Perle 594
Reference Guide

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How To Use This Guide

The *Perle 594 Reference Guide* provides a set of reference material for the 594 family of controllers. Some models of the 594 may not support all features described in this manual. Please refer to the appropiate User's Guide for details on the features that are supported.

Configuration Examples	Read *Chapter 1: Configuring the AS/400* for common examples on how to configure the AS/400.
Configuration Parameters	Read *Chapter 2: Understanding Configuration Parameters* for an alphabetical list of parameters that require configuration on the AS/400.
Problems	Read *Chapter 3: Message Codes and SRC's* for a list of the error codes that can be displayed on front panels or recorded in error logs.
Ethernet Address Formats	Read *Chapter 4: Specifying Ethernet Address Formats* for information on Ethernet addressing formats.
594 and AS/400 TCP/IP Configuration	Read *Chapter 5: TCP/IP White Paper* for information on configuration of TCP/IP controllers

Conventions used in this guide

Information that you enter by typing on a workstation keyboard, or on the Perle 594M key panel, is shown in **`bold Courier`** typeface characters.

Buttons that you press on a workstation keyboard, or on the Perle 594M key panel, are shown in **bold** characters.

All titles are shown in italic characters; titles include: *book titles*, *chapter titles*, and *section titles.*

Chapter 1: AS/400 Configuration Examples

This chapter provides configuration examples for the following connections:

- SDLC Leased
- X.21 Switched
- X.25 Switched
- X.25 Permanent
- AS/400 Token-Ring Attachment
- AS/400 Ethernet Attachment
- SDLC Leased through SNA SubArea Network
- SDLC Leased through APPN Network
- AS/400 Frame Relay Attachment and FR-TR Bridge
- AS/400 Frame Relay Attachment and IP Routing (with 594 IP Routing Feature only)
- AS/400 TCP/IP Token-Ring Attachment
- AS/400 TCP/IP Ethernet Attachment and Twinax IP Routing (with 594 IP Routing Feature only)
- AS/400 TCP/IP Frame Relay Attachment

These examples demonstrate how configuration parameters on the AS/400 relate to those on the Perle 594. These parameters are listed under the title of the configuration screen on which they can be found (on the AS/400 or the Perle 594).

Refer to *Chapter 2* for more information on Perle 594 parameters, or to the appropriate AS/400 documentation on AS/400 parameters.

SDLC Leased

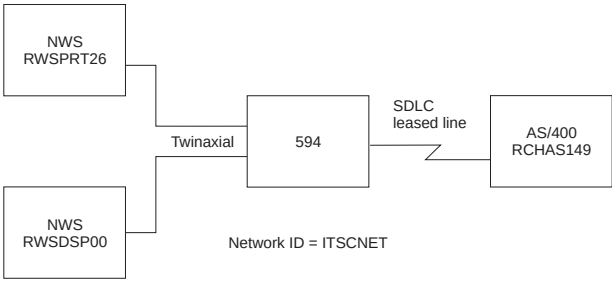


Fig. 1: SDLC Leased configuration

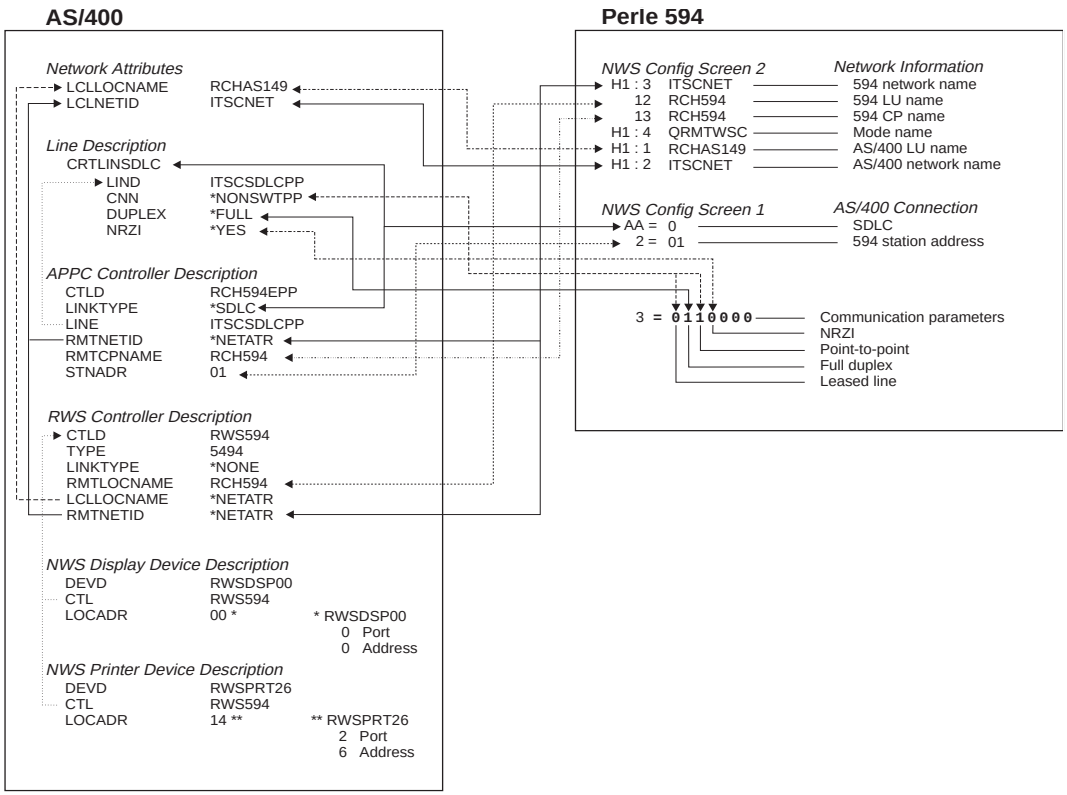


Fig. 2: SDLC Leased configuration cross-reference

X.21 Switched

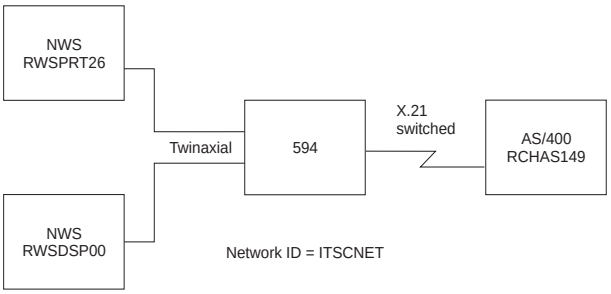


Fig. 3: X.21 Switched configuration

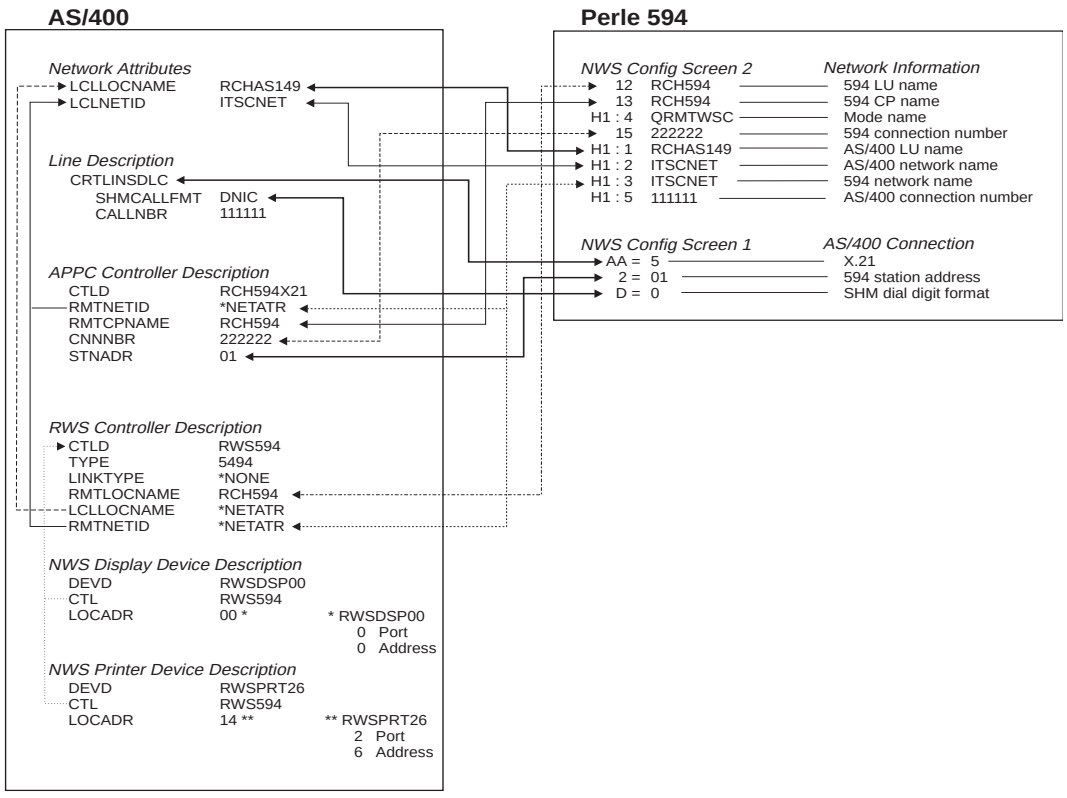


Fig. 4: X.21 Switched configuration cross-reference

X.25 Switched

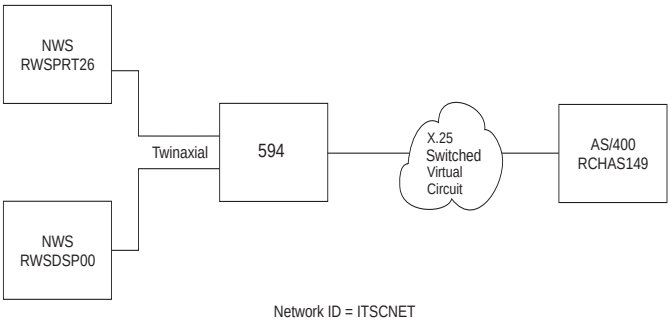


Fig. 5: X.25 Switched configuration

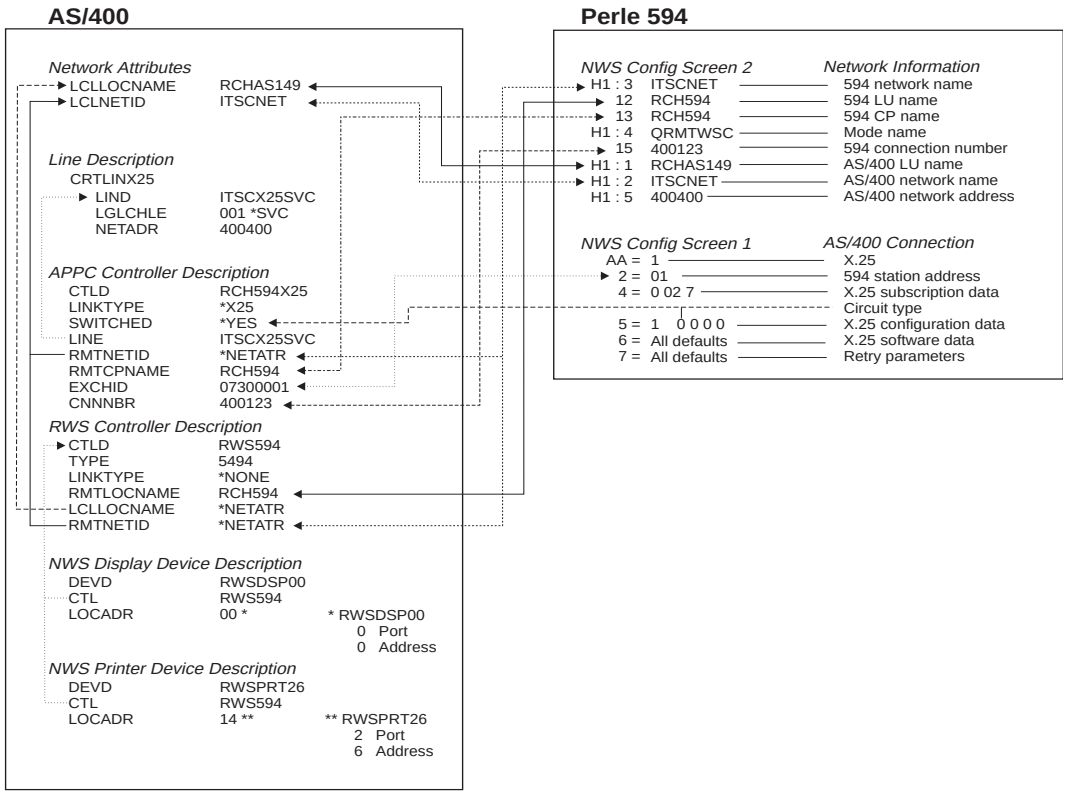


Fig. 6: X.25 Switched configuration cross-reference

X.25 Permanent

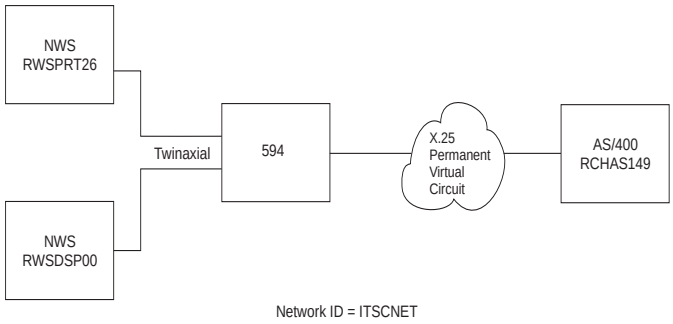


Fig. 7: X.25 Permanent configuration

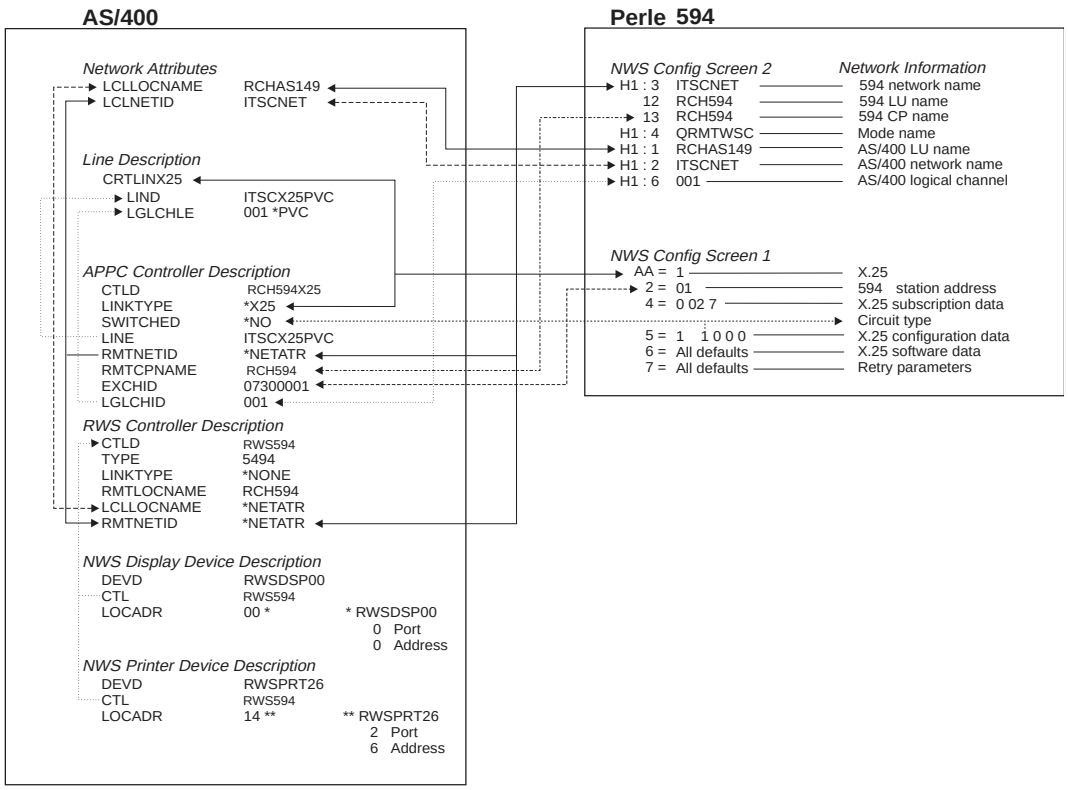


Fig. 8: X.25 Permanent configuration cross-reference

AS/400 Token-Ring Attachment

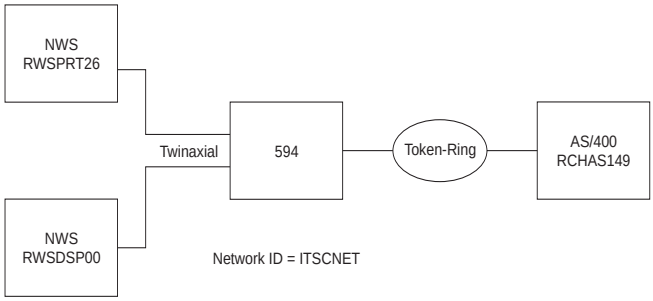


Fig. 9: AS/400 Token-Ring configuration

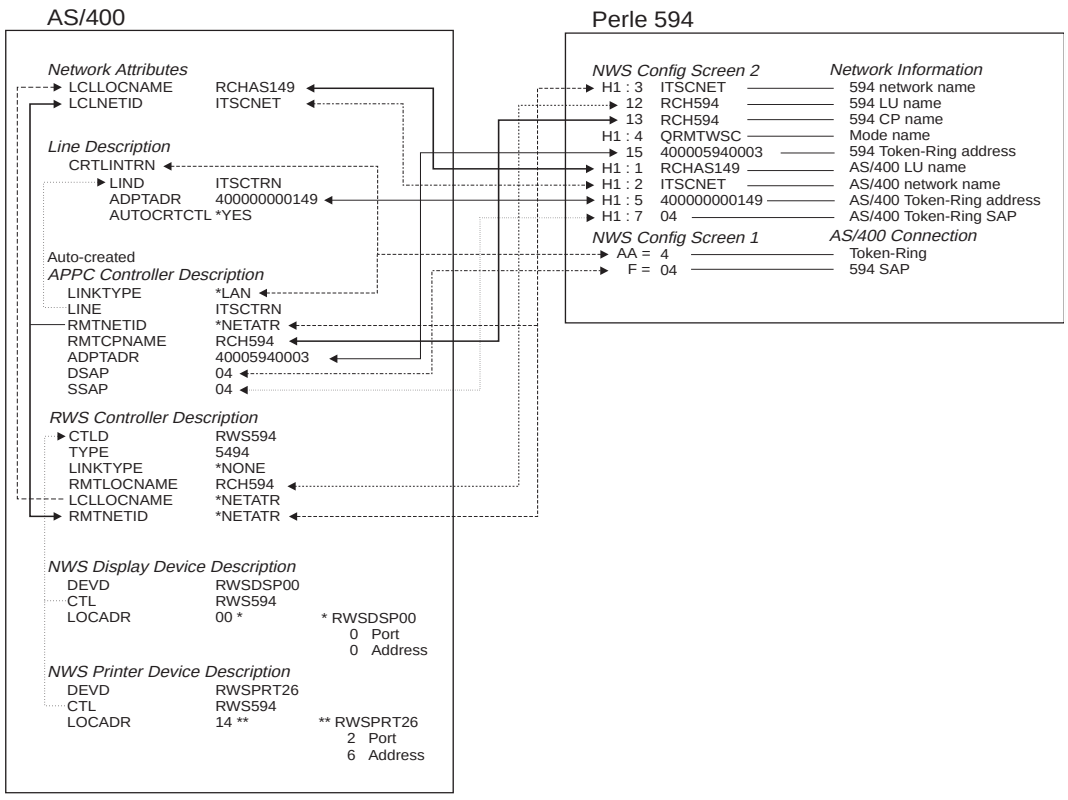


Fig. 10: AS/400 Token-Ring configuration cross-reference

AS/400 Ethernet Attachment

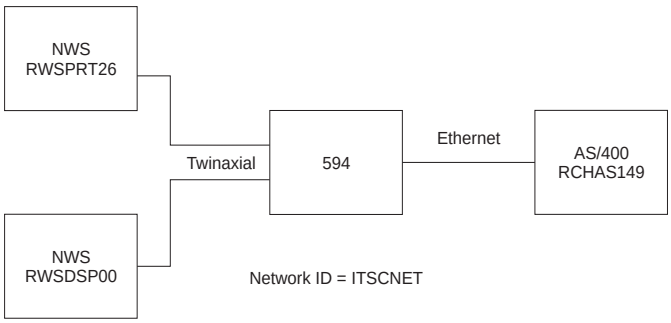


Fig. 11: AS/400 Ethernet configuration

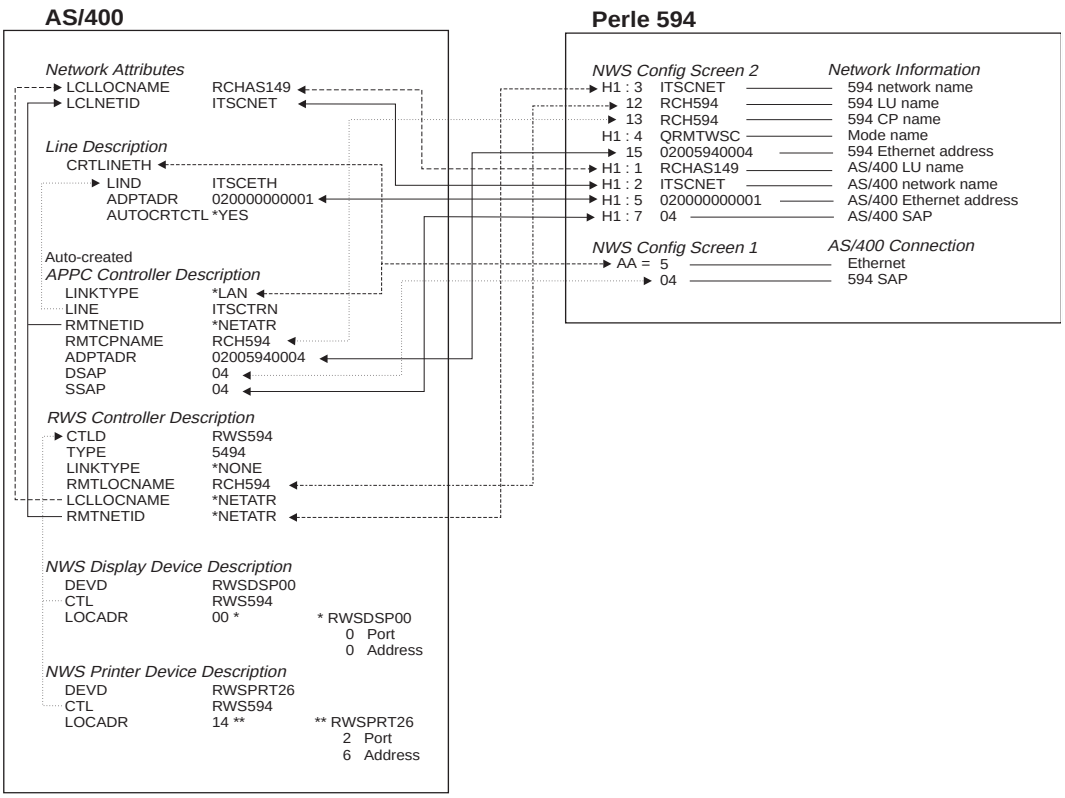


Fig. 12: AS/400 Ethernet configuration cross-reference

SDLC Leased through SNA SubArea Network

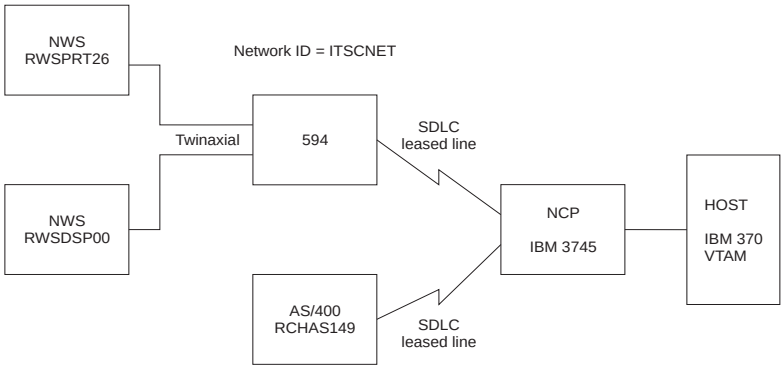


Fig. 13: SNA SubArea Network configuration

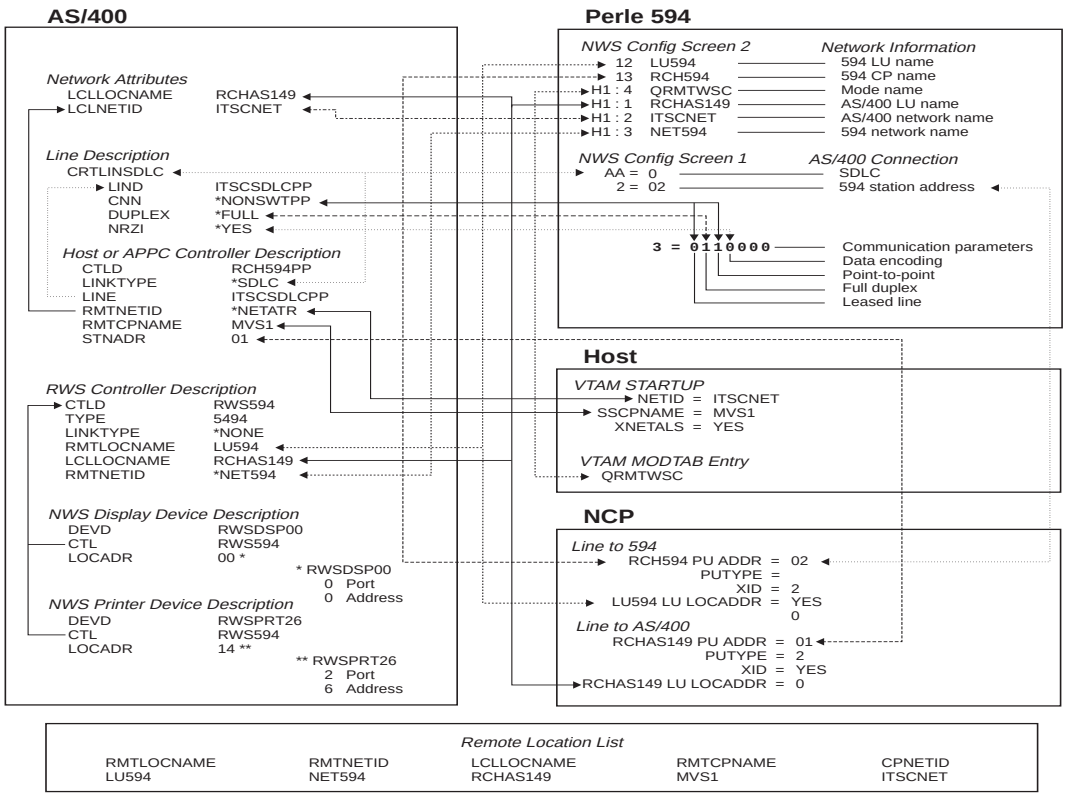


Fig. 14: SNA SubArea Network configuration cross-reference

SDLC Leased through APPN Network

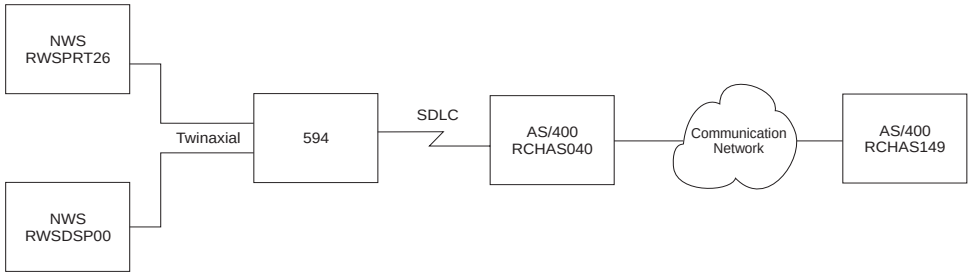


Fig. 15: APPN Network configuration

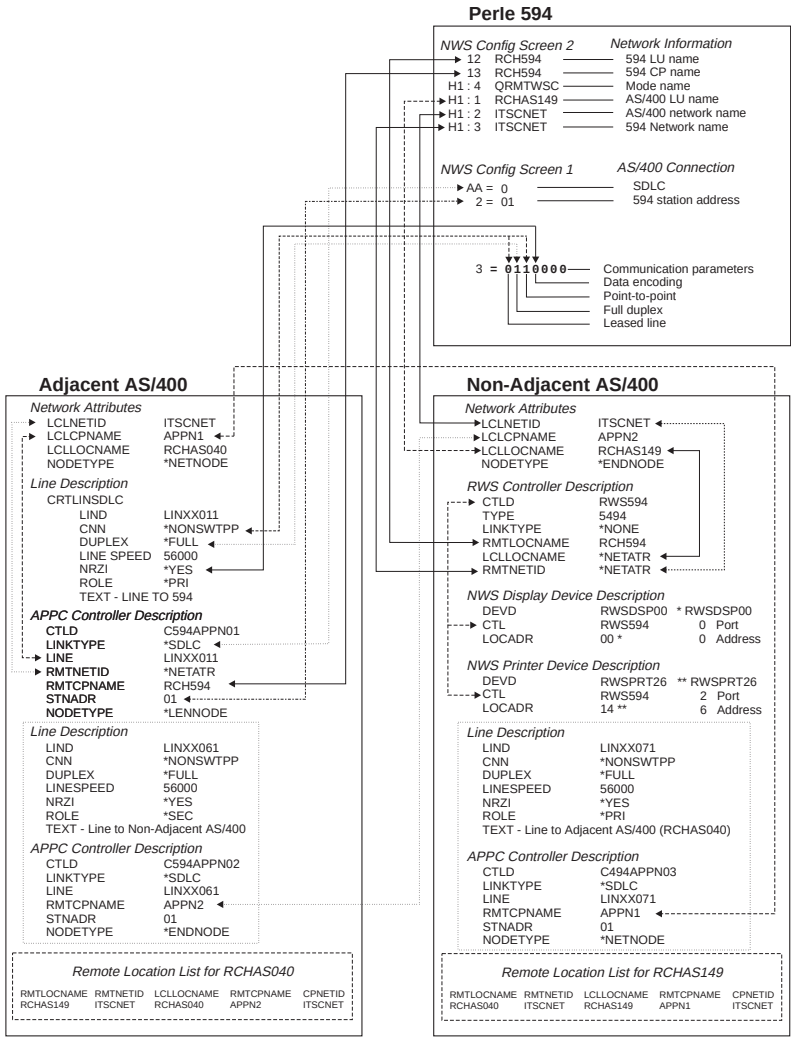


Fig. 16: APPN configuration cross-reference

AS/400 Frame Relay Attachment and FR-TR Bridge

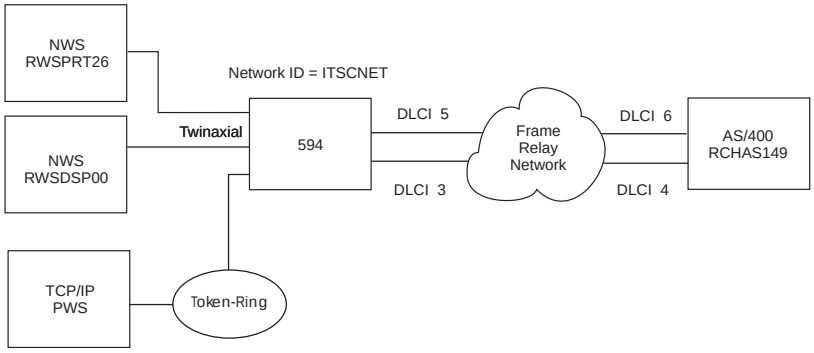


Fig. 17: AS/400 Frame Relay and IP Routing configuration

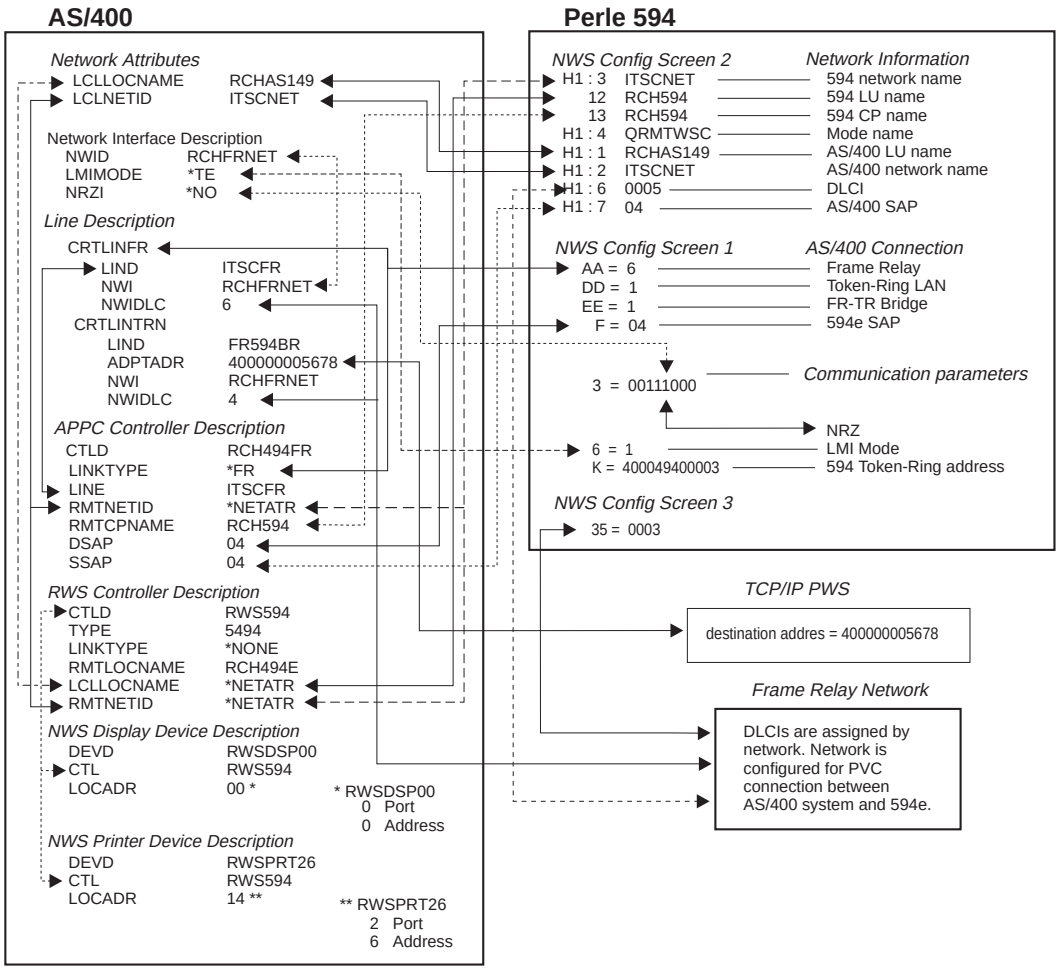


Fig. 18: AS/400 Frame Relay Configuration cross reference

AS/400 Frame Relay Attachment and IP Routing (with 594 IP Routing Feature only)

