1 is configured. Through GENEDIT, you enter the name TCB3 at the first available device number on the appropriate IOP when configuring the 6550.

CHAPTER 3
WSNEDIT ENHANCEMENTS

3.1 OVERVIEW

This chapter describes all WSNEDIT enhancements with the exception of Store and Forward and default path routing support. Store and Forward and default path routing support are covered in Chapter 4. It also describes the changes to the LOGCNTRL utility that is required to define the volume where CNS log files will reside.

WSNEDIT enhancements other than Store and Forward and default path routing are

- System Definition Enhancements -- When you define a system in the directory, you must specify whether or not Store and Forward is installed, and whether or not the VS Terminal Emulation Service should use CNS.

- General Transport Definition Enhancements -- WSNEDIT enables you to enter parameters that CNS uses to balance message loading when more than one transport is configured between two adjacent systems.

- Multipoint, Point-to-Point, and X.25 Transport Enhancements -- You can specify 56,000 bps as a valid line speed for a Multipoint, Point-to-Point, or X.25 transport.

- IDS Transport Enhancements -- Several IDS tuning parameters can now be configured.

- X.25 Subscription Parameters -- WSNEDIT supports X.25 subscription parameters. These parameters are entered only if your VS is equipped with the WSN X.25 General Access Interface (GAI) Service.

3.2 SYSTEM DEFINITION ENHANCEMENTS

When you define a system in the directory through WSNEDIT, you must specify whether or not Store and Forward is installed on the system. You no longer have to define whether or not the VS Terminal Emulation Service should use CNS. You must enter the Store and Forward parameters on the System Definition screen.

To access the System Definition screen, perform the following steps:

1. Press PF2 from the WSNEDIT main menu (see Figure 3-1). The Area List menu appears (see Figure 3-2).

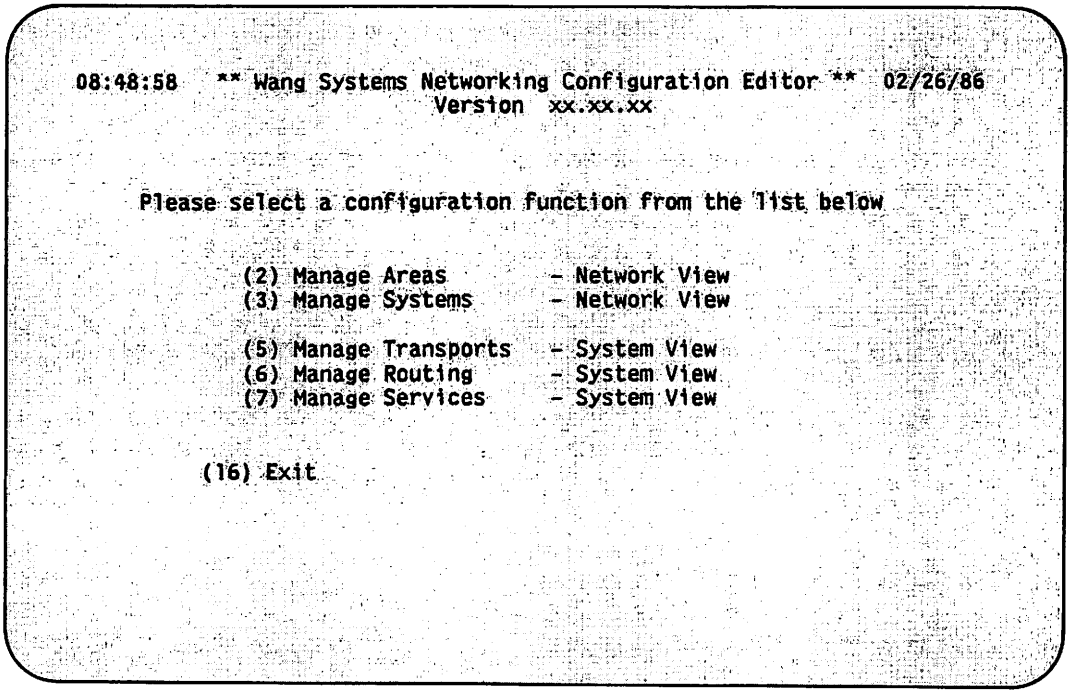

Figure 3-1. WSNEDIT Main Menu

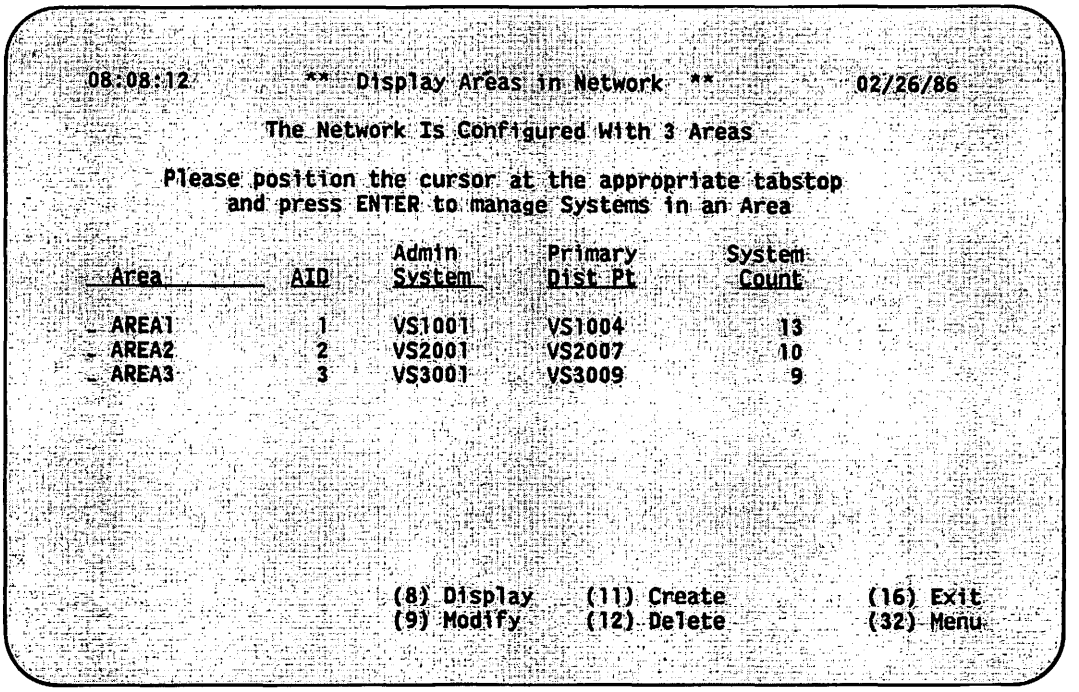

Figure 3-2. Area List Menu

2. The Area List menu enables you to access system definition functions (i.e., Create, View, Modify modes). To access system definition functions, position the cursor next to the appropriate area and press ENTER. The Area System List menu appears (see Figure 3-3).

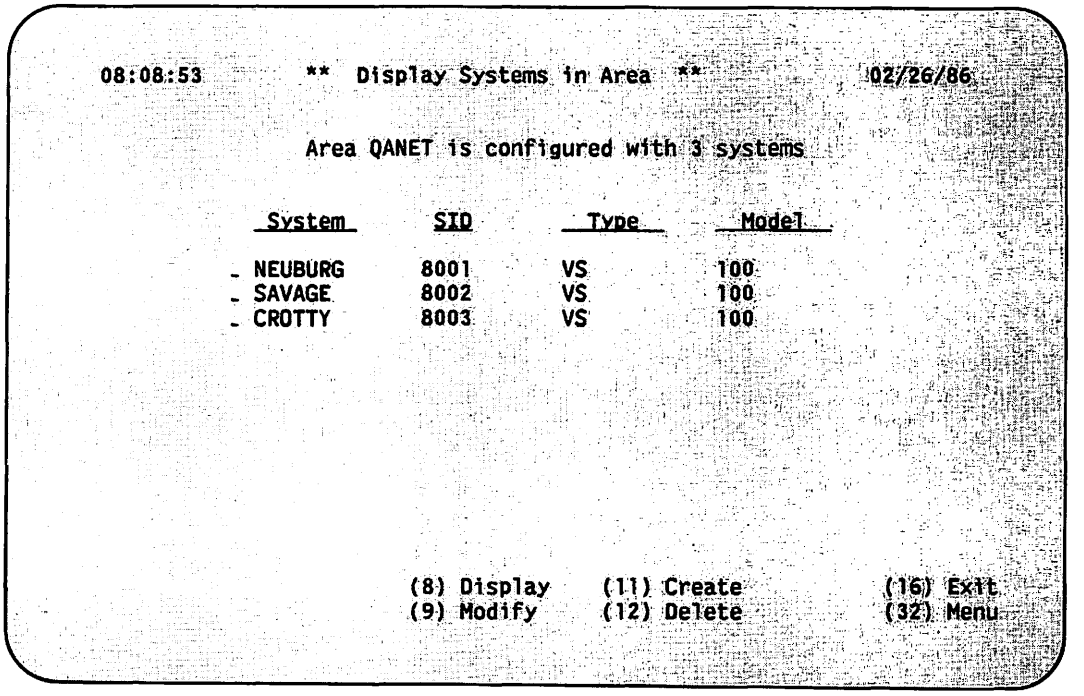

Figure 3-3. Area System List Menu

The Area System List menu enables you to create, view, or modify system definitions.

a. To create system definitions for a newly created area, press PF11 from the Area System List menu.

b. To view existing system definitions, press PF8.

c. To modify existing system definitions, press PF9.

4. When you have completed either Step 3a, 3b, or 3c, the System Definition screen appears (see Figure 3-4). The screen appears in either Create, Display or Modify mode depending on which PF key (8, 9, or 11) that you pressed from the Area System List menu.

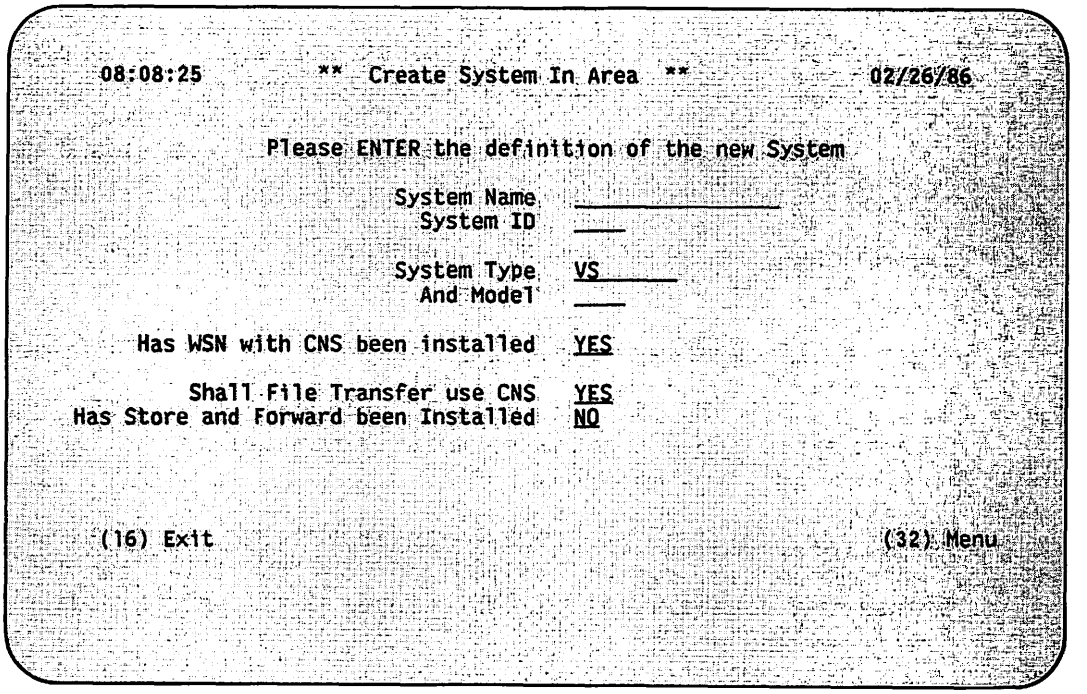

Figure 3-4. System Definition Screen

The System Definition screen enables you to specify the information required to define a new system in an area or modify an existing system definition. The screen in Figure 3-4 is in Create mode. You must define the local system as well as each remote system in the network. Specify the information in the following fields:

- System Name -- Enter a valid system name. For VS systems, the name you type in this field should match the System WangNet ID that was entered in that system's system generation (i.e., GENEDIT) file at the time of that system's last IPL. For a Wang PC, PIC, or Wang Remote Office Connection (WRMC), enter the system name defined when the PC was configured for network communications. For an OIS or an Alliance® system, enter the name the MIS or Alliance system administrator assigned when that particular system was configured. For a 2200 system, enter the name that was assigned when the 2200 system administrator defined local system options. For a Wang Office Assistant system, enter the system name that was entered in the configuration record of the particular Wang Office Assistant.

  The system name can contain from one to eight alphanumeric characters. The name must be unique within the network.

- System ID -- Enter a valid system ID. Valid IDs range from 1 to 9999.

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- System Type -- Enter the system type for the system that you are defining. Valid types are VS (for VS systems), OIS (for Office Information Systems), ALLIANCE (for Alliance systems), 2200 (for 2200 systems), WPC (for Wang PC, PIC systems, and WROC), IDS (for IBM or plug-compatible mainframes equipped with IDS) and WOA (for Wang Office Assistants).

- System Model -- Enter the model number for the system that you are defining. For example, enter 140 for an OIS 140.

- Has WSN with CNS been installed? -- Enter YES in this field if CNS is installed on the system. Enter NO if CNS is not installed on the system. Only VS, IDS, and Wang PC systems can have CNS installed. If you enter YES for a system that is not CNS compatible, WSNEDIT displays an error message.

- Shall File Transfer use CNS? -- Enter YES in this field if CNS is installed on the system and you want the WSN File Transfer service to use the capabilities of CNS. Enter NO in this field if CNS is not installed on the system or the WSN File Transfer service cannot use the capabilities of CNS. Enter YES if the system in an IDS system.

- Has Store and Forward been installed? -- Enter YES if Store and Forward is installed on the system. Enter NO if Store and Forward is not installed on the system.

When you have specified the appropriate information in the fields on the System Definition screen, perform the following steps:

1. Press ENTER. The information that you entered is displayed.

2. Press PF16 to return to the Area System List menu from which you can define more systems. Or, press PF32 to return to the WSNEDIT main menu.

3.3 GENERAL TRANSPORT DEFINITION ENHANCEMENTS

When multiple transports are configured between two adjacent systems for load balancing, network traffic is switched from one transport to another to balance message loading. This is called load balancing. (Refer to Chapters 1 and 4 in the WSN VS Network Configuration Guide and Chapter 1 in this document for a description of load balancing).

The General Transport Definition screen of WSNEDIT (see Figure 4-3 in the WSN VS Network Configuration Guide) has been changed to enable you to enter new load balancing parameters. Instructions on how to access the General Transport Definition screen are contained in Chapter 4 of the configuration guide. These instructions are summarized as follow:

1. Press PF5 (Manage Transports) from the WSNEDIT main menu (see Figure 3-1).

2. Press ENTER if you are creating a new configuration file or PF2 to view or modify the active configuration file. To edit a configuration file that is not the active configuration file, specify that file, its library, and its volume and press ENTER. The Transport List menu appears (see Figure 3-5).

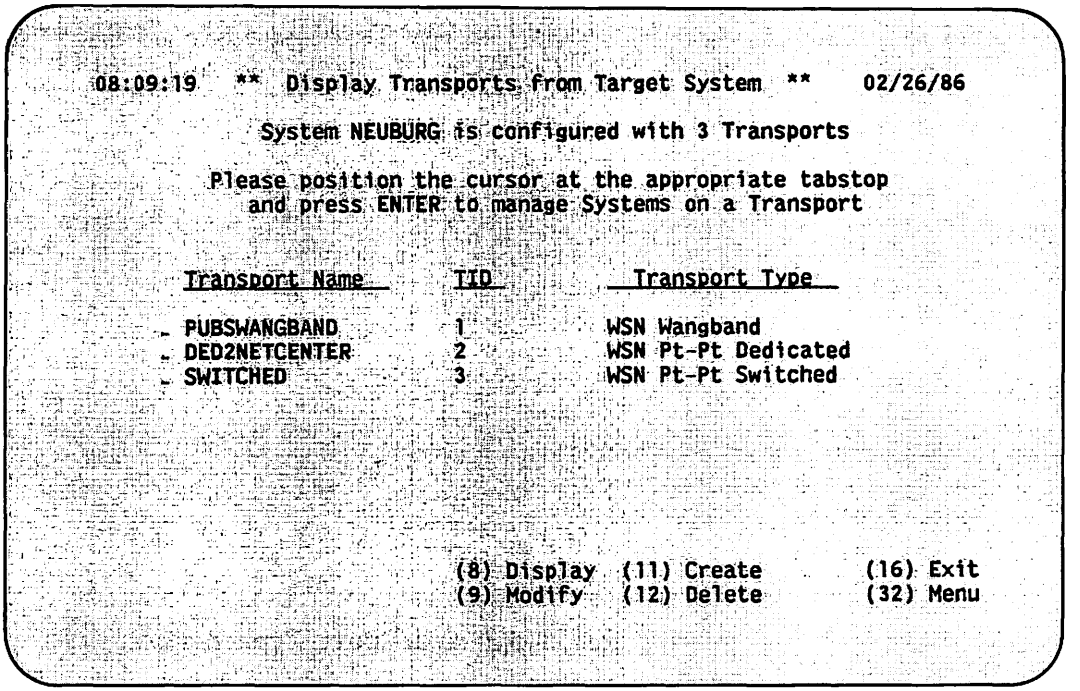

Figure 3-5. Transport List Menu

a. To view or modify an existing Transport definition, select the transport from the Transport List menu. Press PF8 to view the transport definition. Press PF9 to modify the transport definition.

NOTE

If X.25 transport records in the local-view configuration file need to be converted so they can be compatible with the current release of WSN standard components, PRIOR RELEASE X.25 will appear in the Transport Type field for that transport. A Wang Analyst has access to the conversion tool required to update the X.25 transport records.

b. Press PF11 to create a transport definition. The Transport Type menu appears (see Figure 3-6).

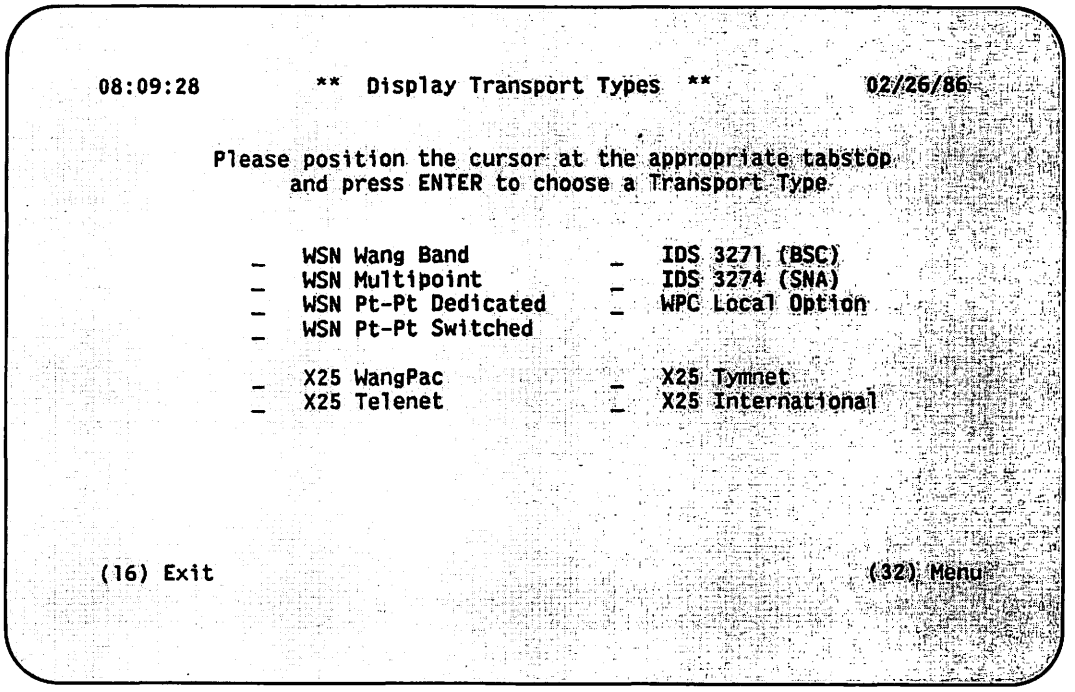

Figure 3-6. Transport Type Menu

Select the type of transport definition that you want to create. and press ENTER.

3. When you have completed Steps 3a or 3b, the new General Transport Definition screen appears (see Figure 3-7). The screen appears in either Create, Display or Modify mode depending on which PF key (8, 9, or 11) you pressed from the Area System List menu.

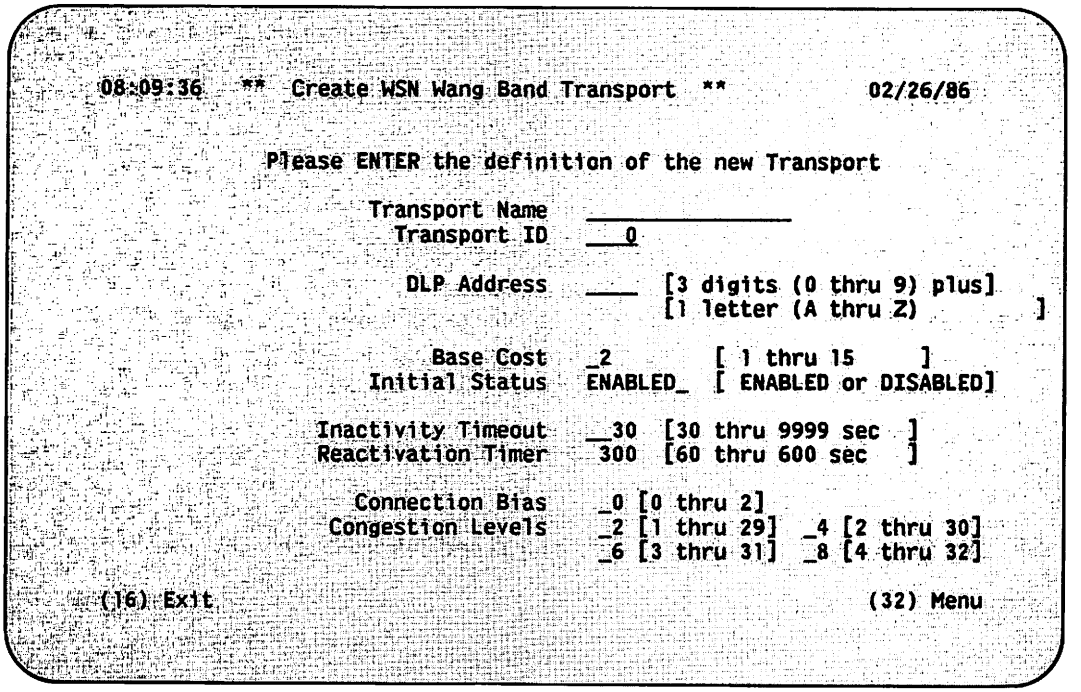

Figure 3-7. General Transport Definition Screen

The new General Transport Definition screen appears whenever you define a transport, regardless of the transport type you selected from the Transport Type menu. The transport type appears at the top of the screen. For the sample screen above, the transport type is a Wang Band transport.

This screen enables you to specify the parameters that all transport definitions require. Recommended parameters and parameter ranges appear next to the fields for each transport type. The following fields appear on the screen:

- Transport Name -- Enter the name of the transport. The name can be from 1 to 16 alphanumeric characters in length.

- Transport ID -- WSNEDIT automatically assigns the transport ID.

- DLP Address -- Enter the device name (the name you assigned to the DLP during GENEDIT) of the CIU, VS-TC, or VS-TC1 that serves the transport you are defining. The DLP name is a combination of the lowest or base device number of the IOP to which the DLP is connected and an uppercase letter that indicates its port assignment. For example, the device name of a VS-TC connected to Port 0 of an IOP with the base device number 96 is 096A.

If you enter an address of a DLP that is not defined in the active GENEDIT file, WSNEDIT displays the message "DLP Not Defined Via GENEDIT." The same message is displayed if your VS was not IPLed after GENEDIT to define the address. This is not a problem; it occurs if you are creating a file for a target system that is not the local system.

The DLP Address field does not appear if you are defining an IDS 3271 BSC or IDS 3274 SNA transport. The DLP address is defined only when the 3271 BSC or 3274 SNA emulators are configured. Refer to the VS 3274 SNA Administrator's Guide and the VS 3271 BSC Emulator User's Guide for more information on 3274 SNA and 3271 BSC emulators.

- Base Cost -- Enter the base cost of the transport. The base cost can be a number from 1 to 15. You can enter the default setting or another valid setting. Refer to Table 4-1 of the WSN VS Network Configuration Guide for required base cost values based on transport type.

NOTE

In WSN releases prior to 8.21, Table 4-1 recommended that you enter a base cost of 1 for some WSN transports (e.g., Wang Band). You should enter a base cost of 2 for these transports under Release 8.21 or greater.

- Initial Status -- This field enables you to specify whether the transport is enabled or disabled at the time WSNSTART is run to bring up CNS. An enabled transport can support communications between systems. It is capable of performing the functions required to initialize itself (e.g., dialing on a switched Point-to-Point transport). Enter the default setting ENABLED if you want the transport to be enabled. Type in DISABLED if you want the transport to be disabled. Disabled transports still support non-CNS traffic. The status can be changed while the network is running through WSNMON.