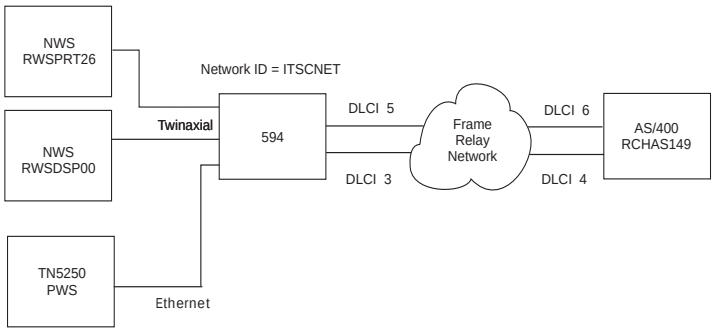


Fig. 19: AS/400 Frame Relay and IP Routing configuration

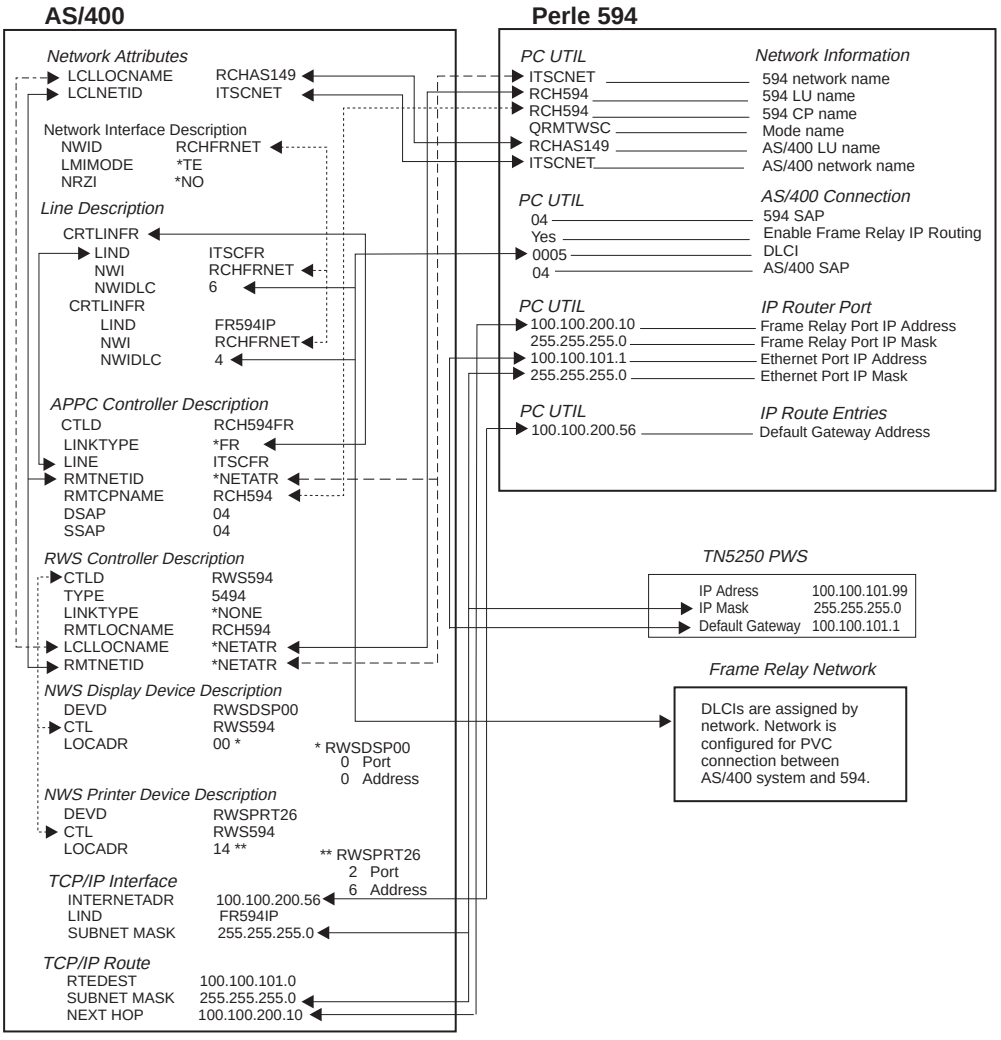


Fig. 20: AS/400 Frame Relay and IP Routing Config. cross reference

AS/400 TCP/IP Token Ring Attachment

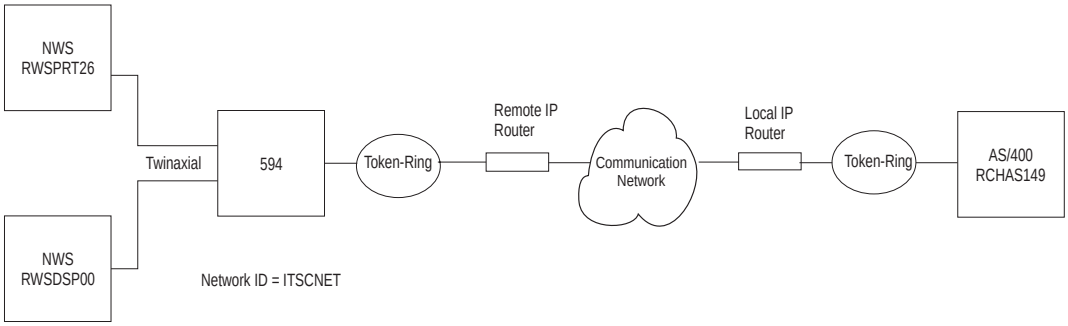


Fig. 21: AS/400 TCP/IP Token-Ring configuration

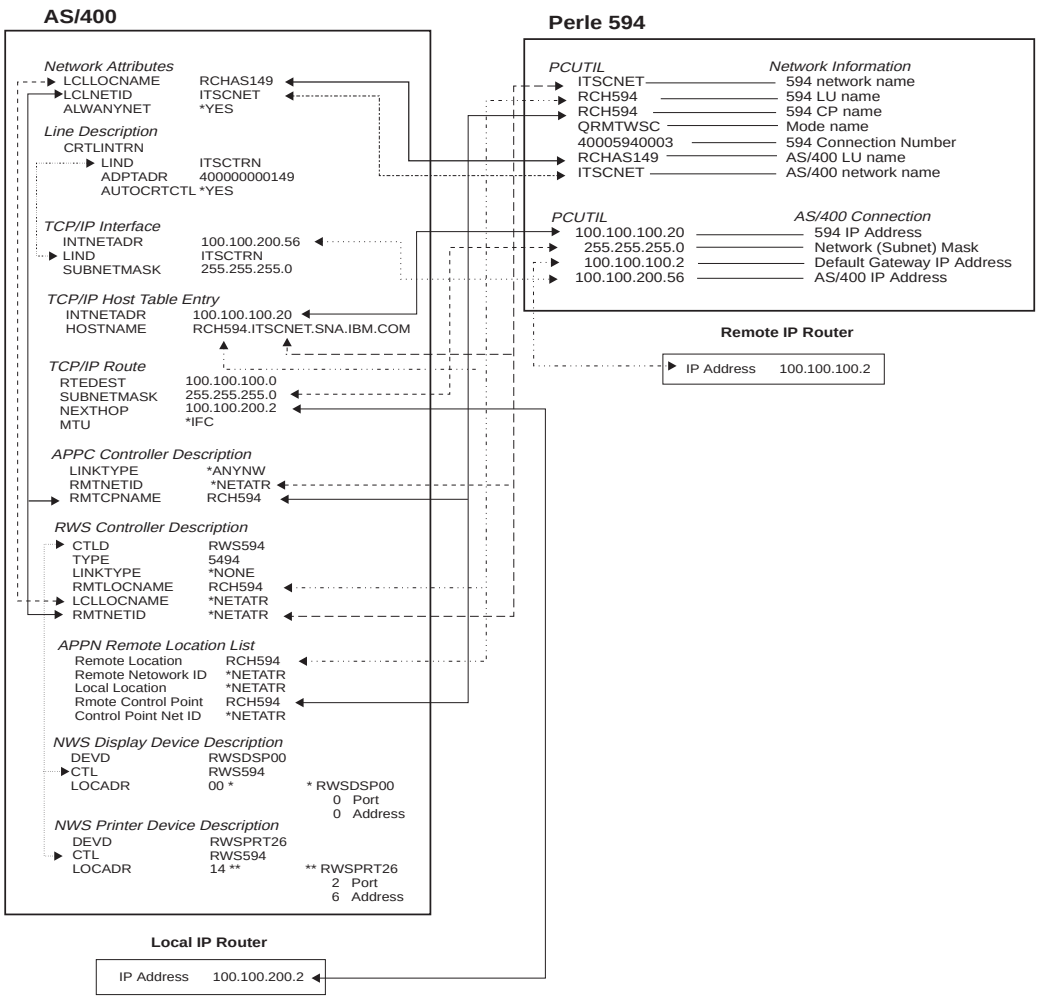


Fig. 22: AS/400 TCP/IP Token-Ring config. cross-reference

AS/400 TCP/IP Ethernet Attachment and Twinax IP Routing (with 594 IP Routing feature only)

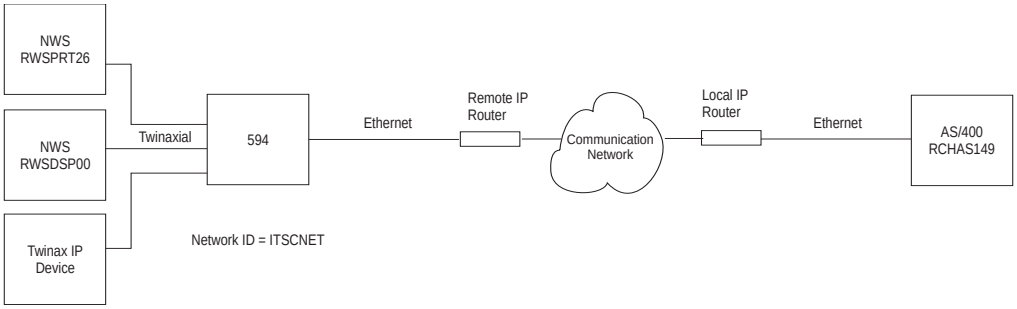


Fig. 23: AS/400 TCP/IP Ethernet configuration

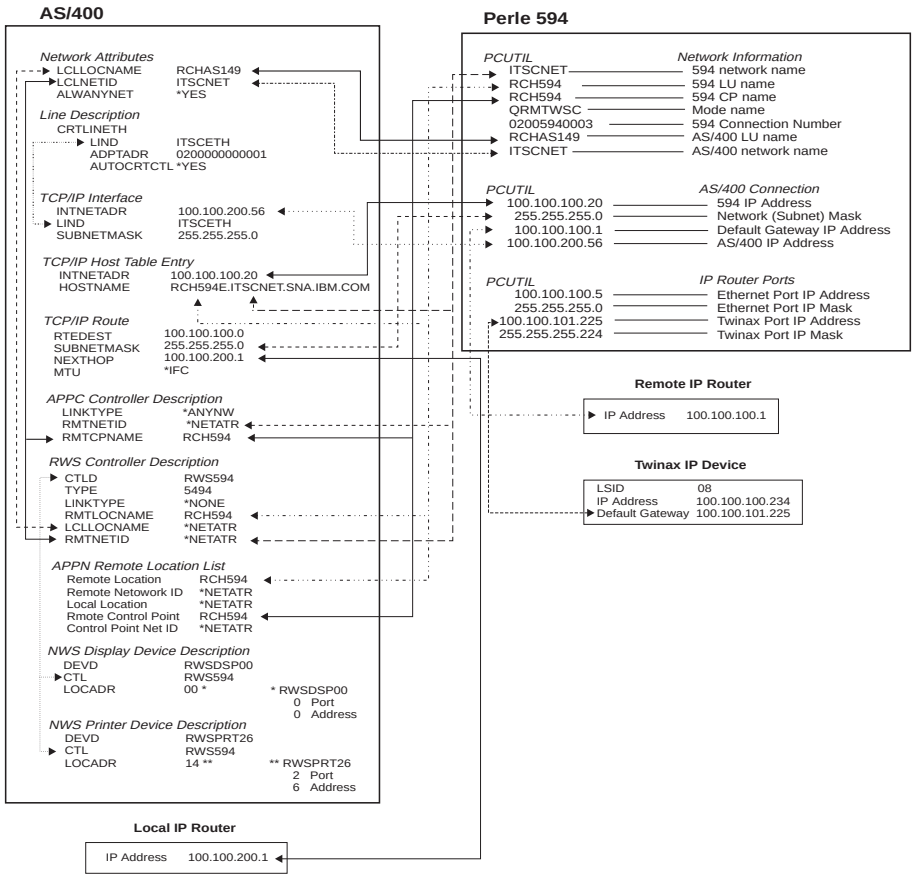


Fig. 24: AS/400 TCP/IP Ethernet and Twinax IP Routing config. cross-reference

AS/400 TCP/IP Frame Relay Attachment

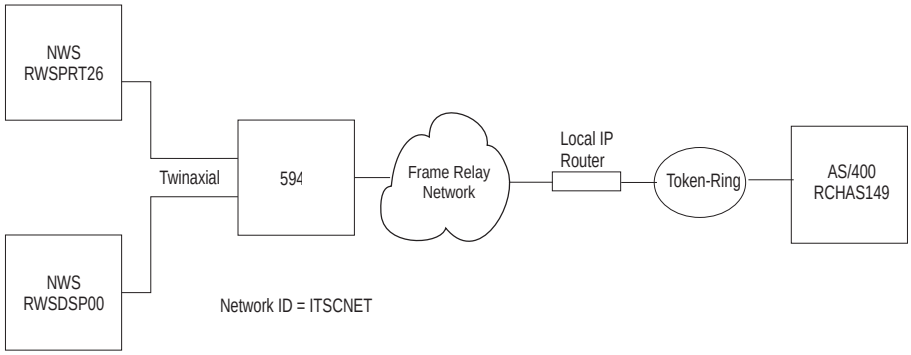


Fig. 25: AS/400 TCP/IP Frame Relay configuration

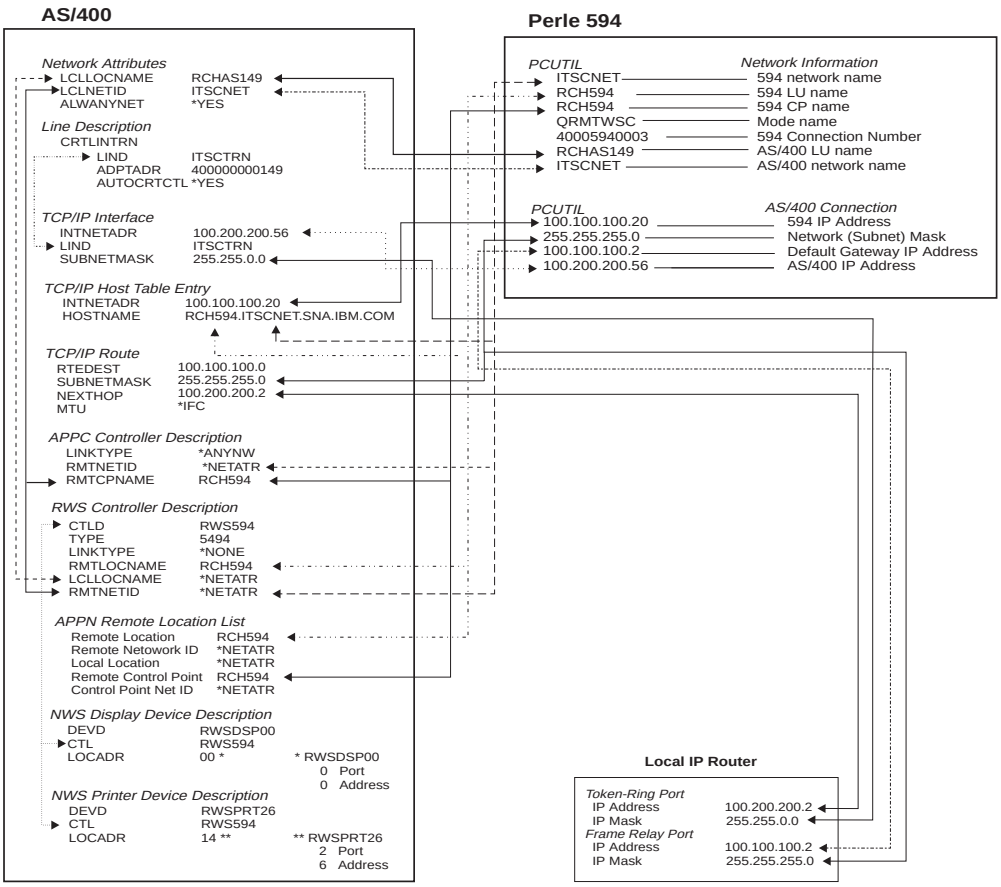


Fig. 26: AS/400 TCP/IP Frame Relay config. cross-reference

Chapter 2: Understanding Configuration Parameters

This chapter contains an alphabetical list (by keyword) of configuration parameters for the Perle 594.

594 address format

When connecting the Perle 594 to an Ethernet LAN you can use one of two formats:

- Use **Ethernet** format if the LAN connection between your controller and host is Ethernet only.
- Use **Token-Ring** format:
  - if your controller is attached to Ethernet and there are Token-Ring segments in your network
  - your network is designed to use the Token-Ring address format.

The order of the bits in each byte is reversed when you use the Token-Ring address format.

594 connection number

The 594 connection number is used as follows:

- for X.21 connections it specifies the telephone number of the Perle 594
- for LAN connections it specifies the Perle 594 LAN address
- for X.25 connections it specifies the network address of the Perle 594.

Set the 594 connection number as follows:

- SDLC Leased connections—The 594 connection number is not used.
- SDLC Switched/Manual Dial connections—The 594 connection number is not used.
- SDLC switched using V.25 bis
- X.25 connections—enter the network address of the Perle 594. Field length is up to 15 numeric characters 0—9. Match to the CNNNBR parameter in the AS/400 APPC controller description.
- X.21 Switched connections—enter the network telephone number (calling number). Field length is four to fourteen numeric characters 0—9. The number must be the FULL international number, including the network ID (or country code), excluding any additional access codes. Match to the CNNNBR parameter in the AS/400 APPC controller description.
- Token-Ring AS/400 attachment—enter the Token-Ring address of the Perle 594. Field length is twelve characters: 0—9, A—F. Match to the ADPTADR parameter in the AS/400 APPC controller description.
- Ethernet attachment—enter the 594 Ethernet address of the Perle 594. Field length is twelve characters: 0—9, A—F. Match to the ADPTADR parameter in the AS/400 APPC controller description.
- X.21 Leased connections—The 594 connection number is not used.

594 CP Name

Specifies the control point name of the Perle 594 controller and identifies it to the AS/400 with which it communicates. This parameter MUST match the remote control point name (RMTCPNAME) in the AS/400 APPC controller description. When the Perle 594 emulates multiple controllers, each emulated controller requires a unique control point name. Field length is up to eight characters: 0—9, A—Z, $, # and @.

Note: *Perle recommends that the RMTLOCNAME and RMTCPNAME parameters use identical names to correlate the APPC controller with an RWS controller. If you do not use identical names, an entry in the Remote Configuration List is required.*

594 Ethernet address

Specifies the last 8 characters of the Ethernet feature card LAN address. The default is 0200494000XX, where XX=the slot number of the card and the first four characters are either **0200** (for Ethernet address format) or **4000** (for Token-Ring address format). Field length is twelve characters: 0—9, A—F. MUST match the ADPTADR parameter on the AS/400 APPC controller description.

594 IP Address

The IP address consists of 4 numbers each between 0-255 which are separated from each other by a period. One or more of the numbers identify the network, while the remaining numbers identify the controller (or host). If you do not plan on attaching your network to the internet, then you may choose any address you like. Otherwise, the network portion of your IP address must be assigned by InterNIC Registration Services.

594 LU Name

This parameter is the Logical Unit (LU) Name of the controller. It describes the location of the Perle 594 to a specific remote controller on the the AS/400. Field length is up to eight characters: 0—9, A—Z, $, # and @. This parameter must match the Remote Location Name in the RWS Controller Description on the AS/400 system. If there is an intermediate ALS, this parameter must also match the Remote Location Name in the ALS. When the Perle 594 emulates multiple controllers, each emulated controller requires a unique LU name.

594 Network Name

This parameter specifies the name of the network to which the Perle 594 is attached. If this parameter is left blank, the Default Local Network Name is used. The 594 Network Name contains up to 8 characters. Each character can be a number from 0 to 9, or a letter from A to Z. This parameter must match the Remote Network ID in the RWS Controller Description on the AS/400 system.

594 SAP

When using LAN connections, the 594 SAP (Service Access Point) uniquely identifies emulated controllers that share the same physical LAN address. The 594 SAP is a two-digit, hexadecimal number from 04 to FC, in multiples of hexadecimal 04. The default value is hexadecimal 04. The 594 SAP on the controller must match the LAN DSAP in the AS/400 APPC controller description.

594 SDLC Station Address

When using an SDLC connection, the Perle 594 controller's SDLC address identifies the Perle 594 to the AS/400. Valid entries are between 01 to FE (Hex). Each controller description on the same line requires a unique station address. This parameter must match the station address in the ALS. Unless the Perle 594 is communicating with an intermediate ALS, this parameter must match the station address in the APPC Controller Description on the AS/400 system.

594 Station Address

When using an X.25 or X.21 Switched communication line, the Station Address of the Perle 594 uniquely identifies this controller. The 594 Station Address contains a two-digit, hexadecimal number from hexadecimal 01 to hexadecimal FE. The default value is hexadecimal 01. This parameter must match the last two characters of the EXCHID keyword in the AS/400 APPC controller description, and the station address for the X.21 Switched and the X.25 SVC.

594 System Password

Use this password with the 594 Utility Program to access the password-protected Concurrent Diagnostics feature. Valid entries include up to eight alphanumeric characters. If the password is not set, access to Concurrent Diagnostics must be enabled through the front panel.

Aborted Frames

If during a data frame, there is an occurrence of more than six logical 1s in a row, this counter is incremented by 1.

Access Code

For X.21 Switched communications, this parameter is the international access country code of the phone number. The access code is a number between 0 and 999. This parameter can be left blank (default) if no access code is required. Match this field to the SHMACC keyword on the AS/400 Line Description.

Address Format

When connecting the Perle 594 to an Ethernet LAN you can use one of two formats:

- Use **Ethernet** format if the LAN connection between your controller and PWS is Ethernet only.
- Use **Token-Ring** format:
  - if your controller is attached to Ethernet and there are Token-Ring segments in your network
  - your network is designed to use the Token-Ring address format.

The order of the bits in each byte is reversed when you use the Token-Ring address format.

Alternate Keyboard Translations

Enter a two-digit code in this parameter to enable use of a keyboard with a different language from the default keyboard type. If an Alternate Keyboard Translation is not specified, the NWSs for that controller use the Default Keyboard Translation. The Keyboard Translation is identified by a two-digit code, called a Keyboard Code. To use this feature the default and alternate keyboard translations must be multinational codes. These codes are listed in the following table:

Country Character Set	Keyboard Code
Albania †	3E
Austria/Germany Multinational	21
Belgium Multinational †	07
Canada/English Multinational	22
Canada/French Multinational	09
Denmark Multinational	0B
Finland Multinational	0D
France (AZERTY) Multinational	05
France (QWERTY) Multinational †	1B
Icelandic Multinational †	2C
International Multinational †	15
Italy Multinational	11
Japanese/English Multinational †	02
Japanese/Kandy Multinational †	37
Japanese/Katahdin Multinational †	01
Japanese Multinational †	03
Latin America Multinational †	0F
Netherlands Multinational	2E
Norway Multinational	17
Portugal Multinational	19

Country Character Set	Keyboard Code
Spain Multinational	1D
Sweden Multinational	1F
Swiss/French Multinational	28
Swiss/German Multinational	2A
United Kingdom Multinational	13
United States Multinational	22
Yugoslav Multinational †	2F

Notes: *Keyboard Codes marked with the cross character (†) in this table are not available on the ASCII Feature Card (Card ID 42).*

Up to three alternate keyboard translations can be used for each emulated controller. The Alternate Keyboard Translations parameter must match the keyboard translation for this NWS on the AS/400 system.

AS/400 Connection Number

The AS/400 connection number is used as follows:

- for synchronous dial connections it specifies the telephone number of the network
- for LAN connections it specifies the host LAN address
- for X.25 connections it specifies the network address of the ALS.

Set the AS/400 connection number as follows:

SDLC Switched connections	Enter the network telephone number (calling number). Field length is up to 64 characters 0 - 9,:, <, =, >, P, T, and &. Match to the CNNNBR parameter in the AS/400 Line Description. No entry is needed if the network does not require this parameter.
X.25 connections	Enter the network address of the ALS. Field length is up to 15 characters 0—9. Match to the NETADR parameter in the AS/400 Line Description
X.21 Switched connections	For an Address Call, enter the network telephone number (calling number). Field length is from four to fourteen numeric characters 0—9. The number must be the FULL international number, including the network ID (or country code), excluding any additional access codes. Match to the CNNNBR parameter in the Line Description. For Direct Call, use the value DC for this parameter.
Token-Ring AS/400 attachment	Enter the 594 Token-Ring address of the ALS. Field length is twelve characters: 0—9, A—F. Match to the ADPTADR parameter in the AS/400 Line Description.
Ethernet attachment	Enter the 594 Ethernet address of the ALS. Field length is twelve characters: 0—9, A—F. Match to the ADPTADR parameter in the AS/400 Line Description.
SDLC Leased connections	The AS/400 connection number is not used
X.21 Leased connections	The AS/400 connection number is not used.

AS/400 Data Link Connection Identifier (DLCI)

An identifier assigned to the link between the 594 and the network so the controller can communicate with the host using the Frame Relay protocol. If the 594 is attached directly to the host, the 594's DLCI and the host's DLCI must match.

AS/400 Ethernet Address

Specifies the Ethernet address which is used for communicating with the AS/400. Field length is eight characters: 0—9, A—Z. This field must match the ADPTADR parameter in the AS/400 Line Description.

AS/400 IP Address

The IP address consists of 4 numbers each between 0-255 which are separated from each other by a period. One or more of the numbers identify the network, while the remaining numbers identify the controller (or host). If you do not plan on attaching your network to the internet, then you may choose any address you like. Otherwise, the network portion of your IP address must be assigned by InterNIC Registration Services.

AS/400 LU Name

This parameter is the Logical Unit (LU) Name of the host AS/400. Field length is up to eight characters: 0—9, A—Z, $, # and @. This parameter must match the Local Location Name on the AS/400. If there is an intermediate ALS, this parameter must also match the Local Location Name in the ALS.

AS/400 Network Name

This parameter is the name of the network to which the AS/400 system is attached when it is communicating with the Perle 594. If this parameter is left blank, the Default Local Network Name is used. The AS/400 Network Name contains up to 8 characters. Each character can be a number from 0 to 9, or a letter from A to Z. This parameter must match the Local Network ID under Network Attributes on the AS/400 system.

AS/400 SAP

When using a LAN connection to the host, the AS/400 SAP (Service Access Point) uniquely identifies the host to the Perle 594. The AS/400 SAP is a two-digit, hexadecimal number from 04 to FC, in multiples of hexadecimal 04. The default value is hexadecimal 04. The AS/400 SAP on the controller must match the LAN SSAP in the AS/400 APPC controller description.

Note: *There is no relation between the AS/400 SAP and 594 SAP, therefore, the values can be either identical or unique.*

ASCII Keyboard Translation

See Default Keyboard Translation.

ASCII Display Type

When using an ASCII Feature Card, this parameter defines the type of terminal emulator that uses this port. The emulator may be an enhanced emulator software such as PerleTALK and PerleTALK for Windows, an adapter handler for Client Access, or an ASCII terminal emulator such as Procomm.

Associated Group

A Group is a name that identifies one or more ports with identical configurations. All ports associated with Groups are placed into a pool of ports whose characteristics can be dynamically changed upon connection by selecting an associated group. The session characteristics of the group are the same as those of the ports to which they are associated. When dialing into a port that has been enabled for

group operations, the user is prompted for the Group name. The Perle 594 then scans all ports not currently in use to find one with a matching group name. The session characteristics of the group are then assigned to the port.

A Group name is 1 to 8 alphanumeric characters, beginning with a letter. If the Group name has already been defined on another port, then the emulation parameters for this port are checked to ensure that they match the other ports in the Group. If they are not identical, an error message appears.

Baud Rate

This parameter specifies the speed at which information is exchanged between this port and the modem to which it is attached.

Circuit Type

This parameter specifies the type of X.25 circuit you will use to access the AS/400 system. The Circuit Type will be one of the following:

SVC	A manual command is required from the Perle 594 to place outgoing call or to answer incoming Switched Virtual Circuit (SVC) calls.
PVC	A manual command is required from the Perle 594 to establish a Permanent Virtual Circuit (PVC) link to the AS/400 system.
SVCIN	Incoming Switched Virtual Circuit calls are automatically answered by the Perle 594.
PVC AUTO	When the Perle 594 is powered on, the Permanent Virtual Circuit link to the AS/400 system is established automatically.

Connect Password

The ASCII Feature Card can control access to the 594 by requiring a password to be entered by the user at connect time. This is enabled by entering a password in the Connect Password field. At connect time, if the password is incorrectly entered, the user is denied access. The password is up to 8 alphanumeric characters in length. If you leave this field blank, users will not be prompted to enter a password when they connect to this port.

Note: *The Connect Password is independent of the AS/400 sign on password, which prevents unauthorized persons from accessing the AS/400 system, and the X.25 password, which uniquely identifies individual controllers to the X.25 network.*

Connection Method

For synchronous host connections, this parameter specifies the way your modem controls auto-answer.

- In the DTR mode, the Perle 594 enables the DTR signal to indicate its readiness to accept a call.
- In the CDSTL mode, the Perle 594 waits for an enabled calling indicator that shows the presence of an incoming call.

DTR method is the most commonly used method by modems for controlling auto-answer. If you are unsure, refer to your modem documentation or contact your Network supplier.

Connection Type

This parameter specifies whether your SDLC or X.21 leased line is a point-to-point line or a multipoint line. This parameter must match the setting in the Line Description on the AS/400 system. The connection type correlates with the line facility.

A point-to-point line is a data link that connects a single remote controller with an AS/400 system. It can be a non-switched or switched connection. If your line is non-switched point-to-point, you must specify *NONSWTPP for the CNN parameter defined in the AS/400 line description. If your line is switched point-to-point, you must specify *SWTPP for the CNN parameter defined in the AS/400 line description.

A multipoint line is a data link that connects 2 or more remote controllers with an AS/400 system. It is considered a non-switched connection and is always leased. Specify multipoint (*MP) for the CNN parameter; the MAXCTL parameter must equal the total number of physical and emulated controllers on the line. You must specify multipoint if a single Perle 594 is emulating multiple remote controllers.

Continuous Retry

This parameter specifies whether the Perle 594 continuously attempts to re-establish a logical connection to the AS/400 if the logical connection is lost. When Continuous Retry is set to **Yes**, the controller will attempt every 10 minutes to re-establish the connection as long as the physical link is still active.

It is recommended that **Yes** be selected if your AS/400 is unavailable for extended periods, or if a leased line is used.

Data Encoding

This parameter specifies the type of Data Encoding that your SDLC or X.21 leased line is using (i.e., NRZI or NRZ). This parameter must match the setting on the AS/400 Line Description.

NRZI specifies that non-return-to-zero inverted data encoding is used. NRZI can allow transmitters and receivers to better maintain synchronization and may be required by some modems that are sensitive to certain bit patterns in the data stream. Normally, analog connections (connections using modems) should specify NRZI data encoding. Specify *YES for the NRZI parameter defined in the AS/400 line description.

NRZ specifies that (non-return-to-zero) inverted data encoding is not used. NRZ is recommended for use with digital data circuit-terminating equipment and networks such as X.21. Specify *NO in the NRZI parameter defined in the AS/400 line description.

Note: *All equipment on the same line must specify the same data encoding method.*

Data Link Connection Identifier (DLCI)

An identifier assigned to the link between the 594 and the network so the controller can communicate with the host using the Frame Relay protocol. If the 594 is attached directly to the host, the 594's DLCI and the host's DLCI must match.

Default Controller Address

When defining a multisession controller, this parameter is the default controller address for each multisession. For more information, see *Multisession Assignment*.

Default Gateway IP Address

The value of the router while linking the controller to the remote host.

Default Keyboard Translation

For NWS attachment, this parameter defines the language and layout of the attached keyboards. The Keyboard Translation is identified by a two-digit code, called a Keyboard Code. All keyboards attached to this emulated controller will share this Keyboard Code unless defined as using an Alternate Keyboard Translation. These codes are listed in the following table:

Country Character Set	Keyboard Code	Country Character Set	Keyboard Code
Albania †	3E	Korea †	38
Austria/German EURO †	49	Latin 2	34
Austria/Germany	20	Latin America †	0E
Austria/Germany Multinational	21	Latin America Multinational †	0F
Belgium Multinational †	07	Macedonia (Cyrillic) †	42
Belgium Multinational EURO †	4A	Netherlands	2D
Brazil †	3C	Netherlands EURO †	52
Brazil EURO †	4B	Netherlands Multinational	2E
Bulgaria (Cyrillic) †	3F	Norway	16
Canada/English	00	Norway EURO †	53
Canada/English Multinational	22	Norway Multinational	17
Canada/French	08	Poland †	43
Canada/French Multinational	09	Portugal	18
Canadian French Multinational EURO †	4C	Portugal EURO †	54
Cyrillic †	31	Portugal Multinational	19
Czech †	40	Romania †	44
Denmark	0A	Russia (Cyrillic) †	45
Denmark EURO †	4D	Serbia (Cyrillic) †	48
Denmark Multinational	0B	Simplified Chinese †	3A
Finland	0C	Slovakia †	46
Finland EURO †	4F	Spain	1C
Finland Multinational	0D	Spain EURO †	58
France (AZERTY)	04	Spain Multinational	1D
France (AZERTY) EURO †	4E	Spanish Speaking (Latin America EURO) †	57
France (AZERTY) Multinational	05	Sweden	1E
France (QWERTY) †	1A	Sweden EURO †	59
France (QWERTY) Multinational †	1B	Sweden Multinational	1F
Greek †	32	Swiss/French Multinational	28
Greek 2	3B	Swiss/French Multinational EURO †	55
Hungary †	41	Swiss/German Multinational	2A
Iceland EURO †	50	Swiss/German Multinational EURO †	56
Icelandic †	2B	Thai †	35

Country Character Set	Keyboard Code	Country Character Set	Keyboard Code
Icelandic Multinational †	2C	Traditional Chinese (Taiwan) †	39
International †	14	Turkish (83 or 122 key keyboard)	36
International Multinational †	15	Turkish 2	47
Italy	10	United Kingdom	12
Italy EURO †	51	United Kindom EURO †	5A
Italy Multinational	11	United Kingdom Multinational	13
Japanese/English Multinational †	02	United States	00
Japanese/Kanji Multinational †	37	United States Multinational	22
Japanese/Katakana Multinational †	01	USA/Canada EURO †	5B
Japanese Multinational †	03	Yugoslav Multinational †	2F

Note: *Keyboard Codes marked with the cross character (†) in this table are not available on the ASCII Feature Card (Card ID 42).*
You will also need to apply OS/400 level PTFs for EURO support. Please contact your AS/400 representative for more details.

Default Local Network Name

This parameter is used if the 594 Network Name or the AS/400 Network name was not entered. Field length is 8 characters. Valid characters are: 0—9, A—Z, $, # and @. See *594 Network Name* for further details.

Default Mode Name (QRMTWSC)

This parameter is used if a Mode Name for the AS/400 system is not defined on the Perle 594. Field length is 8 characters. Valid characters are: 0—9, A—Z, $, # and @. See *Mode Name* for further details.

Delay between Retries

When using an X.21 Switched host connection, this parameter sets the delay between Short Hold Mode retries. The Delay between Retries is entered in seconds, from 1 to 15. The default value is 6 seconds.

Diagnostic Code Format

Specifies the format of the diagnostic codes sent by the 594 in Call Clearing, Restart or Reset packets. The option represents the year the standard was written.

Dial Digit Format

When using an X.21 Switched host connection, this parameter specifies the format of the 594 and AS/400 Connection Numbers. Two Dial Digit Format are used: Data Network Identification Code (DNIC) or Data Country Code (DCC). DNIC format uses a four-digit network ID followed by a network terminal number. DCC format uses a three-digit country code followed by the national number. The default is DNIC.

Direct Call Support

When using an X.21 Switched host connection, this parameter specifies whether the controller uses Direct Call to re-establish a link to the AS/400 system. The default is that the controller will not use Direct Call.

DLCI

An identifier assigned to the link between the 594 and the network so the controller can communicate with the host using the Frame Relay protocol. If the 594 is attached directly to the host, the 594's DLCI and the host's DLCI must match.

Enable Inactivity Time Limit

This option specifies whether the ASCII Feature Card automatically disconnects devices that have been inactive for a specified period of time. This can prevent unnecessary telephone charges if a user fails to properly disconnect their device or modem. The time limit is specified in the Inactivity Time Limit field. When the time limit is reached, the ASCII Feature Card notifies the AS/400 of the disconnection and ends the session.

Select **No** to disable the Inactivity Time Limit. The connection will never be dropped due to inactivity.

Enable Passthrough Printer

When using an ASCII Feature Card, this option specifies whether or not this dial-in port supports a passthrough printer. Select **Yes** to allow users who have a printer attached to their PC to emulate a 5250 printer. Select **No** if this port will not support a passthrough printer.

Enable Reconnect Time Limit

With the ASCII Feature Card, this option specifies whether a user can reconnect to a session that has been inadvertently disconnected. When dialing in to an ASCII port, it is possible that a session could be disrupted due to a dial-in line problem. If Enable Reconnect Time Limit is set to **Yes**, the ASCII Feature Card will keep the AS/400 session active with the host for the duration of the Reconnect timer. If a user dials in before the Reconnect timer expires, the user will return to the point in their session where the disruption occurred.

If multiple users have access to this port, it is recommended that the Reconnect Time Limit be enabled, and that it be set for immediate disconnection by setting the value to zero. Otherwise, another user may accidentally gain access to the AS/400 session before the original user can reconnect.

Select **No** to disable the Reconnect Time Limit. When a disconnection occurs, the ASCII Feature Card maintains the AS/400 session indefinitely.

Ethernet address

This is the Ethernet address of the Perle 594 Ethernet Feature Card when used as a LAN gateway. The default address is 0200494000xx, where xx is the slot number of the Feature Card. The field length is twelve characters: 0—9, A—F. All PWSs on the same Ethernet gateway must use the same Ethernet address.

Ethernet Frame Format

This field is used to identify the Ethernet frame type or standard to be used on the Ethernet local area network. The Perle 594 supports the Ethernet IEEE 802.3 standard and the Ethernet version 2.0 standard by DEC, Intel, & Xerox (DIX) corporations. The advantages of specifying the IEEE 802.3 standard is that it supports frame sequencing, flow control, and error recovery capabilities which the DIX version 2 standard does not support.

A third option supported by the Perle 594 is AUTO CONFIG. The Auto Configure option allows the Perle 594 to automatically adjust to the frame type being used by the AS/400. However, the initial connection to the AS/400 may be a little slower since the Perle 594 tries one frame type first, and if no response is received, it tries the other frame type.

Unless AUTO CONFIG is specified, this field must match the ETHSTD parameter defined in the AS/400 Line Description.

FCS Error Count

If the FCS (Frame Check Sequence) is incorrect, this counter is incremented by 1.

Fill In Default Values

When defining a multisession value, this setting will cause the multisession addresses to be filled with default values. For more information, please see *Multisession Assignment*.

Flow Control

This ASCII Feature Card option specifies the type of flow control that will be used on this port. Flow Control is a way for a receiving device to temporarily halt the flow of data so that its capacity to hold data is not exceeded. The Hardware method uses hardware signals to control the flow of data. The Xon/Xoff method uses software messages to control the flow of data. This setting must match the setting on the modem and on the remote ASCII display.

Should you wish to use software flow control (i.e., Xon/Xoff) with your modem, you should refer to your modem's user guide and modify the Modem Initialization String field.

Flow Control Negotiation Allowed

This feature lets you alter packet size and packet window size. If the network allows flow control negotiation, you can change the packet size and packet window size from call to call.

Frame Relay LMI Mode

Select which LMI (Link Management Interface) mode will be used for the 594. LMI specifies the exchange of management-related information.

Note: *The mode you select must match the mode configured on the network or, if you attached directly to the host, the mode must match the mode configured on the AS/400.*

Full Inquiry Interval

On a regular basis, the 594 sends to the network a "full" Status Enquiry message that contains more information than is contained in a standard Status Enquiry. Full Inquiry Interval (FULLINQITV) is the number of Status Enquiry messages sent between full Status Enquiry messages plus 1 (so the full Status Enquiry message will be included in the count).

Inactive Timer (Ti)

When using a LAN connection, the Inactive Timer (Ti) is used to detect an inoperative condition on the LAN. If there has been no data received or transmitted during the Inactive Timer interval, a message will be sent to verify that the connection is still active. If there is no response to this message, the 594 will wait for the Inactive Timer to expire again, then retry. This will repeat for the number of times set by the Retry Count (N2) value. If there is no response after the Retry Count has expired, the 594 will disconnect the link, and will then attempt to re-establish communications.

The inactive timer (Ti) value should be at least 5 to 10 times greater than the response timer (T1) value. Valid entries are from 1 to 99 seconds. The default is 30 seconds. If the response timer (T1) is specified as "*", then the default Ti value of 30 seconds is adequate. This field should match the LAN Inactivity Timer (LANINACTMR) parameter defined in the AS/400 APPC controller description.

Inactivity Time Limit

This parameter is the amount of time that the ASCII Feature Card allows the connection to remain idle before disconnecting the device from this port. When the time limit is reached, the ASCII Feature Card ends the session. This can prevent unnecessary telephone charges if a user fails to properly disconnect their device or modem. The time is entered in minutes, from 1 to 99. To use the Inactivity Time Limit, set the Enable Inactivity Time Limit field to Yes.

LAN Link Station Status (Gateway)

Displays status of 594-to-workstation link station status.

LAN Link Station Status (Upstream)

Displays status of 594-to-host link station status.

Line Facility

When using a synchronous host line connection, this parameter specifies whether the line operates in Half Duplex or Full Duplex mode. Half Duplex mode allows communication in only one direction at a time, but allows more than one physical controller to be attached to a line. Full Duplex allows communication in both directions simultaneously, but only allows one physical controller to be attached to the line. In cases where Full Duplex operation can be used, better performance may result.

Use Half Duplex if you have more than one physical controller sharing the line. Use Full Duplex if you have only one physical controller sharing the line. You may use Full Duplex if you have a single 594 on a line, and it is emulating multiple controllers.

This field must match the DUPLEX parameter defined in the AS/400 line description. In addition, all communications equipment on the line should be set accordingly.

Line Speed (valid For Direct Cable Only)

When using a synchronous host line connection, this parameter specifies the speed at which data is transmitted on the communication line. The Line Speed is specified only if the Perle 594 is being directly connected to the AS/400 system. Otherwise, the line speed is established by the modems.

Valid line speed entries are from 1200 to 128000 bits per second. This field must match the LINESPEED parameter defined in the AS/400 line description.

Line Type

For an SDLC host connection, this parameter specifies the type of line you are using: leased or switched/manual dial. A leased line is permanently allocated to the Perle 594, and is always available for its use. A switched/manual dial line is a switched point-to-point line that requires dialing to establish a connection between the Perle 594 remote site and the AS/400 site. The default is a leased line.

Link Initiation

This parameter specifies by what means link initiation is accomplished. Either the network alone performs link initiation; or either the network or the 594 performs link initiation.

Link State/LLC State

Link State:

1 = Disconnected
2 = Define station sent
3 = Define station done
4 = Test sent
5 = Test done
6 = XID sent
7 = XID done
8 = Connected

LLC State:

1 = Reserved
2 = Reserved
3 = Reserved
4 = Closing
5 = Closed
6 = Reserved
7 = Open
9 = Connecting
10 = Connected
11 = Close station

Link Window Size

For an X.25 connection, this parameter specifies the maximum number of information frames (I-frames) which can be awaiting acknowledgment at any one time. The Link Window Size can be from 1 to 7, but must match the Link Window Size specified in your X.25 Network Subscription. In a network with large transmission delays, a larger Link Window Size may increase throughput.

LMI Protocol Error Count

If the 594 detects an error in the format of an LMI Status Enquiry response message, this counter is incremented by 1.

LMI Sequence Error Count

If the 594 detects an error in the sequence number of a response to an LMI Status Enquiry, this counter is incremented by 1.

LMI Timeout Count

If the network does not respond to a 594 LMI Status Enquiry within the Polling Interval time (Pollitv), this counter is incremented by 1

Local Loopback Supported

Local loopback is a test used to determine if the modem attached to the 594 is operating correctly.

Logical Channel

For an X.25 connection, this parameter is the logical channel number used for connection with the AS/400 system. This parameter is only required for SVC circuits and must match the logical channel assigned by your network.

The Logical Channel contains 3 characters. Each character can be a number from 0 to 9, or a letter from A to F. The first character specifies the Logical Group Number. The last two characters specify the Logical Channel Number. Each alternate AS/400 system can have a different Logical Channel.

Logical Link Control (LLC)

When using an X.25 host connection, this parameter specifies the type of LLC used between the Perle 594 and the AS/400. The LLC provides end-to-end link level functions to the SNA protocol. Two LLCs are supported: Qualified Logical Link Control (QLLC) and Enhanced Logical Link Control (ELLC). The default is QLLC. This parameter must match the LLC specified on the AS/400 system.

Manual Options

These options permit the operator to change call parameters from call to call.

Maximum In (N3)

When using a LAN connection, this parameter specifies the maximum number of information frames that the Perle 594 can receive before sending an acknowledgment. An acknowledgment indicates whether all frames since the previous acknowledgment were error free. If the acknowledgment indicates an error, all frames since the previous acknowledgment are retransmitted.

In an error free network, it is best to set Maximum In to a large value. This will improve throughput by reducing the number of acknowledgments.

In an error-prone network, it is best to set Maximum In to a small value. This will increase the probability that a successful acknowledgment will be returned, and will reduce the number of frames that must be retransmitted.

The N3 parameter should be half of the Maximum Out (TW) value. Valid entries are from 1 through 4 frames. The default is 1 frame. This field should match the LAN Max Outstanding Frames (LANMAXOUT) parameter defined in the AS/400 APPC controller description.

Maximum Out (TW)

When using a LAN connection, this parameter specifies the maximum number of sequentially numbered frames which the controller can send before it must receive an acknowledgment. An acknowledgment indicates whether all frames since the previous acknowledgment were error free. If the acknowledgment indicates an error, all frames since the previous acknowledgment are retransmitted.

In an error free network, it is best to set Maximum Out to a large value. This will improve thoroughput by reducing the number of acknowledgments.

In an error-prone network, it is best to set Maximum Out to a small value. This will increase the probability that a successful acknowledgment will be returned, and will reduce the number of frames that must be retransmitted.

The Maximum Out parameter can be from 2 to 8. The default value is 2. The Maximum Out parameter must be at least two times as large as the Maximum In (N3) parameter. If you are using a LAN AS/400 attachment and Alternate AS/400 systems, you must enter the Maximum Out value for each AS/400 system. This field should match the LAN Acknowledgment Frequency (LANACKFRQ) parameter defined in the AS/400 APPC controller description.

Misaddressed Frames

If the 594 receives a frame having an address that the 594 is not configured for, this counter is incremented by 1.

Mode Name

This Network parameter is the name of the Mode Description which will be used for communication with the AS/400. The Mode Name defines LU6.2 communications characteristics. A Mode Name contains up to 8 characters. Each character can be a number from 0 to 9, a letter from A to Z, or one of the following symbols: $, # or @.

An AS/400 predefined mode is supplied for use with remote controllers named QRMTWSC. Perle recommends that you use this mode.

Modem

When using an ASCII Feature Card, this parameter indicates the type of modem you are using on a port. Select the Modem which is closest to the type you are using. Codes are listed on the Help screen for this parameter.

Modem Initialization String

When using an ASCII Feature Card, this parameter is a string of characters that will be sent to the

modem to set up the modem for use on this port. The Modem Initialization String field is initialized when the modem code is entered. You may customize this string in order to initialize your modem in a different way. Consult your modem vendor's documentation for details.

Multisession Assignment

To the AS/400, a Multisession controller looks like a single physical remote controller. However, the sessions for this controller do not belong to any physical device. The Multisession Assignment screen permits you to assign the multisessions to any Twinaxial or ASCII NWS attached to the 594.

At the heart of the Multisession Assignment is the assignment matrix. One axis is labeled Port, the other Twinaxial Station Address. You can think of this matrix in a similar fashion to the Keyboard Translation matrix, but instead of assigning Keyboard Translation codes, you will be assigning the physical device that will have this multisession.

For each entry in the matrix, you specify three parameters:

- The primary station address of the controller. This will be the 594 Station Address if the connection to the host is synchronous, or the 594 SAP if the connection to the host is via LAN.
- The port number of the controller to which the device is attached. For a Twinaxial Controller, enter the physical port number. For an ASCII Feature Card, enter the ASCII Workstation port number from the table below.
- The workstation address of this device. For a Twinaxial Controller, enter the actual workstation address. For an ASCII Feature Card, enter the ASCII Workstation address from the table below.

You can assign as many multisessions to a single physical device as you wish.

If you wish to assign one multisession to each physical device on a controller, you can quickly do this by setting the Default Controller Address to a physical controller, and then setting *Fill in Default Values* to Yes. Each multisession will be assigned to the corresponding session on the physical controller.

ASCII PORT	0	1	2	3	4	5	6	7
MULTISESSION PORT FIELD	0	0	0	0	0	0	0	1
MULTISESSION WORKSTATION ADDRESS FIELD	0	1	2	3	4	5	6	0

Network (subnet) Mask

This parameter is a bit mask that defines the portion of an IP address that identifies the network. The mask is logically added with the IP address to determine which network the host or controller is attached to.

Network Subscription

Specifies the level of the X.25 network used to access the controller. The parameter indicates the year the standard was issued.

No Receive buffers

If the 594 runs out of buffer space, this counter is incremented by 1.

Number of filtered frames

Number of times there was invalid data in the Frame Relay header.

Number of frames received in error

Number of FCS errors received.

Number of frames received with BECN

Number of times the BECN (Backward Explicit Congestion Notification) bit in the Frame Relay Core header was set.

Number of frames received with DE

Number of times the DE (Discard Eligibility) bit in the Frame Relay Core header was set.

Number of frames received with FECN

Number of times the FECN (Forward Explicit Congestion Notification) bit in the Frame Relay Core header was set.

Number of Multisession Controllers

This parameter is the number of Multisession Controllers which will be emulated by the Perle 594. A maximum of 39 Multisession Controllers can be defined. The total of physical and emulated controllers defined within a single Perle 594 must not exceed 40.

Number of Retries

X.21 switched — When using Short Hold Mode, this parameter is the number of times that the controller will attempt to re-establish a link to the AS/400 after a Short Hold disconnect. The Number of Retries can be from 0 to 255. The default value is 5 retries.

X.25 — This parameter is the number of times that the controller will resend a transmitted frame that was not successfully received. The Number of Retries can be from 0 to 255. The default value is 10 retries.

Number of times T1 timer expired

Number of times the Response Timer expired.

Overruns

If the 594 cannot receive data fast enough to keep up with the data rate, this counter is incremented by 1.

Packet Level Sequence Numbering

Specifies the set of numbers used to identify packets. Modulo 8 specifies numbers 0-7; modulo 128 specifies numbers 0-127.

Packet Size

This parameter specifies the size of each packet, in bytes. The Packet Size can be 64, 128, 256 or 512 bytes. The default Packet Size is 128 bytes.

Packet Window Size

When using an X.25 host connection, this parameter specifies the maximum number of outstanding packets which can be sent before an acknowledgment must be received. The Packet Window Size can be from 2 to 7. The default value is 2.

Parity

When using an ASCII Feature Card, this parameter sets the type of parity checking that will be used on this port. The parity must be the same for the port and the remote ASCII device. It is recommended

that parity be set to None unless your remote device explicitly requires another setting.

Passthrough ASCII Printer Type

When using an ASCII Feature Card, this parameter defines the type of printer that will be connected to the remote PC for use as a Passthrough printer. If the printer type is defined as Select at Connect, the user will be prompted at connect time for the printer type. Note that for PerleTALK for Windows and PC Support/400, this parameter has no effect as the Passthrough printer type is defined in the remote emulator.

Passthrough Printer Emulation

When using an ASCII Feature Card, this parameter specifies the type of IBM 5250 printer that will be emulated on this port. Any of the listed IBM printers can be emulated, regardless of the type of ASCII printer that will actually be used. The corresponding printer device description on the AS/400 system must be configured as the same type.

Password

When using an X.25 host connection, and there are multiple emulated controllers defined for the Perle 594, this parameter is used to uniquely identify this controller to the X.25 network during link establishment. It is only required when Switched Virtual Circuits (SVC) are being used. A password is necessary with an SVC since the Logical Channel number is assigned dynamically and, therefore, cannot be used to identify a specific controller.

This parameter is not required if the Perle 594 is emulating a single controller.

PM CTS Error Count

If the CTS signal is dropped by the modem connecting the 594 to the network, this counter is incremented by 1.

PM DSR Error Count

If the DSR signal is dropped by the modem connecting the 594 to the network, this counter is incremented by 1.

Polling Interval

The 594 repeatedly sends a Status Enquiry message to the network. The Polling Interval (POLLITV) value is the number of seconds between Status Enquiry messages.

Printer Port and Station

When using the NWS Configurator, this field identifies the printer to which configuration screens will be sent during a Print Screen. This field specifies the following: port address and workstation address.

Receiver Acknowledgment Timer (T2)

When using a LAN connection, T2 specifies the maximum amount of time that the Perle 594 waits before sending acknowledgments to the sender. The Perle 594 will send an acknowledgment as soon as the T2 timer expires. Before the T2 timer expires, the Perle 594 determines whether it can send an acknowledgment along with an information frame. If an information frame is not available, the Perle 594 will only send an acknowledgment. Therefore, a larger T2 value could improve performance on the network by reducing the number of frames.

If the LAN connection is to the host, the T2 timer must be set to a value that is less than the AS/400 LAN Response Timer (LANRSPTMR) parameter defined in the AS/400 APPC controller description. This is to ensure that an acknowledgment is received before the AS/400 LAN response timer expires. If the AS/400 LAN Response Timer expires, the link will be lost and the Perle 594 must attempt to re-establish communications again.

Valid entries are from 1 to 255 milliseconds. The default is 30 milliseconds. This field should match the LAN Acknowledgment Timer (LANACKTMR) parameter defined in the AS/400 APPC controller description.

Reconnect Time Limit

This parameter is the amount of time during which the ASCII Feature Card will maintain the AS/400 session following an inadvertent disconnection. While this timer is active, the user can reconnect to the port and continue the AS/400 session. After the time limit is reached, the ASCII Feature Card will inform the AS/400 of the disconnection, and end the session.

The time is entered in minutes, from 0 to 99. When zero is entered, the ASCII Feature Card will immediately notify the AS/400 system of the disconnection. For more information, see *Enable Reconnect Time Limit*.

Residue Errors

If the FCS (Frame Check Sequence) for a valid data frame contains any more data bits, this counter is incremented by 1.

Response Timer (T1)

For a LAN connection, T1 specifies the amount of time that the Perle 594 waits for an acknowledgment or a response from the network. The T1 timer should be set to a value that is equal or greater than the maximum delays accumulated in a network. This delay is dependent on the number of bridges between the Perle 594 and the AS/400 system, the queuing delay at those bridges, the buffer sizes at those bridges, and the transmission delay across the link.

If the T1 setting is lower than the total delays in the network, the T1 timer will expire before a response to a frame is received. If attempts to resend the frame also fail, the Perle 594 will drop the link, and will start the sequence to re-establish communications. All active sessions with the AS/400 will be brought down if this occurs.

If the T1 timer is set much higher than the total delays in the network, performance can be affected. For example, if an information frame is lost or damaged due to line errors, the Perle 594 needs to wait longer before detecting that there has been a line error.

Valid entries are from 1 to 20 seconds. The default is 1 second. A setting of 1 to 2 seconds is typical, however, this value is dependent on the number of bridges in the network. Also, since delay is affected by LAN congestion, the delay may vary throughout the day. For Token-Ring, enter an * for the Perle 594 to automatically calculate T1 based on the number of bridges in the path.

This field should match the LAN Frame Retry (LANFRMRTY) parameter defined in the AS/400 APPC controller description.

Retry Count (N2)

When using a LAN connection, this parameter specifies the number of times the Perle 594 attempts to resend an information frame following the expiration of the response timer (T1). If the specified retry count expires, and no responses are received, the Perle 594 drops the link and attempts to re-establish communications.

Valid entries are from 1 to 99 retries. The default is 8 retries. If you have an error-prone network, you may need to increase this value. This field should match the LAN Frame Retry (LANFRMRTY) parameter defined in the AS/400 APPC controller description.

Retry Counter

The number of times that the Perle 594 attempts to re-establish a logical connection to the AS/400. The Retry Counter is from 0—255. The default value is 10.

Retry Interval

This parameter specifies the amount of time that the Perle 594 will wait between attempts to re-establish a logical connection to the AS/400 if the logical connection is lost. The Retry Interval is measured in 10-second increments from 1 to 60 (i.e., from 10 to 600 seconds). The default value is 6 (i.e., 1 minute).

Retry of Optional Call Progress Signals

When using an X.21 Switched host connection, a Call Process Signal (CPS) is returned if a Short Hold Mode link re-establishment fails. If a CPS from the table below is returned, the 594 will consider the link to have failed, and not attempt to retry. However, in some X.21 networks, some of the codes may be returned when a retry should be attempted.

If you wish to have the 594 retry if any of the Call Process Signals below are received, specify them in the field. Up to eight call progress signals can be tried again. These signals are listed in the following table:

Code	Meaning
01	Terminal called
02	Redirected call
03	Connect when free
04	Private network reached
05	Public network reached
41	Access barred
42	Changed number
43	Not obtainable
44	Out of order
45	Controlled not ready
46	Uncontrolled not ready
47	DCE power off
48	Facility request not valid
49	Network fault in local loop
51	Call information service
52	Incompatible user class of service
71	Long-term network congestion
72	RPOA out of order

Consult your network representative before entering any codes. CPSs which start with 2 and 6 are automatically tried again during SHM link re-establishment, and should not be entered here.