NOTE

XIDs are not exchanged between systems on an enabled switched Point-to-Point transport when WSNSTART is run to bring up CNS. The XID exchange takes place when user data is sent for the first time. Refer to Chapter 5 in the WSN VS Network Control and Monitoring Guide for more information on XID exchanges.

Generally, you enter Initial Status = DISABLED only when you are attempting to configure a transport before the transport software has been installed or if you want to manually enable the transport through WSNMON. For example, if there is a dedicated Point-to-Point transport connecting the target VS and a Wang PC, you may want to set Initial Status = DISABLED. Then you could manually set Initial Status = ENABLED when you know that the Wang PC is powered on. Refer to Chapter 2 of the WSN VS Network Control and Monitoring Guide for more information.

You may also want to enter Initial Status = DISABLED for IDS transports. The IDS transport initialization process is very complex. You may want to manually enable the IDS transport through WSNMON so that you can observe the initialization process and be prepared to immediately detect problems if they occur.

- Inactivity Timeout -- This is the length of time (in seconds) CNS waits before releasing a virtual circuit from a transport on which there is no CNS traffic. The number can be from 0 to 9999. This timeout is especially useful in switched line configurations where you do not want the line connection to remain established after sessions have ceased. The default setting in this field depends on the transport type. The default setting that appears falls within the range of required values in Table 4-1 of the WSN VS Network Configuration Guide. Refer to Table 4-1 for required inactivity timeout values based on transport type.

  If the local system for which the transport is configured is an intermediate node in a multihop configuration and the transport is frequently used, you may want to use a high inactivity timeout value. A high inactivity timeout value gives all the transports from source system to destination system time to connect. A high inactivity timeout value is especially useful when the transports from source to destination along the multihop configuration support low line speeds (e.g., 4800 bps), or there are several intermediate systems along the multihop path with significant system and network overhead or both. If connectivity continues to fail because of transport inactivity timeout, keep raising the inactivity timeout value until connectivity is consistently successful.

- Reactivation Timer -- Enter the amount of time (in seconds) that CNS will wait after detecting that a line for a transport is down before attempting to use that transport. The default setting in this field depends on the transport type. The default setting that appears falls within the range of required values in Table 4-1 of the WSN VS Network Configuration Guide.

- Connection Bias -- Enter the connection bias for the transport. Valid connection bias values can be from 0 to 2. Connection bias is the value subtracted from a transport's base cost so that a transport currently in use remains the preferred transport for as long as possible. Refer to Chapter 1 of the WSN VS Network Configuration Guide and Chapter 1 of this document for a detailed explanation of connection bias.

  Enter the default setting 0 if you are not setting up a load balancing configuration. Enter 0, 1, or 2 if the transport being configured will be part of a load balancing configuration. If you want the transport being configured to be the preferred transport in this configuration, enter 2 for the transport and enter 0 or 1 for the other transports in the configuration. If the transport being configured is not to be the preferred transport, enter 0 or 1. Remember that as the difference in connection bias values between transports in a load balancing configuration increases, the traffic volume that the preferred transport handles also increases.

- Congestion Levels -- Congestion levels determine the number of messages that can accumulate in the transport queue before a congestion factor is added to the base cost. Refer to Chapter 1 for an explanation of congestion levels.

  - Congestion Level Fields -- Enable you to associate a number of messages with each of the four congestion levels. For example, if you specify the default value 2 for Level 1, a congestion level factor of 1 is added to the transport's base cost if 2 or more messages reach the queue. If you specify the default value 4 for Level 2, a congestion factor of 1 is added to the transport's base cost if 4 messages accumulate in the queue. The fields are described as follow:

  - Level 1 Field -- Displays a default value of 2. You may enter any value from one to 29, as long as the value is less than the value entered in the Level 2 field. The default value in this field is recommended for most configurations.

  - Level 2 Field -- Displays a default value of 4. You may enter any value from 2 to 30, as long as the value is greater than the Level 1 value and less than the value entered in the Level 3 field. The default value in this field is recommended for most configurations.

- Level 3 Field -- Displays a default value of 6. You may enter any value from 3 to 31, as long as the value is greater than the Level 2 value and less than the value entered in the Level 4 field. The default value in this field is recommended for most configurations.

- Level 4 Field -- Displays a default value of 8. You may enter any value from 4 to 32, as long as the value is greater than the Level 3 value. The default value in this field is recommended for most configurations.

The following PF keys appear at the bottom of the General Transport Definition screen (see Figure 3-7).

- PF16 (Exit) -- Press PF16 to return to the Transport List menu (see Figure 3-6).

- PF32 (Menu) -- Press PF32 to return to the WSNEDIT main menu (see Figure 3-1).

3.4 MULTIPOINT AND POINT-TO-POINT ENHANCEMENTS

The WSN Multipoint and Point-to-Point transports support a line speed of 56,000 bps. The Multipoint Transport Definition screen (see Figure 4-6 in the WSN VS Network Configuration Guide) and the first Point-to-Point Transport Definition screen (see Figure 4-9 in the WSN VS Network Configuration Guide) of WSNEDIT have been changed to support this line speed. Instructions on how to access these screens are contained in Chapter 4 of the WSN VS Network Configuration Guide. These instructions are summarized below:

1. Press PF5 (Manage Transports) from the WSNEDIT main menu (see Figure 3-1).

2. Press ENTER to create a new configuration file or PF2 to view or modify the active configuration file. If you want to edit a configuration file that is not the active configuration file, specify that file, its library, and its volume and press ENTER.

3. The Transport List menu (see Figure 3-5) appears after Step 2 is complete.

   a. To view or modify an existing Point-to-Point transport definition, select the transport from the Transport List menu. Press PF8 to view the transport definition. Press PF9 to modify the transport definition.

   b. Press PF11 to create a Multipoint or Point-to-Point transport definition. When the Transport Type menu appears (see Figure 3-6), select the appropriate transport. Press ENTER.

4. When you have completed Steps 3a or 3b, the General Transport Definition screen appears (see Figure 3-7).

   a. Press ENTER if you are viewing or modifying an existing Multipoint or Point-to-Point Transport definition. If you are viewing or modifying an existing Multipoint transport definition, the new Multipoint Transport Definition screen appears (see Figure 3-9). If you are viewing or modifying an existing Point-to-Point transport definition, the new first Point-to-Point Transport Definition screen appears (see Figure 3-8).

   b. If you are creating a Point-to-Point transport definition, the General Transport Definition screen appears (see Figure 3-7). Enter the appropriate information as described in the General Transport Definition Enhancements section of this chapter and press ENTER. The First Point-to-Point Transport Definition screen appears (see Figure 3-8).

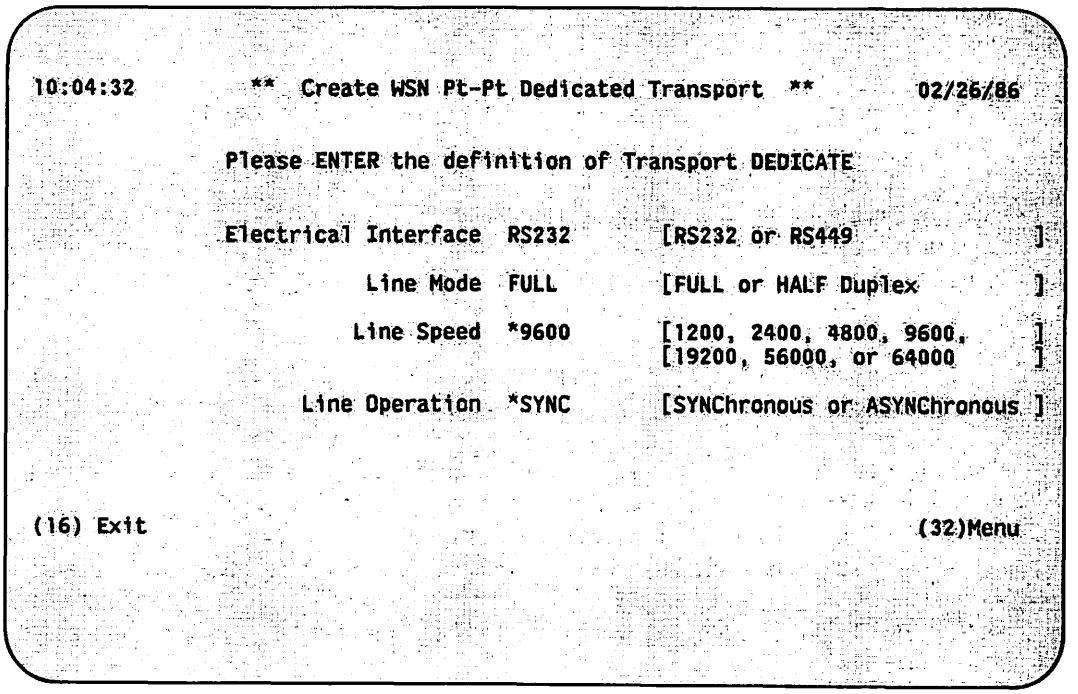

Figure 3-8. First Point-to-Point Transport Definition Screen

In Figure 3-8, the screen appears in dedicated Point-to-Point mode There is little difference between the appearance of the screen in dedicated Point-to-Point mode and switched Point-to-Point mode.

Each field on the First Point-to-Point Transport Definition screen has a default setting. Press ENTER to continue if you wish to enter all the default settings. To change the default settings, enter new entries.

The following fields appear on the First Point-to-Point Transport Definition screen:

- Electrical Interface -- Enter the type of modem connector for the Point-to-Point transport. The type can be either RS232 (the default setting) or RS449.

- Line Duplex Mode -- Enter the mode for the line that serves the transport. The line mode can be full-duplex or half-duplex. A full-duplex line permits simultaneous, 2-way communication. A half-duplex line permits alternate, 2-way communication. For a dedicated Point-to-Point transport, the default setting is FULL (full-duplex). For a switched Point-to-Point transport, the default setting is HALF (half-duplex). If the default setting is correct, press ENTER. Otherwise, enter the correct setting.

- Line Speed -- Enter the modem speed for the Point-to-Point transport you are defining. For a dedicated Point-to-Point transport, the default setting is 9600. For a switched Point-to-Point transport, the default setting is also 9600. Remember that all modems that use the same transport must send and receive data at the same speed. Therefore, the number you enter in this field must be the same as the modem rates defined in the configuration files of all other systems that use the transport. Valid line speeds are (in bps) 1,200, 2,400, 4,800, 9,600, 19,200, 56,000 and 64,000.

NOTE

Most dial-up modems support half-duplex communications. Check your line and the manufacturer's instructions for your modem to determine whether the modem and line support half- or full-duplex communications.

- Line Operation -- Leave this field set as SYNC. WSN asynchronous communications are not available at this time.

The following PF keys appear at the bottom of the first Point-to-Point Transport Definition screen:

- PF16 (Exit) -- Press PF16 to return to the Transport List menu (see Figure 3-5).

- PF32 (Menu) -- Press PF32 to return to the WSNEDIT main menu (see Figure 3-1).

Press ENTER when you have entered the appropriate information on the first Point-to-Point transport definition screen. Refer to the WSN VS Network Configuration Guide for further instructions on defining a Point-to-Point transport.

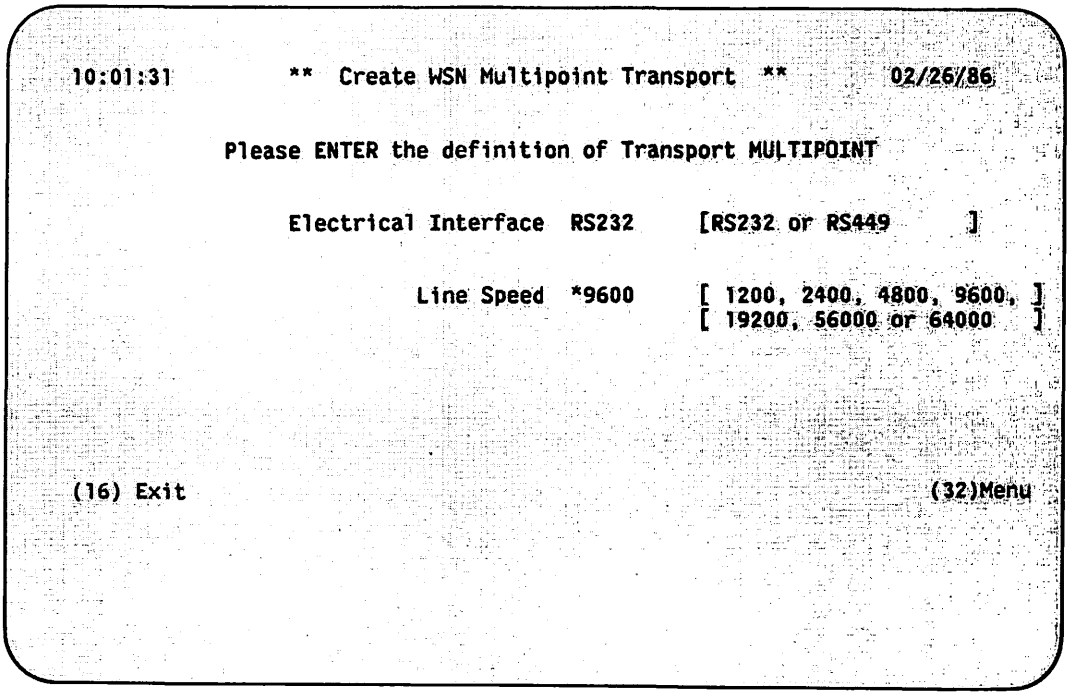

Figure 3-9. Multipoint Transport Definition Screen

The Multipoint Transport Definition screen enables you to specify the Multipoint specific parameters required to define a Multipoint transport. Each field on the screen has a default setting. Press ENTER to use all the default settings. To change the default settings, enter the appropriate information.

The following fields appear on the Multipoint Transport Definition screen:

- Electrical Interface -- Enter the type of modem connector for the multipoint transport. The type can be either RS232 (the default setting) or RS449.

- Line Duplex Mode -- This field is protected. WSNEDIT automatically enters information in this field based on whether or not the system is designated as a primary or secondary in a Multipoint configuration. WSNEDIT enters FULL (for full-duplex) in this field if the target system is designated as the primary. WSNEDIT enters HALF (for half duplex) in this field if the target system is designated as a secondary. Refer to Chapter 4 in the WSN VS Network Configuration Guide for more information on Multipoint primary and secondary systems.

- Line Speed -- Enter the modem speed for the Multipoint transport that you are defining. All modems on the same transport must use the same speed. Therefore, the number you enter in this field must be the same as the modem rates defined in the configuration files of all other systems on the transport. Valid line speeds are (in bps) 1,200, 2,400, 4,800, 9,600 (the default setting), 19,200, 56,000, and 64,000.

The following PF keys are referenced at the bottom of the Multipoint Transport Definition screen.

- PF16 (Exit) -- Press PF16 to return to the Transport List menu (see Figure 3-5).

- PF32 (Menu) -- Press PF32 to return to the WSNEDIT main menu (see Figure 3-1).

Press ENTER when you have specified the appropriate information in the fields on the Multipoint Transport Definition screen. The Transport List menu appears, enabling you to define systems on the Multipoint transport.

3.5 IDS TRANSPORT DEFINITION ENHANCEMENTS

You can enter several IDS parameters through WSNEDIT when you define a new IDS 3271 BSC or 3274 SNA transport or modify an existing IDS transport definition. These parameters give you some control over IDS operation. The parameters include:

- Attach Timeout
- Attach Retry
- Host Response Timeout
- CICS Logon Timeout
- IDS Signon/Signoff Timeout
- IDS Signon/Signoff Retry

These parameters appear in the new first IDS 3271 BSC Transport Definition screen (see Figure 3-10) and on the new first IDS 3274 SNA Transport Definition screen (see Figure 3-11). Instructions on how to access these screens are contained in Chapter 4 in the WSN VS Network Configuration Guide. These instructions are summarized as follows:

1. Press PF5 (Manage Transports) from the WSNEDIT main menu (see Figure 3-1).

2. Press ENTER to create a new configuration file or PF2 to view or modify the active configuration file. If you want to edit a configuration file that is not the active configuration file, specify that file, its library, and its volume and press ENTER.

3. The Transport List menu appears (see Figure 3-5) after Step 2 is complete.

   a. To view or modify an existing IDS Transport definition, select the transport from the Transport List menu. Press PF8 to view the transport definition. Press PF9 to modify the transport definition.

   b. Press PF11 to create an IDS 3271 or IDS 3274 transport definition. When the Transport Type menu appears (see Figure 3-6), select the appropriate transport. Press ENTER.

4. When you have completed Step 3a or 3b, the new General Transport Definition screen appears (see Figure 3-7).

   a. Press ENTER if you are viewing or modifying an existing IDS Transport definition. The new first IDS 3271 Transport Definition screen (see Figure 3-10) appears if you are viewing or modifying an IDS 3271 transport definition. The new first IDS 3274 Transport Definition screen (see Figure 3-11) appears if you are viewing or modifying an IDS 3274 transport definition.

   b. If you are creating an IDS 3271 or IDS 3274 transport definition, enter the appropriate information as described in Chapter 4 of the WSN VS Network Configuration Guide and press ENTER. The new first IDS 3271 Transport Definition screen appears (see Figure 3-10) if you are creating an IDS 3271 transport definition. The new first IDS 3274 Transport Definition screen appears (see Figure 3-11) if you are creating an IDS 3274 transport definition.

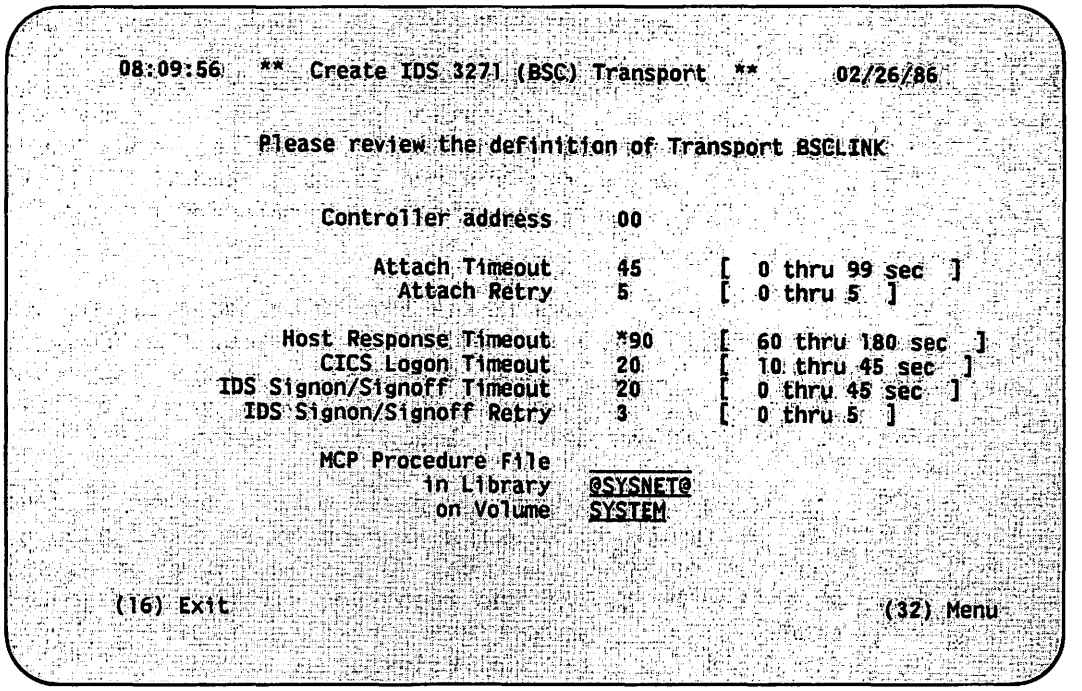

Figure 3-10. First IDS 3271 Transport Definition Screen

The new first IDS 3271 Transport Definition screen displays the first screen of fields in which you must enter the appropriate parameters to define an IDS 3271 BSC transport.

The following fields appear on the new first IDS 3271 Transport Definition screen:

- Controller Address -- Identifies the Control Unit Address (Cluster Controller Address) the host uses for polling and selection. The value entered here must be in hexadecimal. It must also match the Control Unit Address specified in the Wang VS 3271 Emulator Master Control Program (MCP). The host generation parameters determine the Control Unit Address.

- Attach Timeout -- Specifies the number of seconds the IDS Transport waits after failing to attach to the Master Control Program (MCP) before it tries again if the Attach Retry Count permits. Values may range from 00 to 99. The field defaults to 45.

- Attach Retry -- Specifies the number of times the IDS Transport attempts to attach to MCP after failing to do so once. Values may range from 0 to 5. The field defaults to 5.

- Host Response Timeout -- Specifies the Host Response Timeout limit in seconds. The value can be from 060 to 180. The default is 90. Host Response Timeout defines how long the VS system waits for a response from the IDS application on the host. If the VS system has not received a response when the timer expires, the VS system deactivates the transport and the session, and the File Transfer Manager, via CNS, sends you the link-terminated message Net Send Return Code 5.

- CICS Logon Timeout -- Specifies the CICS Logon Timeout limit in seconds. CICS Logon Timeout defines how long the VS system waits for a response after sending a sign-on to CICS. The value can be from 10 to 45 and the default 20. A low value (10 to 15) does not realistically allow time for logon to be accomplished.

- IDS Signon/Signoff Timeout -- Specifies the number of seconds the local VS system waits for link sign-on or sign-off events to occur. The timer begins when the local VS issues a sign-on or sign-off request to the host. If the requested sign-on or sign-off has not been received from the host when the timer expires, the failure is logged and the IDS Transport tries again to fulfill the request if the IDS Signon/Signoff Retry Count permits. Values may range from 00 to 45 seconds. The field defaults to 20. Values between 10 and 45 give the best results.

- IDS Signon/Signoff Retry -- Specifies the number of times the VS attempts to fulfill sign-on or sign-off events after failing to do so once. Values may range from 0 to 5. The field defaults to 3.

- MCP Procedure File -- Specifies the file containing the procedure that runs MCP. It is recommended that you write a procedure that supplies input required by program MCP and enter the procedure's file name, library, and volume on this menu. Doing this enables CNS to activate MCP automatically when CNS attempts to enable the IDS link. MCP may be running when CNS attempts to activate it through such a procedure.

- In Library -- Specifies the library containing the procedure that runs MCP. Refer to FILE above.

- On Volume -- Specifies the volume containing the procedure that runs MCP. Refer to FILE above.

The following PF keys appear at the bottom of the new first IDS 3271 BSC Transport Definition screen:

- PF16 (Exit) -- Press PF16 to return to the new General Transport Definition screen (see Figure 3-7).

- PF32 (Menu) -- Press PF32 to return to the WSNEDIT main menu (see Figure 3-1).

Press ENTER when you have entered the appropriate information on the new first IDS 3271 BSC Transport Definition screen. Refer to the configuration guide for further instructions on defining an IDS 3271 transport.

The new first IDS 3274 SNA Transport Definition screen displays the same tuning parameter fields that the new first 3271 Transport Definition screen displays (see Figure 3-11).

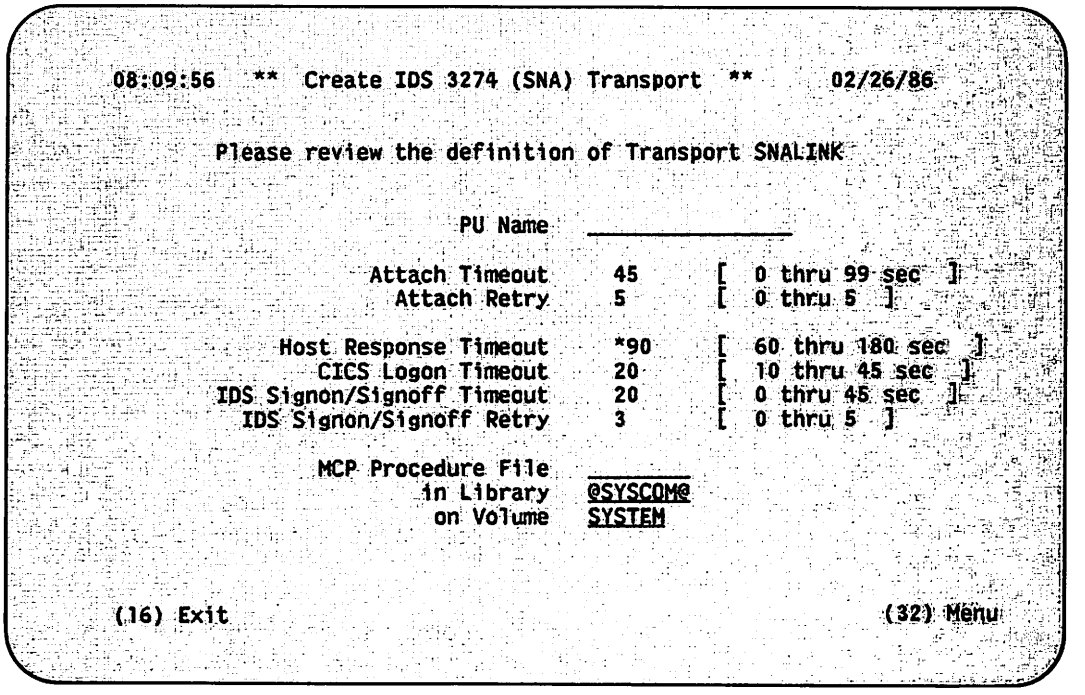

Figure 3-11. First IDS 3274 SNA Transport Definition Screen

The following fields appear on the First IDS 3274 SNA Transport Definition screen:

- PU Name -- Identifies the physical unit (which implies a unique SDLC address) the host uses for polling and selection. The value you enter here must match the PUNAME specified in the Wang VS 3274 Emulator configuration program (SNAEDIT). The host generation parameters determine the PUNAME. The PUNAME also matches the specifications in the CICS Terminal Control Table defined on the host.