Reverse Charging Accepted

Reverse charging refers to a facility that allows virtual calls to be billed to the receiving DTE.

SAP

The Service Access Point (SAP) is used as the logical address for communicating with the PWS. When the Perle 594 emulates more than one LAN gateway, the SAP can be either unique or identical because LAN Feature Cards are distinguished from one another by their unique network address. Valid characters are from 04 to FC, in multiples of 04. The default is 04. All PWSs on the same LAN gateway must specify the same SAP.

Seconds Between Retries

When using an X.25 connection, this parameter is the amount of time that the controller will wait for a response to a transmitted frame. It is also used to determine the time that the controller will wait before sending a link initiation request. The Seconds Between Retries is from 1 to 60. The default value is 3 seconds.

Select Alternate Language at Connect

When using the ASCII Feature Card, this parameter specifies whether or not the users will be prompted to select a language when they connect to this port. With Yes selected, when the user connects to the port, the following prompt will appear:

```
1=ENGLISH,2=FRANCAIS,3=DEUTCH,4=ITALIANO,5=ESPANOL ===>>
```

The user then enters the number which corresponds to the appropriate language. When Select Alternate Languages at Connect is set to No, all messages sent to the user by the ASCII Feature Card will be in the default language.

Select Group at Connect

When using the ASCII Feature Card, this parameter specifies whether the user will be prompted to enter a Group name at connect time.

- Select Yes to allow the user to select a Group Name when a connection is made to this port.
- Select No to disable Select Group at Connect. Users will not be prompted to enter a Group and will be assigned the predefined configuration for the port.

For more information, see *Associated Group*.

Send Leading Pad

When using an SDLC host connection, a leading pad character will be added to all information frames if Send Leading Pad is set to Yes. Some modems require a leading pad for synchronization. If your modem requires a leading pad character, you must also select NRZI data encoding. Note that specifying an incorrect entry for this field may cause retransmission of frames and degrade line performance.

Serial Number

This parameter is a user-defined serial number for this controller. The Serial Number is sent to the AS/400 system in some messages for purposes of identification. The Serial Number contains 7 characters. Each character can be a number from 0 to 9, or a letter from A to Z.

Choose a Serial Number that uniquely identifies this controller to the AS/400 system. If no Serial Number is entered, then seven zeros are used. If network user verification is used, the first 2 characters of the Serial Number must be "XI".

Although you may wish to set this field to the 594 Hardware Serial Number, this relationship is not enforced. If the unit is emulating multiple controllers, the serial number for each of the emulated controllers should be unique.

Slot

On the 594 - Configuration - Hardware screen, this parameter displays the Card ID for each slot which is currently defined. Slots which are not yet defined display blanks. Card IDs can be changed to match the actual hardware configuration. The following table lists valid Card IDs for each slot:

Slot Number	Purpose
0	00 (Multisession Controller)
1	96 (Synchronous Communication Card)
2—7	41 (Twinaxial Feature Card) 42 (ASCII Feature Card) 43 (Token-Ring Feature Card) 44 (Twinaxial Feature Card) 45 (Ethernet Feature Card) 48 (Twinaxial Feature Card) 49 (Fast Ethernet Feature Card)

On the 594T - Configuration - Hardware screen, this parameter displays the Card ID for each slot which is currently defined. Slots which are not yet defined display blanks. Card IDs can be changed to match the actual hardware configuration for slot 3 only. The following table lists valid Card IDs for slot 3:

Slot Number	Purpose
1	97 (Synchronous Communication Card)
2	48 (Twinaxial Feature Card)
3	43 (Token-Ring Feature Card) 45 (Ethernet Feature Card) 49 (Fast Ethernet Feature Card)

On the 594M , there are no slot numbers. The hardware is installed at the factory and cannot be changed in the field.

Telenet-Type Network Attachment

This parameter specifies whether or not the 594 is attached to a Telenet-type network. If not, the 594 responds with a DISCONNECT MODE (DM) to a DISC received after sending SABM. If the 594 is attached to a Telenet-type network, the network expects the 594 to respond with UNNUMBERED ACKNOWLEDGMENT (UA) to a DISC command after sending SABM.

Token-Ring Address

This is the Token-Ring address of the Perle 594 Token-Ring Feature Card when used as a LAN gateway. The default address is 4000594000XX, were XX is the slot number of the Feature Card. Each emulated controller must specify a unique Token-Ring address. Field length is twelve characters: 0—9, A—Z. All PWSs on the same Token-Ring gateway must use the same Token-Ring address.

Total number of bytes received

Total number of data bytes received from the host/network.

Total number of bytes transmitted

Total number of data bytes transmitted to the host/network.

Total number of frames received

Total number of data frames received from the host/network.

Total number of frames transmitted

Total number of data frames transmitted to the host/network.

Underruns

If the 594 cannot send data fast enough to keep up with the data rate, this counter is incremented by 1.

Chapter 3: Message Codes and SRCs

This chapter describes message codes and System Reference Codes (SRCs). Message codes are three digits long. They appear on the LCD, on the left side of the bottom line. SRCs may appear on workstation screens and on the LCD, on the right side of the bottom line.

Note: *The 594M does not have a front panel display. The SRCs in this chapter will be recorded in a time-stamped error log file for all 594 models. The 594Utility is used to view this file and determine which SRCs have been logged.*

Message Codes

The bottom line of the LCD has the following format:

```
xxxxx aaaaaa(a)
```

The letters "xxxxx" indicate a message code.

The letters "aaaaaa(a)" indicate a System Reference Code (SRC). All SRCs are listed in the next section.

The top line of the LCD may display one of the following messages:

- The CP Name of the controller reporting the error.
- The slot number and card type of the card reporting the error.
- The 594e will display the message **`Perle 594`** if the 594 is in compatible mode.
- Blanks.

Message Code	Description
000	Request command selected. To enter a request, type a request number, then press **Enter**. To clear the request command, press **ESC**.
001 to 099	Diagnostic testing in progress.
199	Perle 594 hardware error. Use the SRC on the LCD display to identify the error.
200 to 220	Request codes for Perle 594 status information.
230	Restart LAN communications request. To activate the request, press **Enter**, or press **ESC** to clear.
240	Stop/Start FR-TR Bridge frame forwarding. To activate the request, press **Enter**, or press **ESC** to clear.
241	Start/Stop IP Routing frame forwarding. To activate the request, press **Enter**.
250 to 257	Request codes for IP Routing status information.
280	Indicates that software is being downloaded to the 594.
290	Enter concurrent diagnostic mode request. To activate the request, press **Enter**, or press **ESC** to clear.
291	Exit concurrent diagnostic mode request. To activate the request, press **Enter**, or press **ESC** to clear.
300 to 350	Copy configuration data, bridge filter file or 594 Network Controller Software messages. Press **ESC** to cancel this operation.
351	System file cannot be read from 594 diskette or 594 Hard Drive. Use the SRC on the LCD display to identify the problem.
352	A configuration problem was detected. Use the SRC on the LCD display to identify the problem.

Message Code	Description
359	Incorrect configuration data was detected. Use the SRC on the LCD display to identify the problem.
361	A configuration problem was found. Use the SRC on the LCD display to identify the problem.
363	AS/400 connection error. Use the SRC on the LCD display to identify the problem.
364	A problem was detected with either the Token-Ring or the Ethernet adapter. Use the SRC on the LCD display to identify the problem.
410	Physical link error. Use the SRC on the LCD display to identify the error.
420	X.25 network error. Use the SRC on the LCD display to identify the error.
430	X.21 network error. Use the SRC on the LCD display to identify the error.
440	A V.25 bis error was detected. Use the SRC on the LCD display to identify the error.
450	SNA communication error. Use the SRC on the LCD display to identify the error.
460	LAN error. Use the SRC on the LCD display to identify the error.
470	Frame-relay error. Use the SRC on the LCD display to identify the error.
480	A Frame Relay Token-Ring Bridge or IP Routing error has been detected. Use the SRC displayed on the operator panel LCD to identify the problem.
500	TCP/IP error. Use the SRC on the LCD display to identify the error.
720	A Perle 594 system failure has been detected. Note any SRC on the LCD display and contact your 594 service representative.
999	Invalid key pressed following a Req key. Press **ESC** to clear the error and retry the operation.
P01-01	Select Perle 594 enhanced mode. On the keypad use the arrow keys to select one of the following: 0 and press the **Enter** key to continue in compatible mode. 1 and press the **Enter** key to select Perle 594 enhanced mode.
P02-01	Delete Perle 594 configuration data. On the keypad use the arrow keys to select one of the following: 0, and press the **Enter** key to return without deleting. 1, and press the **Enter** key to delete Perle 594 configuration data.
P22-01	The loopback diagnostic test is in progress.
P22-02	The loopback diagnostic test has passed successfully.
P22-03	The loopback adapter has not been detected. Press **Esc** to return to the extended diagnostic menu, or attach the loopback adapter to the connector on the back of the Synchronous Communication card, and press **Enter** to continue loopback diagnostics.
P22-04	The loopback diagnostics test has failed.
P24-01	The Card ID of the feature card is displayed on the right side of the bottom line of the LCD display. The slot number of the feature card is displayed on the top line of the LCD display. Use the up and down arrows to select the feature card to configure.
P24-02	The current Token-Ring or Ethernet speed of the selected LAN Feature Card is displayed on the LCD display. The slot number of the card is displayed on the top line of the LCD display. Use the up and down arrow keys on the keypad to select a new LAN speed and press the **Enter** key.
P24-03	The configuration data does not match the Perle 594 hardware. Use the 3-digit SRC on the LCD to identify the problem. Press **Enter** to correct the configuration data, or press **Esc** to leave the configuration data unchanged.

System Reference Codes

System Reference Codes (SRCs) may appear on workstation screens and on the LCD, on the right side of the bottom line.

The bottom line of the LCD has the following format:

```
xxx-xx aaaaaa(a)
```

The letters "aaaaaa(a)" indicate an SRC.

The top line of the LCD may display one of the following messages:

- The CP Name of the controller reporting the error.
- The slot number and card type of the card reporting the error.
- The 594 will display the message **`Perle 594`** if the 594 is in compatible mode.
- Blanks.

SRCs may be from 3 to 6 digits long. SRCs are listed in this section in numerical order.

594 System Hardware and Configuration SRC's (100-199)

The following SRCs indicate hardware problems with the Perle 594:

SRC	Description
100 - 123	A problem has been detected during diagnostic testing. See the *594 Diagnostic Guide* for more information.
124	Perle 594 System Diskette problem detected, restart the Perle 594 with the backup diskette. If the problem continues contact your 594 service representative.
126	No configuration data found for this card. Press the right arrow key on the keypad to display the slot number of the card generating the error.
127	A Perle 594 card failed the self test procedure. Press the right arrow key on the keypad to display the slot number of the card generating the error, and the self test error code. Power the Perle 594 off and on. If the problem continues contact your 594 service representative.
128	Motherboard memory error detected during power on diagnostics. Power the Perle 594 off and on. If the problem continues contact your 594 service representative.
129	This card has failed loopback diagnostics test. Power the Perle 594 off and on. If the problem continues contact your 594 service representative.
130	The card ID assigned during configuration does not match the card installed in the slot. Press the right arrow key on the keypad to display the slot number of the card generating the error.
131	The card ID assigned during hardware setup does not match the card installed in the slot. Press the right arrow key on the keypad to display the slot number of the card generating the error.
132	None of the card IDs have been assigned for Feature Card slots 2 through 7. The card IDs are assigned using the keypad during the hardware setup procedure. Refer to Appendix D.
133	None of the card IDs have been assigned for the Feature Cards used to communicate with the workstations. The card IDs are assigned using the keypad during the hardware setup procedure. Refer to Appendix D.

SRC	Description
134	All of the configured Feature Cards used to communicate with the workstations have failed the POST procedure. Power the Perle 594 off and on. If the problem continues contact your 594 service representative.
135	None of the card IDs have been assigned for the Feature Cards used to communicate with the Host systems. The card IDs are assigned using the keypad during the hardware setup procedure. Refer to Appendix D.
136	All of the configured Feature Cards used to communicate with the Host systems have failed the POST procedure. Power the Perle 594 off and on. If the problem continues contact your 594 service representative.
137	No Twinax card has been installed. Therefore, the 594 cannot operate in compatible mode. Use the 594 Utility program to configure the 594 in enhanced mode, which can operate with a LAN gateway only.
138	The wrong diskette is in the diskette drive. Use the Base Controller Software or Networking Controller Software Diskette to start up in normal operating mode.
139	There is no configuration file in CMOS or on the Controller Software Diskette. Use Req 300 to restore the configuration file from your backup diskette to CMOS. For information about backing up and restoring the configuration file, refer to Chapter 6, *594 Utility Configuration Method*.
140	The 594 Controller Setup Diskette was not in the diskette drive when initiation of configuration mode was attempted. Insert the correct diskette in the drive and try again.
141	The 594 Controller Setup Diskette was not in the diskette drive when initiation of extended diagnostics mode was attempted. Insert the correct diskette in the drive and try again.
142	The Timestamped Error Log is invalid. Contact your Perle Systems representative.
143	Insufficient memory for the number of controllers you have assigned. Contact your 594 service representative.
145	An enhanced hardware setup is being used with a configuration file that is configured for compatible mode.
146	More than 2 LAN cards are installed in the Perle 594. Enter Extended Diagnostics to configure the additional cards.
147	A Perle feature card has been configured with the same slot number as an existing LAN card.
148	The primary Token-Ring card has not been installed in slot 3.
149	The 594 contains a secondary LAN card, but no primary.
150	The synchronous communication card has failed the self test procedure. Power the 594 off and on. If the problem continues, contact your 594 service representative.
151	An invalid twinax card was detected in slot 2 of the 594.
152	Two (2) unconfigured Token-Ring cards have been installed in the 594 at the same time. See the section *Setting the Token-Ring Feature Card Position* in Appendix D for instructions.
153	More than 2 Ethernet LAN cards are installed in the Perle 594.
168(n)	Configuration data does not match Perle 594 hardware; (n) indicates the slot number of the card generating this error.
169(n)	The Feature Card is not been placed in the correct slot; (n) indicates the slot number of the card generating this error.
170	Insufficient memory for current configuration.
171	No 594 Hard Drive was found. The 594 was started with a Network Controller Software disk but no hard drive was found in the unit.

SRC	Description
172	No 594 Networking Controller Software was found on the 594 Hard Drive. Use **REQ 340** to load system software onto your 594 hard drive.
173	The 594 controller software in the disk drive is not compatible with the 594 hardware.
199	The test code corresponding to the testing error is not found in the test code table.

NWS Operational SRC's (0000-0177)

The following SRCs indicate keyboard errors. To recover from the error, press the **Error Reset** key, correct any problems, and continue.

SRC	Description
0000	Help key is not valid.
0001	Keyboard overrun.
0002	Invalid scan code.
0003	Invalid key followed CMD or ALT key.
0004	Only data from a magnetic stripe reader or a light pen is allowed.
0005	Cursor in protected area of display.
0006	Invalid key followed System Request key.
0007	Mandatory entry field not filled in.
0008	Only alphabetical data is allowed.
0009	Only numeric data allowed.
000G	Secondary session not available at this time, session power down in progress. Retry this request when the power down is completed.
000H	Hot key to secondary session failed, either the session has not been configured or the session could not be allocated during power up.
0010	Only characters 0 through 9 allowed.
0011	Key not allowed in last position of signed numeric field.
0012	No room to insert data in the field.
0013	Terminal still in insert mode, only data keys allowed.
0014	Mandatory fill field, must be filled or empty.
0015	Self-check field error.
0016	Field not valid for this field.
0017	Mandatory field must be filled or empty.
0018	You pressed a data key to exit a nondata field. To exit this field, use Field Exit.
0019	Dup or Field Mark key not permitted.
0020	You pressed a function key that is not valid in a right-adjust field. To exit this field press Field -, Field +, or Field Exit.
0021	Data must be entered in mandatory enter field.
0022	System error.
0023	Hexadecimal mode error.
0024	Invalid key, only 0 through 9 and Dup key allowed.
0026	Field entry not allowed, last position must be 0 through 9.
0027	Key not valid on this display station.

SRC	Description
0028	Key not valid on this display station.
0029	Diacritic character not valid.
0031	Data buffer overflow.
0032	Magnetic stripe reader, invalid data.
0033	Magnetic stripe reader, data not authorized.
0034	Magnetic stripe reader, data exceeds field length.
0035	Magnetic stripe reader, card cannot be read.
0036	Cursor select not allowed in field exit mode.
0037	Cursor select not allowed in a nonselectable field.
0038	Magnetic stripe reader or light pen not allowed for this field.
0040	Modem or DCE Not Ready. Data Set Ready (DSR) Line Inactive for V.24 or V.35, or DCE Not Ready for X.21. This error indicates that the modem or DCE was not ready during required intervals of normal operation. The operating state of the modem or DCE is checked at different times, depending on the specific link-level protocol in use.
0041	The receive line was idle for at least 15 bit times. Verify all cable and line connections. If the problem persists, contact the network administrator.
0042	The receive clock signal from the modem or DCE is not being received. Verify all cable and line connections. If the problem persists, contact the network administrator.
0043	The data set ready (DSR) signal was not deactivated by the modem or DCE even though the 594 tried to disconnect from the line. Verify all cable and line connections. If the problem persists, contact the network administrator.
0044	30-Second Timeout. For a synchronous connection this error indicates that no valid data has been received for 30 seconds. For a LAN connection this error indicates the Ti timer has expired before a valid frame was received by the Perle 594.
0045	During link setup, either a disconnect mode (DM) or disconnect (DISC) command was received; the DCE will not active. Verify all cable and line connections. If the problem persists, contact the network administrator.
0046	Frame reject received. The Perle 594 received a FRMB from the network. Verify all cable and line connections. If the problem persists, contact the network administrator.
0047	The Perle 594 received an unexpected disconnect mode or disconnect command. Verify all cable and line connections. If the problem persists, contact the network administrator.
0048	An unexpected Unnumbered Acknowledgment (UA) frame was received. Verify all cable and line connections. If the problem persists, contact the network administrator.
0049	The Perle 594 received an unexpected SABME. Restart communication, if the problem persists, contact the network administrator.
0050	An error was detected in the Ready For Sending (RFS) or Clear To Send (CTS) signal. Verify all cable and line connections. If the problem persists, contact the network administrator.
0051	The transmit clock failed during a transmit operation. If the problem persists, contact the network administrator.
0052	No transmit clock, modem, or DCE signal was detected even though the link adapter did not complete a transmit operation within the allotted time period. Verify all cable and line connections. If the problem persists, contact the network administrator.

SRC	Description
0053	Expiration of Retry Counter (X.25 only). No acknowledgment of a transmission was received within the allowed timeout. (Timeout retry counter (N2) and retry interval (T1) are specified in Field 7 of the NWS configurator.)
0054	Frame reject sent. The Perle 594 has sent a FRMR response to the AS/400 system after receiving an invalid DLC or LAPB command.
0055	The Perle 594 has determined that the communication cable is not attached to the 594. Attach a cable to the 594 or replace the one currently attached.
0056	Link was broken between the Perle 594 and the host. Ensure that delays and timer values are sufficiently long. If the problem persists, contact the network administrator.
0060	Alphanumeric character entered into double-byte data characters or a key that is invalid within an embedded segment was pressed.
0061	Double-byte character entered into an alpha numeric field or a key that is invalid outside an embedded segment was pressed.
0062	Change data type not allowed, the cursor must be in an open field or in the first position ideographic field.
0063	Invalid ideographic character entered while in alternate entry mode.
0064	Invalid key pressed for the current keyboard mode.
0065	Invalid cursor position, column reserved for shift-out or shift-in characters.
0066	Repeat key not valid at current position.
0067	Workstation extension character RAM is full. Therefore, additional extension characters will be displayed as default characters.
0068	Perle 594 output data stream is not valid for extension characters. Therefore, any additional extension characters will be displayed as default characters.
0069	Perle 594 output data stream contains invalid or undefined extension characters. Additional extension characters will be displayed as default characters.
006G	Invalid terminal type. A double byte character terminal is attached to a Twinaxial Feature Card with Card ID 41. A card with Card ID 44 must be used.
0070	Word spill or carrier return error.
0071	Invalid start copy, move, or delete text operation while a previous operation is still in progress.
0072	Invalid key pressed for the current cursor position.
0073	Invalid instruction attempted while the general prompt function was not active.
0074	Invalid key pressed while the general prompt function is active.
0075	Keyed characters not found.
0076	Insert function failed, the AS/400 has not processed the text on the screen.
0077	Invalid function key pressed or a 3270 keyboard function was entered while in word processing mode.
0078	Application error, the required scale line is not defined for your workstation.
0081	Configuration error, there are too many devices attached.
0082	Invalid keyboard function.
0083	Invalid selection.
0084	Selection field unavailable.
0087	Flow control error. Be sure X.25 communication settings on the Perle 594 match X.25 communication worksheet.
0089	One or more required fields not complete.

SRC	Description
008A	One or more fields contain an invalid embedded blank.
008B	Too many keyboard country codes defined; four is the maximum.
008C	Duplicate values configured error. One of the following duplicate values have been configured:
	• Two or more hosts have been given the same fully qualified name (Hx:1 joined together with Hx:2). If concurrent host is enabled, each host must have a unique, fully qualified name.
	• A FR-TR Bridge DLCI is the same as another FR-TR bridge DLCI or the same as a Host DLCI.
	• The frame relay ring number and LAN ring number are the same on a FR-TR bridge configuration.
	• The frame relay MAC address and the 594 token-ring LAN address are the same on a FR-TR bridge configuration
008D	The printer port and/or station address values are invalid.
008E	One or more fields contain an insufficient number of characters.
008F	One or more fields contain a value outside the valid range.
008G	NWS configuration can only be accessed on slot 2.
008H	Perle 594 hardware setup for enhanced mode only. You must use the PWS configuration to modify your configuration data.
008J	Perle 594 configuration file valid for enhanced mode only. You must use the PWS configuration to modify your configuration data.
0091	The Reverse and Close keys are not valid for this field.
0092	The Reverse key is not valid on this display because it is configured for shared addressing.
0097	Test request not supported by the host system.
0098	Hardware error.
0099	In operating mode, the requested function is not supported or there is no session with AS/400 system established. In configuration mode, only one device can be in configuration mode at any time. Another device is currently active in the configuration program.
009A	Three invalid passwords have been entered on this PWS.
009G	The default word processing message table is currently active for this session. All word processing functions are available.
009H	The 594 requires additional system memory to operate with the current configuration. Only the primary session(s) will be active, multisession(s) will not be available.
0170	An attached workstation failed to detect a valid end of printer definition table (PDT).
0172	An attached workstation detected invalid data in a host-originated printer definition table (PDT).
0173	An attached workstation received a printer definition table (PDT) that exceeded the maximum size.
0176	An attached workstation detected an error in a host-originated microcode correction file.
0177	An attached workstation detected an error in a host-originated font file.

X.25 Communication SRC's (100000-1BFF00)

If you are using X.25 communication and an error occurs during the keyboard entry of a command, option or parameter, a 6-digit SRC between 100000 and 10FFFF is displayed.

If the controller accepts the keyboard-entered options but the network operation with the AS/400 system fails, an SRC between 110000-1BFF00 is displayed on all display stations attached to that controller. These SRCs indicate a communication network problem at the packet level.

SRC	Description
100000	Previous X.25 command still being executed.
100100	A virtual circuit has already been established. The Perle 594 can only communicate over one virtual circuit per controller at a time.
100200	An answer command was entered for a PVC circuit. A PVC circuit requires an open command.
100300	A call command was entered for a PVC circuit. A PVC circuit requires an open command.
100400	The logical channel ID is not valid because it is not three characters long.
100500	The logical channel ID option is not valid because it is not a hexadecimal value between 001 and FFF.
100600	The password option is not valid because it is longer than eight characters or contains nonalphanumeric characters.
100700	The host network address is not valid because it is longer than 15 decimal digits or contains nonnumeric characters.
100A00	The operator attempted to enter option fields not supported by that connection type.
100B00	The X.25 facility entered contains invalid characters.
100C00	The X.25 packet window size entered is invalid because it is less than 02.
100D00	The X.25 packet window size entered is invalid because modulo 8 is specified and the packet size is greater than 07.
100E00	The X.25 packet window size entered is invalid because modulo 128 is specified and the packet size is greater than 15.
100F00	The X.25 packet size is not equal to 64, 128, 256, or 512.
101000	The X.25 closed user group option does not contain 2 decimal digits.
101100	An invalid control character was entered.
101300	For X.25: Either a) the first control character entered was not one of A, O, C, or D or b) the first control character has already been entered.
101500	The password option was entered for a PVC.
101600	The X.25 password is invalid because it contains characters that are not alphanumeric.
101800	The X.25 closed user group option was entered for a command that was not a CALL command issued on an SVC.
101900	The option Q (QLLC) or E (ELLC) is not valid with an answer command. Use these options with an SVC call or PVC open command.
101A00	The X.25 F or R option was entered for a command that was not initiating a CALL command on an SVC.
101B00	The recovery value for the E (ELLC) option must be from 100 to 199.
101C00	A CALL command was entered for an answer-only SVC. The 594 configuration may be incorrect.
101D00	An open command was entered for a manual connect SVC controller.

SRCs 110000—1100FF

The controller issued a clear request packet after detecting an error.

SRC	Description
110000	No additional information. Report the problem to your AS/400 system operator.
110014	The Perle 594 received an X.25 packet type that is invalid for state p1 and issued a Clear Request.
110015	The Perle 594 detected an X.25 packet type that is invalid for state p2 and issued a Clear Request.
110017	The Perle 594 detected an X.25 packet type that is invalid for state p4 and issued a Clear Request.
110018	The Perle 594 detected an X.25 packet type that is invalid for state p5 and issued a Clear Request.
110031	The Perle 594 issued an X.25 Clear Request because a Call Connected was not received within 200 seconds. Contact the X.25 network service provider.
110032	The Perle 594 issued an X.25 Clear Request because a Clear Confirmation was not received within 200 seconds. Contact the X.25 network service provider.
110046	Call from unexpected DTE. Verify the network address and retry. If the problem continues, report the problem to your AS/400 system operator.
110050	A general ELLC/QLLC error has occurred. Report the problem to the AS/400 system operator.
110051	An undefined ELLC C field was detected. Report the problem to the AS/400 system operator.
110054	An undefined ELLC I field was detected. Report the problem to the AS/400 system operator.
110055	An I field that was longer than the allowed 521 bytes was detected. Report the problem to the AS/400 system operator.
110056	An error occurred and an ELLC frame reject was received. Report the problem to the AS/400 system operator.
110057	An invalid ELLC header was detected. Report the problem to the AS/400 system operator.
110059	An ELLC timeout condition was detected. Report the problem to the AS/400 system operator.
11005A	An invalid ELLC receive sequence count was detected. Report the problem to the AS/400 system operator.
11005B	An ELLC recovery was rejected or terminated.
1100A1	The Perle 594 detected an invalid X.25 M-bit packet sequence and, therefore, issued a Clear Request. Be sure the packet size entered matches the packet size specified in the network subscription.
1100A6	The Perle 594 detected an X.25 packet that was too short and, therefore, issued a Clear Request. Be sure the packet size entered matches the packet size specified in the network subscription.
1100A7	The Perle 594 detected an X.25 packet that was too long and, therefore, issued a Clear Request. Be sure the packet size entered matches the packet size specified in the network subscription.
1100AA	The Perle 594 detected an unsupported, X.25 interrupt packet and, therefore, issued a Clear Request. Contact the X.25 network service provider.

SRC	Description
1100AB	The Perle 594 detected an invalid X.25 packet send sequence number (Ps) and, therefore, issued a Clear Request. Contact the X.25 network service provider.
1100AC	The Perle 594 detected an invalid X.25 packet receive sequence number (Pr) and, therefore, issued a Clear Request. Contact the X.25 network service provider.
1100AD	The Perle 594 received an invalid X.25 D-bit and, therefore, issued a Clear Request. Report the problem to the AS/400 system operator.
1100D0	The Perle 594 received an X.25 general resources error and, therefore, issued a Clear Request. Report the problem to the AS/400 system operator.
1100D2	The Perle 594 received an X.25 path information (PIU) that was too long and, therefore, issued a Clear Request. Report the problem to the AS/400 system operator.
1100E0	An invalid facility length was detected. Report the problem to the AS/400 system operator.
1100E6	Unsupported facility parameters were detected. Report the problem to the AS/400 system operator.
1100E7	An unsupported facility was detected. Report the problem to the AS/400 system operator.
1100E8	A call from an unexpected DTE was detected. Retry the operation.
1100E9	The Perle 594 detected an invalid X.25 D-bit and, therefore, issued a Clear Request. Report the problem to the AS/400 system operator.
1100EA	An error was detected, and there was a reset indication on an SVC.
1100EB	An invalid protocol identifier was detected. Retry the operation.
1100EC	A password mismatch was detected. Retry the password.
1100F4	Connection rejection, reason unspecified (transient condition). Retry the operation. Report the problem to your AS/400 system operator.
1100F5	Connection rejection, reason unspecified (permanent condition). Retry the operation. You should report the problem to your AS/400 system operator.
1100F6	Connection rejection, requested quality of service not available (transient condition). Verify your configuration. If the problem continues, report the problem to your network representative.
1100F8	Connection rejection, incompatible information in user data. Verify your configuration. If the problem continues, report the problem to your network representative.

SRCs 120000—1200FF

The controller issued a reset request packet after detecting an error.

SRC	Description
120000	No additional information. Report the problem to your AS/400 system operator.
120001	Invalid packet sent sequence number (Ps). Report the error to your network representative.
120002	Invalid packet received sequence number (Pr). Report the error to your network representative.
12001B	Invalid packet type for state d1. Retry the operation. You may be allowed temporary operation. However, you should report the error to your network representative.
120020	Packet not allowed. Report the problem to your AS/400 system operator.
120026	Packet too short. Make sure that the packet size entered in the configuration or entered manually matches your network subscription.
120027	Packet too long. Make sure that the packet size entered in the configuration or entered manually matches your network subscription.
120033	Reset confirmation not received within 200 seconds. Report the problem to the AS/400 system operator.
120050	A general ELLC/QLLC error has occurred. Report the problem to the AS/400 system operator.
120051	An undefined ELLC C field was detected. Report the problem to the AS/400 system operator.
120054	An undefined ELLC I field was detected. Report the problem to the AS/400 system operator.
120055	An Ifield that was longer than the allowed 521 bytes was detected. Report the problem to the AS/400 system operator.
120056	An error occurred and an ELLC frame reject was received. Report the problem to the AS/400 system operator.
120057	An invalid ELLC header was detected. Report the problem to the AS/400 system operator.
120059	An ELLC timeout condition was detected. Report the problem to the AS/400 system operator.
12005A	An invalid ELLC receive sequence count was detected. Report the problem to the AS/400 system operator.
12005B	An ELLC recovery was rejected or terminated.
1200A1	The Perle 594 detected an invalid X.25 M-bit packet and, therefore, issued a Reset Request. Ensure packet size entered matches packet size in network subscription.
1200A6	The Perle 594 detected an X.25 packet that was too short and, therefore, issued a Reset Request. Ensure packet size entered matches packet size in network subscription.
1200A7	The Perle 594 detected an X.25 packet that was too long and, therefore, issued a Reset Request. Ensure packet size entered matches packet size in network subscription.

SRC	Description
1200AA	The Perle 594 detected an X.25 unsupported interrupt packet and, therefore, issued a Reset Request. Contact the network service provider.
1200AB	The Perle 594 detected an invalid X.25 packet send sequence number (Ps) and, therefore, issued a Reset Request. Contact the network service provider.
1200AC	The Perle 594 detected an invalid X.25 packet receive sequence number (Pr) and, therefore, issued a Reset Request. Contact the network service provider.
1200AD	The Perle 594 detected an invalid X.25 D-bit and, therefore, issued a Reset Request. Report the problem to the AS/400 system operator.
1200D0	The Perle 594 detected an X.25 general resources error and, therefore, issued a Reset Request. Report the problem to the AS/400 system operator.
1200D2	The Perle 594 detected anX.25 path information unit (PIU) that was too long and, therefore, issued a Reset Request. Report the problem to the AS/400 system operator.
1200F4	General resources. Retry the operation. Other applications may operate normally. However, you should report the error to your AS/400 system operator.
1200F5	PIU too long. Retry the operation. Other applications may operate normally. However, you should report the error to your AS/400 system operator.

SRCs 1800zz -18FFzz

The DCE issued a clear indication packet after detecting an error.

Note: *Most diagnostic codes (zz) are issued by the network and may vary from network to network. The diagnostic codes (zz) are defined later in this section.*

SRC	Description
1800zz	Call clearing originated at AS/400 system. Report the problem to the AS/400 system operator.
1801zz	AS/400 system busy. Wait, then retry the operation.
1803zz	Invalid facility request. Verify the request. Report the problem to your network representative.
1805zz	Network congestion. Retry the operation. If the problem continues, report the problem to your network representative.
1809zz	Out of order. AS/400 system not ready. Wait, then retry the operation. If the problem continues, report the problem to your network representative.
180Bzz	Access to the AS/400 system not allowed. Verify the request. Report the problem to your AS/400 system operator.
180Dzz	Unrecognized AS/400 system network address. Verify the request. Report the problem to your AS/400 system operator.
1811zz	Error at the AS/400 system. Report the problem to your AS/400 system operator.
1813zz	Error at the Perle 594 controller. Verify the request. Report the problem to your network representative.
1815zz	Recognized private operating agency (RPOA) out of order. Verify the request. Report the problem to your network representative.

SRC	Description
1819zz	Reverse charging not subscribed. Verify the request. Report the problem to your network representative.
1821zz	Incompatible destination. Verify the request. Report the problem to your network representative.
1829zz	Fast select not supported. Verify the request.
1841zz	Gateway-detected procedure error. Repeat the operation. Report the problem to the network representative.
1843zz	Gateway congestion error. Repeat the operation. Report the problem to the network representative.
1880xx	Call clearing originated at target X.25 DTE. Report the problem to the system operator.
1881zz	Target X.25 DTE is busy. Verify the call. Report the problem to the system operator.
1883zz	Invalid facility request. Verify the facility. Report the problem to the network representative.
1885zz	Network is congested. Repeat the operation. Report the problem to the network representative.
1889zz	Target X.25 DTE is not ready. Verify the call. Report the problem to the system operator.
188Bzz	Access to selected target X.25 DTE denied. Verify the link and configuration. Report the problem to the system operator.
188Dzz	Target X.25 DTE network address is not recognized. Verify the address. Report the problem to the system operator.
1891zz	Error at target X.25 DTE. Report the problem to the system operator.
1893zz	Error at the Perle 594.
1895zz	Recognized private operating agency (RPOA) is out of order. Verify the RPOA. Report the problem to the network representative.
1899zz	Reverse charging not subscribed to. Report problem to the network representative.
18A1zz	Incompatible destination. Verify the link and address. Report the problem to the network representative.
18A9zz	Fast select not subscribed to. Verify the link.
18C1zz	Gateway-detected procedure error. Wait and retry the operation. Report the problem to the network representative and the system operator.
18C3zz	Gateway congestion error. Wait and retry the operation. Report the problem to the network representative and the system operator.

SRCs 1900zz—19FFzz

The DCE issued a reset indication packet after detecting an error.

Note: *Most diagnostic codes (zz) are issued by the network and may vary from network to network. The diagnostic codes (zz) are defined later in this section.*

SRC	Description
1900zz	Reset originated at AS/400 system.
1901zz	Out of order-disconnected AS/400 system.
1903zz	Error at the AS/400 system.
1905zz	Error at the controller.
1907zz	Network congestion.
1909zz	Remote DTE operational. This is not an error, it is a normal condition at startup.
190Fzz	Network operational. This is not an error, it is a normal condition at startup.
1911zz	Incompatible destination.
191Dzz	Network out of order.
1980zz	Call clearing from the target X.25 DTE.
1981zz	Disconnected target X.25 caused an out of order.
1983zz	Error at the target X.25.
1985zz	Error at the Perle 594.
1987zz	Network congestion.
1989zz	Remote DTE is operational. This is not an error; it is a normal condition at startup.
198Fzz	The network is operational. This is not an error; it is a normal startup condition.
1991zz	Incompatible destination.
199Dzz	Network is out of order.

SRCs 1A00zz—1AFFzz

The DCE issued a restart.

Note: *Most diagnostic codes (zz) are issued by the network and may vary from network to network. The diagnostic codes (zz) are defined later in this section.*

SRC	Description
1A00zz	No additional information.
1A01zz	Local procedure error.
1A03zz	Network congestion.
1A07zz	Network is operational. This is not an error, this is a normal condition at startup.
1A7Fzz	Registration or cancellation confirmed. This is not an error.

18yyzz—1Ayyzz (zz) Diagnostic Codes

The following are the diagnostic codes (zz) for 18yyzz, 19yyzz, and 1Ayyzz:

Diagnostic Code (zz)	Description
00	No additional information.
01	Send sequence P (s) not valid.
02	Received sequence P (r) not valid.
10	Packet type not valid.
11	State r1.
12	State r2.
13	State r3.
14	State p1.
15	State p2.
16	State p3.
17	State p4.
18	State p5.
19	State p6.
1A	State p7.
1B	State d1.
1C	State d2.
1D	State d3.
20	Packet not allowed.
21	Unidentifiable packet.
22	Call on oneway logical channel.
23	Invalid packet type on a permanent virtual circuit.
24	Packet on unassigned logical circuit.
25	Reject not subscribed to.
26	Packet too short.
27	Packet too long.
28	Invalid general format identifier.
29	Restart with LCID not equal to hexadecimal 000.
2A	Packet type not compatible with facility.
2B	Unauthorized interrupt confirmation.
2C	Unauthorized interrupt.
2D	Unauthorized reject.
30	Timer expired, general.
31	Timer expired for incoming call.
32	Timer expired for clear indication packet.
33	Timer expired for reset indication packet.
34	Timer expired for restart indication packet.
40	Call setup or call clearing problem.
41	Facility code not allowed.
42	Facility parameter not allowed.

Diagnostic Code (zz)	Description
43	Invalid called address.
44	Invalid calling address.
45	Invalid facility/registration length.
46	Incoming call barred.
47	No logical channel available.
48	Call collision.
49	Duplicate facility requested.
4A	Nonzero facility address.
4B	Nonzero facility length.
4C	Facility not provided when expected.
4D	Invalid CCITTspecified DTE facility.
50	Miscellaneous problems.
51	Improper cause code from DTE.
52	Octet not aligned.
53	Inconsistent Q bit setting.
70	International problem.
71	Remote network problem.
72	International protocol problem.
73	International link out of order.
74	International link busy.
75	Transit network facility problem.
76	Remote network facility problem.
77	International routing problem.
78	Temporary routing problem.
79	Unknown called DNIC.
7A	Maintenance action.
80-FF	Network-specific diagnostic information.

SRCs 1B0000—1BFF00

The controller issued a restart request packet after detecting an error.

Note: *Most diagnostic codes (zz) are issued by the network and may vary from network to network. The diagnostic codes (zz) are defined earlier in this section.*

SRC	Description
1B1100	Unsolicited restart confirmation received.
1B2400	LCID=0 nonrestart/diagnostic packet.
1B2800	Invalid GFI (restart indication/confirmation only).
1B2900	LCID is not equal to 0 on restart indication/confirmation.
1B3400	Restart confirmation packet not received within 200 seconds.
1BA5yy	Diagnostic packet was received.
1BA500	Diagnostic packet received.
1BA600	Packet is too short.
1BA700	Packet is too long.
1BA800	General format identifier (GFI), restart indication, or confirmation not valid.
1BE200	Restart indication/confirmation packet logical channel identifier (LCID) is not equal to 0.
1BE500	Non-restart/diagnostic packet logical channel identifier (LCID) is equal to 0.

X.21 Switched Communication SRCs (200000-250300)

If the controller accepts the keyboard entered options but the network operation with the AS/400 system fails, an SRC indicating the type of communication problem code is displayed on all the display stations attached to that controller.

The 200000 through 25FFFF SRCs occur when a call progress signal is received from the network.

Contact your network supplier to determine the time period you must wait between recovery attempts and the maximum number of retries allowed by your network.

SRC	Description
200000	A call command is already in progress. Wait until call is completed or a different SRC is displayed.
200100	Detach command accepted, call clearing in progress.
200200	Detach command attempted while a call command in progress or no circuit established.
210100	The incoming call was received by the AS/400 system. Communication should be established shortly. Wait 1 minute or until a different SRC is displayed. This status is temporary.
210200	The call is being redirected to a number other than the one entered. Wait 1 minute or until a different SRC is displayed. This status is temporary.
210300	The call was queued, and communication will be established when the AS/400 system is not busy. Wait 1 minute or until a different SRC is displayed. This status is temporary.
210400	A private network was reached. Wait 1 minute or until a different SRC is displayed. This status is temporary.

SRC	Description
210500	A public network was reached. Wait 1 minute or until a different SRC is displayed. This status is temporary.
212000	There is no connection. Make sure that the number called is correct, and try the operation again. This is a DCE or a network error.
212100	The number is busy. Make sure that the number called is correct, and try the operation again. If the number is busy for longer than normal, call the AS/400 system operator to see if the system port for the number dialed is actually busy. If the number is correct and the port is not busy, this is a network problem.
212200	There is a procedure error in the selection signals sent to the network. Make sure that the operating procedures are correct, and try the operation again. If the same failure occurs, the problem is caused by the DCE or the network.
212300	The network detected a transmission error in the selection signals. Make sure that the number called is correct, and try the operation again. This is a DCE or a network error.
214100	Access is barred. Make sure that the number called is correct and that the operating procedures and configuration are compatible with the network subscription for the controller and the AS/400 system location. If the number, the procedures, and configuration are correct and compatible, the failure is a network problem.
214200	The number you are calling has changed. Make sure that the number called is correct and that the operating procedures and configuration are compatible with the network subscription for the controller and the AS/400 system location. If the number, the procedures, and configuration are correct and compatible, the failure is a network problem.
214300	The called DTE address is not valid or not assigned to any DTE, or the user class of service is not compatible. Make sure that the number called is correct and that the operating procedures and configuration are compatible with the network subscription for the controller and the AS/400 system location. If the number, the procedures, and configuration are correct and compatible, the failure is a network problem.
214400	The number you called is out of order. Make sure that the number called is correct, that the AS/400 system you called as well as the DCE are on and ready, and that the controller is brought online by the AS/400 system operator. If the AS/400 system and DCE are on and ready and the controller is online, the failure is a network problem.
214500	The called DTE is signaling controlled-not-ready. Make sure that the number called is correct, that the AS/400 system you called as well as the DCE are on and ready, and that the controller is brought online by the AS/400 system operator. If the AS/400 system and DCE are on and ready and the controller is online, the failure is a network problem.
214600	The called DTE is signaling uncontrolled-not-ready. Make sure that the number called is correct, that the AS/400 system you called as well as the DCE are on and ready, and that the controller is brought online by the AS/400 system operator. If the AS/400 system and DCE are on and ready and the controller is online, the failure is a network problem.
214700	The called DCE is powered off. Make sure that the number called is correct, that the AS/400 system you called as well as the DCE are on and ready, and that the controller is brought online by the AS/400 system operator. If the AS/400 system and DCE are on and ready and the controller is online, the failure is a network problem.

SRC	Description
214800	The facility request code is not valid. Make sure that the facility request code is correct and that the operating procedures and configuration are compatible with the network subscription for the controller and the AS/400 system location. If the code, the procedures, and configuration are correct and compatible, the failure is a network problem.
214900	There is a network problem in the local loop at the DCE you called. Make sure that the number called is correct and that the operating procedures and configuration are compatible with the network subscription for the controller and the AS/400 system location. If the number, the procedures, and configuration are correct and compatible, the failure is a network problem.
215100	The number called cannot be obtained. Make sure that the number called is correct and that the operating procedures and configuration are compatible with the network subscription for the controller and the AS/400 system location. If the number, the procedures, and configuration are correct and compatible, the failure is a network problem. Call your network supplier to find out why the number is unobtainable.
215200	The user class of service is not compatible. Make sure that the number called is correct and that the operating procedures and configuration are compatible with the network subscription for the controller and the AS/400 system location. If the number, the procedures, and configuration are correct and compatible, the failure is a network problem.
216100	The network is congested. Make sure that the number is called is correct, and try the operation again. This is a network error.
217100	There is long-term network congestion. Make sure that the number is called is correct, and try the operation again. This is a network error.
217200	The recognized private operating agency (RPOA) is out of order. The failure is caused by an RPOA problem or a network problem.
218100	The registration or cancellation is confirmed. This is a confirmation, not an error.
218200	Redirection of the call facility is activated. This is a response to a status inquiry, not an error.
218300	Redirection of the call facility is deactivated. This is a response to a status inquiry, not an error.
219x00	Codes reserved for national purposes. Your network supplier can provide you with the meaning of the call progress signal 9*x*.
220000	An invalid XID was received (invalid short hold indicators). Make sure that the number called was correct. There may be an AS/400 system programming error or a configuration problem.
220100	An invalid XID was received (more than 27 digits were received or the number of digits received does not equal the number of digits specified for short hold mode). Make sure that the number called was correct. There may be an AS/400 system programming error or a configuration problem.
220200	The wrong XID was received. Make sure that the number called was correct. There may be an AS/400 system programming error or a configuration problem.
220300	An XID was required and was not received first. Make sure that the number called was correct. There may be an AS/400 system programming error or a configuration problem.

SRC	Description
220400	A DCE clear was received during call selection. The failure is caused by a network or DCE problem. Report the problem to a network service representative.
220500	Invalid transition to data transfer state while message was received. Report problem to network representative.
220600	Message was too long for buffer. Report problem to network representative.
220700	Attempt was made to send an X.21 message to the network in SDLC state. Contact your Perle 594 representative.
220800	Attempt was made to send an SDLC frame to the network in X.21 state. Contact your Perle 594 representative.
220900	Message was received in the not-ready queue. Contact your Perle 594 representative.
221101	A timeout (T1) for call-request response occurred. The failure is caused by a network or DCE problem. This error can occur if the AS/400 system configuration does not match the Perle 594 configuration. Make sure that the controller is in operating mode. Report the problem to a network service representative.
221102	A timeout (T2) for selection-signal response occurred. The failure is caused by a network or DCE problem. Report the problem to a network service representative.
221103	A timeout (T3A or T3B) for call-progress-signal response occurred. The failure is caused by a network or DCE problem. Report the problem to a network service representative.
221104	A timeout (T4B) for call-accepted response occurred. The failure is caused by a network or DCE problem. Report the problem to a network service representative.
221105	A timeout (T5) for DTE-clear-request occurred. The failure is caused by a network or DCE problem. Report the problem to a network service representative.
221106	A timeout (T6) for DTE-clear-confirmation occurred. The failure is caused by a network or DCE problem. Report the problem to a network service representative.
221300	A call-collision error occurred. Try the operation again. If the error occurs again, report the problem to a network service representative.
221400	A DCE clear was received during X.21 data-transfer state. Connection to the AS/400 system was lost. Make sure that the number called is correct. If the number called is correct, there is an AS/400 system or network problem.
221500	Received Exchange Station Identifier (XID) indicated the AS/400 system was busy.
23xx00	A call progress signal (xx) was received from the network, but a call was not placed. The failure was caused by a network or DCE problem. Report the problem to a network service representative.
240000	The DTE received an invalid call progress signal. The failure is caused by a network or DCE problem. Report the problem to a network service representative.
250100	Invalid XID3 command received, no network name control vector. Contact the AS/400 system operator, there is an AS/400 configuration error.
250200	Invalid XID3 command received, no short hold mode control vector. Contact the AS/400 system operator, there is an AS/400 configuration error.

SRC	Description
250300	Invalid XID3 command received, no short hold connection ID. Contact the AS/400 system operator, there is an AS/400 configuration error.

Vi25 bis SRC's (300000-323400)

SRC	Description
300000	Call request not allowed. Wait 30 seconds and retry the call or wait until a different SRC is displayed.
300100	Disconnect command accepted.
300200	Call clearing not allowed. Do not try to clear the call.
3101ET	Number is busy. Verify the call then try the call again. Contact the system operator.
3102xx	Delayed Call Indication received. Wait the length of time in minutes indicated by xx. Then recall.
310300	Invalid Call Indication was received. Try call again. If needed, contact the network representative.
320100	Error occurred in message transmission. Try call again. If needed, contact Perle 594 service.
320600	Message was too long to fit in buffer. Contact Perle 594 service.
320900	Message was received in the not-ready queue. Contact Perle 594 service.
321000	Ready for Sending (RFS) timeout occurred while the link was being established. Verify the link is correct. If needed, contact the network representative.
321100	Call-connected timeout occurred for an outgoing call. Verify the link is correct. If needed, contact the network representative.
321200	Call-connected timeout occurred for an incoming call. Verify the link is correct. If needed, contact the network representative.
322000	Call-collision error occurred. Try call again. If needed, contact the network service representative.
322100	Incoming call was rejected because state of the call was invalid. Try call again. If needed, contact the network service representative.
323100	Message containing fewer than 3 characters was received. Contact service representative for the modem or the network.
323300	Invalid call-failure-indication parameter was received. Contact service representative for the modem or the network.
323400	No time was indicated for the delayed call failure indication that was received. Contact service representative for the modem or the network.

SNA Communication SRC's (400000-470200)

SRC	Description
400000	Connection attempt is already in progress.
400100	Connect request was rejected. Retry call in one minute. If needed, contact service representative for the modem, DCE, or network.
400200	Data entered in the wrong format, correct the request and retry.
400300	Disconnect attempt from an unconnected AS/400, correct the request and retry.
400400	Request rejected, LU name is not configured for the selected AS/400 system. Correct the request and retry.
400500	Request rejected, command not allowed for this communication configuration. Correct the request and retry.
400600	Invalid request format, correct the request and retry.
400700	Request rejected, connection number is not configured for the selected AS/400 system. Correct the request and retry.
400800	Request rejected, the link to the AS/400 already exists.
400900	Request rejected, the Perle 594 is already establishing a link to the AS/400.
400A00	Request was rejected because: a) the 594 controller is not configured for concurrent hosts. b) an attempt was made to perform a host switch from an NWS to which multisessions were assigned. Concurrent host switches are only allowed from NWSs to which no multisessions have been assigned.
400B00	Request was rejected because link to the host is already active. Wait for a different SRC to be displayed or for a sign-on screen.
400C00	Disconnect command was rejected. Wait two minutes for a sign-on screen. Then try the operation again.
400D00	Request was rejected because no printer is powered on at the address you specified or is not being recognized by the 594.
410000	Exchange protocol error occurred for an Exchange Station Identifier (XID). Verify the configuration. If needed, contact the system operator or the network service representative.
410100	XID command length error, contact the AS/400 system operator.
410200	XID contains an unsupported I field format, contact the AS/400 system operator.
410300	XID command exchange state indicators are set to "not supported", contact AS/400 system operator.
410400	XID3 command did not specify SDLC, contact the AS/400 system operator.
410500	XID3 command specified ABM support, contact the AS/400 system operator.
410600	XID3 command specified ALS as secondary, contact the AS/400 system operator.
410700	XID3 command specified a maximum BTU length less than 256 bytes, contact the AS/400 system operator.
410800	XID3 command specified an SDLC profile that is not valid, contact the AS/400 system operator.
410900	XID3 command specified a maximum I frame outstanding value that is not valid, contact the AS/400 system operator.
411200	The AS/400 reported an error in the XID response. This may be an invalid configuration on the AS/400 of the Perle 594. Sense data contains the 3-byte error offset received in the control vector. Verify the AS/400 and the Perle 594 configuration (note CP names).

SRC	Description
420000	There was a timeout on completion of a change number of sessions (CNOS). Try communicating with the AS/400 system again. If needed, contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
420100	A CNOS reply contains unacceptable values, contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
420200	A CNOS reply contains a format error, contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
4203xx	Abnormal CNOS reply, if xx=02 the Perle 594 mode name is not defined on the AS/400. Contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
420400	There was a timeout on completion of a change number of sessions (CNOS). Contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
421000	There was a negative response to the change number of sessions (CNOS) BIND. Try communicating with the AS/400 system again. If needed, contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
4211xx	The Perle 594 received an unbind (type xx), try to re-establish communication, if unsuccessful contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
421200	Error detected in the LU6.2 CNOS session. The Perle 594 received a function management header indicating session termination. Verify configuration, if problem persists contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
421300	An error occurred while the change number of sessions (CNOS) between the 594 and the AS/400 system was being established or was in progress. Verify the configuration. Then try to reconnect. If needed, contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
4221xx	The Perle 594 sent an xx type unbind to the AS/400. Verify configuration, if problem persists contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.

SRC	Description
430000	An error occurred while the LU 6.2 session between the 594 and the AS/400 system was being established or was in progress. Try to reconnect. If needed, contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
430001	An error occurred while the LU 6.2 session between the 594 and the AS/400 system was being established or was in progress. Contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
431000	The Perle 594 received a negative response to a bind command. Verify configuration, if problem persists contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
4311xx	Error detected in the LU6.2 session. The Perle 594 received an UNBIND type xx. Verify configuration, if problem persists contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
431200	Error detected in the LU6.2 session. The Perle 594 received a function management header indicating session termination. Verify configuration, if problem persists contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
431300	An error occurred while the LU 6.2 session between the 594 and the AS/400 system was being established or was in progress. Verify the configuration, if the AS/400 is operating. If not, wait for the connection to be established again or for a different SRC to be displayed. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
4321xx	Error detected in the LU6.2 session. The Perle 594 sent an UNBIND type xx. Verify configuration, if problem persists contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
438904	The AS/400 did not accept the Perle 594 connection request, no controller description was found. Verify the AS/400 and the Perle 594 configuration (note CP names). By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
438905	The AS/400 did not accept the 594 connection request because this 594 description was already active. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.

SRC	Description
438908	The AS/400 did not accept the 594 connection request because this 594 description has been varied offline. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
438909	The AS/400 did not accept the 594 connection request because the 594 recovery is pending. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
438910	The AS/400 did not accept the 594 connection request because the recovery of this 594 has been canceled. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
438911	The AS/400 did not accept the 594 connection request because this 594 description is in a fail state. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
438912	The AS/400 did not accept the 594 connection request because the AS/400 has an internal error. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
439900	Invalid data was received from the AS/400 while the 594 was waiting for a response to its connection request. Contact the AS/400 system operator. By examining the content of the first sense byte, you can tell which AS/400 host the 594 controller was trying to contact when the error occurred: 00 = H1; 40 = H2; 80 = H3; C0 = H4.
4411xx	LU6.2 session error for an NWS. The Perle 594 received an unbind type xx, contact the AS/400 system operator. By examining the content of the first sense byte, you can find the LSID of the NWS in the low 6 bits. The identity of the AS/400 host the 594 controller was trying to contact when the error occurred is in the high 2 bits. B'00' = H1; B'01' = H2; B'10' = H3; B'11' = H4.
441200	LU6.2 session error for an NWS. The Perle 594 received an FMH7 indicating abnormal termination, contact the AS/400 system operator. By examining the content of the first sense byte, you can find the LSID of the NWS in the low 6 bits. The identity of the AS/400 host the 594 controller was trying to contact when the error occurred is in the high 2 bits. B'00' = H1; B'01' = H2; B'10' = H3; B'11' = H4.
4421xx	LU6.2 session error for an NWS. The Perle 594 sent an unbind type xx, contact the AS/400 system operator. By examining the content of the first sense byte, you can find the LSID of the NWS in the low 6 bits. The identity of the AS/400 host the 594 controller was trying to contact when the error occurred is in the high 2 bits. B'00' = H1; B'01' = H2; B'10' = H3; B'11' = H4.
4500xx	PWS error detected during link initialization, verify PWS configuration. xx=01 indicates bad initiate link reply (incorrect length). xx=02 indicates bad initiate link reply (nonzero return code).
4501xx	PWS error detected during communication, an invalid frame was received from a PWS, verify PWS configuration, xx is the first byte of the control field.

SRC	Description
4510xx	PWS error detected during XID exchange, verify PWS configuration. xx=80 frame length too long. xx=40 not a format 3 XID. xx=20 length inconsistency between XID and I/O block length. xx=10 XID exchange state not 01 or 00. xx=08 link station role was not 00. xx=04 maximum BTU acceptable to PWS was less than 109. xx=02 PWS responded to XID with neither an XID nor a disconnect. xx=01 XID frame length is too short.
4511xx	PWS error detected during communication, an invalid twinaxial data link control frame was received from a PWS, verify PWS configuration, xx is the first byte of the control field.
4520xx	PWS error detected during communication, the link was ended because of a severe session state conflict, verify PWS configuration.
4521xx	LAN link with a PWS error detected during communication, the link was ended because of a severe session state conflict, verify PWS configuration.
4522xx	PWS error detected during communication, an invalid twinaxial data link control frame was received from a PWS, verify PWS configuration, xx is the twinaxial workstation ID.
4523xx	LAN link with a PWS error detected during communication, an invalid frame was received from a PWS, verify PWS configuration, xx is the LAN workstation ID.
4524xx	Twinaxial data link control (TDLC) link with the PWS terminated. Turn power to the PWS off and on. Verify the PWS communication is installed and configured correctly.
4525xx	LAN link with the PWS terminated. Turn power to the PWS off and on. Verify the PWS communication is installed and configured correctly.
460000	A frame was received with an invalid session address. If problem persists, contact the AS/400 system operator.
460100	A frame was received with an invalid format identification (FID) type. If problem persists contact the AS/400 system operator.
460200	A frame was received that did not contain a full transmission header (TH). If problem persists, contact the AS/400 system operator.
460300	A frame was received that did not contain a full transmission header (TH) and request header (RH). If problem persists contact the AS/400 system operator.
460400	A frame was received that did not contain a session control request code. If problem persists, contact the AS/400 system operator.
460500	The Perle 594 received an unsupported segmented frame. If problem persists contact the AS/400 system operator.
470100	An invalid BIND request was received (incorrect ODAI), contact the AS/400 system operator.
470200	An invalid BIND request was received (incorrect SIDH/SIDL), contact the AS/400 system operator.

594 System Operations SRC's (500000-520003)

SRC	Description
500001	Error trying to read information from the 594 floppy diskette or 594 hard drive.
500002	Hardware cannot support parameters specified by the current configuration. Verify configuration and communication cable are correct.
500003	Perle 594 hardware is not compatible with system diskette. Replace diskette.
500004	Diskette is not a Perle 594 Controller Software Diskette.
500005	Perle 594 system diskette is write-protected.
500006	Error trying to write information to the 594 floppy diskette or 594 hard drive.
500007	Perle 594 system diskette has been superseded by a later release.
500009	Invalid value was detected in the Perle 594 configuration file. Reconfigure the 594.
50000A	The attempt to download a configuration file has failed. The previous configuration file has been restored.
50000B	The back up configuration file could not be found.
50000G	The configuration file contains features not supported by the current version of Controller Software. Upgrade to the newest version of Controller Software or use the appropriate version of 594 Utility Program.
500011	Perle 594 is not operating in configuration mode and could not find a valid configuration file.
500013	This error indicated one of the following problems: - no AS/400 connection cable attached - faulty AS/400 connection cable attached - the communication mode configuration does not match the cable attached.
500014	The Token-Ring or Ethernet adapter is not recognized even though the 594 is configured for a LAN Gateway or a LAN AS/400 connection.
500015	Diskette error, the KTT or PDT files on the diskette are not valid. These files will be downloaded from theAS/400.
500016	A microcode error occurred. Report the SRC that appears on the front panel to your 594 service representative.
500018	Indicates the date and time the Perle 594 was restarted. This is not an error.
500019	You can only use either the Token-Ring adapter or the Ethernet adapter, depending on the configuration. If no configuration exists, the 594 will use the adapter in the lowest slot number.
50001A	Indicates the configuration file was changed and the 594 will use the changed configuration file for the next installation. This is not an error.
50001C	The 594 has been started with a 594 controller software that does not support one of the features currently configured in the 594 configuration file. Refer to *Features of the Perle 594* in the appropriate User's Guide.
50001D	594 has been started with a 594 Networking Controller Software Diskette with a subsequent software release level then is presently loaded on the 594 hard drive. This SRC is informational only.
50001E	A SNA twinax device (NWS or PWS) has been connected to a twinax controller which has been configured as an IP Router Port with the SNA controller disabled. The SNA twinax device will not be able to communicate with the AS/400.
500040	The 594 has detected a low buffer pool condition while running a TCP/IP, FR-TR Bridge or IP Routing configuration. This SRC is informational only.
500041	The 594 has recovered from a low buffer pool shortage. This SRC is informational only.

SRC	Description
520000	No printer found for local copy to print function, verify printer is powered on and online.
520001	Device specified for local copy to print function is not a printer, verify configuration.
520002	Printer is busy, powered off, or in error state, correct printer condition.
520003	The Perle 594 has lost communication with the printer, correct printer condition.

LAN SRC's (540000-540425)

SRC	Description
540010	The LAN Feature Card did not initialize correctly. Power the Perle 594 OFF and ON, if problem continues contact service.
540011	Token-Ring restart in progress.
540021	The network is recovering from a beaconing condition.
540105	Command to the Ethernet or Token-Ring adapter has failed. Press the right arrow key on the Perle 594 keypad to obtain sense data. Run extended diagnostics to test all hardware.
540106	Token-Ring Gateway adapter open error. Verify the Perle 594 Token-Ring speed setting matches the LAN speed. If the problem persists, contact the Token-Ring administrator. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: 1100 lobe media function failure. 2400 physical insertion ring failure, wrong speed 2600 physical insertion ring failure. 2700 physical insertion ring failure, ring beaconing. 2A00 physical insertion error, timeout. 2D00 no monitor detected. 3200 address verification, signal loss. 3300 unable to transmit 3500 address verification, timeout. 3600 address verification, ring failure. 3700 address verification, ring beaconing. 3800 address verification, duplicate node address. 3A00 address verification, remove received. 4200 ring poll, signal loss. 4500 ring poll, timeout. 4600 ring poll, ring failure. 4700 ring poll, ring beaconing. 4A00 ring poll, remove received. 5500 request parameter, timeout. 5600 request parameter, ring failure. 5700 request parameter, ring beaconing. 5900 request parameter, request. 5A00 request parameter, remove received.