- Attach Timeout -- Specifies the number of seconds the IDS transport waits after failing to attach to the MCP before it tries again if the Attach Retry permits. Values may range from 00 to 99.

- Attach Retry -- Specifies the number of times the IDS transport attempts to attach to MCP after failing to do so once. Values may range from 0 to 5. The field defaults to 5.

- Host Response Timeout -- Specifies the Host Response Timeout limit in seconds. The value can be from 60 to 180. The field defaults to 90. Host Response Timeout defines how long the VS system waits for a response from the IDS application on the host. If the VS system has not received a response when the timer expires, the VS system deactivates the transport and the session, and the File Transfer Manager, via CNS, displays the transport-terminated message "Net Send Return Code 5."

- CICS Logon Timeout -- Specifies the CICS Logon Timeout limit in seconds. CICS Logon Timeout defines how long the VS system waits for a response after sending a sign-on to CICS. The value can be from 10 to 45 and the default is 20. A low value (10 to 15) does not realistically allow time for logon to be accomplished.

- IDS Signon/Signoff Timeout -- Specifies the number of seconds the local VS system waits for link sign-on or sign-off events to occur. The timer begins when the local VS issues a sign-on or sign-off request to the host. If the requested sign-on or sign-off has not been received from the host when the timer expires, the failure is logged and the IDS Transport tries again to fulfill the request if the IDS Signon/Signoff Retry permits. Values may range from 00 to 45 seconds. The field defaults to 10. Values between 10 and 45 give the best results.

- IDS Signon/Signoff Retry -- Specifies the number of times the VS attempts to fulfill sign-on or sign-off events after failing to do so once. Values may range from 0 to 5. The field defaults to 3.

- MCP Procedure File -- Specifies the file containing the procedure that runs SNAMCP. It is recommended that you write a procedure that supplies input required by program SNAMCP and enter the procedure's file name, library, and volume on this menu. Doing this means that when CNS activates IDS, CNS can also activate SNAMCP. SNAMCP may be running when CNS attempts to activate it through such a procedure.

- IN Library -- Specifies the library containing the procedure that runs SNAMCP. Refer to FILE above.

- ON Volume -- Specifies the volume containing the procedure that runs SNAMCP. Refer to FILE above.

The following PF keys appear at the bottom of the new first IDS 3274 SNA Transport Definition screen:

- PF16 (Exit) -- Press PF16 to return to the Transport List menu (see Figure 3-5).

- PF32 (Menu) -- Press PF32 to return to the WSNEDIT main menu (see Figure 3-1).

Press ENTER when you have specified the appropriate information in the fields on the new first IDS 3274 SNA Transport Definition screen. Refer to Chapter 4 in the WSN VS Network Configuration Guide for more information on defining an IDS 3274 SNA transport.

3.6 X.25 TRANSPORT DEFINITION ENHANCEMENTS AND SUBSCRIPTION PARAMETERS

WSNEDIT enables you to enter 56,000 bps as a line speed for an X.25 transport and enables you to enter the following X.25 subscription parameters the WSN General Access Interface Service (GAI) requires:

- Packet Window Size Negotiation
- Packet Size Negotiation
- Throughput Class Negotiation
- Fast Select Support
- D Bit Modification Support
- Call Statistics Support
- Subaddressing Support
- Diagnostic Bytes Support

Enter these parameters only if the WSN X.25 GAI Service is installed on your VS.

These parameters appear on the X.25 Subscription Parameters screen. This is a new WSNEDIT screen. You must enter an appropriate parameter on the new X.25 Transport Definition screen (see Figure 3-12). Instructions on how to access this screen are contained in Chapter 4 of the WSN VS Network Configuration Guide. These instructions are summarized as follows:

1. Press PF5 (Manage Transports) from the WSNEDIT main menu (see Figure 3-1).

2. Press ENTER to create a new configuration file or PF2 to view or modify the active configuration file. If you want to edit a configuration file that is not the active configuration file, specify that file, its library, and its volume and press ENTER.

3. The Transport List menu appears (see Figure 3-5) after Step 2 is complete.

   a. To view or modify an existing X.25 transport definition, select the transport from the Transport List menu. Press PF8 to view the transport definition or press PF9 to modify the transport definition.

b. Press PF11 to create an X.25 transport definition. When the Transport Type menu appears (see Figure 3-6), select the appropriate transport type. Press ENTER.

4. When you have performed the actions described in Steps 3a or 3b, the new General Transport Definition screen appears (see Figure 3-7).

   a. Press ENTER if you are viewing or modifying an existing X.25 transport definition. The X.25 Transport Definition screen appears (see Figure 3-12) if you are viewing or modifying an X.25 transport definition.

   b. If you are creating an X.25 transport definition, enter the appropriate information as described in Chapter 4 in the WSN VS Network Configuration Guide and press ENTER. The new X.25 Transport Definition screen appears (see Figure 3-12) if you are creating an X.25 transport definition.

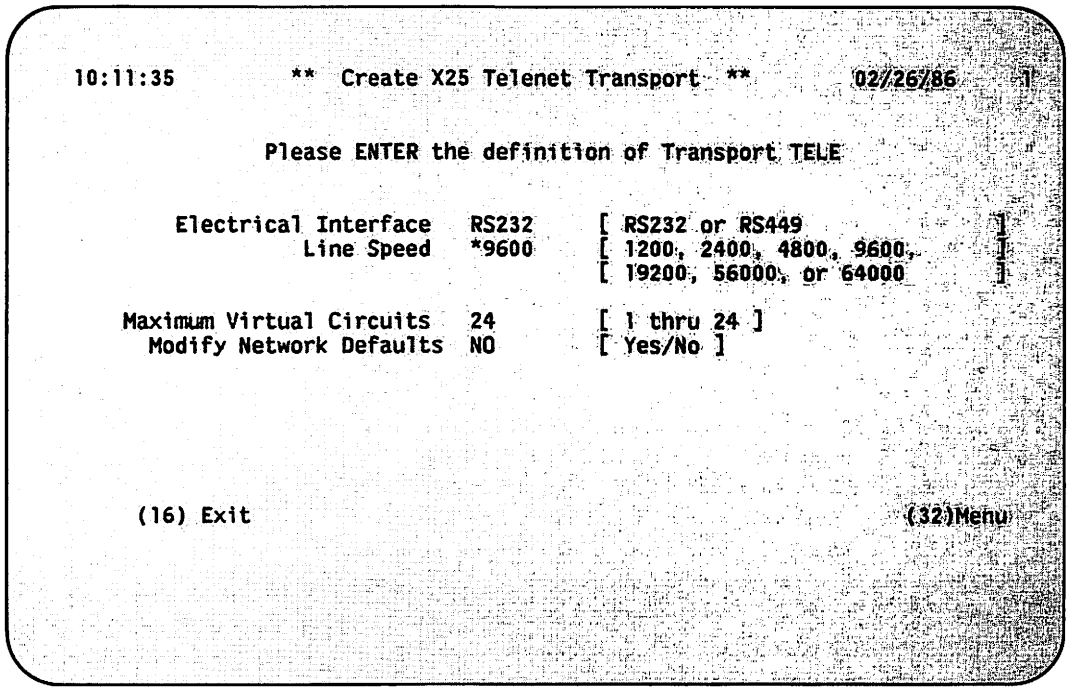

Figure 3-12. X.25 Transport Definition Screen

Each field on the screen has a default setting. Press ENTER if you want to use all of the default settings. If you want to change the default settings, enter the appropriate information over them.

The following fields appear on the X.25 Transport Definition screen:

- Electrical Interface -- Enter the type of modem connector for the link. The modem connector acts as the interface between Data Terminal Equipment (e.g., TCB3) and Data Communication Equipment (e.g., a modem). Valid types are RS232 (default) and RS449.

- Line Speed -- Enter the modem speed for the transport. (The network generally supplies the modem.) The speed is based on the agreement between the network and the customer. Remember that all modems on the same transport must use the same speed. Therefore, the number you enter in this field must be the same as the modem rates defined in the configuration files of all other systems on the transport. Valid line speeds are (in bps) 1,200, 2,400, 4,800, 9,600 (the default setting), 19,200, 56,000 and 64,000.

- Maximum Virtual Circuits -- Enter the default setting, 24, or a value less than that at this time, based on your overall system configuration. Higher values are reserved at this time.

- Modify Network Defaults -- Enter YES or NO to specify whether or not the screen that enables you to enter X.25 subscription parameters is displayed. Enter YES in this field if your VS is equipped with the WSN X.25 GAI Service. Enter NO if your VS is not equipped with this service.

The following PF keys appear at the bottom of the new X.25 Transport Definition screen:

- PF16 (Exit) -- Press PF16 to return to the Transport Type menu (see Figure 3-6).

- PF32 (Menu) -- Press PF32 to return to the WSNEDIT main menu (see Figure 3-1).

Press ENTER when you have finished specifying information on the X.25 Transport Definition screen. If you entered NO in the Enter Subscription data field, the Transport List menu appears, enabling you to define systems on the X.25 transport. If you entered YES in this field, the X.25 Subscription Parameters screen appears (see Figure 3-13).

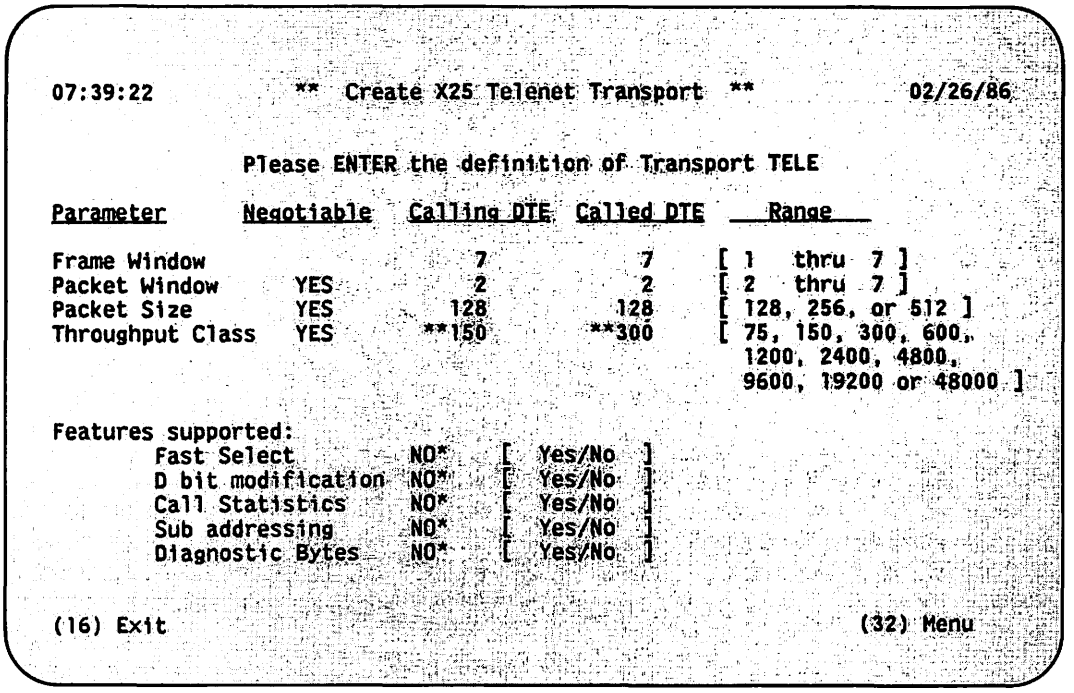

Figure 3-13. X.25 Subscription Parameters Screen

The X.25 Subscription Parameters screen enables you to specify the parameters that the WSN GAI Service requires. The screen is divided into two parts. The top part of the screen enables you to enter frame window, packet window size, packet size, and throughput class parameters. The bottom part of the screen enables you to specify whether or not certain features are supported. The fields in the top part of the screen are arranged in matrix form. The columns of the matrix include the specific parameter, whether or not the parameter is negotiable, the parameter assigned to the calling (i.e., local) Data Terminal Equipment (DTE), the parameter assigned to the called DTE, and the range of negotiation.

NOTE

Your X.25 Packet-Switched Data Network (PSDN) representative should supply information for the following fields. The majority of these networks support frame and packet window defaults of 2 and packet size defaults of 128.

The fields on the top part of the X.25 Subscription Parameters screen are as follows:

- Frame Window Fields -- These fields enable you to specify

  - The number of frames the target system's DTE can send before receiving an acknowledgment of their arrival when the target system is the calling DTE. The number can be from 1 to 7 (the default settings). Enter this parameter in the Calling DTE column.

  - The number of frames that the target system's DTE can receive from the called DTE before sending an acknowledgment. The number can be from 1 to 7 (the default settings). Use the value agreed upon with the network. Enter this parameter in the Called DTE column.

- Packet Window Fields -- These fields enable you to specify

  - Whether or not the packet window is negotiable. The Negotiable column enables you to specify whether or not the VS can acquire a packet window size from the network other than the default specified in the Calling and Called DTE columns. The range of negotiation can be from 2 to 7 (Modulo 8 flow control support). For example, if some packets are outstanding, a packet size other than the default may be required. Enter YES in the Negotiable column if negotiation is permitted; enter NO if the default specified in the Calling and Called DTE fields is always to be used.

  - The number of packets that the local system's DTE should send before receiving an acknowledgment of their arrival when the local DTE is the calling DTE. The number can be from 2 (the default setting) to 7. Enter this parameter in the Calling DTE column.

  - The number of packets that the target system should receive from the called DTE before sending an acknowledgment of their arrival. The number can be from 2 (the default setting) to 7. Enter this parameter in the Called DTE column.

- Packet Size Fields -- These fields enable you to specify

  - Whether or not the network enables the VS to send packets with sizes that differ from the size specified in the Calling and Called DTE columns. For example, if the packet size is normally 128 bytes and circumstances suddenly require that the size be increased to 256 bytes, the VS would be permitted to transmit 256-byte packets. The range of negotiation is 128 to 512. Enter YES if negotiation is permitted; enter NO if the default specified in the Calling and Called DTE columns is always to be used.

- The size (in bytes) of the outbound packets when the local DTE is the calling DTE. The size can be 128 (the default setting), 256, or 512 bytes. Enter this parameter in the Calling DTE column.

- The size (in bytes) of the inbound packets from a called DTE. The size can be 128 (the default setting), 256, or 512 bytes. Enter this value in the Called DTE column.

• Throughput Class Fields -- These fields enable you to specify

- Whether or not the service contract permits throughput class negotiation. For each user class of service the network provides, a DTE-to-DTE throughput class is associated with it. The throughput class negotiation facility is a user facility agreed to for a period of time that a DTE can use for virtual calls. If subscribed to, this facility permits negotiation of throughput classes on a per call basis. The throughput classes are considered independently for each direction of data transmission. Enter YES if throughput class negotiation is permitted; enter NO if it is not permitted.

- The throughput class for transmission from the calling (i.e., local) DTE. Enter this value (in bps) in the Calling DTE column.

- The throughput class for transmission from the called DTE. Enter this value (in bps) in the Called DTE column.

The fields on the bottom part of the X.25 Subscription Parameters screen are as follows:

• Fast Select -- Specify whether or not the service contract permits fast select support. Fast select is an optional user facility that DTEs can request on a per call basis by means of an appropriate facility request in a call request packet. If requested in the call request packet and if the packet indicates no restriction on response, the following items are authorized:

- The call request packet may contain a user field of up to 128 octets.

- During the DTE waiting state, the Data Communication Equipment (DCE) may transmit a call connected or clear indication packet with a called or clear user data field respectively of up to 128 octets.

- After the call is connected, the DTE and DCE may transmit a clear request or a clear indication packet respectively with a clear user data field of up to 128 octets.

  Enter YES if this facility is permitted in the contract; enter NO if it is not permitted.

- D bit modification -- Specify whether or not the service contract provides for Delivery Confirmation (D) Bit Modification support. The D bit is Bit 7 of the General Format Identifier (GFI). Every packet starts with a GFI, which identifies the general type of packet group (e.g., call accept). The setting of the D bit is used to indicate whether or not the DTE is to receive an end-to-end acknowledgement of delivery for data it is transmitting by means of the packet receive sequence number. Without D Bit Modification support, the bit is set to 0, signifying that the local DTE does not request acknowledgement from the remote DTE. With D Bit Modification support, the local DTE sets the D bit to 1 to request acknowledgement from the remote DTE. Enter YES if the service contract provides for D bit modification support; enter NO if it is not provided.

- Call statistics -- Specify whether or not the service contract provides for call statistics or charging information support. If this facility is provided, the network supplies charging information and other statistical records for calls. Enter YES if the service contract provides for this support; enter NO if this support is not provided.

- Subaddressing -- Specify whether or not the service contract provides for subaddressing support. A subaddress is a 2-digit address that is attached to the DTE address. The subaddress identifies a particular end user. Enter YES if subaddressing support is provided; enter NO if it is not provided.

- Diagnostic bytes -- Specify whether or not the service contract provides for Diagnostic-bytes support. A diagnostic byte is found in clear, reset, and restart packets to explain reasons for events involving those packets. Enter YES if Diagnostic-bytes support is provided; enter NO if it is not provided.

The following PF keys appear at the bottom of the screen:

- PF16 -- Press PF16 to return to the new X.25 Transport Definition screen (see Figure 3-12).

- PF32 -- Press PF32 to return to the WSNEDIT main menu (see Figure 3-1).

Press ENTER when you have entered the appropriate parameters. The Transport List menu appears, displaying the X.25 transport you just created. You may then proceed to define systems on the X.25 transport. Refer to Chapter 4 in the WSN VS Network Configuration Guide for information on defining systems on an X.25 transport.

3.7 LOGCNTRL SUPPORT FOR DISTRIBUTED MANAGEMENT FACILITY (DMF)

In previous WSN releases, the log control utility LOGCNTRL was run to define the volume on which CNS logs reside. LOGCNTRL still performs this function. For the 8.21 release of WSN, you must also use LOGCNTRL to define certain parameters that the Distributed Management Facility (DMF) requires. Refer to the DMF Network Management Operations Guide for more information on DMF.

Run LOGCNTRL from the configuration aid utility CNFGAID. To run LOGCNTRL, perform the following steps:

1. Run CNFGAID. CNFGAID resides in library @SYSCOM@. @SYSCOM@ is usually located on the system volume.

2. Press PF8 when the CNFGAID main menu appears (see Figure 1-11 in the WSN VS Network Configuration Guide). This action runs LOGCNTRL. The LOGCNTRL screen appears (see Figure 3-14).

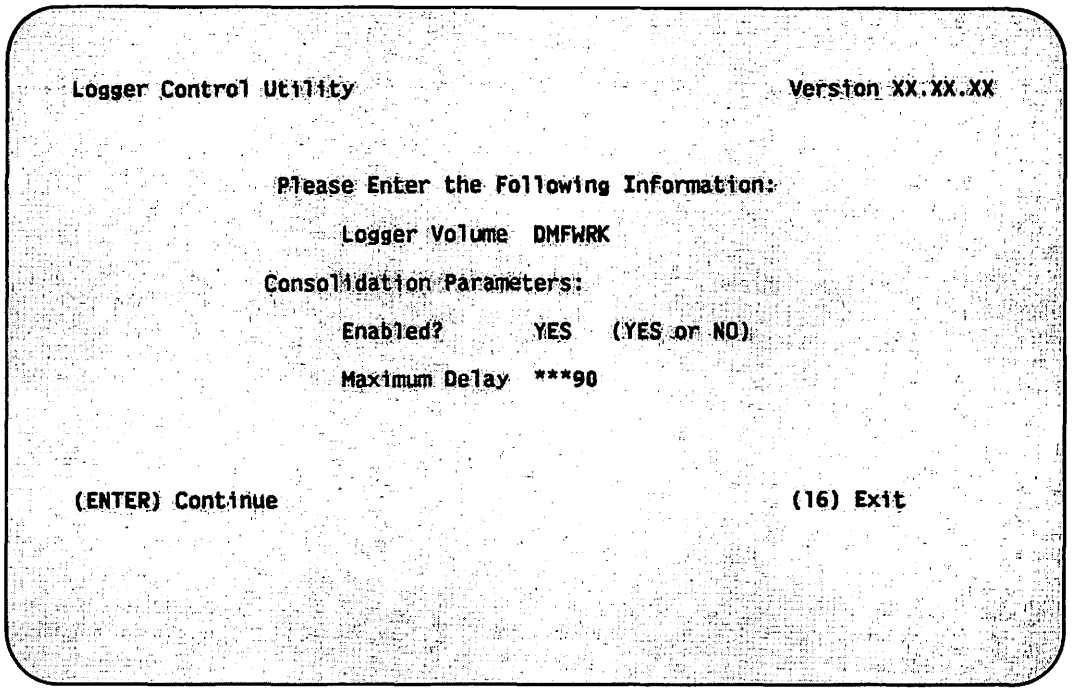

Figure 3-14. The LOGCNTRL Screen

Enter information in the following fields on the LOGCNTRL screen:

- Logger Volume -- Specifies the volume on which @LOG@, the library for log files, will reside.

- Enabled? -- Enter YES or NO to specify whether or not the capability to send log records to remote systems is enabled (YES) or disabled (NO). Consolidation Parameters on the screen refers to DMF logger consolidation profiles which define destination systems for specific log messages in the network. DMF operations require that log records be distributed to appropriate systems in the network in order to generate alert and other log messages. Enter NO if DMF is not installed on the local system, or consolidation is not desired. Enter YES if DMF is installed on the local system, and consolidation is desired.

- Maximum Delay -- Enter the time (in seconds) CNS waits to receive logs from a remote system before attempting to transmit. This field only applies to DMF; do not modify this field if DMF is not installed. A logging component called LOGCOM submits the request to CNS which sends it to the remote system. CNS then waits for the response.

  Valid settings range between 60 and 300 seconds. The default is 90 seconds. Enter a high delay value (e.g., 200 to 300) if network and system performance problems (e.g., line congestion) seriously affect traffic flow between the local system and remote systems. Enter a low value (e.g., 60 to 80) if network traffic is moving with little difficulty through the network. A low value causes alerts to be delivered promptly.

The following PF keys appear at the bottom of the LOGCNTRL screen:

- ENTER -- Press ENTER after you have entered the appropriate information. This action updates the information and returns you to the CNFGAID main menu (see Figure 1-11 in the WSN VS Network Configuration Guide).

- PF16 -- Press PF16 to exit this function without entering information. This action returns you to the CNFGAID main menu (see Figure 1-11 in the WSN VS Network Configuration Guide).

CHAPTER 4
STORE AND FORWARD AND CNS ROUTING ENHANCEMENTS

4.1 OVERVIEW

WSNEDIT provides enhanced routing support for Store and Forward and CNS default path routing. It is recommended that you read Chapters 1 and 5 of the WSN VS Network Configuration Guide and Chapter 1 of this document for a conceptual discussion of CNS routing and CNS routing enhancements for 8.21.

Make sure that regular CNS paths are appropriately configured when you configure Store and Forward paths. Remember that Store and Forward uses CNS, and CNS must have knowledge of network topology. Regular CNS paths must be configured to define adjacent systems where messages are routed to destinations. The purpose of Store and Forward routing is to define Store and Forward systems along regular CNS paths where mail is to be stored before being forwarded to the destination.

4.1.1 Store and Forward Routing Enhancements

The 8.21 Store and Forward routing implementation is based on the concept of Store and Forward next hops. A Store and Forward next hop is a Store and Forward system that you designate to store mail originating from your system before it is forwarded to a destination. The destination can be a system in the same area, another area, or another Store and Forward next hop.

Do not confuse Store and Forward next hop and CNS next hop. CNS next hops are adjacent systems. A Store and Forward next hop may or may not be an adjacent system.

Store and Forward works like this: Store and Forward on the originating system establishes a CNS end-to-end session with the Store and Forward application on the next hop. Mail is then stored at the application level on the next hop. Store and Forward on the next hop establishes an end-to-end CNS session with another next hop or with the destination. CNS routing determines the physical path between these Store and Forward systems.

There are two kinds of Store and Forward next hops: default next hops and override next hops. If no override next hop is defined, WSNEDIT assigns each Store and Forward destination a default next hop. WSNEDIT assigns the default next hop according to the following rules:

- If the target system is not the area distribution point, the default next hop is always the area distribution point for the target system's area. In Figure 4-1, System A's default next hop is the distribution point for A's area (System B).

- If the target system is the area distribution point and the destination system is any Store and Forward system in another area, the default next hop is the area distribution point for the specific destination area. In Figure 4-1, System B's default next hop to systems in Area 2 is System C. System B's default next hop to the systems in Area 3 is System D.

- If the target system is the area distribution point and the destination system is in the distribution point's own area, the default next hop is the destination system itself. In Figure 4-1, System B's default next hop to System A is System A.