SRC	Description
540107	LAN Gateway frame error. Verify configuration, if problem persists, contact the LAN administrator. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC. The first byte of sense data is a cause code, the final six bytes are the AS/400 LAN address. Token-Ring cause codes: 22 error in frame transmission. 23 error in frame transmitted readback checking. 24 unauthorized MAC frame. Ethernet cause codes: 22 too many collisions
540108	Command to the Ethernet or Token-Ring adapter has failed. Press the right arrow key on the Perle 594 keypad to obtain sense data. Run extended diagnostics to test all hardware.
540109	Token-Ring Gateway XID error. Verify PWS configuration, if problem persists contact the AS/400 system operator.
540122	Token-Ring Gateway wire fault. The Perle 594 has detected a Token-Ring wire fault between the Perle 594 and the multistation access unit (MSAU). Contact the Token-Ring administrator and report that a wire fault has been detected.
540123	Token-Ring Gateway. The Perle 594 has removed itself from the network. Contact the Token-Ring administrator and report that an auto-removal command was received.
540124	Token-Ring Gateway. The Perle 594 received a remove command from the Token-Ring network. Contact the Token-Ring administrator and report that a remove command was received.
540125	Token-Ring network error, the network is beaconing due to a permanent error on the Token-Ring. Contact the Token-Ring administrator and report the condition.
5402wd	There was an error during device driver initialization. The value for w indicates the error type. The value for d indicates the device driver. Press the right arrow key on the Perle 594 keypad to obtain sense data. Run extended diagnostics to test all hardware.
540404	The AS/400 did not respond to a TEST command sent from the Perle 594, contact the AS/400 system operator.
540405	The AS/400 did not respond to the XID3 command sent from the Perle 594, contact the AS/400 system operator.

SRC	Description
540406	Token-Ring adapter open error. Verify the Perle 594 Token-Ring speed setting matches the LAN speed. If the problem persists, contact the Token-Ring administrator. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: 1100 lobe media function failure 2400 physical insertion ring failure, wrong speed. 2600 physical insertion ring failure. 2700 physical insertion ring failure, ring beaconing. 2A00 physical insertion error, timeout. 2D00 no monitor detected. 3200 address verification, signal loss. 3500 address verification, timeout. 3600 address verification, ring failure. 3700 address verification, ring beaconing. 3800 address verification, duplicate node address. 3A00 address verification, remove received. 4200 ring poll, signal loss. 4500 ring poll, timeout. 4600 ring poll, ring failure. 4700 ring poll, ring beaconing. 4A00 ring poll, remove received. 5500 request parameter, timeout. 5600 request parameter, ring failure. 5700 request parameter, ring beaconing. 5900 request parameter, request. 5A00 request parameter, remove receive.
540407	LAN frame error. Verify configuration, if problem persists contact the LAN administrator. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC. The first byte of sense data is a cause code, the final six bytes are the LAN address. Token-Ring cause codes: 22 error in frame transmission. 23 error in frame transmitted readback checking. 24 unauthorized MAC frame. Ethernet cause codes: 22 too may collisions
540422	The Perle 594 has detected a Token-Ring wire fault between the Perle 594 and the multistation access unit (MSAU). Contact the Token-Ring administrator and report that a wire fault has been detected.
540423	The Perle 594 has removed itself from the network. Contact the Token-Ring administrator and report that an auto-removal command was received.
540424	The Perle 594 received a remove command from the Token-Ring network. Contact the Token-Ring administrator and report that a remove command was received.
540425	Token-Ring network error, the network is beaconing due to a permanent error on the Token-Ring. Contact the Token-Ring administrator and report the condition.

Frame Relay Communication SRCs (560000-560410)

SRC	Description
560010	There was an initialization error with the Perle 594 host-twinaxial adapter. Run extended diagnostics to test all hardware.
560011	There is a response problem with the network's LMI. Make sure the 594's LMI matches the host/network's LMI.
560404	The ALS is not responding to the 594's TEST command. Ask the host operator to ensure the ALS is operating and is configured for the 594, and to ensure the line is varied on at the host.
560405	The ALS is not responding to the 594's XIDS command. Ask the host operator to ensure the ALS is operating, and to ensure the host system's APPC controller description and RWS controller description for your 594 are varied on.
560406	An error occurred when the Perle 594 tried to attach to the frame relay network. Run extended diagnostics to test all hardware.
560407	An error occurred when the Perle 594 tried to transmit a frame. Press the right arrow key on the Perle 594 keypad to obtain sense data. The sense data cause code is one of: 22 (frame transmission error); 23 (frame transmitted read-back checking error); 24 (medium access control frame is unauthorized). The last three digits of the sense data frame relay address are the data link connection identifier. Run extended diagnostics to test all hardware.
560408	There was a problem with a command to the Perle 594 host-twinaxial adapter. Press the right arrow key on the Perle 594 keypad to obtain sense data. Run extended diagnostics to test all hardware.
560409	The network is not reporting a configured DLCI. If the DLCI indicated in the sense data is for the correct host, make sure the configuration contains the correct DLCI for your 594. Also, this may be due to a temporary problem in the network.
560410	The network is reporting a configured DLCI as not active. If the DLCI indicated in the sense data is for the correct host, report the problem to the network service provider. *Note: This can be a temporary condition caused when the network is first started up.*

Frame Relay Token-Ring Bridge SRC's(570000-57FFFF)

SRC	Description
570000	The filter file has been verified by the CHKFILT program and contains no errors.
570001	The filter file contains one or more errors. The 594 bridge will not activate with an invalid filter file.
570030	The 594 FR-TR bridge initialized with no filter file or a null filter file. No bridge filtering will be performed.
570041	The filter file contains an illegal character.
570042	The filter file contains a line with numeric characters but no keyword.
570049	The 594 FR-TR bridge partner's ring number and the frame relay ring number configured on the 594 does not match. The 594 will discard frames from this bridge partner. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: bytes 1 and 2 = DLCI of bridge partner bytes 3 and 4 = ring number of bridge partner
570063	The 594 FR-TR bridge port for the token-ring or frame relay has failed. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: 00 indicates the token-ring port 01 indicates the frame relay port
570066	The 594 encountered a problem when changing operational states. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: byte 1 = current state byte 2 = return code
570092	The 594 FR-TR bridge could not start operations.
570112	The FR-TR bridge detected a SAP failure on the adapter and has closed the SAP. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: 00 indicates the token-ring port 01 indicates the frame relay port
570114	The 594 FR-TR bridge operation has failed on a specific port. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: 00 indicates the token-ring port 01 indicates the frame relay port
570119	The 594 FR-TR bridge was unable to initialize. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC.
570143	The 594 FR-TR bridge was unable to initialize.
570149	The FR-TR bridge has detected the presence of another bridge between the 594 token-ring gateway LAN and the frame relay virtual LAN with the same bridge number.

SRC	Description
570151	The FR-TR bridge has experienced an adapter failure. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: 00 indicates the token-ring port 01 indicates the frame relay port
570152	The FR-TR bridge did not successfully open the adapter on a specified port. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: Sense byte 1 indicates the port: 00 indicates the token-ring port 01 indicates the frame relay port Sense bytes 2-3 indicate the sense data. Values for the token ring port are: 1100 lobe media function failure 2400 physical insertion ring failure, wrong speed. 2600 physical insertion ring failure. 2700 physical insertion ring failure, ring beaconing. 2A00 physical insertion error, timeout. 2D00 no monitor detected. 3200 address verification, signal loss. 3500 address verification, timeout. 3600 address verification, ring failure. 3700 address verification, ring beaconing. 3800 address verification, duplicate node address. 3A00 address verification, remove received. 4200 ring poll, signal loss. 4500 ring poll, timeout. 4600 ring poll, ring failure. 4700 ring poll, ring beaconing. 4A00 ring poll, remove received. 5500 request parameter, timeout. 5600 request parameter, ring failure. 5700 request parameter, ring beaconing. 5900 request parameter, request. 5A00 request parameter, remove receive. Values for the frame relay port are: 3300 Unable to transmit
570153	The FR-TR bridge has sent out an 802.5 TEST frame from one port to the other and has not received a response.
570155	The FR-TR bridge experienced a SAP failure on a specified port. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: 00 indicates the token-ring port 01 indicates the frame relay port
570156	The FR-TR bridge has experienced congestion where the required resources were not available. The 594 will retry the operation.

SRC	Description
570161	The FR-TR bridge did not receive a BPDU before the message age timer expired. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: 00 indicates the token-ring port 01 indicates the frame relay port
570176	The 594 was unable to initialize the FR-TR bridge.
570186	The 594 detected a FR-TR bridge configuration problem. Verify the 594 configuration matches your network.
570410	The network is reporting a configured FR-TR bridge DLCI as not active. *Note: This can be a temporary condition caused when the network is first started up.*

TCP/IP Error SRCs(5A000-5AFFFF)

SRC	Description
5A00xx	The ALS TCP/IP connection attempt to establish an SNA session has failed because an invalid parameter was detected in the TCP/IP connection request at the offset indicated by xx.
5A01xx	The 594 TCP/IP connection attempt to establish an SNA session with the ALS has failed because an invalid parameter was detected in the connection response or because a connection reject/negative response was sent from the ALS. If an invalid parameter was detected, xx indicates the offset of the invalid parameter. If a reject/negative response was sent, xx is 0.
5A0200	The ALS TCP/IP connection attempt to establish an SNA session has failed because an invalid parameter was detected in the SNA BIND data in the TCP/IP connection request.
5A03xx	A TCP/IP record was either rejected or discarded because an invalid command was detected in the MPTN header. xx is the value of the invalid command.
5A04xx	The ALS rejected an TCP/IP record sent by the 594. If xx = 00, the TCP/IP response was discarded. If xx = 01, the connection was abnormally reset.
5A05xx	The 594 received an unrecognized TCP/IP record that was discarded. xx indicates an unsupported TCP/IP command or compensation detected in the record.
5A0600	There are no accessible TCP ports for establishing a connection to the ALS because all ports have been stranded by the ALS. To remove the strand status from a port so that it will become available, speak to your ALS operator.
5A0601	The 594 is waiting for the ALS to terminate previously established TCP/IP sessions. This process may take up to 10 minutes. This process resulted if the 594 was powered off and on, or if the 594 was disconnected from the host for more than the 594 configured AnyNet Keep Alive duration.
5A0602	The 594 attempted to start a new TCP/IP session with the AS/400 but the AS/400 rejected the connection request or did not respond.
5A07xx	A TCP/IP out-of-band record was either rejected or discarded because an invalid parameter was detected in the record at the offset indicated by xx.
5A1000	A TCP/IP protocol error was detected in the TCP/IP record sent from the ALS. The record length did not match the overall length minus the headers and administration data.
5A1001	A TCP/IP protocol error was detected in the TCP/IP record sent from the ALS. The TCP/IP record was out of sequence.

Frame Relay IP Routing SRCs(5B000-5BFFFF)

SRC	Description
5B0010	A 594 IP Routing port has failed. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: 01 indicates the Frame Relay Port 02-07 indicates the LAN port number (which equals the configured LAN slot number), of the router port that has failed.
5B0020	An Inverse-ARP reply has been received that reported an IP address that has already been pre-configured on a different DLCI. The new DLCI information will be ignored and the configured DLCI will be used for this IP address. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: sense byte 1-2: xxxx indicates the DLCI number that the Inverse-ARP reply was received on sense byte 3-6: aabbccdd indicates the IP address, in hex (aa.bb.cc.dd) that was reported in the Inverse-ARP reply. Sense byte 7-8: yy indicates the DLCI number that was already configured with the reported IP address.
5B0021	An Inverse-ARP reply has been received that reported an IP address that has already been reported by an Inverse-ARP on a different DLCI. The new DLCI information will be used and the previously reported DLCI information will be ignored. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: sense byte 1-2: xxxx indicates the DLCI number that the Inverse-ARP reply was received on sense byte 3-6: aabbccdd indicates the IP address, in hex (aa.bb.cc.dd) that was reported in the Inverse-ARP reply. Sense byte 7-8: yyyy indicates the DLCI number that had previously reported the IP address.
5B0022	An Inverse-ARP reply has been received that reported an IP address that is not on the same IP network that was configured for the Frame Relay port. The new DLCI information will be ignored. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: sense byte 1-2: xxxx indicates the DLCI number that the Inverse-ARP reply was received on sense byte 3-6: aabbccdd indicates the IP address, in hex (aa.bb.cc.dd) that was reported in the Inverse-ARP reply.

SRC	Description
5B0030	The network is reporting a IP Routing DLCI as not active, that was previously active. Note: This can be a temporary condition caused when the network is first started up Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: xxxx indicates the DLCI number
5B0040	A newly discovered DLCI has been reported by the LMI, but the maximum number of DLCIs (40 Maximum), is already active. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC: xxxx indicates the DLCI number
5B00120	The Perle's 594 pre-defined IP address assigned to a twinax IP device conflicts with an IP address already assigned (via BOOTP or DHCP), to another twinax IP device. This may be a temporary condition, until the new twinax IP device is assigned an IP address from a BOOTP or DHCP server. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC. Sense byte 1: xx indicates the LSID of the newly connected twinax IP device Sense byte 2-5: aabbccdd indicates the IP address, in hex (aa.bb.cc.dd) that was attempted to be assigned to the new twinax IP device. Sense byte 6: xx indicates the LSID of the twinax device that is already assigned this IP address via BOOTP or DHCP.
5B00121	An IP address was assigned to a twinax IP device via BOOTP or DHCP that conflicts with an IP address that was pre-defined by the Perle 594 to another twinax IP device. This may be a temporary condition, until the other twinax IP device is assigned an IP address from a BOOTP or DHCP server. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC. Sense byte 1: xx indicates the LSID of the twinax IP device assigned a new IP address by a BOOTP or DHCP server Sense byte 2-5: aabbccdd indicates the IP address, in hex (aa.bb.cc.dd) that was assigned to the new twinax IP device via BOOTP or DHCP. Sense byte 6: xx indicates the LSID of the other twinax device that is already assigned this IP address by the Perle 594.

SRC	Description
5B00122	An IP address was assigned to a twinax IP device via BOOTP or DHCP that is not on the same IP network that was configured for the 594 twinax port. The new IP address information will be ignored. Press the right arrow key on the Perle 594 keypad to display the sense data for this SRC. Sense byte 1: xx indicates the LSID of the twinax IP device that the new IP address was received for via a BOOTP or DHCP server Sense byte 2-5: aabbccdd indicates the IP address, in hex (aa.bb.cc.dd) that was attempted to be assigned to a twinax IP device.
5B0150	Invalid BOOTP request received from a twinax IP device. The BOOTP request had no hardware address associated with the twinax IP device.

Hardware Error SRCs(E00XXX)

SRC	Description
E00xxx	Indicates the hardware failure. xxx is the 3-digit SRC. Report the SRC to the 594 service representative.

Software Error SRCs(FXXXX)

SRC	Description
Fxxxxx	Perle 594 code error detected, contact your 594 service representative.

Utility Program Messages and SRCs

This section describes message and System Reference Codes (SRCs) which are used by the 594 Utility Program.

594 Utility Program Installation Codes

The following SRC codes are displayed during the installation of the 594 Utility Program:

SRC	Description
0000	Installation complete
1010	Invalid destination drive. Restart the install program with a valid drive selection.
1020	Invalid mode parameter. Restart the install program with a valid selection (0,1,2, and blank).
1031	Invalid 5250 workstation address. Restart the install program with a valid drive selection (06).
1032	Invalid Token-Ring Address. Restart the install program with a valid Token-Ring Address.
1040	Invalid Token-Ring SAP. Restart the install program with a valid Token-Ring SAP.
1100	Invalid number of parameters. Restart the install program with valid parameters.
2000	Insufficient memory available to run the installation program. Free up at least 100 kb of memory and restart the installation program.
3000	Error reading the 594 Utility disk. Retry the 594 Utility installation, if the problem continues contact a service representative.
4000	Cannot create the destination directory. Restart the install program with a valid destination directory.
4001	Cannot write to destination drive. Verify drive and retry.
4002	Not enough disk space on destination drive. Restart the install program with a valid destination drive.
4005	Installation error. Retry the install program.
4007	Invalid run time parameters or options. Verify and restart the install program.

594 Utility Program Run Time Messages

The following messages are displayed when running the 594 Utility program:

Message	Description
594 Controller Software diskette build started... please wait	The controller is creating the 594 Base Controller Software diskette. This might take about 2 minutes.
594 Controller Software diskette file error	There is a problem with the 594 Base Controller Software diskette. Restart the 594 and use the backup diskette. If the problem persists, contact your service representative.
594 Controller Software diskette invalid	The diskette in the 594 diskette drive is not a valid 594 Base Controller Software diskette. Replace the diskette with the appropriate diskette and try again.
594 Controller Software diskette write protected	Remove the write protect and try again.

Message	Description
594 Controller Software diskette write protected or damaged	Remove the write protect and try again. If the diskette is damaged, use the backup diskette.
594 Controller Software file names must end in ".IMG"	The File name has the wrong extension.
594 Controller Software successfully transferred to 594 memory	This message appears only if the Quick Disconnect option was invoked and indicates that the first stage of the download was completed successfully.
594 Controller Software transfer started	The first stage of the download process has begun.
594 Network Controller Software file names must end in ".KIM"	The file name has the wrong extension.
594 out of memory	Insufficient memory available to run the download option. Contact your service representative.
594 file shared error	A file used by the 594 is currently owned by another program. Do not lock out the 594 files.
594 Hardware error	A hardware error has occurred on the 594. Use any SRC or message displayed on the 594 LCD display to determine the cause of the error. Power the 594 off and on. If the problem continues contact your Perle 594 service representative.
594 is not in Network Controller mode	The 594 must have the 594 Network Controller Feature installed and must be running the Networking Controller Software in order to perform this operation
594 Local session cannot be started	The AS/400 PC Support router could not allocate a local session. Verify the configuration and restart the 594 Utility program.
594 Local Session connection ended	The local session physical connection has been terminated. Verify the 594 power and all cable connections. Correct any problem and restart the 594 Utility program.
594 Local Session deallocated	The 594 Utility program received a deallocate from the 594. Reinstall and restart the 594 Utility program. If the problem continues, contact a service representative.
594 Local Session ended	The 594 local session ended prematurely because of a failure. Start the 594 Utility program again. If the problem continues contact a service representative.
594 Network Controller Feature not enabled	"Enable Network Controller Features" must be set to Yes in order to configure this option.
594 Network Controller Software diskette invalid	The diskette in the 594 diskette drive is not a valid 594 Network Controller Software diskette. Replace the diskette with the appropriate diskette and try again.
594 Utility Program Error	Contact your service representative.
594 Utility program version mismatch with 594 controller	The configuration file includes features not yet supported by this version of controller.
594 version does not support this function	The configuration file includes features not yet supported by this version of controller.
Added Ethernet card must be in higher slot than first	The second Ethernet card must be installed in a higher numbered slot than the first (primary) Ethernet card.
AS/400 connection has not been configured	To complete your configuration you must complete the AS/400 connection parameters.

Message	Description
AS/400 connection must be Frame Relay, Token Ring, or Ethernet	The AS/400 Connection must be configured for either Frame Relay, Token Ring or Ethernet before you can select Global Paramaters.
AS/400 Connection not Frame Relay	The AS/400 connection must be configured for frame relay before you can select Frame Relay Bridging.
ASCII interactive session with 594 not supported	PC Utility does not support interactive sessions through the ASCII feature card.
At least one DLCI must be configured	If LMI mode is set to No LMI and "Use Dynamically discovered DLCIs" is set to No then at least one DLCI must be configured
Bridge Filtering file exceeds 10000 bytes	The size of the FR-TR bridge filter file is greater than 10000 bytes in length.
Cannot disable Network Controller Features while configured	Remove all Network Controller feature configurations before attempting to disable the Network Controller Features.
Cannot find modem name for configured modem code	Select another modem code, or enter your own Initialization String.
Cannot select more than 1 controller for switched line	A switched AS/400 Attachment will only support one controller. Change the configuration to one controller only.
Card has not been defined for any slot	At least one Feature Card must be defined.
Communication Manager not started	The OS/2 communication manager has not been started for the 594 local session. Start the OS/2 communication manager for the 594 local session and retry.
Configuration contains features not supported	The configuration file has been created by a newer version of software. Upgrade to the newest version of the 594 Utility Program.
Configuration file is being saved	Wait while the configuration file is being saved.
Controller IP address in same subnet as twinax IP address	An IP controller has been configured for a network that is a subnet of one of the twinax IP router ports
Controller IP Address is not in same network as IP Ports	All TCP/IP Controller IP addresses must be in one of the configured local IP networks.
Controller IP Address is same as Destination IP Address	All configured IP addresses must be unique.
Controller IP Address is same as Host IP Address	All configured IP addresses must be unique.
Controller IP Address same as IP Router Port IP Address	All configured IP addresses must be unique.
Controller IP Addresses are not in same network	All TCP/IP Controllers must be configured on the same IP network.
Controller is inactive	The controller cannot be selected because it is inactive.
Controller Software not compatible with Utility	The software on the Controller Software Diskette does not support all features of the 594 Utility in use. Either use a Controller Software Diskette that supports the 594 Utility in use, or install the version of 594 Utility Program that is compatible with the Controller Software Diskette.
Controller wrong type	The type of controller does not match the type of data requested.
Corresponding IP DLCI must be configured	A configured IP address in the IP DLCI table requires a DLCI number to be configured.

Message	Description
Could not reset LAN error counters	There is a communication problem between the controller and the PC Utility program.
Create software file operation was successful	The process of creating the 594 software file was completed successfully.
Data verified	The data and selections on the current menu have been verified and are correct.
Date Time Synchronization already configured	The Synchronize Date and Time with Primary AS/400 System can only be configured on one emulated controller.
Default Gateway Address is not in same network as Controller	Default Gateway IP addresses must be in one of the configured local IP networks.
Default Gateway Address is not in same network as Ports	Default Gateway IP addresses must be in one of the configured local IP networks.
Default Gateway Address same as controller IP address	All configured IP addresses must be unique.
Default Gateway Address same as port IP address	All configured IP addresses must be unique.
Destination IP Address in same network as Controller	The Destination IP address in a IP Static Route Entry must not be in the same network of any of the configured local IP networks
Destination IP Address in same network as IP Router Ports	The Destination IP address in a IP Static Route Entry must not be in the same network of any of the configured local IP networks
DLCI IP Address must be configured	An IP address must be configured in the IP DLCI table.
Download was successful	The complete process of transferring to the 594 controller and creating the 594 Software Diskette was completed successfully.
Duplicate controller addresses are configured	Two controllers have been configured with the same station address. Change the configuration so each controller has a unique address.
Duplicate controller TCP/IP addresses are configured	The same TCP/IP address has been configured for more than one controller in the 594.
Duplicate CP names are configured	All CP names configured for an AS/400 system must be unique. Change the configuration so that no CP name is duplicated on an AS/400 system.
Duplicate DLCI IP Addresses configured	All configured DLCI IP address must be unique
Duplicate DLCI Table Entries configured	All configured DLCI Table Entries must be unique
Duplicate Ethernet Gateway addresses configured	Two Ethernet cards have been configured with the same high order address.
Duplicate Logical Channels Configured	All logical channels configured for an AS/400 system must be unique. Change the configuration so that no logical channel is duplicated on an AS/400 system.
Duplicate LU names are configured	All LU names configured for an AS/400 system must be unique. Change the configuration so that no LU name is duplicated on an AS/400 system.
Duplicate Passwords configured	All passwords configured for an AS/400 system must be unique. Change the configuration so that no password is duplicated on an AS/400 system.

Message	Description
Duplicate Router Port IP Addresses are configured	Two IP Router Ports have been configured with the same IP address
Duplicate Token-Ring Gateway addresses configured	Each Token-Ring Gateway requires a unique Token-Ring address.
Duplicated Destination exists	A duplicate destination IP address exist in the Static IP Router Entries
Embedded Zeros found in IP Mask	IP Mask is in an invalid format. Leading high bits of IP Mask must be consecutive ones followed by consecutive zeros. See PC Util help for detail
Error in creating Software File	An error has occurred while trying to create a Software File for downloading to the 594
Error in downloading Software File	An error occurred while downloading the software file to the 594, try the operation again
Error in getting concurrent diagnostic data	There is a communication problem between the controller and the PC Utility program.
Error with serial communication	594 Utility is having a communication problem with the serial connection to the 594. Verify correct COM port and cable conenction.
Ethernet card not defined for any slot	No Ethernet card has been installed. Therefore, Ethernet cannot be used for high order communication.
First Ethernet card must be in lowest available slot	The first (primary) Ethernet card must be installed in the lowest numbered available slot.
First Token-Ring card must be in slot 3	The 594 requires the first Token-Ring Feature card be installed in slot 3 of the 594. Verify and correct the configuration information before proceeding.
Frame Relay Bridging DLCI not unique	A FR-TR Bridge DLCI is the same as another FR-TR Bridge DLCI.
Frame Relay Bridging DLCIs must not match DLCIs for host(s)	A FR-TR Bridge DLCI is the same as a host DLCI.
Frame Relay Bridging not configured	"Frame Relay Bridging to Token-Ring" must set to Yes before you can select Frame Relay Bridging.
Frame Relay IP Routing not enabled	"Enable Network Controller Features" must be set to Yes in order to configure this option.
Frame Relay MAC Address same as Token Ring Gateway Address	The frame relay MAC address and the 594 token-ring LAN address are the same on a FR-TR bridge configuration.
Frame Relay Ring Number must be different from LAN Ring Number	The frame relay ring number and LAN ring number are the same on a FR-TR bridge configuration.
Function not available	The function you have selected is not available because the menu choice is inappropriate or there is a mismatch with the current setup.
Group data does not match	The emulated port parameters for all members of this group must be identical.
Hardware does not match User configuration	The 594 hardware configuration does not match the 594 user configuration data. Verify and correct the configuration information before proceeding.
Host Network names and LU names must be unique for all hosts	Two or more configured hosts were assigned the same name as the host network name and the LU name.

Message	Description
Insert the 594 Network Controller Software disk and hit Enter	Insert the 594 Network Controller Software Diskette into the selected floppy drive and press enter.
Invalid data	The value entered is not valid.
Invalid data format	The value entered is not in the right format
Invalid length	The value entered is not valid.
Invalid number of Multinational Countries	Too many keyboard codes have been entered. The maximum number of unique keyboard codes allowed is four.
Invalid password	The password entered does not match the configured password.
Invalid range	The value entered is not valid.
IP Address in DLCI IP Table not in same network as Controller	A DLCI IP address must be in the same network as the Frame Relay TCP/IP Controllers network
IP Address in DLCI IP Table not in same network as Frame Relay Port	A DLCI IP address must be in the same network as the Frame Relay IP port network
IP Address in DLCI IP Table same as Controller address	All configured IP addresses must be unique.
IP Address in DLCI IP Table same as Port address	All configured IP addresses must be unique.
IP Mask allows insufficient number of IP addresses for Twinax	The IP mask configured for the twinax IP router port does not allow for the minum 32 IP addresses. Select a different IP Mask.
Keyboard country codes do not match within group	Change the Keyboard country code to match the other ports in this group, or assign this port to another group.
LAN Gateway not Token-Ring	The LAN Gateway must be configured for token-ring before you can select Frame Relay Bridging
Maximum controllers would be exceeded	Too many controllers have been configured. The number of multisession controller defined in the configuration data has been exceeded. Either delete existing controllers or update the configuration parameter.
Maximum of 2 Ethernet cards are allowed	No more than two Ethernet feature cards are valid for the 594.
Maximum of 2 Token-Ring cards are allowed	No more than two Token-Ring feature cards are valid for the 594.
Maximum of 2 type-48 Twinaxial cards exceeded	The 594 can accept no more than 2 type-48 Twinaxial Feature cards.
May not be able to display all Concurrent Diagnostic data	The concurrent diagnostic data includes features not yet supported by this version of controller.
Must enable passthrough printer for PerleTALK for Windows	A passthrough printer field has not yet been enabled.
Must have IP Routing enabled or TCP/IP configured	"Frame Relay IP Routing Ports and Tables" can not be selected unless IP routing has been enabled or Frame Relay TCP/IP has been configured.
Network Mask is not compatible with Destination IP Address	Network portion of Destination IP address, (based on Network Mask), must be specified only
Next hop IP address is not in same network as controller	All Next hop IP addresses must be in one of the configured local IP networks.

Message	Description
Next hop IP Address is not in same network as IP Ports or IP Controllers	All Next hop IP addresses must be in one of the configured local IP networks.
Next hop IP address same as controller IP address	All configured IP addresses must be unique.
Next hop IP address same as port IP address	All configured IP addresses must be unique.
No .IMG files found	Only files with an extension of ".IMG" can be selected for download.
No .KIM files found	Only file with an extension of ".KIM" can be selected for Network Software download
No diskette or diskette is not a 594 Controller Software diskette	Either there is no diskette in the floppy drive or the diskette is not a 594 Controller Software diskette.
Not a 594 Controller Software diskette	The diskette currently in the floppy drive is not a 594 Controller Software diskette.
Not a 594 Network Controller Software diskette	The diskette currently in the floppy drive is not a 594 Network Controller Software diskette.
Not a physical NWS controller	A physical NWS controller must be defined.
Not available: Ethernet AS/400 connection is configured	The Ethernet card cannot be used for LAN communication because it is already being used for host communication.
Not available: LAN Gateway is configured	The AS/400 connection cannot be Token-Ring or Ethernet if a LAN Gateway is configured. Verify and correct the configuration information before proceeding.
Not available: Token-Ring AS/400 connection is configured	A Token-Ring Gateway cannot be configured if the AS/400 connection is configured for Token-Ring. Verify and correct the configuration information before proceeding.
Operation complete	The operation you selected has completed successfully.
Operation in progress	The operation you selected is in progress.
Passthrough printer not valid for AS/400 PC Support	If you wish to use a Passthrough printer, select a different ASCII Display Type.
Physical NWS controller not configured	A Feature Card definition is required.
PWS disk error	An error occurred writing to the 594 Controller Software Diskette. Replace or correct the disk and retry.
PWS disk is full	There is not enough room on the PWS diskette to write the configuration file. Correct the diskette and retry.
PWS diskette is write protected	Remove the write protect and retry.
PWS drive Not Ready	The drive specified in the configuration file name is not ready. Insert the 594 diskette into the specified drive and retry.
PWS file access denied	A file used by the 594 Utility program is access-protected. Assign the 594 Utility program access to this file.
PWS file error	One of the text files in the "Menus" directory is invalid. Reinstall and then restart the 594 Utility program.
PWS file not found	A file used by the 594 Utility program could not be found. Assign the 594 Utility program access to this file. Reinstall the 594 Utility program and retry.
PWS file open failure	A file used by the 594 Utility program could not be opened. Assign the 594 Utility program access to this file. Reinstall the 594 Utility program and retry.

Message	Description
PWS file shared error	A file used by the 594 Utility program is currently owned by another program. Do not lock out the 594 Utility program files. Reinstall the 594 Utility program and retry.
PWS incorrect diskette type or no diskette	Either there is no diskette in the PWS floppy drive or the diskette is not a 594 Controller Software diskette.
PWS invalid drive	The drive specified in the configuration file name is not valid. Specify a valid drive.
PWS out of memory	Insufficient memory available to run the program. Refer to Chapter 7 for system requirements.
PWS path not found	A path used by the 594 Utility program could not be found. Assign the 594 Utility program access to this file. Reinstall the 594 Utility program and retry.
PWS router is not installed	The AS/400 PC Support router has not been installed and is required by the 594 Utility program. Install the AS/400 PC Support program and then reinstall the 594 Utility program and retry.
PWS too many open files	The operating system has too many files open. Verify that other programs are not accessing the 594 Utility program files. Reinstall the 594 Utility program and retry.
Rebooting 594. Wait 5 min. before restarting Utility	The 594 is being rebooted. This takes about 5 minutes.
Required field	A value must be entered in the current field.
Required field - AS/400 TCP/IP Address	A host TCP/IP address has not yet been defined.
Required field - Controller TCP/IP Address	A controller TCP/IP address has not yet been defined.
Required field - Frame Relay Bridging	Frame Relay Bridging information must be configured if "Frame Relay Bridging to Token-Ring" has been set to Yes.
Required field - Frame Relay IP Routing	Frame Relay IP Routing information must be configured if "Enable Frame Relay IP routing" has been set to Yes.
Required field - Logical Channel	An logical channel number has not been entered for a configured AS/400 system.
Required Field - Network Information	The Network Information has not been completed for all controllers selected.
Required field - Station Address	A station address has not been entered for all the controllers selected.
Router port IP address in same subnet as twinax IP address	An IP router port has been configured with a network that is a subnet of one of the twinax IP router ports
Router Port IP Address is same as Host IP Address	All configured IP addresses must be unique.
Save completed	The configuration data has been saved.
Selected file is not a 594 Controller Software file	Be sure you select a 594 Controller Software file.
The configuration file is not for a 594M controller.	The configuration file that was the Utility tried to open was not configured for a 594M controller.
This entry is incomplete	All the required field in a table entry have not been configured
To use dynamically discovered DLCIs, LMI must not be set to NO	Either set LMI mode to ANSI Annex D or CCITT or set "Use dynamically discovered DLCIs" to No

Message	Description
Token-Ring card not defined for slot 3	To configure the AS/400 connection as Token-Ring, a Token-Ring card must be installed in slot 3 of the 594.
Version mismatch between Network and Base diskettes	The software version of the Base and Network Controller Software diskettes must be the same

Chapter 4: Specifying Ethernet Address Formats

When configuring an Ethernet host or gateway attachment you need to specify the Ethernet Address option in one of two formats:

- Ethernet address format
- Token-Ring address format.

Using Ethernet address format

Use Ethernet address format if the LAN connection between your controller and host is Ethernet only.

Using Token-Ring address format

Use Token-Ring address format when:

- your controller is attached to Ethernet and there are Token-Ring segments in your network, or
- your network is designed to use the Token-Ring address format.

Every LAN device on the network has a unique physical address, known as the Media Access Control (MAC) address. The format for this address is different for Token-Ring and Ethernet. In particular, the bit order with each byte of the address is reversed.

Refer to the procedure on the following page when using Token-Ring address format.

Converting Token-Ring address formats

Use the following procedure to convert the LAN address before entry into configuration when specifying Token-Ring address format:

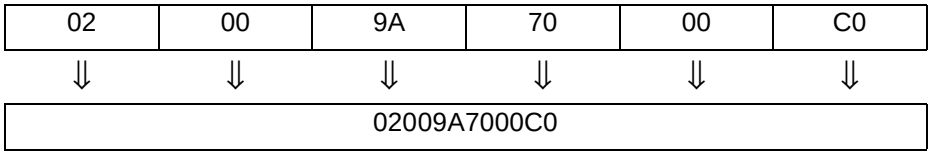
1. Write out the 12-digit Perle 594 LAN address separating it into 6 pairs. For example, the default 594 LAN address is written as:

400059400003					
⇓	⇓	⇓	⇓	⇓	⇓
40	00	59	40	00	03

2. Use the Pair Conversion Table on the following page to locate the conversion pair by using the first digit of each pair as a row coordinate and the second digit as a column coordinate. For example:

40	00	59	40	00	03
4 0	0 0	5 9	4 0	0 0	0 3
⇓ ⇓	⇓ ⇓	⇓ ⇓	⇓ ⇓	⇓ ⇓	⇓ ⇓
Pair Conversion Table					
⇓	⇓	⇓	⇓	⇓	⇓
02	00	9A	70	00	C0

3. Combine the 6 converted pairs into a 12-digit LAN address. For example:



Pair Conversion Table

2nd Char →(Column) **1st Char ↓ (Row)**	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	80	40	C0	20	A0	60	E0	10	90	50	D0	30	B0	70	F0
1	08	88	48	C8	28	A8	68	E8	18	98	58	D8	38	B8	78	F8
2	04	84	44	C4	24	A4	64	E4	14	94	54	D4	34	B4	74	F4
3	0C	8C	4C	CC	2C	AC	6C	EC	1C	9C	5C	DC	3C	BC	7C	FC
4	02	82	42	C2	22	A2	62	E2	12	92	52	D2	32	B2	72	F2
5	0A	8A	4A	CA	2A	AA	6A	EA	1A	9A	5A	DA	3A	BA	7A	FA
6	06	86	46	C6	26	A6	66	E6	16	96	56	D6	36	B6	76	F6
7	0E	8E	4E	CE	2E	AE	6E	EE	1E	9E	5E	DE	3E	BE	7E	FE
8	01	81	41	C1	21	A1	61	E1	11	91	51	D1	31	B1	71	F1
9	09	89	49	C9	29	A9	69	E9	19	99	59	D9	39	B9	79	F9
A	05	85	45	C5	25	A5	65	E5	15	95	55	D5	35	B5	75	F5
B	0D	8D	4D	CD	2D	AD	6D	ED	1D	9D	5D	DD	3D	BD	7D	FD
C	03	83	43	C3	23	A3	63	E3	13	93	53	D3	33	B3	73	F3
D	0B	8B	4B	CB	2B	AB	6B	EB	1B	9B	5B	DB	3B	BB	7B	FB
E	07	87	47	C7	27	A7	67	E7	17	97	57	D7	37	B7	77	F7
F	0F	8F	4F	CF	2F	AF	6F	EF	1F	9F	5F	DF	3F	BF	7F	FF

Enter the converted address into the related field in configuration data.

Chapter 5: TCP/IP White Paper

This appendix contains a copy of the Perle White Paper
594 and AS/400 TCP/IP Configuration

594 and AS/400 TCP/IP Configuration

95-2435-02

Overview

Using the Perle's enhanced 5494 compatible controller, it is now possible to support native SNA applications and devices over your TCP/IP network. The Perle 594 looks like a 5494 compatible workstation controller to native 5250 devices and LAN attached workstations but is able to take the SNA traffic and convert it into TCP/IP for delivery over the network. The 594 accomplishes this by integrating IBM's implementation of MPTN architecture into the 594 controller. This means that the 594 provides 5250 devices and LAN attached workstations with the equivalent of the AnyNet router that runs inside client applications on intelligent workstations.

The information in this white paper is intended for customers and Perle technical professionals who are in the process of, or planning to connect Perle 594 TCP/IP controllers to their AS/400 via Anynet (APPC over TCP/IP). This white paper will discuss the following major topics:

- **AS/400 System Requirements**
- **AS/400 and AnyNet (APPC over TCP/IP) Configuration**
- **594 Configuration**
- **Verification of the APPC over TCP/IP Configuration**
- **Performance and Operation Considerations**

AS/400 System Requirements:

The AnyNet/400 APPC over TCP/IP code is part of the base OS/400 V3R1 code. There are no special installation requirements. You must be running AS/400 with V3R1 or a later OS/400 version in order to configure and establish communication with the 594 TCP/IP controller. IBM has made several fixes to the TCP/IP and AnyNet code on the AS/400, so it is **strongly** recommended that your AS/400 be at the latest PTF level.

If you do not wish to load the latest AS/400 Cumulative PTF package in it's entirety then you should at least load any PTF's related to TCP/IP, AnyNet and APPN/APPC. To find out more information on what is contained in these PTF packages you can look at the IBM AS/400's Preventive Service Planning (PSP) Information web site at the following URL:

`http:/www.as400service.ibm.com/as4sde/sline003.nsf/sline003home`

AS/400 and AnyNet (APPC over TCP/IP) Configuration

The following OS/400 configuration steps are required to successfully bring up a 594 TCP/IP controller:

1. **Establish a TCP/IP Configuration between the AS/400 System and the 594**
2. **Change the Network Attribute ALWANYNET to *YES**
3. **Create APPC Controller with LINKTYPE (*ANYNW)**
4. **Create RWS Controller and NWS Devices Descriptions**
5. **Add Entries to the APPN Remote Location List**
6. **Map 594 LU name to an Internet Address**
7. **Start TCP/IP**

The user ID under which the APPC over TCP/IP configurations are created, must have sufficient authority to access the relevant commands. Some of the commands require the user ID to have the IOSYSCFG authority. The following examples shown here were created using a profile with QSECOFR authority.

In the following sections we will create the necessary OS/400 configurations for the "PERLE" AS/400 system in Figure 1. They will illustrate the configuration steps required for this 594 TCP/IP configuration example.

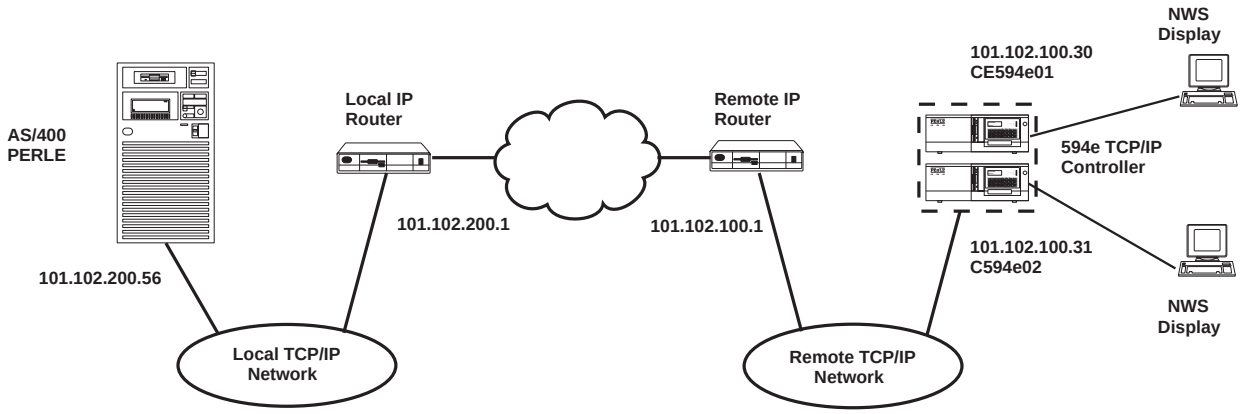


Figure 1. 594 Configured for Two Controllers Connected via APPC over TCP/IP

Note: In this White Paper we use a 594 TCP/IP over Token-Ring configuration for our sample configuration. If you wish to view other sample 594 configurations using TCP/IP over Ethernet or Frame Relay refer to "AS/400 Configuration Examples" section in the *Perle User and Reference Guide*.

In our example configuration we used a Perle 594e controller. The configuration for a Perle 594T controller would be the same except for the limitations in the number of controllers that can be configured. The 594M supports only one controller.

1. Establish a TCP/IP configuration between the AS/400 system and the 594

In this section we show the basic steps to establish a TCP/IP configuration between your AS/400 and the remote network where your 594 is situated. If your system already has a TCP/IP configuration to the remote network with which you want to communicate with your 594 via APPC over TCP/IP, then you can skip this step and proceed to step 2 in this section. The basic steps to establish a TCP/IP configuration between your AS/400 and the remote network are:

- **Create an AS/400 Line Description.**
- **Add a TCP/IP Interface**
- **Add a TCP/IP Route**

Create an AS/400 Line Description

The AS/400 line description defines the physical interface to the network. If an appropriate line description does not already exist (they can be shared), you will need to create one. Here we use the **CRTLINTRN** command to create a token-ring line description.

```
                Create Line Desc (Token-Ring) (CRTLINTRN)

Type choices, press Enter.

Line description . . . . . .>   TCPTKRN       Name
Resource name  . . . . . . . .>   LIN061       Name, *NWID, *NWSD
Online at IPL  . . . . . . . .    *YES         *YES, *NO
Vary on wait . . . . . . . . .    *NOWAIT      *NOWAIT, 15-180 (1 second)
Maximum controllers  . . . . .    40           1-256
Line speed . . . . . . . . . .>   16M          4M, 16M, *NWI
Maximum frame size . . . . . .    1994         265-16393, 265, 521, 1033...
Local adapter address  . . . .    *ADPT        400000000000-7FFFFFFFFFFF...
Exchange identifier  . . . . .    *SYSGEN      05600000-056FFFFF, *SYSGEN
SSAP list:
  Source service access point  .  *SYSGEN      02-FE, *SYSGEN
  SSAP maximum frame . . . . . .                *MAXFRAME, 265-16393
  SSAP type  . . . . . . . . . .                *CALC, *NONSNA, *SNA, *HPR
            + for more values
Text 'description' . . . . . .   *BLANK

                                                                      Bottom
F3=Exit   F4=Prompt   F5=Refresh   F10=Additional parameters   F12=Cancel
F13=How to use this display       F24=More keys
```

Figure 2. Creating a Token-Ring Line Description

Add a TCP/IP Interface

The TCP/IP interface defines the AS/400 on the TCP/IP network. The interface defines the association of an IP address with a line description on your AS/400.

Each line description that is associated with a physical communications line can have several interfaces. Each interface must have a unique IP address. These IP addresses are the IP addresses that you are assigning to each interface on this AS/400. They are **not** the IP addresses for any other systems in the network. In most cases, you only need one IP interface address on your AS/400

Enter **CFGTCP** command to access the Configure TCP/IP panel, and select option 1 to work with TCP/IP interfaces.

```
                          Work with TCP/IP Interfaces
                                                          System:   PERLE
Type options, press Enter.
  1=Add   2=Change   4=Remove   5=Display   9=Start   10=End

     Internet         Subnet             Line       Line
Opt  Address          Mask             Description  Type
1    _______________
__   127.0.0.1        255.0.0.0        *LOOPBACK    *NONE









                                                                      Bottom
F3=Exit      F5=Refresh   F6=Print list   F11=Display interface status
F12=Cancel   F17=Top      F18=Bottom
```

Figure 3. Work with TCP/IP Interfaces display

Besides allowing you to add, change and remove TCP/IP interfaces, this screen also allows you to start and end these interfaces

If a TCP/IP interface does not already exist, add an entry using the internet address allocated to your system and the mask of the subnet in which your communication line is connected to, by entering a 1 under the Opt field.

```
                       Add TCP/IP Interface (ADDTCPIFC)
Type choices, press Enter.

Internet address . . . . . . . . >   '101.102.200.56'
Line description . . . . . . . .     TCPTKRN       Name, *LOOPBACK
Subnet mask  . . . . . . . . . .     255.255.255.0
Type of service  . . . . . . . .     *NORMAL       *MINDELAY, *MAXTHRPUT...
Maximum transmission unit  . . .     *LIND         576-16388, *LIND
Autostart  . . . . . . . . . . .     *YES          *YES, *NO
PVC logical channel identifier                     001-FFF
             + for more values
X.25 idle circuit timeout  . . .     60            1-600
X.25 maximum virtual circuits  .     64            0-64
X.25 DDN interface . . . . . . .     *NO           *YES, *NO
TRLAN bit sequencing . . . . . .     MSB           *MSB, *LSB



                                                                     Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 4. Add TCP/IP Interface display

If TCP/IP is already started on your AS/400 system then you will need to start the interface by typing 9 in the Opt field beside the TCP/IP interface you have just added.

Add a TCP/IP Route

A route entry provides the connection between your AS/400 system and an external network. If your 594 resides in a different network or subnetwork to your AS/400 via an IP router, it will be necessary to configure at least one route entry. This route entry can be a default route or an explicit route entry. If just one TCP/IP interface is defined on your AS/400 system then a default route entry will do. If, however, you have defined multiple TCP/IP interfaces, it is recommended that you to add an explicit route entry for every subnetwork that your 594 controller resides on. It is possible to have multiple default routes, but it is not recommended.

The default route tells the AS/400 system to route any traffic for locations that are not on the local subnetwork to the IP router. An explicit route entry prompts the AS/400 to route frames destined for a specific subnetwork to the IP router. The router handles delivering the packets to their destination IP address whether a default or explicit route entry is used.

To define a default route, return to the Configure TCP/IP menu and select Option 2, Work with TCP/IP routes. If an appropriate route entry does not already exist, add a route entry by entering a 1 under the Opt field. *Figure 5* and *Figure 6* below show the required parameters for a default route entry and an explicit route entry for the example configuration in *Figure 1*.

```
                          Work with TCP/IP Routes
                                                        System:   PERLE
Type options, press Enter.
  1=Add   2=Change   4=Remove   5=Display

                                                Type
       Route                Subnet              of              Next
Opt     Destination         Mask                Service         Hop
__   _______________    _______________    _________    _______________
__    *DFTROUTE           *NONE              *NORMAL      101.102.200.1




                                                                   Bottom
F3=Exit   F5=Refresh   F6=Print list   F12=Cancel   F17=Top   F18=Bottom
```

Figure 5. Work with TCP/IP Routes display - Default Route Entry

```
                          Work with TCP/IP Routes
                                                        System:   PERLE
Type options, press Enter.
  1=Add   2=Change   4=Remove   5=Display

                                               Type
         Route               Subnet             of              Next
Opt       Destination        Mask               Service         Hop
__     _______________    _______________    _________    _______________
__     101.102.100.0      255.255.255.0      *NORMAL      101.102.200.1




                                                                   Bottom
F3=Exit   F5=Refresh   F6=Print list   F12=Cancel   F17=Top   F18=Bottom
```

Figure 6. Work with TCP/IP Routes display - Explicit Route Entry

It is recommended that the *IFC option be selected for the Maximum Transmission Unit (MTU) parameter instead of the default value of 576 (refer to "Performance and Operation Considerations" later in this document).

Note: If you are removing any TCP/IP Interfaces it is strongly recommended that you stop TCP/IP (ENDTCP), and start TCP/IP (STRTCP) again in order to make sure the AS/400 has properly removed residual information about that TCP/IP interface's IP address.

2. Change the Network Attribute ALWANYNET to *YES

Changing this network attribute will allow APPC over TCP/IP to run on your system. If you are not sure what the parameter is set to, enter DSPNETA at the AS/400 command prompt. Page down to the last page and find "Allow AnyNet Support".

If the value is *NO, then enter the following command:

```
CHGNETA ALWANYNET (*YES)
```

After changing this attribute, you can verify the change by entering the DSPNETA command again to display the parameter.

3. Create APPC controller with LINKTYPE (*ANYNW)

A new LINKTYPE has been added to the APPC controller description for APPC over TCP. With APPC over TCP/IP, the APPC controller is no longer directly attached to a line description but rather can be thought of as being defined as an AS/400 AnyNet class of service. Because of this fact, when a PWS or a 594 controller tries to connect to the AS/400 via APPC over TCP/IP, the AS/400 seems to couple that APPC over TCP device with the first active APPC controller defined as *ANYNW. As a result, if you have multiple AnyNet APPC controllers defined and active on your AS/400, the same 594 or PWS will randomly come up under any of these defined APPC controllers every time they connect via APPC over TCP/IP. Because of this behavior on the AS/400, Perle recommends that you use one of the following two methods for configuring your AnyNet APPC controllers on your AS/400.

Method 1: Define an AnyNet APPC Controller for Each 594 TCP/IP Controller

Using this method an APPC controller with LINKTYPE (*ANYNW) is defined for each 594 TCP/IP controller. Note that **no other AnyNet APPC controllers** should be defined on the AS/400. If other AnyNet APPC controller are created then you run the risk that your 594 controller APPC device will autocreate under the additional APPC controllers and will NOT allow NWS devices to find a path back to the controller. These AnyNet APPC controllers you define for the 594 TCP/IP controllers will be used by any PWSs connected via APPC over TCP/IP. The RMTCPNAME for each of these AnyNet APPC controllers should match your CP and LU names configured for each 594 TCP/IP controller. Use the CRTCTLAPPC (create APPC Controller Description) command to create the AnyNet APPC for each controller. For our example configuration in *Figure 1*. you would enter the following two commands on the AS/400 command prompt:

```
CRTCTLAPPC CTLD(c594e01) LINKTYPE(*ANYNW)
           RMTCPNAME(c594E01) RMTNETID(*NETATR)
CRTCTLAPPC CTLD(c594E02) LINKTYPE(*ANYNW)
           RMTCPNAME(c594e02) RMTNETID(*NETATR)
```

Benefits:

- More traditional way of configuring 5494 type controllers and easier conceptually to understand
- Each AnyNet controller allows a combination of 254 594s and PWSs connected via AnyNet.

Disadvantages:

- AnyNet PWSs will randomly come up under the different 594 APPC controllers. This is sometimes confusing and makes it hard to find the APPC device descriptions for individual PWSs.
- 594 controller APPC device descriptions may randomly come under different AnyNet APPC controllers, which can be confusing but does NOT affect operation.

Method 2: Define a Single AnyNet APPC Controller

Using this method, **only one** AnyNet APPC controller is defined on your AS/400 system and it will be used for all PWSs and 594s connected via APPC over TCP/IP. The RMTCPNAME for this AnyNet APPC controller should not match the CP and LU names configured on any of your 594 TCP/IP controllers. Use the CRTCTLAPPC (create APPC Controller Description) command to create this AnyNet APPC controller. For our example configuration in *Figure 1.* you would enter the following command on the AS/400 command prompt:

```
CRTCTLAPPC CTLD(anynetappc) LINKTYPE(*ANYNW)
           RMTCPNAME(anyntctl)RMTNETID(*NETATR)
```

Benefits:

- Easy to locate all AnyNet APPC devices
- No need to configure APPC AnyNet controllers for each 594 TCP/IP controller added, you just need to add a remote location list entry

Disadvantages

- Limited to no more than a combination of 254 PWSs and 594s connected via AnyNet. An AnyNet APPC controller can only have up to 254 APPC devices associated with it and each PWS and 594 connected via AnyNet requires an APPC device to be auto/manually created under the AnyNet APPC controller.

4. Create RWS Controller and NWS Devices Descriptions

For every 594 TCP/IP controller a remote workstation controller needs to be created. With OS/400 V3R1 or later the RWS controller device description can be automatically created by the AS/400 system. Enable this support by setting the system value autoconfigure remote controller (QAUTORMT) to ON (1). If you wish to manually create the RWS controller, then for the configuration example shown in *Figure 1.* you would enter the following commands on the AS/400 command prompt:

```
CRTCTLRWS CTLD(c594e01r) TYPE(5494) MODEL(2) LINKTYPE (*NONE)
          RMTLOCNAME(c594e01) AUTOCRTDEV (*ALL)
CRTCTLRWS CTLD(c594e02r) TYPE(5494) MODEL(2) LINKTYPE (*NONE)
          RMTLOCNAME(c594e02) AUTOCRTDEV (*ALL)
```

The 594 attached NWS device descriptions are automatically created by the host by setting autocreate device (AUTOCRTDEV) to *ALL in the RWS controller description as shown above.

5. Add Entries to the APPN Remote Location List.

To Communicate using APPC over TCP/IP support, the AS/400 system requires a configuration list entry for each 594 TCP/IP controller. The APPC over TCP/IP communications uses the information in the APPN remote location list to determine which controller description to use when it activates an NWS session. To update the APPN remote configuration list, use the following command:

```
CHGCFGL *APPNRMT
```

The following two figures show what entries you would add depending on the method you used in step 3 to create your AnyNet APPC controller(s).

```
                  Change Configuration List                PERLE
                                                      07/21/97  18:21:03
Configuration list  . . :   QAPPNRMT
Configuration list type :   *APPNRMT
Text  . . . . . . . . . :

Type changes, press Enter.

---------------------------APPN Remote Locations-----------------------------
          Remote               Remote   Control
Remote    Network    Local     Control   Point     Location          Secure
Location  ID         Location  Point     Net ID    Password          Loc
C594E01   *NETATR    *NETATR   C594E01   *NETATR   ________________  *NO
C594E02   *NETATR    *NETATR   C594E02   *NETATR   ________________  *NO
________  *NETATR    *NETATR   ________  *NETATR   ________________  *NO
________  *NETATR    *NETATR   ________  *NETATR   ________________  *NO
________  *NETATR    *NETATR   ________  *NETATR   ________________  *NO
________  *NETATR    *NETATR   ________  *NETATR   ________________  *NO
________  *NETATR    *NETATR   ________  *NETATR   ________________  *NO
________  *NETATR    *NETATR   ________  *NETATR   ________________  *NO

                                                                   More...
F3=Exit   F11=Display session information   F12=Cancel   F17=Top   F18=Bottom
```

Figure 7. AS/400 APPN Remote Location List Panel (Method 1)

```
                  Change Configuration List                PERLE
                                                      07/21/97  18:35:03
Configuration list  . . :   QAPPNRMT
Configuration list type :   *APPNRMT
Text  . . . . . . . . . :

Type changes, press Enter.

---------------------------APPN Remote Locations-----------------------------
          Remote               Remote    Control
Remote    Network    Local     Control    Point     Location          Secure
Location  ID         Location  Point      Net ID    Password          Loc
C594E01   *NETATR    *NETATR   ANYNTCTL   *NETATR   ________________  *NO
C594E02   *NETATR    *NETATR   ANYNTCTL   *NETATR   ________________  *NO
________  *NETATR    *NETATR   ________   *NETATR   ________________  *NO
________  *NETATR    *NETATR   ________   *NETATR   ________________  *NO
________  *NETATR    *NETATR   ________   *NETATR   ________________  *NO
________  *NETATR    *NETATR   ________   *NETATR   ________________  *NO
________  *NETATR    *NETATR   ________   *NETATR   ________________  *NO
________  *NETATR    *NETATR   ________   *NETATR   ________________  *NO

                                                                   More...
F3=Exit   F11=Display session information   F12=Cancel   F17=Top   F18=Bottom
```

Figure 8. AS/400 APPN Remote Location List Panel (Method 2)

The remote location names must match the RMTLOCNAME names entered in the RWS controllers while the remote control point name must match the RMTCPNAME name(s) entered in the AnyNet APPC controller(s).

6. Map 594 LU names to an Internet address

The AS/400 TCP/IP host table provides the mapping between the SNA remote location name/remote network ID of the 594 TCP/IP controller and a remote internet address. Enter the CFGTCP command to access the Configure TCP/IP panel, and select option 10 to work with the TCP/IP host table.

```
                        Work with TCP/IP Host Table Entries
                                                        System:   PERLE
Type options, press Enter.
  1=Add   2=Change   4=Remove   5=Display   7=Rename

     Internet                   Host
Opt  Address                    Name
__   _______________
__   101.102.100.30             C594E01.PLSNET.SNA.IBM.COM
__   101.102.100.31             C594E02.PLSNET.SNA.IBM.COM
__   127.0.0.1                  LOOPBACK




                                                                    Bottom
F3=Exit   F5=Refresh   F6=Print list   F12=Cancel   F17=Position to
```

Figure 9. AS/400 TCP/IP Host Table Entries

The IP address entered must match the remote IP address of your 594 TCP/IP controller. The host name entered must be in the form **rmtlocname.appn.sna.ibm.com**, where

rmtlocname	is the RMTLOCNAME entered in the RWS controller
appn	is the remote network ID of the 594 TCP/IP controller
sna.ibm.com	is the SNA domain suffix

The SNA domain suffix is needed for AnyNet (APPC over TCP/IP) communications in SNA networks. The AnyNet standard for SNA domain suffix is **sna.ibm.com** and you should not change it unless absolutely necessary.

7. Start TCP/IP

Before any TCP/IP services are available, the TCP/IP servers must be started. To start all TCP/IP servers, select option 3 from the TCP/IP Administration menu (GO TCPADM). Option 3 starts TCP/IP processing, starts the TCP/IP interfaces, and starts the TCP/IP server jobs. Note that the APPC over TCP/IP servers cannot be started individually.

Allow a few moments for TCP/IP to start, then select Option 20, Work with TCP/IP jobs in the QSYSWRK subsystem from the TCP/IP Administration menu. The job QTCPIP should be in the list (along with jobs for FTP, POP, TELNET, LPD and SMTP). To check for the successful start of TCP/IP, enter the following Display Message command at the AS/400 prompt:

```
DSPMSG QTCP
```

Note: You must start TCP/IP whenever all subsystems are ended or you IPL the AS/400 system. To have TCP/IP start automatically after an IPL, you need to change the IPL start-up program.

594 Configuration

In order to create a 594 TCP/IP configuration you must use Perle's 594 Utility Program in enhanced mode. Refer to Perle's *594 User and Reference Guide* for details on installing and navigating through the 594 Utility configuration screens.

From the *594 - Configuration* screen of every controller card you are configuring for TCP/IP, select *the AS/400 Connection* menu, TCP/IP and then Token-Ring, Ethernet or Frame Relay. For our example configuration in *Figure 1*. you would select Token-Ring.

```
PC2E-C-1-5A 594e - Configuration - AS/400 Connection - TCP/IP Token-Ring
                                                                  More   ↓
Fill in the fields, then press F6.
Press Enter to verify the data.