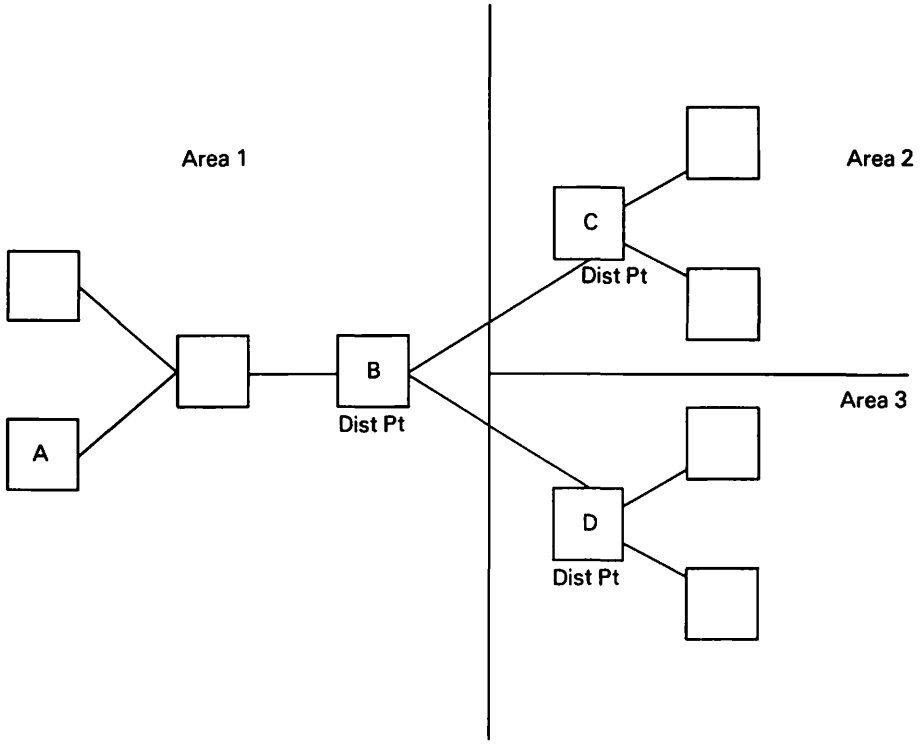

Figure 4-1. Default Next Hops

If the area distribution point is defined as the default next hop for every Store and Forward system in it's own area,

and

it is also defined as the default next hop by other distribution points in the network, all intra- and inter-area Store and Forward mail passes through the distribution point.

In addition, the distribution point handles CNS traffic on the switching layer level. If the area distribution point is not sufficient (i.e. is too small), this situation can cause serious network and system performance degradation at the area distribution point, especially in large networks (e.g., 50 systems or more).

If the distribution point is not sufficient, WSNEDIT enables you to assign an override next hop to each Store and Forward destination. You may also consider other options such as diverting non-Store and Forward CNS traffic away from the system by modifying your CNS routing configuration, improving system performance, or designating another (larger) system as the area distribution point.

Three Store and Forward routing options are available:

- Use the area distribution point as the Store and Forward next hop for inter-area (between areas) Store and Forward traffic only. Specify a nondistribution point system in the area to be the override Store and Forward next hop for intra-area (between systems in the same area) traffic. (If the destination system is adjacent, specify the destination system itself as the override. Adjacent Store and Forward systems should send mail to each other directly.)

  Thus, you divide the Store and Forward load between the area distribution point (for traffic between areas) and the other Store and Forward systems in the area (for traffic between systems in the same area).

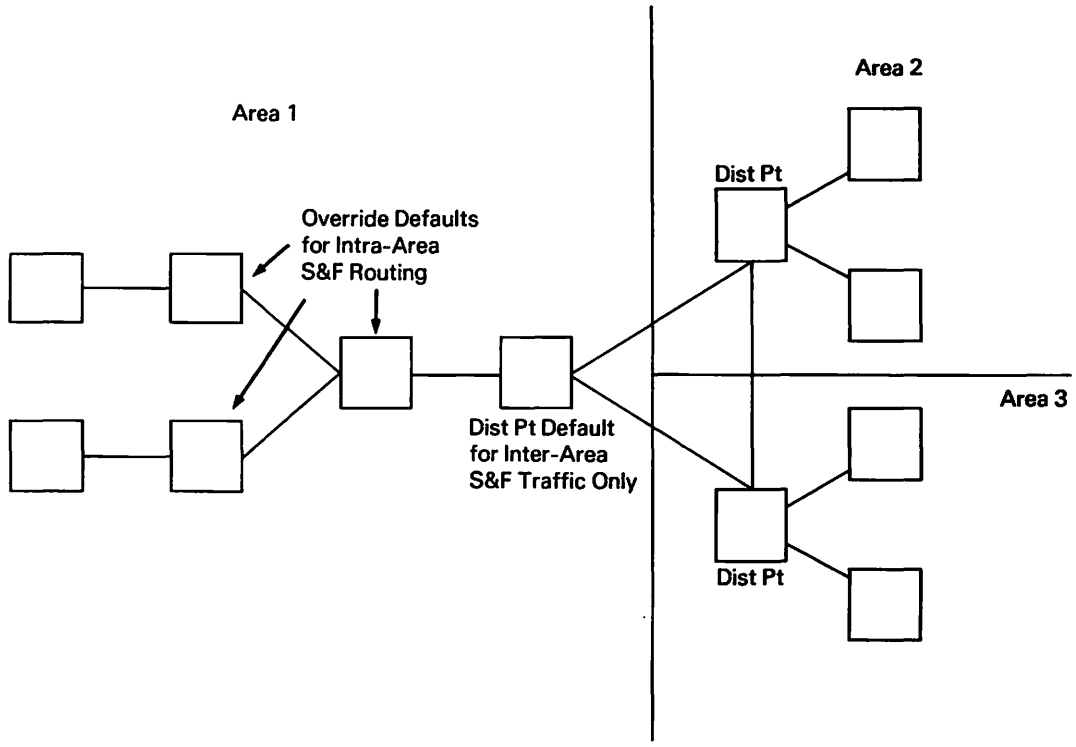

Figure 4-2. Intra-Area Routing Option

- Divert some inter-area Store and Forward traffic away from the area distribution point. When you configure Store and Forward routing on each nondistribution point system in your area, specify other nondistribution point systems in the area to be the override Store and Forward next hops to other areas.

  When you configure Store and Forward routing on other area distribution points, specify other Store and Forward systems in the area of the congested distribution point as the override Store and Forward next hop. Allow the area distribution point to handle the bulk of inter-area Store and Forward traffic and its own inter-area Store and Forward traffic.

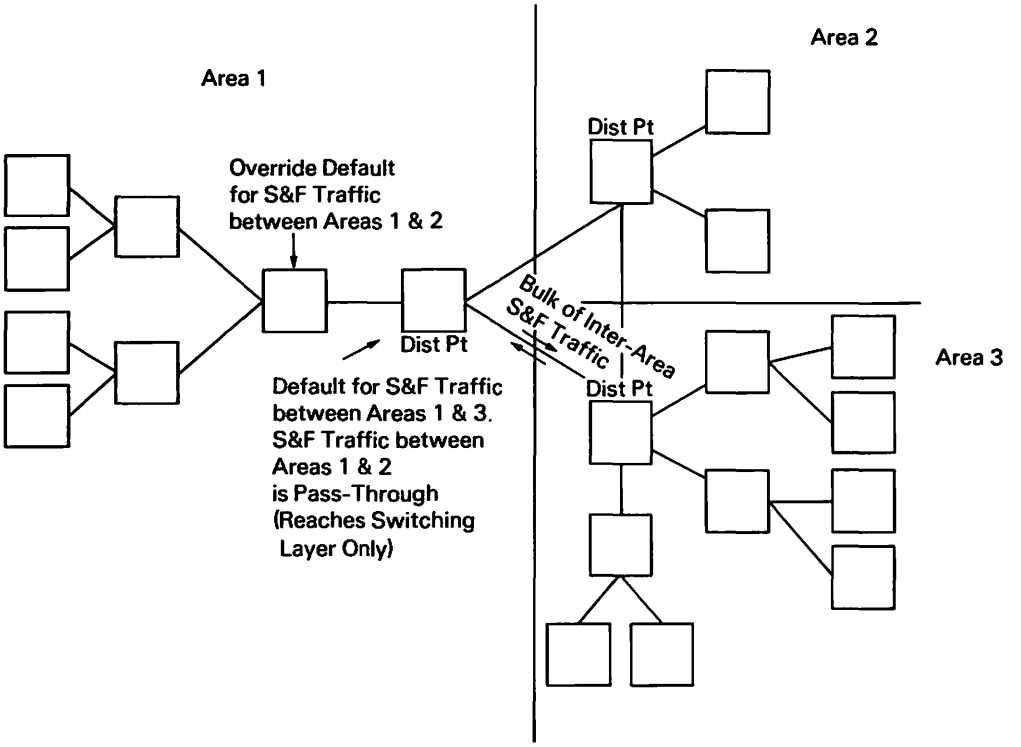

Figure 4-3. Inter-Area Routing Option

- Use a combination of the intra- and inter-area routing options. Divide the overall intra- and inter-area Store and Forward traffic load between the distribution point and other systems in the area. Allow the distribution point to handle the bulk of the inter-area load.

There is one other situation when it is useful to assign an override next hop: adjacent Store and Forward systems in the same area. Adjacent Store and Forward systems in the same area should send mail directly to each other. The mail should not be stored and forwarded from an intermediate system. The default next hop (i.e., the area distribution point) for each adjacent system should be overridden. Specify the destination adjacent system as the override next hop.

The rules you should follow when assigning override next hops are as follows:

- If the target system and the destination are in the same area, the override next hop that you assign should be in that area.

- If the target system is the distribution point (in Area A), and the destination is in another area (Area B), the override next hop should be in Area B.

- Never assign a CNS end-point system with Store and Forward as the override next hop to another Store and Forward destination.

- When an override next hop is not the destination system, make sure that the override next hop has the necessary Store and Forward routing knowledge required to reach the destination.

  For example, the override next hop for Store and Forward mail traveling from Area 2 to Area 1 in Figure 4-3 should have the Store and Forward knowledge required to forward mail to nondistribution point Area 1 systems either directly or via the area distribution point.

Generally, the default next hop is acceptable for most systems in a network. Override next hops can be specified to divert network traffic away from heavily congested distribution points and other congested next hops. Systems with only one connection to the network (i.e., end-point systems) or with many connections benefit most from overrides.

NOTE

Make sure that regular CNS paths are appropriately configured when you configure Store and Forward paths. Remember that Store and Forward uses CNS, and CNS must have knowledge of network topology. Regular CNS paths must be configured to define adjacent systems where messages are routed to destinations. The purpose of Store and Forward routing is to define Store and Forward systems along regular CNS paths where mail is stored before being forwarded to the destination.

4.2 WSNEDIT MANAGE ROUTING FOR RELEASE 8.21

The WSNEDIT Manage Routing function has been enhanced to support Store and Forward and end-point routing configuration. Most screens accessed through Manage Routing have changed to reflect these enhancements. As a result, Chapter 5 in the WSN VS Network Configuration Guide is no longer accurate for screen presentation. However, you can still refer to Chapter 5 for general information on CNS routing configuration.

The enhanced Manage Routing function includes

- CNS Routing Enhancements
- Store and Forward Routing Support

4.2.1 Defining CNS Paths

CNS paths now are configured differently. In previous WSN releases, an adjacent system was selected and destinations were associated with it. For Release 8.21, you select a destination, define one or two adjacent systems by way of which the destination may be reached, and associate a path cost with the adjacent system or systems you define.

Remember not to confuse CNS path and Store and Forward path definition. Store and Forward routes rely on standard CNS path definitions, since Store and Forward uses CNS. The Store and Forward routing configuration only specifies Store and Forward systems along regular CNS paths that store mail before it is forwarded to the destination.

After you have created all the transport configurations for the target VS, you can define paths to destinations. A path is the course over which a message travels between the system from which it originates and its destination.

CAUTIONS

CNS does not yet fully support more than three communications paths between a target system and a destination. Do not configure more than two paths between the target system and each destination.

Do not design your network with more than four intermediate systems between the target system and another system in the network. Messages may be lost if they have to pass through more than four systems between source and destination.

Do not create your routing configuration so that a system in one area must route messages to a destination in that area through a system in another area. For example, System A and System B are in the same area. The routing configuration should not be created so that the only way for System A to route messages to System B is through a system in another area.

When you run WSNEDIT to define paths, specify the destinations to which messages are routed by way of an adjacent or next hop system that is running CNS. You may define no more than two paths from the target system to a destination; that is, you may not define paths from the target system to the destination by way of more than two next hop systems. Refer to the CNS Routing Overview in Chapter 1 of the WSN VS Network Configuration Guide and the sections on default path and adjacent system routing in Chapter 1 of this document before you run WSNEDIT to configure routes.

The transport configuration determines which systems are adjacent and which systems are nonadjacent. The routing configuration cannot be created until adjacent systems have been designated on the appropriate transports. The terms "adjacent" and "nonadjacent" are explained in Chapter 1 of the WSN VS Network Configuration Guide.

CNS-routed messages either originate from the target VS or are passing through the target VS on their way to a destination. Thus, messages that originate from one system are affected by the routing configuration on all the systems along the path.

Press PF6 from the WSNEDIT main menu (see Figure 3-1) to access the Manage Routing function. The Destination Systems and Areas menu appears if you specified the configuration file when you accessed the Manage Transports or Manage Services function.

If you have not previously specified the configuration file, a screen appears that asks you to specify the file and the target system for which it is intended. The Destination Systems and Areas menu appears (see Figure 4-4) after you specify the file and press ENTER. Chapter 4 in the WSN VS Network Configuration Guide describes how to specify the configuration file.

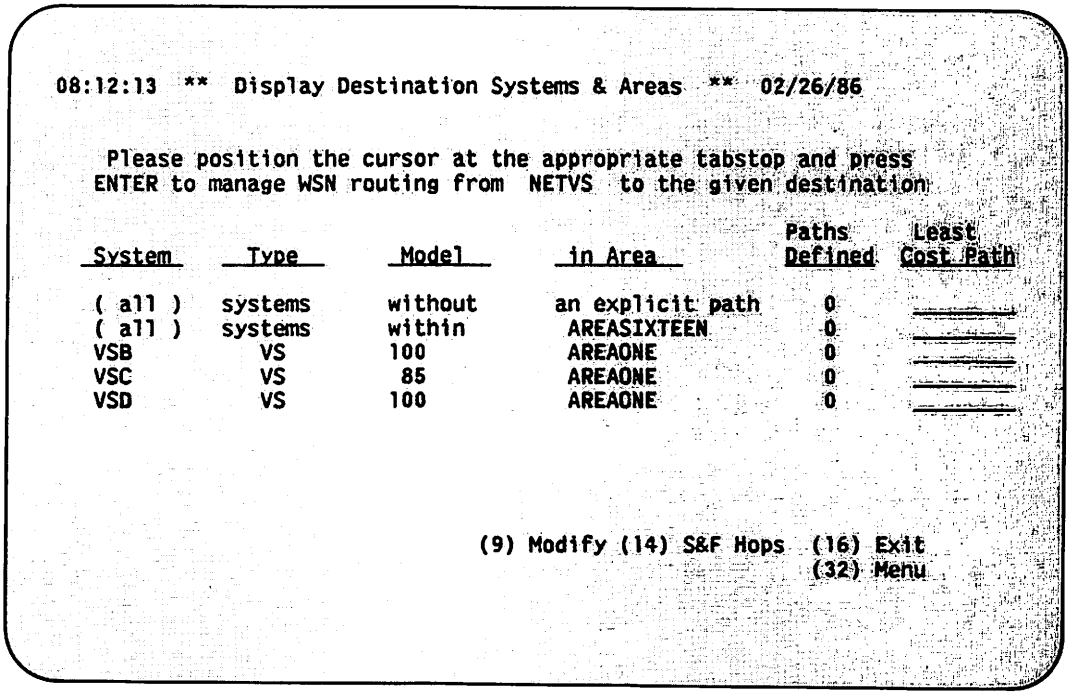

Figure 4-4. Destination Systems and Areas Menu

The Destination Systems and Areas menu lists all the destination systems and areas in the network. Messages that originate from or pass through the target VS are sent to these destinations. Destinations are listed as either individual systems in the same area as the target VS, as all the systems within another area, or as all systems reached by means of a default path. The menu displays the following information for each destination:

- Type -- For individual systems in the same area as the target VS, the system type is listed if it was entered in the directory for that system. If the destination is all the systems in another area or all the systems to which a path has not been defined (for default path routing), systems appears in this field to indicate all systems.

- Model -- For individual systems in the same area as the target VS, the system model is listed if it was entered in the directory for that system. If the destination is all the systems in an area, within appears to indicate all the systems in an area. If the destination is all the systems to which paths have not been defined (for default path routing), without appears in this field.

- in Area -- The area in which the destination system or systems reside. Without an explicit path appears in this field to indicate that all destinations in the network that are not associated with specific and general routing records can be reached by way of a default path. Refer to Chapter 1 for an explanation of specific and general routing records.

- Paths Defined -- The number of paths defined from the target VS to the destination. The number of paths defined is equal to the number of specified adjacent systems by way of which the target VS can route messages. If no paths have been defined to a destination, 0 appears in this field.

- Least Cost Path -- If two paths are defined to the destination, this field indicates the path assigned the lower path cost. If only one path is defined, the field indicates the single path. The field displays the name of the adjacent system associated with the lower path cost. Remember that each path is associated with an adjacent system, and each adjacent system, in turn, is associated with a path cost. If no paths have been defined for the destination, the Least Cost Path field is blank.

The following PF keys appear at the bottom of the screen:

- PF2 (First), PF3 (Last), PF4 (Prev), PF5 (Next) -- Press PF2, PF3, PF4, or PF5 to scroll through the list of destinations when the list consists of more than one screen. Some or all of these keys appear at the bottom of the screen, depending on the number of screens that the list requires and the specific screen you are viewing at the time.

- PF9 (Modify) — Press PF9 to specify a least cost path. When PF9 is pressed, the fields in the Least Cost Path column are highlighted. When the field becomes highlighted, it may be modified. You may then specify a least cost path to a destination. To specify a least cost path, enter the name of the adjacent system associated with the path. Press ENTER. This action automatically defines the least cost path and assigns it a path cost of two.

  You may use this field to create a path when none previously exists. This field does not enable you to change a least cost path. To change a least cost path, you must select the destination and the appropriate adjacent system as described in this section. Then specify the appropriate path cost.

- PF14 (S&F Next Hops) -- Press PF14 to configure Store and Forward routing and to display a screen that lists Store and Forward destinations and associated next hops. You may then configure Store and Forward routing.

- PF16 (Exit) -- Press PF16 to return to the WSNEDIT main menu (see Figure 3-1).

- PF32 (Menu) -- Press PF32 to return to the WSNEDIT main menu (see Figure 3-1).

To define a path to a destination, position the cursor at the tabstop next to the destination to which you want to define a path. If the target VS is an end-point system, select the destination identified by the All in the Area field, which signifies all systems in all areas. If the target VS is an end-point system, you need only configure the default path. Press ENTER. The Path Definition menu appears (see Figure 4-5).

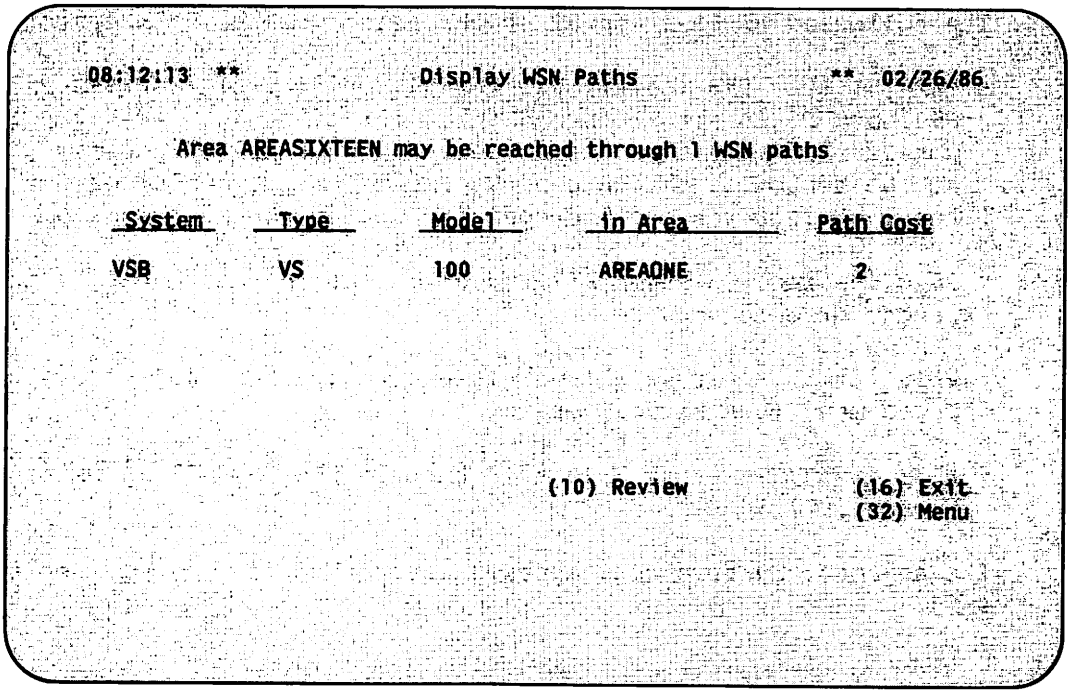

Figure 4-5. Path Definition Menu

The Path Definition menu lists the defined paths to the destination selected from the previous screen. The path is identified on the screen by the adjacent system with which it is associated. If no paths have been defined yet, none appear on the screen.

The Path Definition menu displays the following information about each path:

- System -- The name of the adjacent system associated with the path.
- Type -- The type of system if a system type was entered for the system in the directory.
- Model -- The model number of the system if a model number was entered for the system in the directory.
- in Area -- The area in which the adjacent system resides.
- Path Cost -- At this time, path cost is a value that you enter to define a destination that is reached from the target system by way of a next hop system. You may define only two paths from the target system to a specific destination. If you are defining only one path, enter any valid path cost for that destination. If you are defining two paths, enter the lower path cost for the primary or least cost path (i.e., the primary next hop). Valid values range from 2 to 99.

The following PF keys appear at the bottom of the Path Definition menu:

- PF2 (First), PF3 (Last), PF4 (Prev), PF5 (Next) -- Press PF2, PF3, PF4, or PF5 to scroll through the list of systems when the list consists of more than one screen. Some or all of these keys appear at the bottom of the screen, depending on the number of screens that the list requires and the specific screen you are viewing.

- PF10 (Review) -- Press PF10 to define new paths, modify existing paths, or delete paths.

- PF16 (Exit) -- Press PF16 to return to the Destination Systems and Areas menu (see Figure 4-4).

- PF32 (Menu) -- Press PF32 to return to the WSNEDIT main menu (see Figure 3-1).

The Adjacent Systems menu appears after PF10 is pressed (see Figure 4-6).

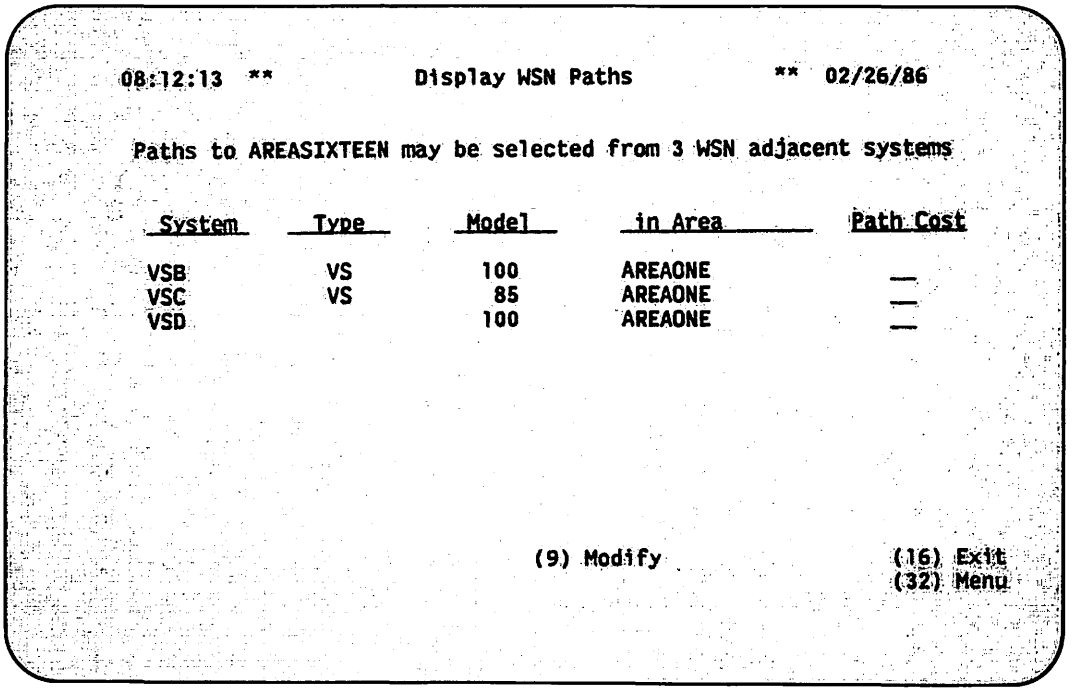

Figure 4-6. Adjacent Systems Menu

The Adjacent Systems menu lists all the possible adjacent systems where the target system can route information to the destination named at the top of the screen. The Adjacent Systems menu displays the following information about each adjacent system:

- System -- The name of the adjacent system.
- Type -- The type of system if a system type was entered for the system in the directory.
- Model -- The model number of the system if a model number was entered for the system in the directory.
- in Area -- The area in which the adjacent system resides.
- Path Cost -- The path cost assigned to the adjacent system if it has been used to define a path to a destination. When a path is defined, a path cost is associated with an adjacent system by way of which messages are routed from the target system to a specific destination. For any alternate path configuration, you should assign path costs according to the following rule:

  Path Cost = Sum of Base Costs along the Path

  Refer to Chapter 1 for additional information.