594e IP Address  . . . . . .  [101].[102].[100].[30 ]

Global Parameters (Required)

  Network (Subnet) Mask  . . . . . .  [255].[255].[255].[0  ]
  Default Gateway IP Address . . . . . .  [101].[102].[100].[1  ]
  AnyNet Keep Alive Duration . . . . . . . . . . . . . . . . . [3 ]

H1 AS/400 System 1
  AS/400 IP Address  . . . . . .  [101].[102].[200].[56 ]

H2 AS/400 System 2
  AS/400 IP Address  . . . . . .  [   ].[   ].[   ].[   ]

H3 AS/400 System 3
  AS/400 IP Address  . . . . . .  [   ].[   ].[   ].[   ]

--------------------------------------------------------------------------------
  Esc=Cancel  F1=Help  F3=Exit  F6=Return  F7=Page Up  F8=Page Down
```

Figure 10. 594 Utility: AS/400 Connection - TCP/IP Token-Ring Panel

Note that the Default Gateway IP Address entered should be the IP address of the remote router, (local to the 594).

The AnyNet Keep Alive Duration field is used to set the duration in minutes that the 594 will send out AnyNet Keep Alive messages, at 30 second intervals for each configured controller, to verify that the connection to the AS/400 is still established. If the 594 gets no responses to the Keep Alive messages for the duration specified, then the 594 will bring down all TCP/IP connection for that controller. If this value is set to zero then the AnyNet Keep Alive timer is turned off and the 594 also informs the AS/400 not to send AnyNet Keep Alive messages. This is a useful setting if you are communicating over a network, (like ISDN), where you are charged for network connection time.

Then select the *Network Information* menu from the *594 - configuration* screen. It is recommended that you configure the *Continuous Retry* field to YES so that the 594 will continuously try to reconnect with your AS/400 if you loose communication. This is useful in the case were your AS/400 is IPLed and you want your 594s to come back up without any user intervention.

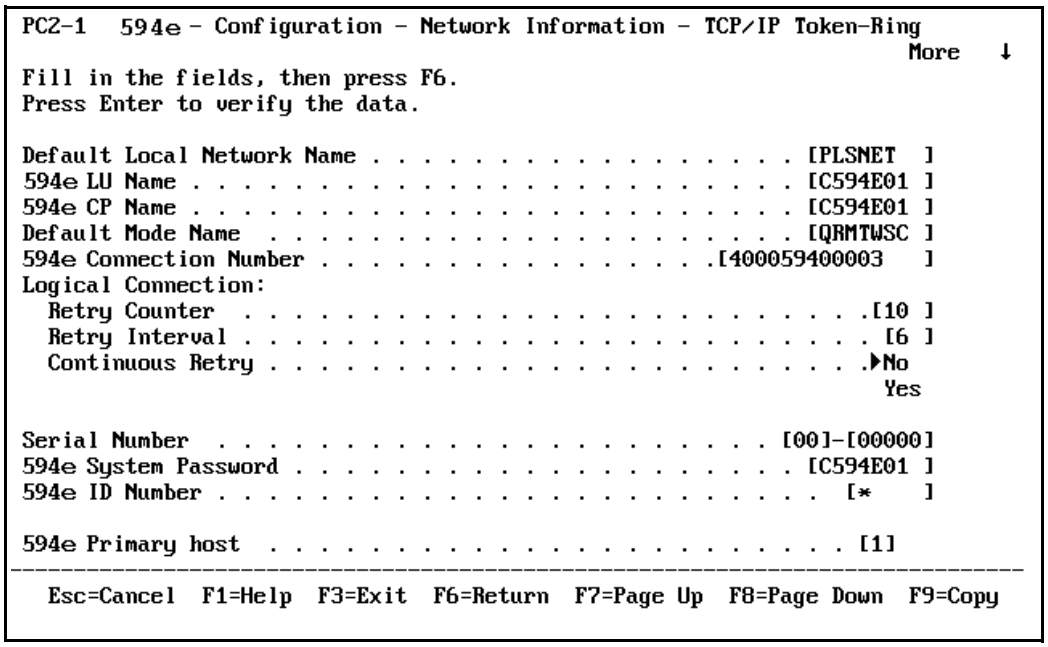


Figure 11. 594 Utility: Network Information - Screen 1

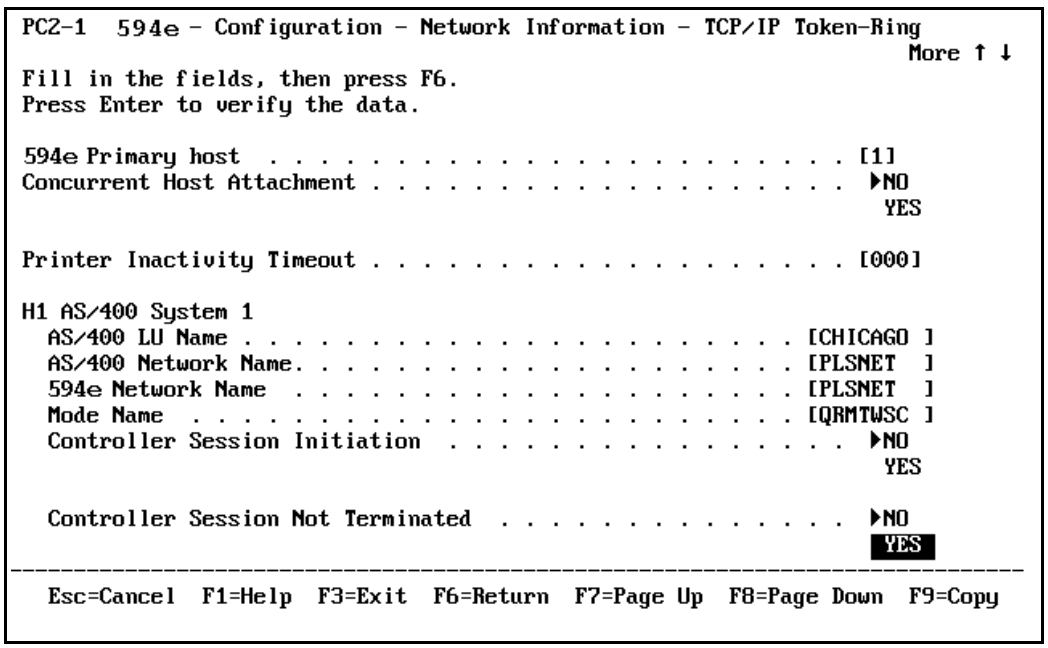


Figure 12. 594 Utility: Network Information - Screen 2

Verification of the APPC over TCP/IP Configuration

The verification of the APPC over TCP/IP should be carried out in the following stages:

- **Verify the TCP/IP Configuration Between the AS/400 and the 594**
- **Verify the APPC over TCP/IP Configuration Between the AS/400 and the 594**

Verify the TCP/IP Configuration Between the AS/400 and the 594

Before you verify the APPC over TCP/IP configuration, you should verify the native TCP/IP configuration. This can be done in such a way that it also verifies part of the APPC over TCP/IP configuration. From our example configuration in *Figure 1*, entering the following command will verify the TCP/IP connection between the AS/400 (PERLE) and the 594 via the APPC over TCP/IP host table entry:

```
ping c594e01.plsnet.sna.ibm.com
```

If the PING operation is successful, the job log should contain messages that are similar to the ones in the following figure. To view the messages, use the Display Job Log (DSPJOBLOG) command, press F10 to display detailed message and then Page Up.

```
ping c594e01.plsnet.sna.ibm.com
    Verifying connection to host system C594E01.PLSNET.SNA.IBM.C at address
      101.102.100.31.
    Connection verification 1 took .033 seconds.  1 successful connection
      verifications.
    Connection verification 2 took .014 seconds.  2 successful connection
      verifications.
    Connection verification 3 took .017 seconds.  3 successful connection
      verifications.
    Connection verification 4 took .015 seconds.  4 successful connection
      verifications.
    Connection verification 5 took .036 seconds.  5 successful connection
      verifications.
    Round-trip (in milliseconds) min/avg/max = 14/23/36
```

Figure 13. AS/400 PING Command Job Log information

Repeat this ping command for every 594 controller you have configured. Once you are satisfied that the TCP/IP configuration is working correctly then you can move on to verify the APPC over TCP/IP configuration.

Verify the APPC over TCP/IP Configuration Between the AS/400 and the 594

First you should check that the APPC over TCP/IP job is running. The command WRKACTJOB SBS(QSYSWRK) will display the active jobs in the QSYSWRK subsystem. The APPC over TCP/IP job QAPPCTCP should be active as shown in the following figure.

```
                    Work with Active Jobs                    PERLE
                                                          07/21/97  19:08:32
CPU %:     .0     Elapsed time:   00:00:00     Active jobs:   57

Type options, press Enter.
  2=Change   3=Hold   4=End   5=Work with   6=Release   7=Display message
  8=Work with spooled files   13=Disconnect ...

 Opt  Subsystem/Job  User      Type    CPU %  Function      Status
 __   QSYSWRK       QSYS      SBS      .0                   DEQW
 _5     QAPPCTCP    QSYS      BCH      .0     PGM-QZPAIJOB  TIMW
 __     QMSF        QMSF      BCH      .0                   DEQW
 __     QTCPIP      QTCP      BCH      .0                   DEQW
 __     QTFTP02615  QTCP      BCH      .0                   DEQW
 __     QTFTP02862  QTCP      BCH      .0                   DEQW
 __     QTFTP05452  QTCP      BCH      .0                   TIMW
 __     QTGTELNETS  QTCP      BCH      .0                   DEQW
 __     QTLPD12982  QTCP      BCH      .0                   TIMW

                                                                More...
Parameters or command
===> _____________________________________________________________________________
F3=Exit      F5=Refresh   F10=Restart statistics   F11=Display elapsed data
F12=Cancel   F23=More options   F24=More keys
```

Figure 14. Work with Active Jobs Panel

If you look at the job log associated with QAPPCTCP, you should see the following:

```
                                Display Job Log
                                                        System:   PERLE
Job . . :   QAPPCTCP     User . . :   QSYS         Number . . . :   345195

 >> CALL QSYS/QZPAIJOB
    APPC over TCP/IP job started.









                                                                    Bottom
Press Enter to continue.

F3=Exit   F5=Refresh   F10=Display detailed messages   F12=Cancel
F16=Job menu          F24=More keys
```

Figure 15. Display Job Log (QAPPCTCP) Panel

Note: The APPC over TCP/IP job (QAPPCTCP) is initially started when the Allow AnyNet support (ALWANYNET) network attribute is changed to *YES. If the job fails for any reason, it is necessary to stop TCP/IP (ENDTCP), and start TCP/IP (STRTCP) again to re-start the job.

To verify the APPC over TCP/IP configuration you must Vary on the APPC controller description(s) you created

for the APPC over TCP/IP connection. For our example in Figure 1 (using method 2), enter the following command at the AS/400 prompt:

```
VRYCFG CFGOBJ(anynetappc) CFGTYPE(*CTL) STATUS(*ON)
```

When the first controller with link type *ANYNW is varied on, two APPC over TCP/IP servers will be started; one is a TCP server that goes to LISTEN state to allow the AS/400 system to accept incoming APPC over TCP/IP connection requests; while the other is a UDP server to handle out-of-band data for all APPC over TCP/IP activity. The command NETSTAT option 3 can be used to display all TCP/IP sessions (native TCP/IP and APPC over TCP/IP). The following figure shows the TCP/IP connection status before any APPC over TCP/IP sessions have been established.

```
                        Work with TCP/IP Connection Status
                                                              System:     PERLE
Local internet address  . . . . . . . . . . . :   *ALL

Type options, press Enter.
  4=End   5=Display details

      Remote        Remote     Local
 Opt  Address       Port       Port             Idle Time  State
      *              *          ftp-con >        012:13:07  Listen
      *              *          telnet           001:24:36  Listen
      *              *          pop3             012:09:27  Listen
      *              *          APPCove >        001:24:06  Listen
      *              *          APPCove >        000:00:10  *UDP
      *              *          lpd              012:11:19  Listen
      *              *          as-file          004:17:11  Listen



                                                                      Bottom
F5=Refresh   F11=Display byte counts   F13=Sort by column
F14=Display port numbers   F22=Display entire field   F24=More keys
```

Figure 16. TCP/IP Connection Status - No APPC over TCP/IP Connections Established

If you manually created your RWS controllers you should now vary them on using the VFYCFG command.

Use the WRKCFGSTS command to show the status of your AnyNet APPC controller(s).

```
                  Work with Configuration Status             PERLE
                                                        07/21/97  19:42:59
Position to  . . . . .  __________   Starting characters

Type options, press Enter.
  1=Vary on   2=Vary off   5=Work with job   8=Work with description
  9=Display mode status ...

Opt  Description     Status              -------------Job--------------
__   C594E01         ACTIVE
__     C594E01       ACTIVE
__       QRMTWSC     ACTIVE/TARGET       C594E01    QUSER      345261
__       QRMTWSC     ACTIVE/SOURCE       C594E01    QUSER      345261
__   C594E02         ACTIVE
__     C594E02       ACTIVE
__       QRMTWSC     ACTIVE/TARGET       C594E02    QUSER      345262
__       QRMTWSC     ACTIVE/SOURCE       C594E02    QUSER      345262


                                                                  Bottom
Parameters or command
===> ____________________________________________________________________________
F3=Exit   F4=Prompt   F12=Cancel   F23=More options   F24=More keys
```

Figure 17. WRKCFGSTS of AnyNet APPC Controllers (Method 1)

```
                    Work with Configuration Status           PERLE
                                                        07/21/97  19:42:59
Position to  . . . . .  __________   Starting characters

Type options, press Enter.
  1=Vary on   2=Vary off   5=Work with job   8=Work with description
  9=Display mode status ...

Opt  Description     Status              -------------Job--------------
__   ANYNTCTL        ACTIVE
__     C594E01       ACTIVE
__       QRMTWSC     ACTIVE/TARGET        C594E01    QUSER      345261
__       QRMTWSC     ACTIVE/SOURCE        C594E01    QUSER      345261
__     C594E02       ACTIVE
__       QRMTWSC     ACTIVE/TARGET        C594E02    QUSER      345262
__       QRMTWSC     ACTIVE/SOURCE        C594E02    QUSER      345262



                                                                  Bottom
Parameters or command
===> ____________________________________________________________________________
F3=Exit   F4=Prompt   F12=Cancel   F23=More options   F24=More keys
```

Figure 18. WRKCFGSTS of AnyNet APPC Controller (Method 2)

The NETSTAT option 3 displayed in the following figure shows the associated TCP/IP connections after they have been established with the 594.

```
                        Work with TCP/IP Connection Status
                                                        System:   PERLE
Local internet address  . . . . . . . . . . . :   *ALL

Type options, press Enter.
  4=End   5=Display details

     Remote          Remote         Local
Opt  Address         Port           Port          Idle Time  State
     *               *              ftp-con >     012:13:07  Listen
     *               *              telnet        001:24:36  Listen
     *               *              pop3          012:09:27  Listen
     *               *              APPCove >     001:24:06  Listen
     *               *              APPCove >     000:00:10  *UDP
     *               *              lpd           012:11:19  Listen
     *               *              as-file       004:17:11  Listen
     101.102.100.30  APPCove >       1024          000:17:52  Established
     101.102.100.30  1025            APPCove >     000:19:22  Established
     101.102.100.31  APPCove >       1025          000:19:22  Established
     101.102.100.31  1025            APPCove >     001:48:37  Established

                                                                  Bottom
F5=Refresh   F11=Display byte counts   F13=Sort by column
F14=Display port numbers   F22=Display entire field   F24=More keys
```

Figure 19. TCP/IP Connection Status - 594 TCP/IP Connections Established

Use the WRKCFGSTS to show the status of the remote workstation controllers.

```
                        Work with Configuration Status          PERLE
                                                             07/21/97  19:42:59
Position to  . . . . .   __________   Starting characters

Type options, press Enter.
  1=Vary on   2=Vary off   5=Work with job   8=Work with description
  9=Display mode status ...

 Opt  Description              Status        -------------Job--------------
 __   C594E01R                 ACTIVE
 __     C594EDSP01             SIGNON DISPLAY
 __   C594E02R                 ACTIVE
 __     C594EDSP02             SIGNON DISPLAY









                                                                       Bottom
Parameters or command
===> ____________________________________________________________________________
F3=Exit   F4=Prompt   F12=Cancel   F23=More options   F24=More keys
```

Figure 20. WRKCFGSTS of Remote Work Station Controllers

Performance and Operation Considerations

You may be able to improve your performance with a few simple changes to the AS/400 TCP/IP Interface and router configuration. Currently the AS/400 system defaults to a Maximum Transmission Unit (MTU) of 576 when a new route is added. This default value is used to ensure packets are not dropped over the route since all TCP/IP implementations have to support at least a 576-byte transmission unit. However, in many cases this value is unnecessarily small since there are no intermediate hops that only support a 576-byte packet. If this is the case, you should change the MTU from 576 to *IFC. The MTU now defaults to the line description frame size. This is approximately 2000 for token-ring and 1500 for Ethernet.

If for any reason you wish to bring down one of your 594 TCP/IP controllers, the following procedure is recommended:

- Vary off the RWS controller associated with the 594 you wish to bring down. Be sure to wait until the controller goes completely to a VARY OFF state. Note, it is not recommended that you vary off the AnyNet APPC controller since there might be other 594 CP sessions or AnyNet PWS sessions that are active under the AnyNet APPC controller. It is also not recommended that you vary off the APPC device description associated with the 594 controller unless you are going to immediately delete the APPC device description. If this is done then the AS/400 may autocreate another APPC device description that will conflict with the current APPC device description that the 594 is currently using.
- Use the NETSTAT Opt 3 command to display the TCP/IP connections and end (using Opt 4) all TCP/IP connections with the IP address of the controller you just varied off. Refresh the TCP/IP connection status screen by pressing F5 a couple of times to verify that all these connections have ended.
- If you want to bring the 594 controller back up, then Vary on the RWS controller again.

The APPC controllers defined with LINKTYPE *ANYNW are no longer directly attached to a line description. This means you will not see the statuses of your AnyNet APPC controllers when you display the status of your line description. You will however see the status of a TCP/IP network controller and device (category *NET), that the AS/400 automatically creates when a TCP/IP interface that is associated with the line description is started. To display the status of your AnyNet APPC controllers you must use the WRKCFGSTS command specifying *CTL as the type of description.

It is recommended that your AS/400 IPL shut-down and start-up programs be changed to end and start the TCP/IP

services respectively. This will ensure that all TCP/IP servers have been properly ended before the AS/400 IPL is performed and will make sure the TCP/IP servers are started before the 594 AnyNet controllers are brought back up.

Copyright and Trademarks

Glossary

594e Connection Number
A parameter used to identify the Perle 594e on the communication network.

594e CP Name
The Control Point (CP) Name of the 594e.

594e LU Name
The Logical Unit (LU) Name of the 594e.

594e Network Name
The Network Name of the 594e.

594e SAP
The Service Access Point (SAP) of the 594e.

594e SDLC Station Address
The SDLC Station Address of the controller used to uniquely identify the controller on an SDLC communication line.

594e Station Address
The Station Address of the controller used to uniquely identify the controller on an X.25 communication line.

594e Utility Program
A program which runs on a PC and is used to enter configuration data for the Perle 594e. The configuration data is saved in a configuration file. When the PC is online to the Perle 594e, the 594e Utility can also be used to establish and end network links. You can use the 594e Utility Program in either standalone or online mode.

Access Code
The international access code of the 594e optionally used for X.21 communications.

Address Call
The full telephone number which the Perle 594e must dial to access AS/400 system. This number contains from 4 to 14 characters. Each character can be a number from 0 to 9. Include the network ID or the country code, but do not include access codes.

Adjacent Link Station (ALS)
A node in the communication network with which a device communicates. In an SNA subarea network, there are one, or more, intermediate ALSs.

Advanced Program-to-program Communication (APPC)
A data communications process that lets AS/400 programs communicate with programs on another system that has a compatible communications process.

ALS
See Adjacent Link Station.

Alternate Keyboard Translations
If an Alternate Keyboard Translation is not specified, then the DWS will use the Default Keyboard Translation. To use an Alternate Keyboard Translation, the Default Keyboard Translation must be a multinational code.

ANSI
American National Standards Institute

APPC
See Advanced Program-to-program Communication.

APPC Controller Description
The AS/400 system has an APPC Controller Description for each APPN connection to another system. This includes connections to a controller emulated by a Perle 594e, and other AS/400 systems.

APPN
Advanced Peer-to-Peer Network.

APPN network
A network of computers using APPC.

ASCII
American National Standard Code for Information Interchange.

ASCII Port
The ASCII Feature Card has eight ports. Each port can be connected to a modem, allowing remote users to make dial-in connections to the AS/400 system. The dial-in connection can be for a single terminal or PC. There can also be a "passthrough" printer attached to the terminal or PC, for a total of 16 ASCII devices on each ASCII Feature Card.

AS/400
Application System 400. A computer in the IBM midrange product line.

Automatic Answer
A feature that allows a station to answer a call on a switched line without operator action.

Automatic Call
A feature that allows a station to call another station on a switched line without operator action.

Beacon Message
A repeating message that an adapter sends to indicate a serious network problem.

BIND Command
A type of command in an SNA environment used to start and define the session.

BPS
Bits per second.

Bridge
A mechanism that connects a network to other networks.

Cable-thru
A type of cabling system that allows multiple workstation to be connected to a single cable path.

Call Command
A command entered at an NWS to place the 594e in Call mode.

Call Progress Signals (CPS)
X.21 signals sent during link establishment that provide status information.

CDSTL
Connect Data Set To Line.

CMOS
Type of integrated circuit technology used for the internal memory of the 594e.

Communication Interface
The physical connection to the Synchronous Communication Card which allows communication with an AS/400 system.

Communication Line
A physical link that allows data transmission between workstations and controllers.

Communication Network
Hardware and software which allow data transmission between two locations.

Communication Protocol
A set of rules which define the orderly transfer of data across a network.

Compatible Mode
A mode of operation in which the Perle 594e operates as a SINGLE controller over a single communication line and is plug-compatible with a single IBM 5494 controller. See Chapter 2 for more details.

Concurrent Host Attachment
A function that allows the 594e to communicate with up to four AS/400s over a single physical link.

Configuration
An arrangement of devices in a network. Also, the activity of defining parameters and options for a particular arrangement of devices.

Configuration Data
The list of parameters and options that have been entered during the process of configuration.

Configuration File
A computer file in which configuration data is stored.

Configuration Mode
The mode of the Perle 594e during which it can be reconfigured. Use Operating mode to establish sessions with the AS/400.

Controller
A device that allows workstations to communicate with an AS/400.

Controller Address
An address which uniquely identifies the controller on the communication line.

Controller Setup Diskette
Use the Perle 594e Controller Setup Diskette during setup and installation of the Perle 594e .

Controller Slot
The slot in which to install Multisession Controllers, The Synchronous Communication Card, or 594e Feature Cards.

Controller Software Diskette
Use the Perle 594e Controller Software Diskette for normal system operation.

CPS
See Call Progress Signals

CPU
Central Processing Unit—the main processing unit of a computer.

DBCS
See Double-Byte Character Set.

DC
Direct Call.

DCC
Data Country Code.

DCE
See Data Circuit Terminating Equipment.

Data Circuit-terminating Equipment (DCE)
The equipment that provides the signal conversion and coding between the data terminal equipment (DTE) and the line.

Data Link
The mechanism (hardware and software) used for sending and receiving data.

Data Terminal Equipment (DTE)
A device, like the 594e or the host, that is connected to a network.

Delimiter
A character used to indicate the beginning and end of a character string.

Device
In this guide, *device* refers to equipment that connects to either the Perle 594e, the AS/400, or the communications network. For example, workstations and printers are individually known to the AS/400 as a device.

Device Description
On the AS/400, the Device Description defines the devices (i.e., display device, print device, etc.) that receive or transmit data through the Perle 594e.

Display Screen
The part of an NWS or PWS that displays information.

DLCI
Data link connection identifier

DNIC
Data Network Identification Code.

Double Byte Character Set (DBCS)
A character set that requires two bytes to represent each character.

DSR
Data set ready.

DSU
Data Service Unit.

DTE
Data Terminal Equipment.

DTR
Data Terminal Ready.

DWS
Display-only workstation. Currently referred to as an NWS (nonprogrammable workstation).

EBCDIC
Extended Binary Coded Decimal Interchange Code.

EIA232
A standard for serial interfaces between computers and communication equipment. Formerly known as RS232, this standard is officially recognized as EIA232.

ELLC
See Enhanced Logical Link Control.

Enhanced Logical Link Control
In X.25 communication, a type of logical link control.

Enhanced Mode
A mode of operation in which the Perle 594e provides additional features and can operate as MULTIPLE controllers sharing a multipoint communication line. See Chapter 2 for more details.

Ethernet
A local area, packet-switched data network mechanism for communication between computers.

Facility Request Code
A number comprised of one or two digits that represents a subscription parameter.

Feature Card
A 594e optional hardware component that adds functions to the 594e.

Field
A location on a workstation screen where data is displayed or entered.

Frame
A transmission of a minimum of 32-bits that is used by SDLC over a communication network.

Frame Relay
An interface standard that provides fast packet-switching by leaving some of the checking and monitoring to higher level protocols.

Full Duplex
The exchange of data in two directions simultaneously.

Gateway
A functional unit that connects networks that have different architecture or use different communication protocols.

Half Duplex (HDX)
The transmission of data in only one direction at a time.

HDX
See Half-duplex

Hexadecimal
The base 16 numbering system using characters 0 through 9 and A through F to represent 0 to 9 and 10 to 15.

Hot Key
A sequence of keys which allow the user of an NWS to access multisessions.

Hz
Hertz.

IEEE
Institute of Electrical and Electronics Engineers

Interface Card
A computer card that may be installed in the Perle 594e and which provides connectors for the attachment of communication cables.

Internal Storage
The internal memory or CMOS of the Perle 594e.

Kb
Kilobyte.

Keyboard Code
A two-digit code which identifies the keyboard translation being used.

Keyboard Translation
The set of symbols used on a keyboard. Each keyboard translation is designed for use in a particular country.

LAN
See Local Area Network.

LAN Card
In the Perle 594e, the LAN card refers to either a Token-Ring Feature Card or an Ethernet Feature Card used for LAN connections.

LAN Gateway
Using the Perle 594e, the LAN Gateway is the functional unit that connects (via Token-Ring or Ethernet) a local area network (LAN) with another network that uses a different architecture or communication protocol.

LCD
Liquid Crystal Display.

Leading Pad
A single byte which is sent to the modem in order to synchronize it.

Leased Line
A communication line which is dedicated to a particular device. This line is always available, and no circuit setup procedures are required.

LED
Light Emitting Diode.

Line Description
On the AS/400, the Line Description defines the communication protocol by which the AS/400 communicates with the Perle 594e.

Link Management Interface (LMI)
For frame-relay networks, the interface that carries status messages between two points.

LLC
See Logical Link Control.

LMI
See Link Management Interface

Local Area Network (LAN)
Two or more computers that are located on a user's premises within a limited distance of each other and that are connected to each other directly or indirectly.

Logical Channel Identifier
A number used to identify a logical channel, consisting of a logical channel group number (4 bits) and a logical channel number (8 bits).

Logical Channel
The method by which data on an X.25 virtual circuit is routed between two devices. More than one logical channel can be used to maintain separate data streams between the same two devices.

Logical Link Control (LLC)
For X.25, the information included in data packets that provides end-to-end link functions to the SNA layers in the 594e and AS/400 systems.

LU
Logical Unit.

Manual Answer
A feature that allows a station to answer a call on a switched line but which requires operator action.

Manual Call
A feature that allows a station to call another station on a switched line but which requires operator action.

MAU
Media Access Unit.

Message Codes
A three-digit number which appears on the operator panel display and indicates a specific condition or error of the Perle 594e.

Mode Description
The Mode Description on the AS/400 controls communications

Modem (Modulator-Demodulator)
A device that converts data from a workstation into a signal that can be transmitted over a communications line, and converts the transmitted signal to data for the receiving device.

Multi-Point Line
A communication line which can support communication with more than one device at a time.

Multinational Keyboard Code
The code number for a keyboard translation which uses the multinational EBCDIC character set on the AS/400 system.

Network Attribute
An individual parameter or option used by the Perle 594e to establish a network link with the AS/400.

Network Information
Parameters and options used by the controller to establish a network link with one of the four alternate AS/400 systems.

Network Link Establishment
The steps which must be performed in order to establish a communication link between the Perle 594e and the AS/400 system.

Non Return to Zero (NRZ)
A type of data encoding.

Non Return to Zero Inverted (NRZI)
A type of data encoding.

NRZ
See Non Return to Zero.

NRZI
See Non Return to Zero Inverted.

Non-programmable Workstation (NWS)
Previously known as a DWS (display-only workstation). An NWS is a workstation attached to your AS/400 that only displays information from the host. It does not have its own CPU and cannot be programmed.

Null
The EBCDIC character that represents the hexadecimal value of 00.

NWS
See Nonprogrammable Workstation

NWS Configuration
A method of configuring the Perle 594e from an attached NWS. The Perle 594e can only be configured for compatible mode using this method of configuration.

Offline
The condition that exists when the 594e is not communicating with the host.

Online
The condition that exists when the 594e is in communication with the host.

Online Mode
When you use the 594e Utility Program online to the Perle 594e, you are working directly on the configuration file contained within the Perle 594e.

Operating Mode
The mode of the Perle 594e during which it can establish sessions with AS/400 systems. Use Configuration mode to reconfigure the Perle 594e.

Packet
A well-defined sequence of bytes, including data and control signals, that is transmitted and switched as one unit.

Packet Size
The maximum number of bytes the user data area of a data packet can contain.

Packet Switched
The transference of data by means of address packets.

Passthrough Printer
An ASCII printer that receives data through a port on a PC or terminal. The data is passed, unchanged, through the PC or terminal.

Permanent Virtual Circuit (PVC)
A type of X.25 virtual circuit which is always available for use between the Perle 594e and the AS/400 systems. No call establishment is required.

Physical Interface
The physical connector which is used to attach the Perle 594e to the communication network, or directly to the AS/400 system.

Point-to-Point Line
A communication line which supports communication between one two devices.

Polling
On a multipoint connection or a point-to-point connection, the process whereby data stations are allowed one at a time to transmit.

Port
The hardware mechanism that attaches workstations or a network to the 594e.

Primary Session Controller
The controller to which an NWS is physically attached.

Programmable Workstation (PWS)
A workstation that can communicate with a host but that can also operate independently of the host.

Protocol
A set of governing instructions, requests, and responses that constitute a way of controlling data transfer.

PVC
See Permanent Virtual Circuit.

PWS
Programmable workstation.

QLLC
See Qualified Logical Link Control.

Qualified Logical LInk Control
For X.25 communication, a type of logical link control.

Remote Workstation
A workstation that is attached to the host through a network.

RS232
A standard for serial interfaces between computers and communication equipment. Formerly known as RS232, this standard is officially recognized as EIA232.

RWS
See Remote workstation.

RWS Controller Description
The RWS Controller Description on the AS/400 contains parameters for nonprogrammable workstations.

SABM
See Set Asynchronous Balanced Mode.

SAP
See Service Access Point.

SBCS
See Single-Byte Character Set.

SDLC
See Synchronous Data Link Control.

Service Access Point (SAP)
An address used in a system that allows data to be directed to the correct remote device.

Set Asynchronous Balanced Mode (SABM)
A data link control command used for establishing a data link connection in asynchronous balanced mode.

SHM
Short Hold Mode.

Short Hold Mode (SHM)
For X.25, an option that allows a link to remain established only when there is data to transfer.

SIMM
Single In-Line Memory Modules.

Single-Byte Character Set (SBCS)
A character set which one requires one byte to represent each character.

Slot
A physical location in the chassis of the Perle 594e where an Interface Card may be installed.

Slot Number
The number assigned to a slot in the Perle 594e. The slots are numbered from left to right.

SNA
Systems Network Architecture.

SNA SubArea Network
A network which allows the Perle 594e to communicate with an AS/400 system to which the Perle 594e has no direct communication line.

SRC
System Reference Code.

SVC
Switched Virtual Circuit.

Switched Virtual Circuit
A type of X.25 virtual circuit which requires a link to be established before each use.

Synchronous Data Link Control
A method of managing data transfer across a synchronous communication line.

System Reference Code
A code which may appear on the operator panel display, or on a workstation screen. The code will identify a specific condition or error with the Perle 594e.

Terminal
Equipment through which data enters or leaves a communication network.

Twinaxial Adapter Cable
A short cable which allows up to four twinaxial communication lines to a Twinaxial Feature Card.

V.35 cable
Used for low-speed communications, this communication cable conforms to the V.35 standard recommended by CCITT.

V
Volts.

VAC
Volts Alternating Current.

Vary Off
To cause a device or line to be unavailable for its normal use.

Vary Off
To cause a device or line to be available for its normal use.

Workstation
Input/output equipment connected to a mainframe, or computer network, at which an individual displays, enters, or manipulates data. There are two basic types of workstations:

- a nonprogrammable workstation (NWS)
- a programmable workstation (PWS).

A Twinaxial NWS or a PC connected to the AS/400 are each known as a workstation.

X.21
A recommendation by CCITT that defines the interface between a DTE and public data networks. Recommendation X.21 also defines procedures for establishing links on switched or leased communication lines.

X.21 switched
A procedure for establishing communications links over circuit-switched communication lines.

X.25
A recommendation by CCITT that defines the interface between a DTE and a packet-switched data network.

X.25 Network Address
The address which uniquely defines this DTE to the X.25 network.

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