The following PF keys appear at the bottom of the screen:

- PF2 (First), PF3 (Last), PF4 (Prev), PF5 (Next) -- Press PF2, PF3, PF4, or PF5 to scroll through the list of systems when the list consists of more than one screen.
- PF9 (Modify) -- Press PF9 to specify the path cost for a path to a destination. The fields in the Path Cost column appear in Modify mode. Enter a path cost in the Path Cost field to define each path to a destination or use the space bar or the DELETE key to delete a path cost for a previously defined path. If you delete the path cost for a path, the target VS can no longer route messages to that destination by way of the adjacent system on the Adjacent Systems menu.
- PF16 (Exit) -- Press PF16 to return to the Path Definition menu (see Figure 4-5).
- PF32 (Menu) -- Press PF32 to return to the WSNEDIT main menu (see Figure 3-1).

You are not required to define each possible path. Enter the path cost in the Path Cost field for each path you want to define after you press PF9. Use the TAB key or the cursor keys to move the cursor from field to field.

To delete a path definition, delete the path cost for that definition from the Path Cost field. Position the cursor on the appropriate path cost and use the space bar or the DELETE key to delete the entry. Repeat this procedure for each path definition you want to delete.

Press ENTER when you have finished entering or deleting path costs. The Adjacent Systems menu appears in Display mode. You can then define more paths by entering path costs next to the appropriate adjacent systems.

When you have defined the routing configuration for the target VS, press PF16 to return to the Path Definition menu (see Figure 4-5). From the Path Definition menu, press PF16 again to return to the Destination Systems and Areas menu (see Figure 4-4) to define the Store and Forward routing configuration.

4.2.2 Defining Store and Forward Routing

Press PF14 from the Destination Systems and Areas menu to define Store and Forward next hops. The Store and Forward Routing menu appears (see Figure 4-7).

```
08:12:13  **  Display Destination Systems & Areas  **        02/26/86

Please position the cursor at the appropriate tabstop and press ENTER
    to manage S & F routing from NETVS to the given destination

                                                          Default
 System     Type      Model      in Area                 Next Hop  Override

 ( all )   systems   without    an explicit path OS11     _______
 ( all )                        AREASIXTEEN      ATLAS    _______
 VSB        VS        100       AREAONE          NETVS    _______
 VSC        VS         85       AREAONE          NETVS    _______
 VSD        VS        100       AREAONE          NETVS    _______


                    (9) Modify (14) WSN Paths (16) Exit
                                                (32) Menu
```

Figure 4-7. Store and Forward Routing Menu

The Store and Forward Routing menu displays all the Store and Forward destinations in the network. The destinations are listed in the system column. "All" in the system column refers to all the Store and Forward systems in an area or, in the case of the default path, all the Store and Forward destinations that are not associated with specific and general CNS routing records. The following information is displayed for each destination:

- Type -- For individual systems in the same area as the target VS, the system type is listed if it was entered in the directory for that system. If the destination is all the systems in another area or all the systems without an explicit path (for default path routing), systems appears to indicate all systems.

- Model -- For individual systems in the same area as the target VS, the system model is listed if it was entered in the directory for that system. If the destination is all the systems in an area, within appears to indicate all the systems in an area. If the destination is all the systems without an explicit path (for default path routing), without appears.

- in Area -- The area in which the destination system or systems reside. An explicit path appears to indicate that all systems in the network to which specific paths have not been defined can be reached by way of a default path.

- Default Next Hop -- The default Store and Forward next hop.

- Override Next Hop -- The override next hop. The override next hop is the Store and Forward next hop you can assign for routing Store and Forward mail to a specific destination.

The following PF keys appear at the bottom of the screen:

- PF2 (First), PF3 (Last), PF4 (Prev), PF5 (Next) -- Press PF2, PF3, PF4, or PF5 to scroll through the list of destinations when the list consists of more than one screen. Some or all of these keys may appear at the bottom of the screen, depending on the number of screens that the list requires and the specific screen you are viewing.

- PF9 (Modify) -- Press PF9 to define, change, or delete an override next hop. The fields in the Override Next Hop column become highlighted. You may then define an override next hop. To delete an override next hop, use the space bar to delete the appropriate entry or entries in the Override Next Hop column. Press ENTER. The screen is redisplayed without the override next hops you deleted.

- PF14 (WSN paths) -- Select the destination and press PF14 to display the WSN/CNS paths from the target VS to the destination. The Path Definition menu appears (see Figure 4-5). You may then perform the CNS path definition functions.

PF14 is helpful when you are defining Store and Forward routes to destinations. Remember that Store and Forward uses CNS, and CNS paths must be defined to Store and Forward destinations. PF14 allows you to determine whether or not CNS paths have been defined to Store and Forward destinations.

- PF16 (Exit) -- Press PF16 to return to the Destination Systems and Areas menu (see Figure 4-4).

- PF32 (Menu) -- Press PF32 to return to the WSNEDIT main menu (see Figure 3-1).

To define or change an override next hop, perform the following steps:

1. Press PF9 to highlight and modify the fields in the Override Next Hop column. When defining an override next hop, enter the system name of the override hop as it appears in the directory in the field associated with the appropriate destination. Enter each override next hop that you want to define. When changing an existing override next hop, enter over the old entry with the new override next hop. Repeat this procedure for each override next hop you want to change. Press ENTER when you have finished defining and changing override next hops. The screen displays the override next hops you entered.

2. Use the cursor to select a destination with which you want to associate an override next hop. Press ENTER. The Store and Forward Next Hop menu appears (see Figure 4-8).

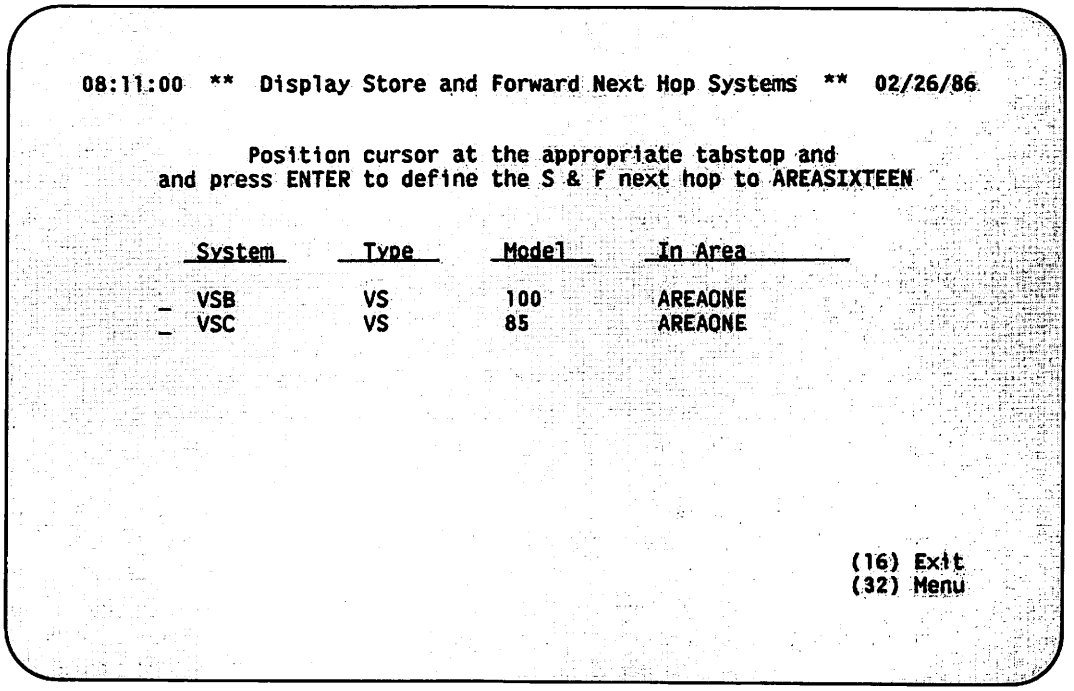

Figure 4-8. Store and Forward Next Hop Menu

The Store and Forward Next Hop menu displays all the Store and Forward systems in the network. To define an override next hop or change an existing one, use the cursor to select the appropriate next hop system. Press ENTER. The Store and Forward Routing menu appears, displaying the override next hop for the destination you specified.

The following PF keys appear at the bottom of the Store and Forward Next Hop menu:

- PF2 (First), PF3 (Last), PF4 (Prev), PF5 (Next) -- Press PF2, PF3, PF4, or PF5 to scroll through the list of systems when the list consists of more than one screen.

- PF16 (Exit) -- Press PF16 to return to the Store and Forward Routing menu (see Figure 4-7).

- PF32 (Menu) -- Press PF32 to return to the WSNEDIT main menu (see Figure 3-1).

CHAPTER 5
HOW TO CONFIGURE STORE AND FORWARD WINDOWS

5.1 INTRODUCTION

This chapter explains how to configure Store and Forward service windows. A service window is a time interval when Store and Forward can establish a session with a peer application on a remote VS. For example, you can set up a window so that Store and Forward on one VS establishes sessions with a peer application on a specific remote VS from 9 AM to 12 AM on Mondays and from 1 PM to 4 PM on Thursdays.

Windows may also be assigned various priorities (e.g., Low, Medium or High) for various timeframes. These priorities correspond to the priority classification assigned to mail from an application such as Store and Forward. Priorities will be discussed later in the chapter.

The session can be initiated to serve one or both of the following purposes:

- To move mail from the local system to a destination or the Store and Forward next hop.

- To query (poll) a peer application on a remote system to check whether that application wants to send mail to the polling VS. The polling VS is the VS system that polls a remote system. This feature is useful in cases in which a VS system is on a switched line and cannot establish an outbound session automatically (e.g., by means of an Automatic Calling Unit). Thus, it requires intervention from a polling VS or manually by a user at the system to initiate a connection. Since it is not usually practical to have a user initiate a connection manually, the polling feature provides a solution for systems that must perform Store and Forward communications over switched lines but do not have auto dial equipment.

NOTE

On a switched line, VS systems running Store and Forward can establish outbound sessions automatically only if they are equipped with Automatic Calling Units (ACU). VS systems with manual dial equipment can only accept inbound sessions from other VS systems automatically. Thus, any VS system that uses Store and Forward to poll other systems over a switched line should be equipped with an ACU.

This window feature also enables a network administrator to regulate Store and Forward traffic through a distribution point. For example, the administrator can set up the Store and Forward routing configuration in an area so that a group of designated Store and Forward systems route Store and Forward traffic by way of the distribution point (see Chapter 4) which is the default for nondistribution point systems in WSNEDIT. The administrator can then set up the window configuration on each nondistribution point system so that each system sends mail to the distribution point at different times. Or the administrator can make the distribution point the polling VS and set up the window configuration so that each Store and Forward system in the group of designated systems is polled at different times, thereby preventing them from sending Store and Forward mail all at once.

When a request to send mail to a remote system is submitted, it is stored until an appropriate service window opens. When the designated window opens, the Store and Forward application attempts to contact the Store and Forward next hop. The information goes through a CNS session that provides a logical connection between two systems.

The polling feature enables a system to contact the other systems, a few at a time, so that each of these systems can establish a session with it. This feature significantly reduces the risk of many systems simultaneously attempting to establish sessions with the same remote VS and exceeding the maximum number of concurrent inbound sessions that the Store and Forward application on the remote VS can support. When one system polls another, it can establish a session with the other system even if the polling system has nothing to send. After a session is established for the poll, the system that is polled can use that same session to forward mail to the polling system.

On your system, you have the following two options:

- Defining a separate set of windows for each destination system on the network.

- Defining one set of windows for a subset of destinations on the network or several windows for several subsets.

One set of windows can serve the function of providing time frames for establishing outbound sessions and polling remote systems. For each set of windows and each destination or subset of destinations, you can use WSNEDIT to configure your system to poll or turn around an outbound session to receive mail or both. The term "Turn Around" is explained below.

- Turn Around -- An option available to the polling VS that enables it to poll a remote VS, send mail to the remote VS, and override the window configuration of the remote VS so that it can send mail to the polling VS. Once the window configuration of the remote VS is overridden, the remote VS sends mail to the polling VS according to the window configuration of the polling VS. The polling VS incurs all the cost for the mail.

Through WSNEDIT, you can configure the following scenarios:

- Your system polls other destinations and turns around a session to receive mail from another system.

- Your system does not poll, but opens an outbound session with a remote system when a window opens to send mail and turns around that session to receive mail that the remote system wants to send to it.

- Your system does not poll and it does not turn around an outbound session to receive mail after it sends mail to a remote system.

- Your system does not open any service windows to poll or to send mail to a remote system.

Even though windows perform a dual function, windows on all systems on the network do not have to be coordinated for polling to be effective. For example, if System A is configured to poll System B on Thursday at 9 AM, System B does not have to be configured to open a window at 9 AM to send mail to System A. System A establishes the session, turns the line around, and accepts mail from System B if that system has any that it wants to send to System A.

For a majority of destinations on the network it may not be necessary to define a unique set of windows. In these cases, a default window exists with set parameters that will serve the needs of those destinations. Using default windows for the majority of systems in the network significantly reduces the amount of window information that must be configured and maintained. If the default window settings are acceptable, you may not need to perform any window configuration functions.

You can also define priority levels (High, Medium, or Low) when you define a window for each day of the week. A priority level defines the classification (High, Medium, or Low) of mail that can be sent through a given window during a given period of time. When you define priority levels, remember that the level you assign to a window enables mail with that level of priority and higher to be sent through the window. For example, a window that is open for Medium priority mail means that Medium, High, and Immediate priority mail may be sent through the window. The terms High Priority, Medium Priority, and Low Priority are defined below.

- High Priority -- A priority level assigned to a particular service window for a given period of time that specifies when High and Immediate priority mail only from an application such as Wang OFFICE will be delivered to the network through the window.

- Medium Priority -- A priority level assigned to a particular service window for a given period of time that specifies when Medium, High, and Immediate priority mail from an application such as Wang OFFICE will be delivered to the network through the window.

- Low Priority -- A priority level assigned to a particular service window for a given period of time that specifies when Low, Medium, High and Immediate priority mail from an application such as Wang OFFICE will be delivered to the network through the window.

Different priority levels may be assigned to a single window. For example, three time periods are assigned to a given window. These time periods are Monday through Friday between 8 AM and Noon, between 1 PM and 4 PM, and between 4 PM and midnight. This means that the window may be used to send data to the systems assigned to it at these times. You can designate Monday through Friday, between 8 AM and Noon, as the time at which High priority mail is sent, 1 PM to 4 PM as the time at which Medium priority mail is sent (which means that both High and Medium priority mail are sent), and 4 PM to midnight as the time at which Low priority mail is sent.

WSN also makes provision for mail that requires immediate priority from the network. The term Immediate Priority is described below:

- Immediate Priority -- A capability that enables the network to grant immediate network access to mail that requires it. This type of mail is designated as having immediate priority by an application such as Wang OFFICE. Unlike High, Medium, or Low priority, Immediate priority does not have to be defined through WSNEDIT.

You may want to think of Immediate priority as a window that the network always reserves for Immediate priority mail and is always open. When mail assigned Immediate priority is queued for transfer, a session with the destination system is, in most cases, established at once. For example, a Wang OFFICE memo from the President of a corporation can be sent immediately to the appropriate destination.

Immediate priority mail can be sent at the moment it is queued for transfer, or it can be delayed for a short time until a regularly scheduled High, Medium, or Low priority window opens. This capability is called Immediate Priority Postponement. Immediate Priority Postponement enables you to use WSNEDIT to specify the maximum length of time that Immediate priority mail is delayed prior to the opening of a regularly scheduled window. This capability enables you to make efficient use of your set of configured windows and your network resources. When you configure Immediate Priority Postponement times, you should be aware of the following rules:

- If you assign an Immediate Priority Postponement time of 0 to a window, Immediate priority mail will never be postponed. For example, if you assign an Immediate Priority Postponement time of 0 minutes to a specific window and the window is scheduled to be open for Medium priority mail between Noon and 2 PM, Immediate priority mail never be postponed, even if it is queued at 11:59 AM.

- If you assign a valid Immediate Priority Postponement time other than 0 (e.g., 5 minutes), all Immediate priority mail that is queued for transfer at that amount of time or less before the window is scheduled to open will be delayed until that window opens. For example, if you assign a postponement time of 5 minutes to a specific Medium priority window which is scheduled to open at Noon, Immediate priority mail that is queued to a destination assigned to the window 5 minutes or less before Noon (e.g., 11:56 AM) will wait until the window opens.

- If you assign a valid Immediate Priority Postponement time other than 0 (e.g., 5 minutes), all Immediate priority mail that is queued for transfer at an amount of time prior to the opening of the window that exceeds the Immediate Priority Postponement time will be sent immediately. For example, if you assign a postponement time of 5 minutes to a specific window which opens at Noon, Immediate priority mail that is queued to a destination assigned to the window at an amount of time that exceeds 5 minutes before Noon (e.g., 11:54 AM) will be sent immediately.

- If an Immediate priority item is queued for transfer to a destination while a High, Medium or Low priority window is already open to that destination, the mail will be sent through that window immediately.

The combination of priority levels, the Immediate Priority Postponement capability, and the ability to define a separate set of windows for each destination enables you to determine when sessions are established with what destinations and to minimize network costs. Remember that the cost of communicating with one system may not be the same as communicating with another system and these costs may vary by time of day if systems are connected by dial-up telephone lines.

5.1.1 Overview of the Configuration Process

This section summarizes the steps you must follow to configure Store and Forward windows.

1. Press PF7 from the WSNEDIT main menu (see Figure 3-1) to access the Service Window function.
2. Position the cursor at the tab stop next to SERVICE WINDOWS and press ENTER.
3. Create a service window and define service window parameters.
4. Designate when a window is open (in 15-minute intervals for each day of the week) and designate the priority (High, Medium, or Low) of that interval.
5. Assign destinations(s) to a window.
6. Review or modify the configuration parameters of a service window, including the default window.
7. Review the list of destinations associated with any window other than the default.
8. Exit the service window configuration functions and return to the WSNEDIT main menu.
9. Press PF16 from the WSNEDIT main menu and specify the output file to save the information that you have created through the Service Window Configuration function of WSNEDIT.

NOTE

For more information about configuring Store and Forward windows, refer to the VS WSN Package Distribution Service (Release 3.05) Software Release Notice.

5.1.2 Store and Forward Service Window Screen Flow

Figure 5-1 shows the screen flow for the Store and Forward Window Configuration function.

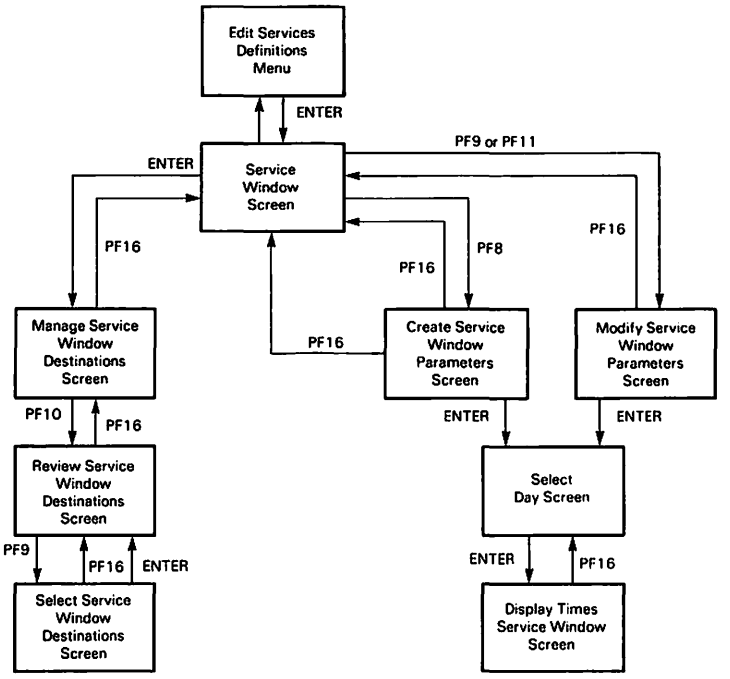

Figure 5-1. Store and Forward Window Configuration Screen Flow

5.2 MANAGING SERVICE WINDOWS

This section explains how to perform the following tasks:

- Access the service window function.
- Create, display, and modify the parameters defined for a service window. These parameters control what happens after a window opens and a target system attempts to establish a session with a remote system.
- Create, display and modify service window times (15-minute intervals) for each day of the week. You can select the days of the week when a window is open and the priority (Low, Medium, High, and Immediate) of each window. Wang OFFICE users assign priority to mail items which are sent when a window with a corresponding priority opens.
- Assign destination systems to windows.
- Review the destination systems that can be assigned to windows.

5.2.1 Accessing the Service Window Function

Position the cursor next to SERVICE WINDOWS on the Edit Service Definition menu, which is shown in Figure 5-2, to configure outbound poll windows and press ENTER. The Service Windows screen (see Figure 5-3) appears. This screen is described in the next section.

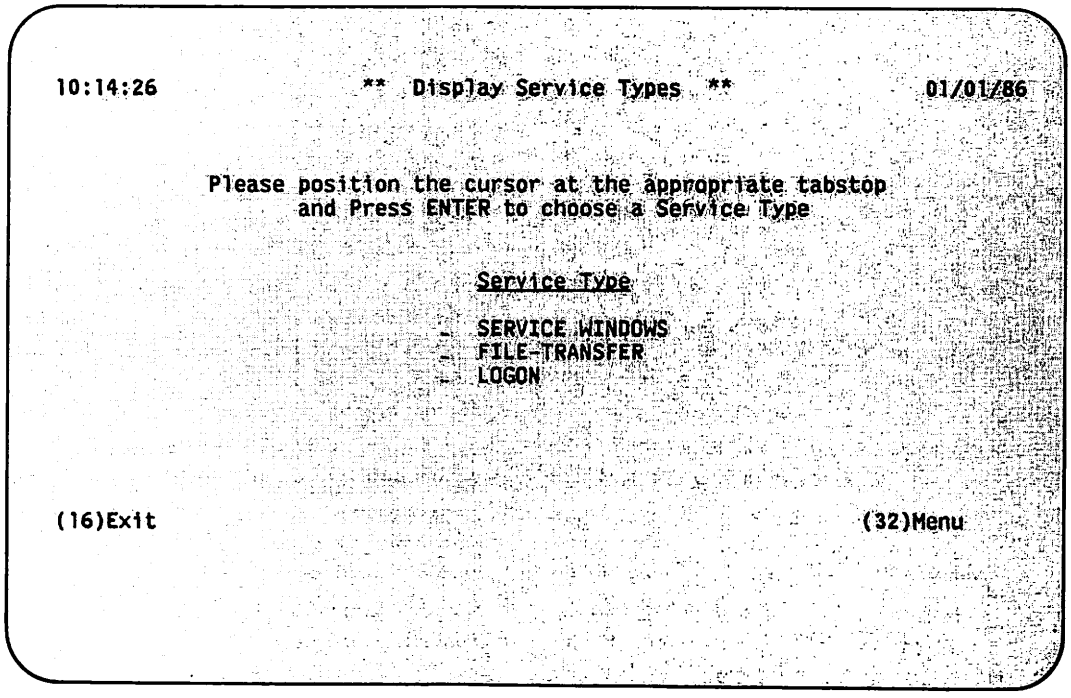

Figure 5-2. Edit Service Definitions Menu

5.2.2 Displaying Service Windows

The Service Window screen (see Figure 5-3) appears when you press ENTER from the Edit Service Definitions menu (see Figure 5-2).

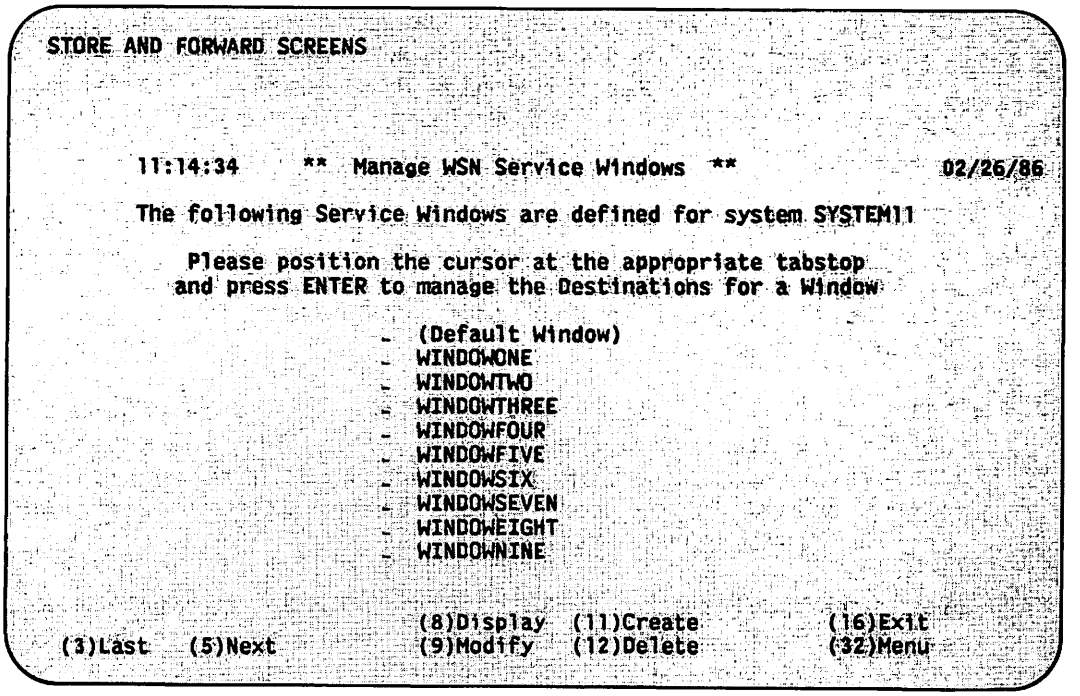

Figure 5-3. Service Window Screen

The Service Window screen lists the names of windows, including the default window, that have been defined. If you or any other WSNEDIT user have not defined any windows, only the default window is displayed. The default window applies to all systems on the network that have not been assigned to an explicitly defined service window. The screen also displays the name of the target system.

To manage the destinations that are assigned to the selected service window, position the cursor next to a window and press ENTER. You cannot display the destination systems associated with the default window by pressing ENTER since the default window is used for all systems that have not been assigned to an explicitly defined Service Window. The Manage Service Window Destinations screen appears (see Figure 5-7).

The following PF key selections appear at the bottom of the Service Window screens:

- PF8 (Display) -- Enables you to review the parameters associated with a service window defined for one or more destination systems. When you press PF8, the Service Window Parameters screen (see Figure 5-4) appears in Display mode. This means that the parameters can be viewed but not modified. When this screen appears in Display mode, the header reads "Display Service Window Parameters." You may press PF9 to modify the parameters on the screen. The screen then appears in Modify mode.

- PF9 (Modify) -- Enables you to change parameters associated with a service window defined for one or more destination systems. When you press PF9, the Service Window Parameters screen (see Figure 5-4) appears in Modify mode. When this screen appears in Modify mode, the header reads "Modify Service Window Parameters."

- PF11 (Create) -- Enables you to define a new service window for another destination. When you press PF11, the Service Window Parameters screen (see Figure 5-4) appears in Create mode. When this screen appears in this mode, the header reads "Create Service Window Parameters."

- PF12 (Delete) -- Enables you to delete a service window from the Service Window screen (see Figure 5-3). When you press PF12, a message appears prompting you to press ENTER to confirm your selection. When you press ENTER, the window is deleted and the Service Window screen reappears.

  You cannot delete the default service window because it is used for all destinations that have not been assigned a window. Therefore PF12 is not enabled when the default service window is the only entry on the Service Window screen (see Figure 5-3).

NOTE

You must first delete all destinations assigned to a service window before you can delete that windcw.

Some or all of the following PF key selections may appear at the bottom of the Service Window screen (see Figure 5-3) when a list on the screen takes up more than one screen:

- PF2 (First), PF3 (Last), PF4 (Prev), PF5 (Next) - Enable you to scroll through the list of windows when the list consists of more than one screen.

5.2.3 Creating, Displaying and Modifying a Service Window

This section describes how to create, display and modify a service window. Instead of describing all three procedures, the section will primarily concentrate on creating a window. The procedures for displaying and modifying a window are similar.

To create a service window and define the parameters associated with it, press PF11 from the Service Window screen (see Figure 5-3). The Service Window Parameters screen, shown in Figure 5-4, appears in Create mode.

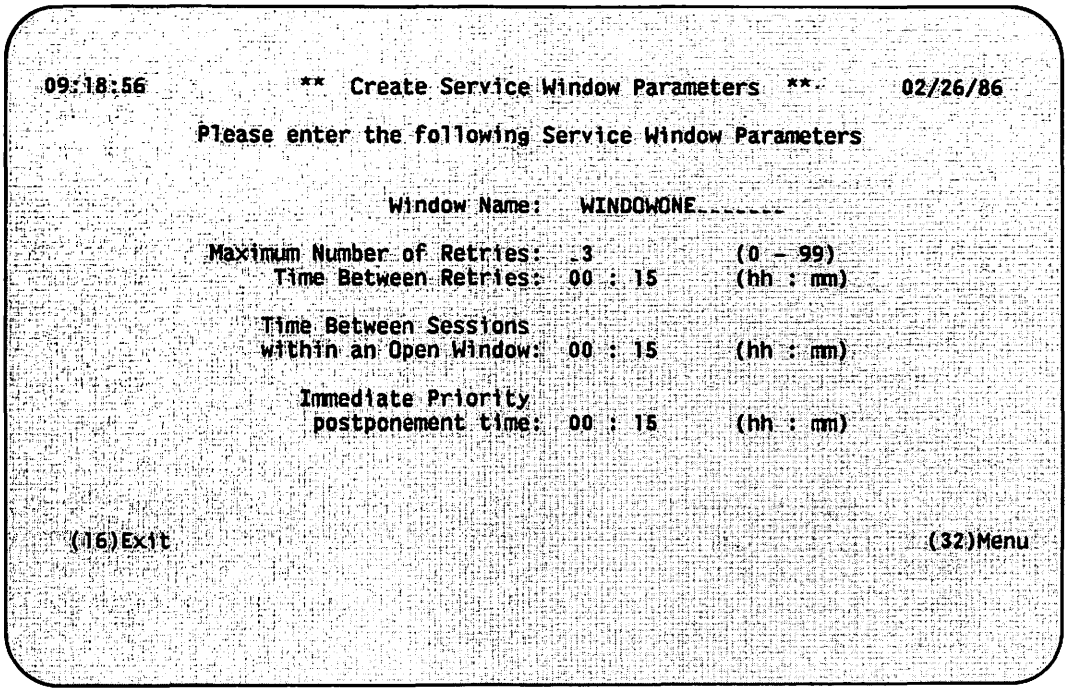

Figure 5-4. Service Window Parameters Screen

The fields on the screen are the same regardless of whether the screen is in Create, Modify, or Display mode. The PF keys are the same except when the screen is in Display mode. When the screen is in Display mode, PF9 appears and enables you to enter Modify mode.

The parameters on this screen apply to all window priorities for each day of the week. The window name field is modifiable only when you are creating a new window. After you define a new window, you cannot modify its name.

Enter the parameters, which apply to all window priorities for each day of the week, in the following fields to create a service window:

- Maximum Number of Retries -- The number of times an attempt should be made to establish a session if the first attempt is not successful. Enter a number between 0 and 99. The default value is 3.

- Time Between Retries -- The length of time between retries. The default value is 15 minutes.

- Time Between Sessions within an Open Window -- The minimum length of time that must pass since the last successful session before another session can be established. The default value is 15 minutes.

- Immediate Priority Postponement Time -- The length of time that an Immediate priority session can be postponed before the next scheduled service window opens. Refer to Sections 5.1 and 5.3.3 for an explanation of Immediate priority.)

  This parameter enables you to balance the number of sessions established against the priority levels of those sessions. For example, if an Immediate priority session request is sent to Destination A at 8 AM and a window is scheduled to open at 8:15 AM with that same destination, the Immediate priority session is postponed until 8:15 AM if the postponement time is 15 minutes or more.

  It is recommended that the value of this parameter not exceed 15 minutes, but the value that you enter depends on how you configure each service window for each day of the week. If you set this value to 0, Immediate priority mail that is sent to destinations through the window will never be postponed.

The following PF key selections appear at the bottom of the screen:

- PF9 (Modify) -- This PF key appears on the Service Window parameters screen only when it is in Display mode. This key enables you to display the screen in Modify mode and change the values of service window parameters.

- PF16 (Exit) -- Returns you to the Service Window screen (see Figure 5-3).

After you enter values for each parameter, press ENTER to save those changes. The Select Day screen appears so that you can review or modify the service window for each day of the week (see Figure 5-5).

5.2.4 Selecting Days

The Select Day screen, shown in Figure 5-5, appears when you press ENTER from the Service Window Parameters screen (see Figure 5-4) after creating a service window or modifying the parameters of an existing window.

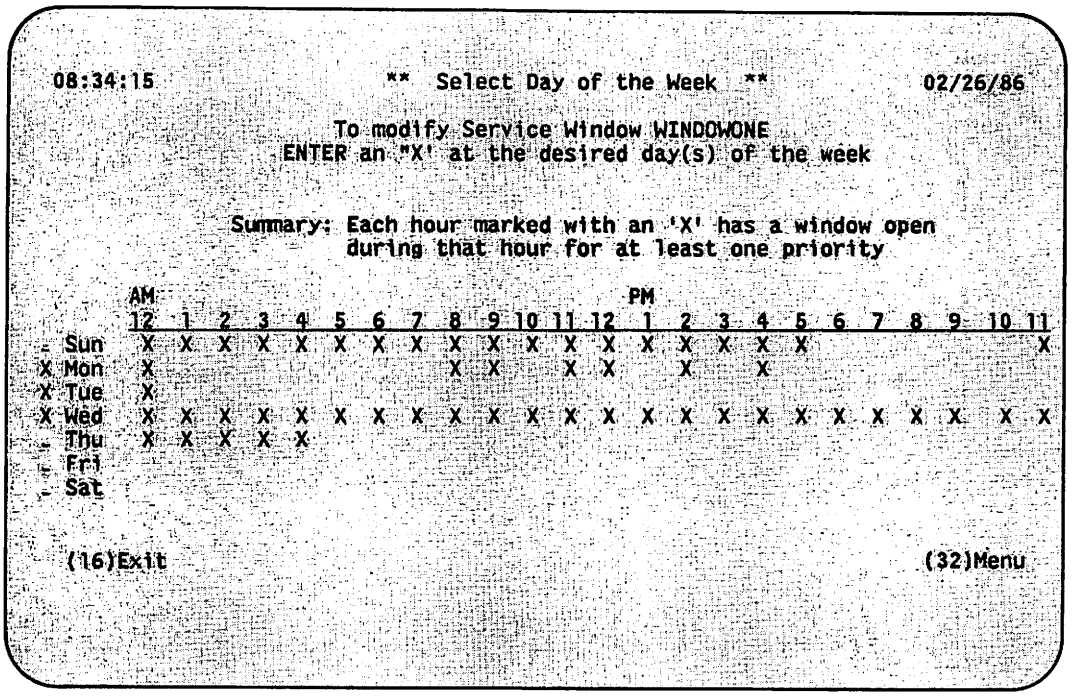

Figure 5-5. Select Day Screen

This screen enables you to review the days of the week when a window is open. The name of the window to which the screen applies appears at the top of the screen. Only those hours marked with an X have open windows.

To display or modify the window for any day of the week, enter an X next to one or more days and press ENTER. If you select more than one day and the service windows for those days are not identical, the screen displays the following message:

```
The selected days do not have matching windows
  Which day should be used as the base? ___
```

Type in the first three letters of the day that you want to use as the pattern for the other days and press ENTER. The Service Window Parameters screen (see Figure 5-4) appears in Modify mode.

The following PF key selections appear at the bottom of the screen:

- PF16 (Exit) -- Returns you the Service Window screen (see Figure 5-3) so that you can select another window.

5.2.5 Managing Service Window Times

The Display Service Window Times screen (see Figure 5-6) appears when you press ENTER from the Select Day screen.

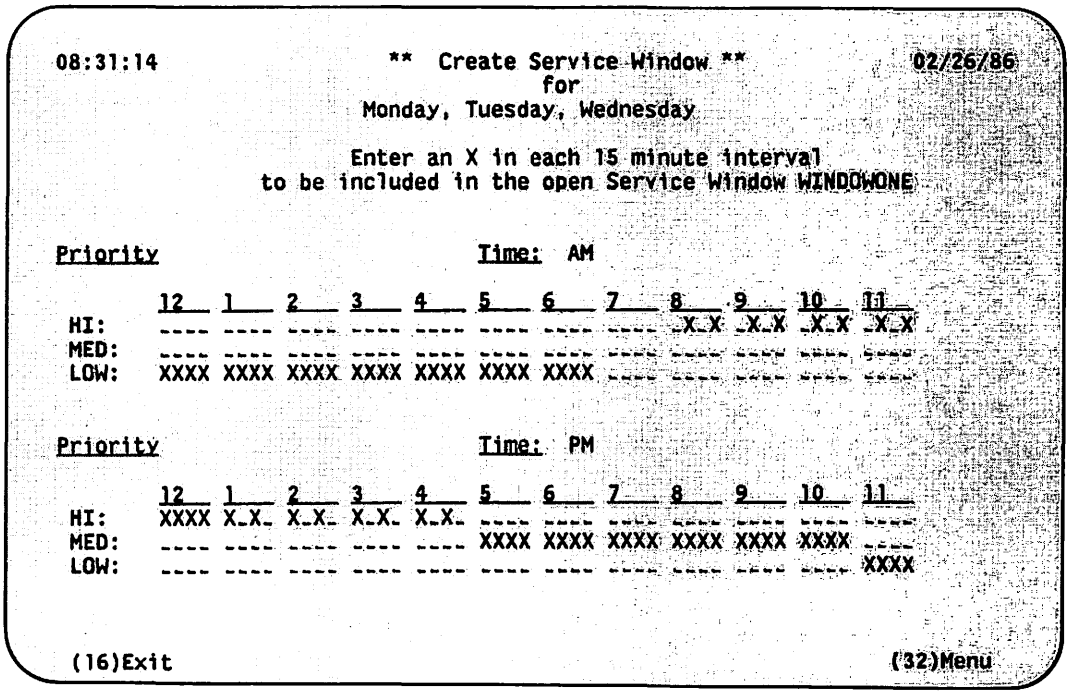

Figure 5-6. Display Service Window Times Screen

This screen displays the exact times during a day when service windows for a destination are open. The days of week to which the window applies appear in the screen title. The name of the window also appears at the top of the screen.

Each service window is divided into three priority levels: High, Medium, and Low. Each priority level divides the day into 24-hour intervals, which, in turn, are divided into 15-minute intervals. When a marked 15-minute interval is reached, Store and Forward will establish sessions to the associated destinations and send mail of the specified priority and any higher priority. It will also poll those systems designated for polling.

In addition, the service window facility has the following features:

- You can define multiple windows. A priority can have a range of 15-minute intervals during which time mail can be sent. For example, High priority can be defined as 8 AM to 9 AM and 3 PM to 4 PM for one or more days of the week. You can define up to 48 intervals for each priority level. (Enter an X for every other interval and leave the other intervals blank.)

- You can define overlapping windows so that two priorities share a range of time. For example, for a period of one or more days High priority can be defined as 3 PM to 5 PM and Medium priority could be defined as 4 PM to 6 PM. When windows overlap, mail that a user has designated as higher priority are moved to the top of the queue and enter the network first. In this case, High priority mail is sent before Medium priority mail between 3 PM and 6 PM since High priority is defined for 3 PM to 5 PM and can be sent from 5PM to 6PM during the last hour of the Medium priority timeframe. Medium priority items are sent between 4 PM and 6 PM only.

A service window is closed for High, Medium and Low priority items during each 15 minute interval of the day that is left blank. Only Immediate priority items may be sent through the window at these times. To close a window, leave any 15-minute interval during the day blank.

For example, if you specify that High priority mail is to be sent at 8:15 and 8:45 AM, Store and Forward attempts to establish Immediate priority sessions at 8:00 AM and 8:30 AM if there are items to send. Between 12 midnight and 8 AM service windows are closed.

You may want values that you enter for priority levels to reflect target area telephone rates or when traffic over the network is reduced. For example, you might send all High priority mail during the business day (weekdays, 9 AM to 5 PM) when telephone rates are highest. Packages designated as Medium priority could be sent during off-hours when telephone rates are lower. Low priority data could be distributed over the weekend.

NOTE

A window closes at the defined time, even when items with that priority remain to be transmitted. An item being transmitted will complete after the 'close' time, but items left on the queue will wait for the next window.

The following PF key selection appears at the bottom of the screen:

- PF9 Modify -- Appears only when the screen is in Display mode. You may press this key to modify the fields on the screen.

- PF16 (Exit) -- Returns you to the Select Day screen (see Figure 5-5) so that you can select another day. If you are in Modify mode, the screen returns to Display mode without saving any changes that you made to the window.

- PF32 (Menu) -- Returns you to the WSNEDIT main menu.

5.2.6 Assigning and Reviewing Service Window Destinations

When you create new windows, you must assign destinations to those windows. More than one destination can share the same window but a destination may be assigned to a single window only. To assign destinations to a window or to review destinations already assigned, position the cursor at the tab stop next to the window you created on the Service Window screen (see Figure 5-3). The Manage Service Window Destination screen, shown in Figure 5-7, appears.

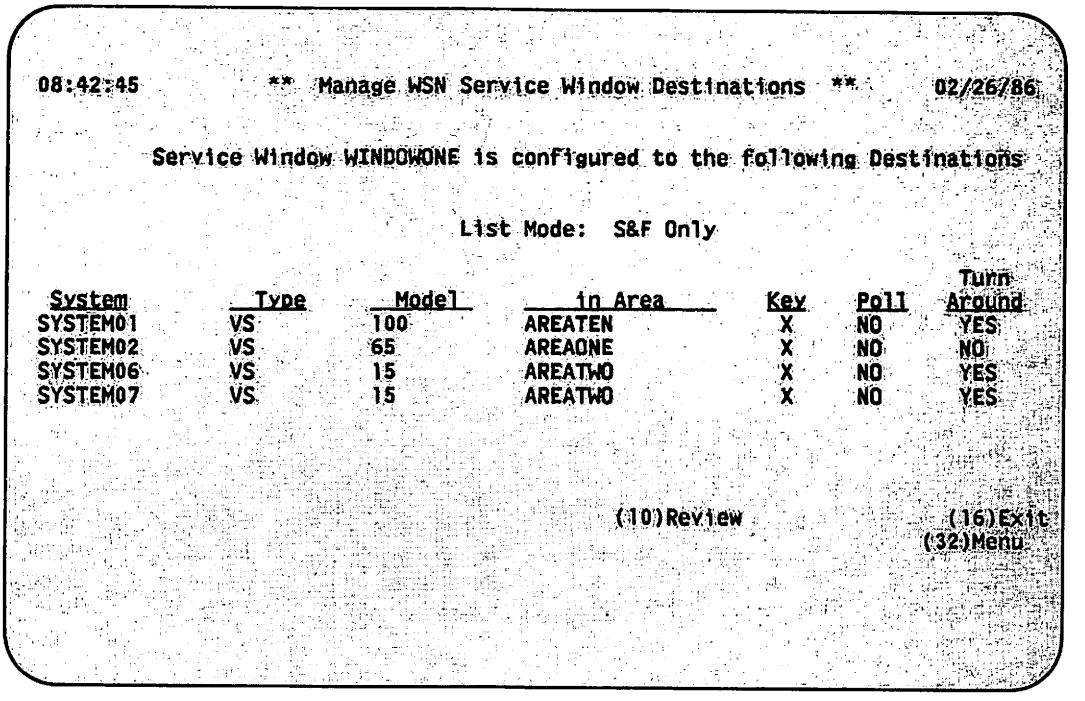

Figure 5-7. Manage Service Window Destinations Screen

When the Manage Service Window Destinations screen first appears for a given window, it displays no Store and Forward destinations since none have been assigned yet. If destinations have already been assigned, they are listed on the screen. Figure 5-7 shows a screen with destinations already assigned. The fields on the screen are as follows:

- System -- Name of the destination system assigned to the service window named at the top of screen.

- Type -- Type of system (e.g., VS, WPC) for which windows have been defined.

- Model -- The system model (e.g., VS65, VS100) for which service windows have been defined.

- in Area -- The area in which the system is located.

- Key -- An X indicates that the destination system has been assigned to the selected service window.

- Poll -- Indicates whether the target system polls the remote system that is associated with a service window. You define a different set of windows for each system or for subsets of systems on the network. Those windows regulate whether the target system can query the remote systems to send mail. If configured, the target system polls whenever a window opens for a remote destination regardless of the priority.

- Turn Around -- Indicates whether the target system enables the remote system to turn a session around to send mail after the target system establishes a session with a remote system for polling or sending mail. When the session is established, the target system tells the remote system that the turn around option is YES and dictates the priority level of the window. When the target system is finished sending mail, the session is turned around and the remote system can send mail. The remote system's window configuration is overridden and the remote system sends mail according to the priority level dictated to it by the target system. For example, if Medium priority was dictated, the remote system could send Medium, High and Immediate priority mail.

- If you set Poll to YES, set Turn Around to YES. This enables the target system to receive data on the session that the target system established for polling.

- If you do not want the target system to poll, but want the target system to receive mail after it sends mail, set Poll to NO and Turn Around to YES.

- If you do not want the target system to poll or receive mail after it sends mail, set Poll to NO and Turn Around to NO.

The following PF key selections appear at the bottom of the screen:

- PF10 (Review) -- Enables you to perform the following tasks:
  - Assign destinations to the window
  - Review the list of destinations that can be assigned to the selected window
  - Remove an assigned destination from the selected window
  - Change the Poll and Turn Around option for an assigned destination
- PF16 -- Returns you to the Service Window screen (see Figure 5-3)

The Review Service Window Destinations screen, shown in Figure 5-8, appears when you press PF10 from the Manage Service Window Destinations screen.

```
09:13:17              ** Review Service Window Destinations **          02/26/86

                 Please review the systems that may be destinations
                          for Service Window WINDOWONE

                          List Mode:  S&F Only

                                                                      Turn
  System      Type      Model      in Area        Key    Poll      Around
  SYSTEM01    VS        100        AREATEN         X     NO        YES
  SYSTEM02    VS        65         AREAONE         X     NO        NO
  SYSTEM03    VS        65         AREAONE
  SYSTEM04    VS        300        AREATWENTY
  SYSTEM05    VS        85         AREATEN
  SYSTEM06    VS        15         AREATWO         X     YES       YES
  SYSTEM07    VS        15         AREATWO         X     YES       YES
  SYSTEM08    WPC                  AREAFIVE
  SYSTEM09    WPC                  AREAFIVE

                                                                  (16)Exit
(3)Last    (5)Next          (9)Modify                             (32)Menu
```

Figure 5-8. Review Service Window Destinations Screen

This screen lists all destinations that meet one or more of the following criteria:

- Assigned to the service window named at the top of the screen (denoted by an X in the Key field).

- Assigned to no other service window. This group of destinations has not been assigned to any other service window by a user and the systems are Store and Forward systems, and therefore can be assigned to this window.

- Assigned as Store and Forward systems. The screen displays List Mode (Store and Forward Only) at the top. Store and Forward Only means that the destinations are Store and Forward destinations that have been assigned already or Store and Forward destinations that may be assigned.

NOTE

When a destination is assigned to another window, the Review Service Window Destinations screen (see Figure 5-8) does not list that destination. If you want to assign a destination to another window, you must first remove that destination from its assigned window before you can assign it to another window.

The following PF key selections appear at the bottom of the screen:

- PF9 (Modify) -- Enables you to assign, remove, or change a destination for the selected service window. The Select Service Window Destinations screen (see Figure 5-9) appears.

- PF16 (Exit) -- Returns you to the Manage Service Windows Destinations screen (see Figure 5-7).

Some or all of the following PF key selections may appear at the bottom of the Service Window screen (see Figure 5-3) when a list on the screen takes up more than one screen:

- PF2 (First), PF3 (Last), PF4 (Prev), PF5 (Next) - Enable you to scroll through the list of systems when the list consists of more than one screen.

5.2.7 Selecting Destination Systems

The Select Service Window Destinations screen, shown in Figure 5-9, appears after you press PF9 from the Review Service Window Destinations screen (see Figure 5-8).

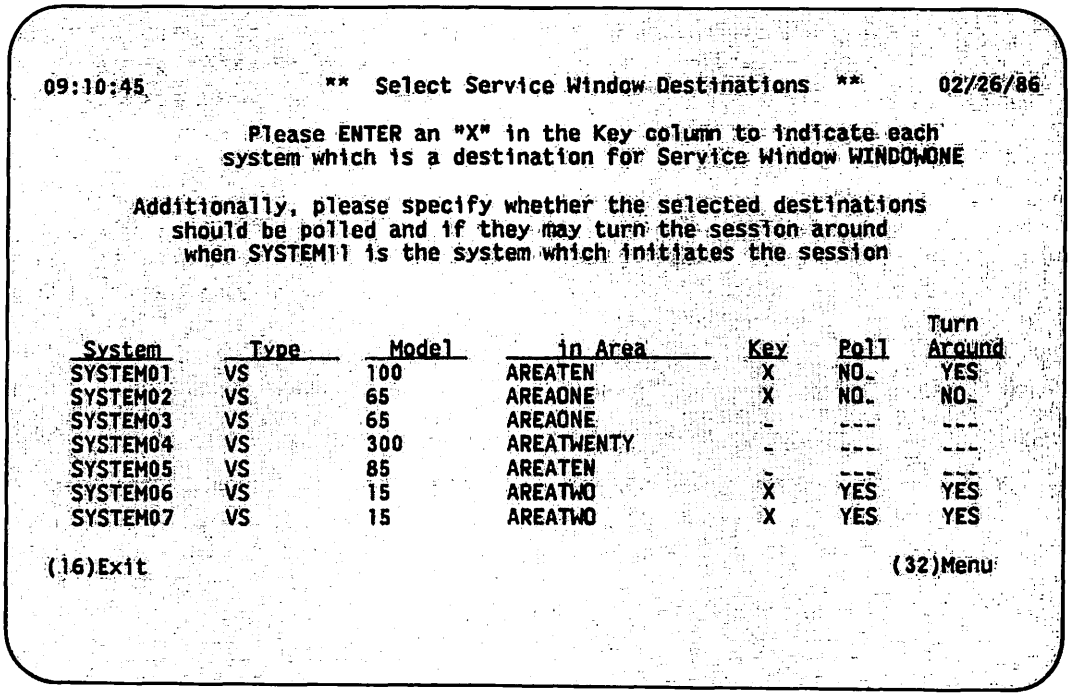

Figure 5-9. Select Service Window Destinations Screen

This screen enables you to perform the following tasks:

- Assign a destination to the selected service window
- Remove a destination from the selected service window
- Change the Poll and Turn Around options for a destination

To assign a destination to the selected service window enter X in the Key column and YES or NO in the Poll and Turn Around columns of the selected destination.

To remove a previously assigned destination from a selected service window, delete the X in the Key columns. Entries in the Poll and Turn Around columns are deleted automatically.

To change the Poll or Turn Around options for a previously assigned destination, change the entries in the Poll and Turn Around columns for the selected destination.

Press ENTER to save the changes. The Review Service Window Destinations screen (see Figure 5-8) appears. Press PF16 to return to the Review Service Window Destinations screen without saving your changes.

CHAPTER 6
WSNMON ENHANCEMENTS

6.1 OVERVIEW

This chapter describes the following enhancements to the WSN Monitor, WSNMON:

- Personal Log Message Function -- Enables you to write personal log messages to the log file.
- Path Trace Function -- A performance and diagnostic tool that gives information on network connectivity.
- Path Cost Modification -- Modified on-line through the WSNMON Control/Monitor Routes function.
- Monitor Relative Costs On-Line -- Refer to Chapter 1 for an explanation of relative cost.

6.2 THE PERSONAL LOG MESSAGE FUNCTION

The WSNMON main menu now enables you to enter a personal log message. When you enter a log message, the message is written to the log file and appears in the log display section of the WSNMON main menu (see Figure 6-1). This feature is helpful in recording your observations on network events.

```
07/01 15:01    *** WSN Monitor (WSNMON) - Ver. XX.XX.XX    ***   [OS11    ]
Main Menu           (c) Copr., Wang, 1985            Update Interval (secs.) 60*
                                                     Alarm w/update (ON/OFF) ON*

02/26/86----------------------CNS Log Display---------------------------- more

19:40:448  WSN0108:  Application Detached, Appl = FTM, User = MRC, Sessions In =
           0, Sessions Out = 1, Messages In = 5, Messages Out = 7, Bytes In = 301,
           Bytes Out = 6674
11:25:067  WSN0208:  Session Terminated Normally with System LOCALNET Msgs In =
           2, Msgs Out = 4, Bytes In = 301, Bytes Out = 6674, ReXmits Out = 0,
           ReXmits In = 0, Rcvd out of seq = 0
11:26:012  WSN0208:  Session Terminated Normally with System SAVAGE Msgs In = 2
           Msgs Out = 7, Bytes In = 404, Bytes Out = 8974, ReXmits Out = 0,
           ReXmits In = 4, Rcvd out of seq = 0
------------------------------------------------------------------------ scroll
Select a function below:
                                                                [PF1 = log funcs]
                     (5) Ctl/mon Trans   (9)  Ctl/mon CNS    (13) Log funcs
                     (6) Ctl/mon Sys/Rts (10) Pause Scroll   (14) Run/Submit
(3) Diagnostics      (7) Ctl/mon Apps    (11) WSNEDIT        (15) Print Log
                     (8) Ctl/mon Sess    (12) Log Message    (16) TERMINATE

CNS (XX.XX.XX) is running -- started in background by DMR on 01/01 AT 14:19
```

Figure 6-1. WSNMON Main Menu

To enter a log message, press PF12 from the WSNMON main menu. The following prompt appears under the log display section of the menu:

(ENTER) message to be logged:

A field appears after the message. You may enter the log message in that field. Press PF1 to cancel the log message operation. To enter the log message, enter the message in the field that appears after the message and press ENTER. The message is written to the log file. The message contains your logon ID, in addition to the contents of the message.

6.3 THE PATH TRACE FUNCTION

The Path Trace function is a diagnostic and performance tool that allows WSNMON to request a map of the current path from the local system to a specified remote system and back. Path information is obtained when you submit a path trace through WSNMON and the VS sends a path trace message to the remote system. This message collects information on all the systems and transports along the path and is routed back to the local system after it has collected information from the remote system. Only VS systems may send path trace messages to other systems; however, all other systems in the CNS network must be able to process this message.

If the specified destination system cannot be reached, the path trace indicates the path to the remote system that discovered the connectivity failure and gives information on the problem encountered. Thus, the path trace identifies the path and, in most cases, the reason for connectivity failures along it.

The path trace provides the following information:

- Name of each transport along the path
- Network address of each system along the path
- Whether or not the system could be reached
- Reasons for connectivity failures

The Path Trace function is accessed through the WSNMON Diagnostics function. To access the WSNMON Diagnostics function, press PF3 from the WSNMON main menu (see Figure 6-1). The Diagnostics screen appears (see Figure 6-2).

```
05/09  15:00      ***  WSN Monitor (WSNMON) - Ver. XX.XX.XX  ***   [VS106005   ]
Diagnostics            (c) Copr., Wang, 1985
page 1 of 1

          Diagnostic Test Tools

        _ THRUTEST . . . Measure throughput or data transfer rate.
        _ PROPTEST . . . Measure propagation delay for data transfer
                         between systems.
        _ SYNCTEST . . . Measure data transfer accuracy.

        _ CONECTST . . . Determine network connectivity.

--------------------------------------------------------------------------------
Position cursor and press (ENTER) or select a function below:
                                                        [PF↑ = other funcs]
(1) Last func     (5) Sbmt/Vu Pth Trc     (9) Set Trace Tbl   (13) Other funcs
                                                              (14) Run/Submit

                                                              (16/↑) EXIT/TERM

CNS (XX.XX.XX) is running -- started in background by user DMR on 01/01 at 14:19.
```

Figure 6-2. The Diagnostics Screen

Press PF5 from the Diagnostics screen to access the Path Trace function. The Path Trace screen appears (see Figure 6-3).

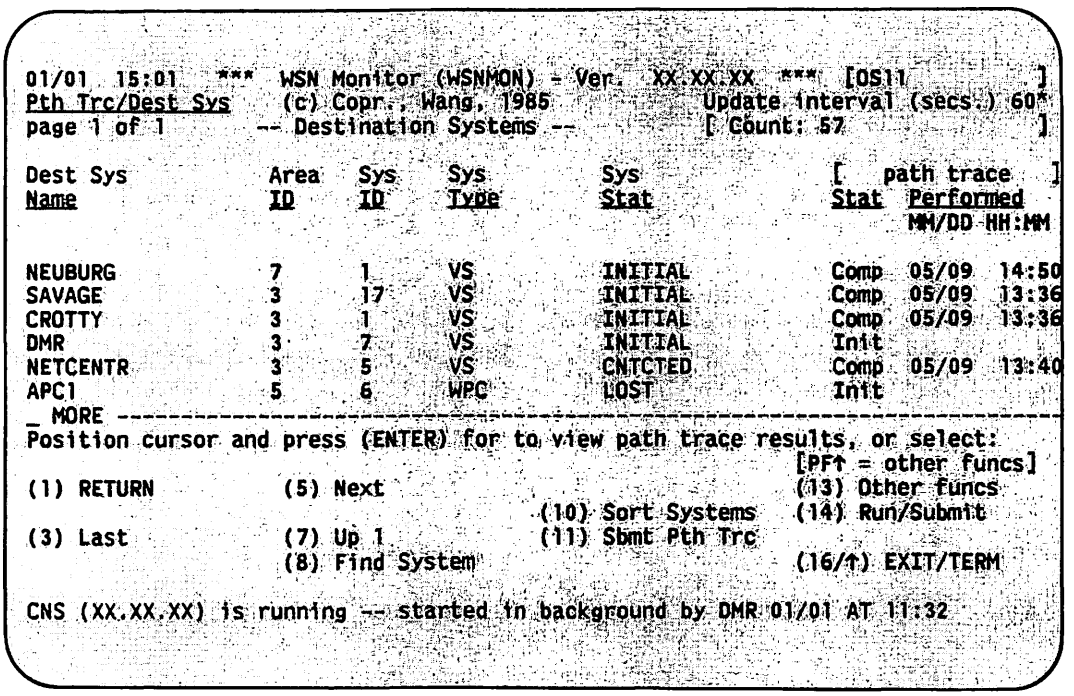

Figure 6-3. Path Trace Screen

The Path Trace screen displays the names of all the CNS systems in the network. The screen displays the following information about each system:

- Dest Sys Name -- Name of the system.
- Area ID -- The area ID of the system.
- Sys ID -- The system ID of the system.
- Sys Type -- The type of system (e.g., VS or WPC)
- Sys Stat -- The system status. The four status types are as follows:
  - Cntcted -- The CNS End-to-End layer on the local VS has successfully exchanged restart commands with the CNS End-to-End layer on the destination system.
  - Initial -- No attempt has yet been made to contact the system and no restart exchanges have taken place with CNS on the destination system since CNS was brought up.
  - Lost -- An attempt to establish communications with this system has failed.

- Pending -- An attempt is being made to establish communications with the system.

- Path Trace Stat -- The status of path trace operations that were submitted. The four status types are as follows:

  - Comp -- The trace has been successfully completed.

  - Init -- No trace has yet been submitted.

  - Pend -- A trace has been submitted but completion is pending.

  - Lost -- A trace was submitted but the path trace timer expired before completion. The path trace is considered lost at this point.

- Path Trace Performed -- The date (MM/DD) and time (HH/MM) the path trace was performed.

The following PF keys appear at the bottom of the Path Trace screen:

- PF1 (Return) -- Press PF1 to return to the Diagnostics screen.

- PF2 (First) -- Press PF2 to display the first screen of destination systems. PF2 appears if the list of destination systems takes up more than one screen, and you are viewing a screen other than the first.

- PF3 (Last) -- Press PF3 to display the last screen of destination systems. PF3 appears if the list of destination systems takes up more than one screen, and you are viewing a screen other than the last.

- PF4 (Previous) -- Press PF4 to display the previous screen of destination systems. PF4 appears if the list of destination systems takes up more than one screen and you are viewing a screen other than the first.

- PF5 (Next) -- Press PF5 to display the next screen of destination systems. PF4 appears if the list of destination systems takes up more than one screen, and you are not viewing the last screen.

- PF6 (Down 1) -- Press PF6 to display the destination system that immediately precedes the destination system that appears at the top of the screen. The destination system at the bottom of the screen scrolls off the screen and creates room for the destination system to scroll to the screen from the top.

- PF7 (Up 1) -- Press PF7 to display the destination system that immediately follows the destination system that appears at the bottom of the screen. The destination system at the top of the screen scrolls off the screen, creating room for a destination system to scroll on to the screen from the bottom.

- PF8 (Find System) -- Press PF8 to search for information on a specific destination system. A field appears that enables you to enter the name of the destination system you want to find. Enter the system name and press ENTER. If you do not know the entire name of the destination system, enter the first letter or letters of the name and press ENTER. If a match exists, a destination system name beginning with the letter(s) that you entered appears at the top of the screen.

- PF10 (Sort Systems) -- The Path Trace function initially lists systems according to system name in alphabetical order. Press PF10 to list systems according to area/system ID or system type. Several new fields appear at the bottom of the Path Trace screen, including Sys name, Area/Sys ID, and Sys type. To list systems according to area/system ID, position the cursor on the selection block next to Area/Sys ID and press ENTER. The systems are then listed in numerical order according to area/system ID. To list systems according to system type, position the cursor on the selection block next to Sys type and press ENTER. The systems are then listed according to system type.

- PF11 (Sbmt Pth Trc) -- Press PF11 to submit a path trace to a destination system you have selected with the cursor. Refer to the next section.

- PF13 (Other Funcs) -- Press PF13 to display the PF keys that enable you to access other WSNMON functions without returning to the WSNMON main menu. These PF keys are the same ones that appear on the WSNMON main menu.

- PF14 (Run/Submit) -- Press PF14 to run programs or procedures. PF14 displays three fields on the screen; these fields enable you to enter the name of the program/procedure and the library and volume in which it resides. You can then press ENTER to run the program or procedure in foreground or PF14 to run it in background. Only procedures can be run in background.

- PF16/↑ (Exit/Term) -- Press PF16 to return to the WSNMON main menu. Press PF32 (shift PF16) to terminate WSNMON.

- PF↑ (Other Functions) -- From any WSNMON screen other than the WSNMON main menu, you can press SHIFT, then the PF key that enables you to access a particular WSNMON function. The keys that enable you to access particular functions are displayed at the bottom of the WSNMON main menu. For example, if you were viewing a screen within the Control/Monitor Transports function, you could press PF23 (i.e., SHIFT PF7) to access the Monitor Applications function.

6.3.1 Submitting a Path Trace

To submit a path trace and monitor its results, position the cursor next to the destination system listed on the Path Trace screen to which the path trace is to be submitted. Press PF11. A message appears at the bottom of the screen prompting you to press ENTER to submit the path trace or to use the PF key functions displayed at the bottom of the Path Trace screen. You may press PF1 to clear the prompting message or PF16 to exit the Path Trace function if you decide not to submit the path trace.

Press ENTER to submit the path trace. The Stat field for the selected system displays Pend, meaning that the trace is in progress. The date and time the trace was submitted is also displayed for the system.

The following events take place once the trace is complete.

- A message next to a selection block appears at the top of the screen. The message indicates that the results have been received for a previously submitted path trace.

- The Stat field for the destination system changes from Pend to Comp. If the path trace timer has expired before the path trace has been completed, Lost appears in the Stat field.

To display more detailed results on the path trace, position the cursor either on the selection block that appeared after the trace was submitted, or on the system name. Press ENTER. The Path Trace Results screen appears (see Figure 6-4).

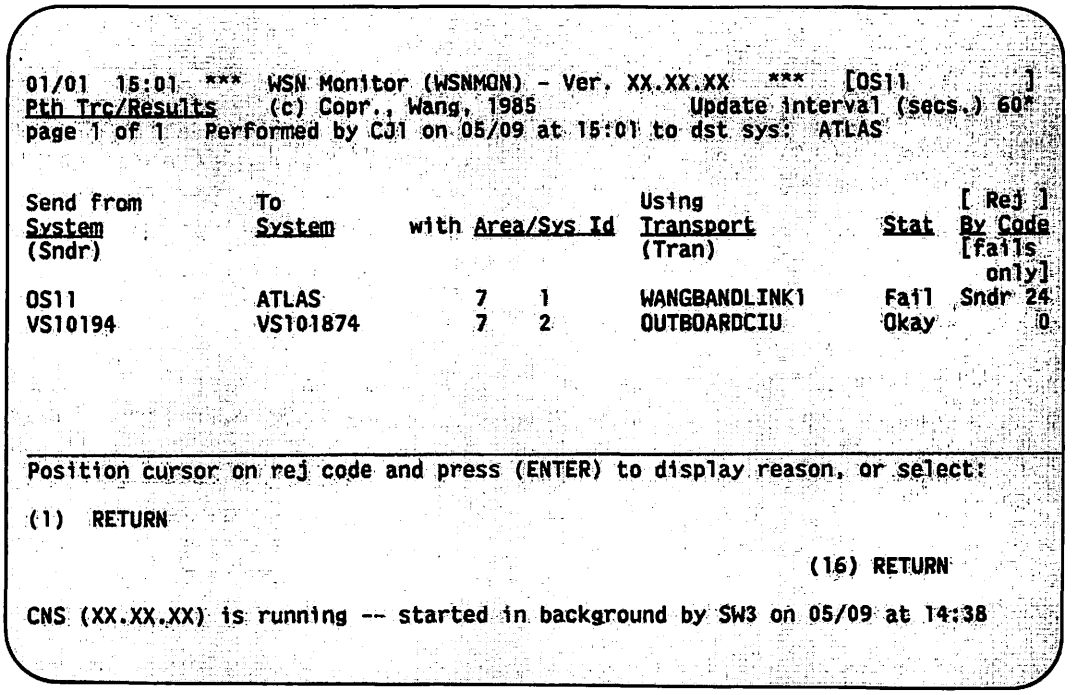

Figure 6-4. Path Trace Results Screen

The Path Trace Results screen displays the results of the path trace that you submitted. Like most WSNMON screens, the modifiable Update interval field appears in the top right-hand corner. A message at the top of the screen gives the user ID of the user who submitted the path trace, the date and time the trace was submitted, and the name of the destination system to which the trace was submitted. The following fields display information on the path trace:

- Send from System -- The name of the system from which the path trace was sent.

- To System -- The name of the system to which the path trace was sent by the system identified in the Send from System field. N/A (Not Available) appears in this field if no routes are defined to the system.

- Area/Sys Id -- The area and system ID of the system identified in the To System field. If no routes are defined to that destination system, N/A appears in the To System field and the Area/Sys Id field displays an area and system ID of 0.

- Using Transport -- The name of the WSN transport over which the path trace message was transmitted from the system identified in the Send from System field to the system identified in the To System field, and back. N/A (Not Available) appears in this field if no routes are defined to the system identified in the To System field.

- Stat -- Indicates whether or not the path trace was successful. The following status types appear in this field:

  - Fail -- The path trace failed. The system to which the trace was sent could not be successfully contacted.

  - Okay -- The path trace was successful. The system to which the trace was sent was successfully contacted.

- [Rej] By Code [fails only] -- Information appears in this field only if the path trace failed. If the path trace was rejected by the transport, 'Tran' and a reason code for the failure appear. If the path Trace was rejected by the system identified in the Send from System field, the word 'Sndr' and a reason code for the failure appear. Refer to Appendix A for a description of reason codes.

If the path trace failed, you may position the cursor under the reason code and press ENTER to display the message associated with the reason code. This message appears at the bottom of the screen. It gives a brief description of the reason for the contact failure.

The following PF keys appear at the bottom of the Path Trace Results screen:

- PF1 (Return) -- Press PF1 to return to the previous screen.

- PF16 (Return) -- Press PF16 to return to the previous screen.

The results of each path trace submitted from the local system is logged. The Path Trace function enables you to display the history of path trace events involving the local system. You may display the history of events from the Path Trace screen. To display the history of events, position the cursor under the name of the appropriate system and press ENTER. The results of the last path trace submitted from the local system to the selected system appear on the Path Trace results screen. If no path trace has ever been submitted to the selected system, an appropriate message appears.

6.4 PATH COST MODIFICATION

WSNMMN now enables you to modify path costs for routes on-line through the Control/Monitor Routes function. Path costs are configured through WSNEDIT. Refer to Chapters 1 and 5 of the WSN VS Network Configuration Guide and Chapters 1 and 3 of this bulletin for more information on path cost configuration.

Use the path cost modification function sparingly. At this time, it should not be used as a means to control network congestion. For example, use it when you know that an adjacent system is going to be down for maintenance and you want to route traffic by way of an alternate route. Remember that CNS selects the path with the lowest path cost if more than one path is configured between the local system and a destination. You may adjust the path costs so that the adjacent system is assigned a path cost higher than an alternate path. CNS will then select the alternate path to transmit messages to a destination.

To modify path costs, perform the following steps:

1. Press PF6 from the WSNMON main menu (see Figure 6-1). The Control/Monitor Routes Page screen appears (see Figure 6-5).

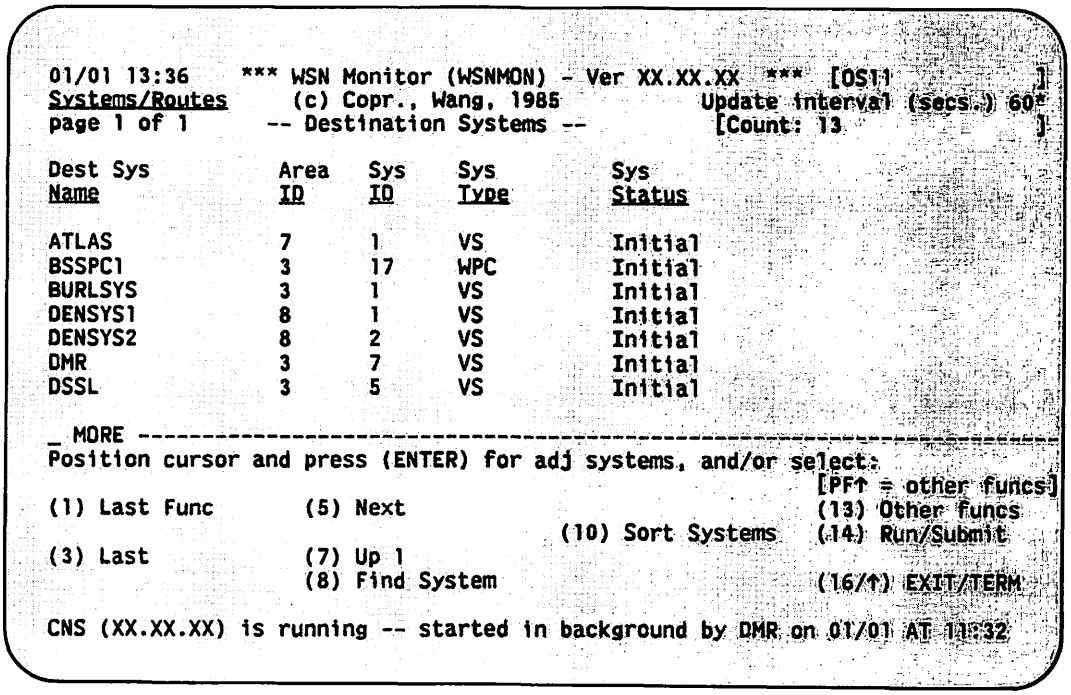

Figure 6-5. Control/Monitor Routes Page Screen

2. Select a destination to which paths are defined from the Control/Monitor Routes Page screen. Press ENTER. The new Adjacent System List menu appears (see Figure 6-6).

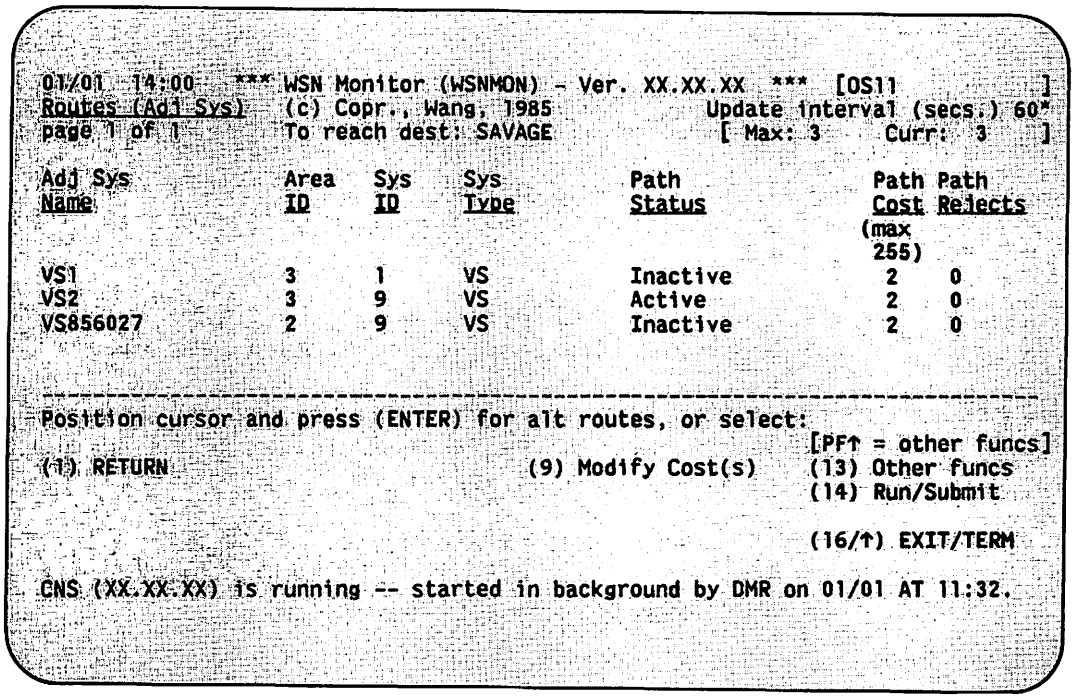

Figure 6-6. Adjacent System List Menu

The new Adjacent System List menu differs from the original Adjacent System List menu (see Figure 5-4 in the WSN VS Network Control and Monitoring Guide). The new menu enables you to modify path costs. To modify path costs, press PF9 (Modify Costs) from the new Adjacent System List menu. The Path Cost fields on the screen appear in Modify (highlighted) mode. Enter the path costs in the fields associated with the appropriate paths. Path cost values may range from 0 to 255. Press ENTER. The Path Cost fields appear in Display mode, showing the path costs that you entered.

Modifying path costs on-line does not change the path costs you entered through WSNEDIT. The path costs that you enter through WSNEDIT are initial values that prioritize paths when CNS is brought up. The path cost for the route that you gave priority is then dynamically updated based on network traffic. You can use the path cost modification feature of WSNMON to switch traffic to an alternate path.

Refer to the WSN VS Network Control and Monitoring Guide for information on the PF keys other than PF9.

6.5 MONITORING RELATIVE COSTS

The Transports to Adjacent Systems menu (see Figure 5-5 in the WSN VS Network Control and Monitoring Guide) has been modified to enable you to monitor the current relative cost associated with an adjacent system as well as the factors that make up the relative cost. To access the new Transports to Adjacent Systems menu, perform the following steps:

1. Press PF6 from the WSNMON main menu (see Figure 6-1). The Control/Monitor Routes Page screen appears (see Figure 6-5).

2. Select a destination to which paths are defined from the Control/Monitor Routes Page screen. Press ENTER. The new Adjacent System List menu appears (see Figure 6-6).

3. Select the adjacent system associated with the relative cost you want to monitor. Press ENTER. The new Transports to Adjacent Systems menu appears (see Figure 6-7).

```
01/01 14:02  *** WSN Monitor (WSNMON) - Version XX.XX.XX ***  [OS11                ]
Routes (Alt)     (c) Copr., Wang, 1985                Update interval (secs.) 60*
page 1 of 1  D:  SAVAGE        A:  NETVS              [ Max:  2     Curr:  1-   ]

Trans            Trans         Route            Trans   Conn.   Cong.   Relative
Name             Type          Status           Cost -  Bias  + Level = Cost
                                                [ for release 3 and higher    ]

PTPTLINK         WSN PtPt/sw     Active         2       2       4       4


-------------------------------------------------------------------------------
Position cursor and press (ENTER) for transport display, or select:
                                                          [PF↑ = other funcs]
(1) RETURN                                                (13) Other funcs
                                                          (14) Run/Submit

                                                          (16/↑) EXIT/TERM

CNS (XX.XX.XX) is running -- started in background by DMR on 01/01 AT 11:32.
```

Figure 6-7. Transports to Adjacent Systems Menu

The local VS uses the transports listed on the new Transports to Adjacent Systems menu to send messages to and receive messages from the adjacent system. The top of the menu displays the maximum and current number of transports that can connect the local VS and the adjacent system. The top of the menu also displays the name of the destination system to which messages will be routed by way of the adjacent system. Like other WSNMON screens, the menu enables you to modify the update interval.

The fields that display transport information are as follows:

- TRANSPORT NAME -- The name of the transport as defined in the local-view configuration file when WSNEDIT was run (refer to Chapter 4 of the WSN VS Network Configuration Guide).

- TRANSPORT TYPE -- The type of transport.

- ROUTE STATUS -- The status of the route. The status types are as follows:

  - Active -- A transport connection is currently established to the adjacent system across the transport.

  - Inactive -- The transport is enabled (i.e., capable of establishing a transport connection), but is not currently supporting a transport connection to the adjacent system.

  - Disabled -- The transport is not capable of supporting a transport connection. To enable the transport, you must access the Control/Monitor Transports function (refer to Chapter 2 of the WSN VS Network Control and Monitoring Guide).

- TRANS COST -- The transport's base cost.

- CONN. BIAS -- The transport's connection bias. Refer to Chapter 1 in the WSN VS Network Configuration Guide and Chapters 1 and 2 of this document for an explanation of connection bias.

- CONG. LEVEL -- The transport's current congestion factor. Refer to Chapters 1 and 2 for an explanation of congestion level factors. A congestion level of 0 means there is no traffic on the transport if the transport is active. 0 always appears in this field if the transport is inactive.

- RELATIVE COST -- Relative cost is equal to

```
  TRANS (Base) Cost
- CONN. BIAS
+ CONG. LEVEL
```

  Refer to Chapter 1 for an explanation of relative cost.

Several PF keys appear at the bottom of the menu. Refer to Chapter 1 in the WSN VS Network Control and Monitoring Guide for an explanation of these PF keys.

You can position the cursor next to the transport ID and press ENTER to display the Transport Summary screen for that transport (see Figure 2-2 in the WSN VS Network Control and Monitoring Guide). Chapter 2 of the WSN VS Network Control and Monitoring Guide describes transport-specific information that can be viewed using WSNMON.

APPENDIX A
TRANSPORT REASON CODES, CNS REASON CODES, AND WSNEDIT ERROR MESSAGES

A.1 OVERVIEW

This appendix lists reason codes received from WSN transports. Section A.2 lists the reason codes generated by the IDS transport. Section A.3 lists the reason codes generated by the other WSN transports. Section A.4 lists the reason codes generated by WSNMON. These codes give reasons for network events. The codes and associated messages can be viewed on the log display section of the WSNMON main menu. These codes and messages are new for Release 8.21. Other codes and messages are listed in Appendix B of the WSN VS Network Control and Monitoring Guide.

This appendix also lists WSNEDIT error messages. These messages and associated descriptions may be found in section A.5.

A.2 IDS TRANSPORT REASON CODES

This section lists transport codes and associated messages generated by the IDS VS transport components as they appear in WSNMON.

A.2.1 General Codes

- 00 -- Link disabled by user.
- 01 -- LU is in use.
- 02 -- Configuration file error.
- 03 -- SNAMCP is not compatible with current CNS; need SNAMCP release 02.05.00 or later.
- 04 -- LU not available or LU not configured. Check line and LU activation. Verify CICS-IDS and WSNEDIT and SNAEDIT configurations.

- 05 -- Controller Off-line.
- 06 -- Session not active.
- 07 -- Keyboard locked.
- 08 -- New device status invalid.
- 09 -- LU not attached.
- 10 -- Invalid request code. Indicates CNS and MCP are out of synchronization.
- 11 -- MCP does not exist. CNS will submit it.
- 12 -- MCP buffer area insufficient.
- 13 -- Invalid PU name or address. Check WSNEDIT and SNAEDIT.
- 14 -- Invalid LU. Check CICS/IDS, WSNEDIT, or SNAEDIT configs.
- 15 -- MCP message pending.
- 16 -- Invalid data length.
- 17 -- Invalid buffer sequence field.
- 18 -- No MCP message pending.
- 19 -- Invalid timer value.
- 20 -- Activation level too low. Usually indicates CICS is down.
- 21 -- Direction conflict.
- 22 -- No sessions selected.
- 23 -- Transfer in progress.
- 24 -- Negative response from Host. SNA error has been received.
- 25 -- Activation level drop. The line or CICS has gone down. CNS will attempt to reestablish the session.
- 26 -- Sequence error.
- 27 -- CANCEL received.
- 28 -- Invalid response code received. Check SNAMCP and the DLP.
- 29 -- LU-W (transparency) not supported by SNAMCP.

- 31 -- LU is already attached.
- 34 -- Host Timeout (IDS has not responded).
- 35 -- Invalid state for SIGNON command.
- 36 -- MCP inactivitiy timeout. Check MCP and DLP.
- 37 -- Invalid command issued by Switching Manager.
- 38 -- Attach retry exhausted.
- 39 -- SIGNON retry exhausted (IDS did not send a SIGNON).
- 40 -- SIGNOFF retry exhausted (IDS did not send a SIGNOFF).

A.2.2 Negative Response Codes

Codes 41 through 49 are received from IDS.

- 41 -- IDS not active.
- 42 -- Link is disabling.
- 43 -- Invalid state for SIGNON.
- 44 -- Invalid revision number.
- 45 -- Link is enabling.
- 46 -- Invalid state for SIGNOFF.
- 47 -- Link is not enabled.
- 48 -- Data loss detected (data chaining error).
- 49 -- No data in data message.
- 50 -- Invalid Subnet Class.

Codes 52 through 59 are sent to IDS by the SNA Link Driver.

- 52 -- Link is disabling.
- 53 -- Invalid state for SIGNON.
- 54 -- Invalid revision number.
- 55 -- Link is enabling.
- 56 -- Invalid state for SIGNOFF.
- 57 -- Link is not enabled.
- 58 -- Data loss detected (data chaining error).
- 59 -- No data in data message.
- 60 -- Invalid Subnet Class.

A.2.3 Standard Sign-off Return Codes

- 61 -- Host initiated SIGNOFF.
- 62 -- VS initiated SIGNOFF.
- 63 -- Host SIGNOFF retry.
- 64 -- Host initiated SIGNOFF, IDS shutdown.

NOTE

A host-initiated SIGNOFF causes the link to be signed off of IDS, but still logged on to CICS. A VS user or an IDS user can re-enable the link after it has been disabled by a host-initiated SIGNOFF.

A VS-initiated SIGNOFF causes the Link Driver's LUs to get signed off of IDS, logged off of CICS, and detached from MCP. Thus, only a VS user may re-enable the link after a VS-initiated SIGNOFF.

A.2.4 Protocol Violation Codes

The following protocol violation codes are sent by the sender LU to IDS:

- 67 -- Invalid subnet header length.
- 68 -- Link disabled.
- 69 -- Invalid subnet header type.
- 70 -- Response received in an invalid state.
- 71 -- General code for protocol violation sent by sender LU.

The following protocol violation codes are received by the sender LU from IDS:

- 74 -- Invalid subnet header length.
- 75 -- Link disabled.
- 76 -- Invalid subnet header type.
- 77 -- Response received in an invalid state.
- 78 -- Invalid terminal ID.
- 79 -- General code for protocol violation sent to sender LU.

The following protocol violation codes are sent by the receiver LU to IDS:

- 82 -- Invalid subnet header length.
- 83 -- Link disabled.
- 84 -- Invalid subnet header type.
- 85 -- Response received in an invalid state.
- 86 -- ENCODE byte invalid.
- 87 -- Invalid SIGNOFF reason code.
- 88 -- General code for protocol violation sent by receiver LU.

The following protocol violation codes are received by the receiver LU from IDS.

- 91 -- Invalid subnet header length.
- 92 -- Link disabled.
- 93 -- Invalid subnet header type.
- 94 -- Response received in an invalid state.
- 95 -- Invalid terminal ID.
- 96 -- General term for protocol violation sent to receiver LU.

A.2.5 Codes Issued to Switching Manager as Reason for WRITE Undeliverable

- 98 -- Link not enabled, (WRITE cmd preceded ENABLE cmd).
- 99 -- Link disabling, (WRITE cmds not yet sent).

A.2.6 Miscellaneous IDS Reason Codes

- 100 -- IDS transport not available on system.
- 101 -- General reason code for negative response sent to IDS.
- 102 -- General reason code for negative response received from IDS.

A.3 REASON CODES FOR OTHER WSN TRANSPORTS

This section lists codes from non-IDS WSN transports.

- /* 00 */ -- Accepted.
- /* 01 */ -- Remote TC path open error.
- /* 02 */ -- Remote link is disabled.
- /* 03 */ -- All remote (virtual) circuits are in use.
- /* 04 *- -- Invalid local device number.
- /* 05 */ -- Local DLP not running.
- /* 06 */ -- All local (virtual) circuits are in use.
- /* 07 */ -- Local DLP has not responded.
- /* 08 */ -- Transportation error.

- /* 09 */ -- Received invalid packet.
- /* 10 *- -- Communications lost with remote DLP.
- /* 11 */ -- Accept received while error pending.
- /* 12 */ -- Data received in response to call.
- /* 13 */ -- Accept/clear received while data transferring.
- /* 14 */ -- Data received after clear request.
- /* 15 */ -- Call request timed out.
- /* 16 */ -- Clear request timed out.
- /* 17 */ -- Packet layer timeout.
- /* 18 */ -- Invalid packet number received from sender.
- /* 19 *- -- Invalid packet number received from receiver.
- /* 20 */ -- Invalid interrupt.
- /* 21 */ -- Link failure, no response from remote DLP.
- /* 22 */ -- Session Manager terminate request.
- /* 23 */ -- DLP request.
- /* 24 */ -- DLP crash.
- /* 25 */ -- Local device I/O error.
- /* 26 */ -- Received error IOSW (received an error from the switching layers IO module).
- /* 27 */ -- Configuration error.
- /* 28 */ -- Session Manager reject.
- /* 29 */ -- DLP powered off.
- /* 30 */ -- DLP microcode error.
- /* 31 *- -- Invalid WangNet driver state.
- /* 32 */ -- DLP has not responded to deactivation.
- /* 33 */ -- Outcall timer expired.
- /* 34 */ -- Waiting for previous outcall response.

- /* 35 */ -- Local DLP not responding.
- /* 36 */ -- Previous active line establishment failed.
- /* 37 */ -- Switched line establishment failed.
- /* 38 *- -- Local switched line already connected.
- /* 39 */ -- Leased line is not up.
- /* 40 */ -- System name is not in DLP tables.
- /* 41 */ -- DLP malfunction.
- /* 42 */ -- Line is close pending (enablement).
- /* 43 */ -- Switched line, (accepting) incoming calls only.
- /* 44 */ -- Close requested (dial timer).
- /* 45 */ -- Recovery timeout.
- /* 46 */ -- Local device OPEN error.
- /* 47 */ -- Unknown system name.
- /* 48 */ -- DLP currently in use.
- /* 49 */ -- No CNS systems on link.
- /* 50 */ -- Create port failed.
- /* 51 */ -- XMIT to Session Manager failed.
- /* 52 */ -- Remote call request in progress.

A.4 CNS REASON CODES

This section lists CNS reason codes and associated messages that appear through WSNMON.

- 01 -- Unacceptable CNS revision level.
- 04 -- Lost message.
- 08 -- Inactive route.
- 09 -- Undeliverable received.
- 11 -- No alternate path exists.

- 12 -- No routing information available. This message appears when a route to a destination has not been configured through WSNEDIT, or this information cannot be accessed in the local-view configuration file.

- 14 -- Inactive transport.

- 15 -- System restarted.

- 16 -- Invalid protocol command.

- 17 -- No active path.

- 18 -- Transport table limit exceeded. This message appears when too many transports have been configured through WSNEDIT. The limit is 50 transports per system.

- 19 -- Invalid transport ID.

- 20 -- No path exists.

- 21 -- No available route.

- 23 -- System not reachable.

- 24 -- Feature not supported.

A.5 WSNEDIT ERROR MESSAGES

This section lists and describes error messages you may see while running WSNEDIT. Each bulleted item lists the message followed by the description.

- Enter VS, OIS, WPC, Alliance, 2200, WOA, or IDS -- Appears when you enter an invalid system type in the System Type field of the System Definition screen (see Figure 3-4). The message describes the valid system types you may enter.

- If WSN with CNS is not installed, please answer NO -- Appears when you enter YES in the Shall File Transfer use CNS, or Has Store and Forward been Installed fields of the System Definition screen (see Figure 3-4), and the system you are defining does not have CNS installed. You must enter NO in these fields if the system does not have CNS installed.

- WSN with CNS is not supported for the given system type -- Appears when you enter YES in the Has WSN with CNS been installed field of the System Definition screen (see Figure 3-4) and if the system type you entered in the System Type field is neither a VS nor a PC system. Only VS and PC systems can have CNS installed.

- Name already exists -- Appears when you enter an area name in the Area Name field of the Area Definition screen (see Figure 3-9 in the WSN VS Network Configuration Guide) or a system name in the System Name field of the System Definition screen (see Figure 3-4) and the area or system name has already been defined in the directory. No two area names within a network and no two system names within an area can be the same. This message also appears when you attempt to assign the same name to two transports and the same name to two service windows.

- Area ID already exists -- Appears when you enter an area ID in the Area ID field of the Area Definition screen (see Figure 3-9 in the WSN VS Network Configuration Guide) and the area ID has already been defined in the directory. No two areas in the network can have the same area ID.

- System ID already exists -- Appears when you enter a system ID in the System ID field of the System Definition screen (see Figure 3-4) and the system ID has already been defined in the directory. No two systems in the same area can have the same system ID.

- System nmt found -- Appears when you attempt to enter a system name in the Admin System Name or Primary Distribution Point field of the Area Definition screen (see Figure 3-9 in the WSN VS Network Configuration Guide) and the system name has not yet been defined. You must define the system name in the directory before you can enter the name in these fields. The message also appears when you specify a system that is not defined in the directory as the override Store and Forward next hop.

- Please delete all systems from the area, first -- Appears when you attempt to delete an area from the Area List menu (see Figure 3-2) and you have not deleted all the systems in the area first. You must use PF12 to delete all system records from the Area System List menu (see Figure 3-10 in the WSN VS Network Configuration Guide) for that area before you can delete the area record.

- The Distribution Point must have WSN with CNS installed -- Appears when you enter a system name in the Primary Distribution Point field of the Area Definition screen (see Figure 3-9 in the WSN VS Network Configuration Guide) and the system has not been defined as having CNS installed in the directory. A distribution point must have CNS installed.

- The Distribution Point must have Store and Forward installed -- Appears when you enter a system name in the Primary Distribution Point field of the Area Definition screen (see Figure 3-9 in the WSN VS Network Configuration Guide) and the system has not been defined as having CNS installed in the directory. A distribution point must have CNS installed.

- File Transfer use CNS is not supported for the given system Type -- Appears when you enter YES in the Shall File Transfer use CNS field of the System Definition screen (see Figure 3-4) and you defined the system as an OIS, Alliance, 2200, IDS or WOA system. File Transfer may use CNS only on VS an PC systems.

- The Admin System must be a VS or WPC -- Appears when you enter the name of a system that is not defined in the directory as being a VS or PC in the Admin System field of the Area Definition screen (see Figure 3-9 in the WSN VS Network Configuration Guide). Only a system defined as being a VS or PC in the directory may be the admin system for the area. The admin system acts as an Area Control Center to synchronize directory records in the area.

- This system is the network center. It must be a VS -- Appears when you enter a system type other than VS in the System Type field of the System Definition screen (see Figure 3-4) and the system was defined as the network center when WSNDIRM was run. The network center must always be a VS.

- This system is the network center. It must have WSN with CNS installed -- Appears when you enter NO in the Has WSN with CNS been installed field of the System Definition screen (see Figure 3-4) and the system you are defining was defined as the Network Center when WSNDIRM was run. You must enter YES in the Has WSN with CNS been installed field if the system you are defining is the network center.

- Please delete systems from transport and/or services, first -- Appears when you attempt to delete a system record from the directory and the system is still defined in the local-view configuration file as residing on a transport or as having a WSN service installed (e.g., file transfer). Before you can delete the system record from the directory, you must access Manage Transports or Manage Services and delete the system definition from the appropriate transport or service.

- Please delete all systems from the transport, first -- Appears when you press PF12 and ENTER to delete a transport from the Transport List menu (see Figure 3-5) and you did not delete the systems defined as sharing the transport. You must access the system definitions for the transport by selecting the transport from the Transport List menu and pressing ENTER. Then you must delete the system definitions.

- Target system must be a VS -- Appears if you attempt to enter a target system that is not a VS when you begin to create or edit a configuration file. The target system for which you create or edit a configuration file must be a VS system.

- Target system must have WSN with CNS installed to manage routing -- Appears when you attempt to access the Manage Routing function from the WSNEDIT main menu (see Figure 3-1) and the target system that you specify is not defined as having CNS installed in the directory. You must access the System Definition screen (see Figure 3-4) for that system and enter YES in the Has WSN with CNS been installed field. Only systems with CNS installed may manage routing.

- The value for each congestion level must be greater than the previous level -- Appears when you enter a value in one of the congestion level fields on the General Transport Definition screen (see Figure 3-7) and the value is equal to or less than the value assigned to the previous level.

- Warning - DLP not yet defined via GENEDIT -- Appears when you enter a DLP in the DLP Address field of the General Transport Definition screen (see Figure 3-7) that has not been defined in the active system configuration file through GENEDIT.

- The maximum cable address allowed is 3FFF -- Appears when you enter a cable address for a system on a Wang Band transport that is greater than 3FFF. Valid cable addresses may range from 01 to 3FFF.

- Primary is not valid for the given system type -- Appears if you enter 01 as the Poll Address for a system that is not a VS when you configure a Multipoint transport (see Figure 4-8 in the WSN VS Network Configuration Guide). Entering 01 as the Poll Address for a system defines it as the Primary on a Multipoint transport. Only a VS may be the Primary.

- Duplicate addresses are not allowed -- Appears when you assign the same Poll Address to two or more systems in a Multipoint configuration (see Figure 4-8 in the WSN VS Network Configuration Guide). Each system in a Multipoint configuration must have a unique hexadecimal address ranging from 01 (for the Primary only) to FE.

- The maximum poll address allowed is FE -- Appears when you attempt to assign a Poll Address greater than FE to a system on a Multipoint transport.

- Least cost path is not an adjacent system -- Appears when you specify a nonadjacent system as the least cost path on the Destination Systems and Areas menu (see Figure 4-4). Only an adjacent system can be the least cost path. Check your transport configuration to determine which systems are adjacent and nonadjacent. Refer to Chapter 1 of the WSN VS Network Configuration Guide for a definition of adjacent and nonadjacent.

- Override system is not in the target system area -- Appears when you specify an override system that is not in the target system's area as the Store and Forward Next Hop to Store and Forward systems in the target system's area (see Figure 4-7). Only a Store and Forward system in the target system's area can be specified as the Store and Forward Next Hop to systems in the area. Access Manage Areas and check the directory for a list of systems in the target system's area.

- Override system is not a store and forward system -- Appears when you specify a system that is not defined as having Store and Forward installed as an override next hop on the Store and Forward Routing menu (see Figure 4-7). An override system must be defined as having Store and Forward installed in the directory (see Figure 3-4).

- Target system cannot be an override system -- Appears when you specify the target system as an override next hop (see Figure 4-7). The target system can never be an override.

- The maximum number of Adjacent Systems is 512 (128 for OS prior to 6.40) -- Appears when the total number of adjacent systems (i.e., all adjacent systems on all transports) exceeds 512. VS operating systems prior to Release 6.40 only supported 128 adjacent systems.

- The maximum number of Transports is 50 -- Appears when you attempt to define more than 50 transports.

- The maximum number of systems in an Area is 300 -- Appears when you attempt to define more than 300 systems in one area.

- The maximum number of Areas in the network is 150 -- Appears when you attempt to define more than 150 areas in the network.

- The maximum number of systems in the network is 6500 -- Appears when you attempt to define more than 6500 systems in the network.

- The maximum number of paths to a destination is 300 -- Appears when you attempt to define more than 300 paths (i.e., next hops) to a destination.

- Default service window may not be deleted -- Appears when you attempt to delete the default window from the Service Window screen (see Figure 5-3). The default window can not be deleted.

- Please delete destination from window, first -- Appears when you attempt to delete a window from the Service Window screen (see Figure 5-3) and you did not delete the destinations assigned to the window first. You must delete the destinations assigned to the window before you can delete the window.

- The maximum number of service windows is 50 -- Appears when you attempt to define more than 50 service windows.

- hh (hours): values must be 0 thru 23; mm (minutes): values must be 0 thru 59 -- Appears when you attempt to enter a value greater than 23 hours or 59 minutes on the Service Window Parameters screen (see Figure 5-4).

- If Poll is YES then Turn Around must also be YES -- Appears when you enter YES in the Poll field and NO in the Turn Around field for a given destination on the Manage Service Window Destinations screen (see Figure 5-7). If you enter YES in the Poll field for a given destination, you must also enter YES in the Turn Around field for that destination.

- Target system must have WSN with CNS installed to manage service windows -- Appears when you attempt to access the SERVICE WINDOWS configuration function through the Edit Service Definitions menu (see Figure 5-2) and the Target System for which you are creating or modifying the configuration file is not defined as having CNS installed in the directory. Only systems that have CNS installed can manage service windows.

- Target system cannot be a least cost path -- Appears when you attempt to specify the target system as a least cost path to a destination through the manage routing function. Only systems adjacent to the target system can be specified as the least cost path.

- The given Target System is not defined in any area -- Appears when you attempt to create or edit a configuration file for a given target system and the system is not defined in the directory. You can continue to create the file even though the system is not defined in the directory.

- Note - Target System in the configuration file is not defined in any area -- Appears when you continue to edit a configuration file for a target system not defined in the directory. You can continue editing the file.

- Run X25 INSTALL software to convert the input configuration file or Press PF12 to delete PRIOR RELEASE X.25 Transport -- Appears on the Transport List menu when the X.25 records for a transport labelled PRIOR RELEASE X.25 in the local-view configuration file have not been converted to make them compatible with the current WSN standard components release. There are two options available. A Wang Analyst could run the X.25 conversion utility to update the existing records or PF12 on the Transport List menu (see Figure 3-5) can be pressed to delete the incompatible transport records from the local-view configuration file. Once deleted, new X.25 configuration records can created under the current WSN standard components release.

- Run X25 INSTALL software to convert the input configuration file or press ENTER to delete systems from PRIOR RELEASE X.25 Transport -- Appears on the Transport List menu (see Figure 3-5) when the X.25 records for a transport labelled PRIOR RELEASE X.25 in the local-view configuration file have not been converted to make them compatible with the current WSN standard components release. There are two options available. A Wang Analyst could run the X.25 conversion utility to update the existing records or you can select the transport and press ENTER to display the systems on the transport. Once displayed, you delete the DTE addresses of the systems on the transport, press ENTER and return to the Transport List menu (see Figure 3-5). When you return to the Transport List menu, the message "Run X25 INSTALL software to convert the input configuration file or press PF12 to delete PRIOR RELEASE X.25 Transport" appears. Refer to the description for this message.

- Transport type is PRIOR RELEASE X.25. Please delete all systems -- Appears when you display the DTE addresses of systems on an X.25 transport labelled PRIOR RELEASE X.25 on the Transport List menu (see Figure 3-5). Delete the DTE addresses of the systems on the transport, press ENTER and return to the Transport List menu (see Figure 3-5). When you return to the Transport List menu, the message "Run X25 INSTALL software to convert the input configuration file or press PF12 to delete PRIOR RELEASE X.25 Transport" appears. Refer to the description for this message.

- X.25 network file access error -- Appears when WSNEDIT cannot read information from the X.25 network file (not to be confused with the local-view configuration file).

- X.25 network file open error -- Appears when WSNEDIT cannot read information from the X.25 network file (not to be confused with the local-view configuration file).

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