Vanguard Managed Solutions

Vanguard Applications Ware
Basic Protocols

Transparent Polled Async

Notice

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To comment on this manual, please send e-mail to LGEN031@vanguardms.com

Overview

The Transparent Polled Async (TPA) software option supports various asynchronous protocols that operate in polled environments. TPA allows complete asynchronous messages to be transmitted without the intercharacter delay normally encountered when using the standard asynchronous PAD.

Hardware Requirements

The Transparent Polled Async option is available on Vanguard platforms.

Custom Software Key (CSKs)

You may have to access TPA by using either a Custom Software Key (CSK). This is provided with your option and is recognized only by the specific product for which it is made. To enter a CSK:

Step	Action
1	Select **Configure** from the Main menu.
2	Select **Software Key Table** from the Configure menu. The Entry Number field is provided for reference purposes in the event you need to change or update a specific option.
3	Assign an **Entry Number** and press Return.
4	Enter the key number in the Key Value field and press Return.
5	Press Escape to exit from the Software Key Table.
6	Save the information when prompted.

Additional Information

For more information about these keys, refer to the *Vanguard Basics Manual.*

In This Manual

Functionality

Introduction   This section describes Transparent Polled Async basic functionality.

Overview of TPA   A polled environment is present when a host computer communicates with remote devices through multipoint modems or a digital sharing device. Figure 1 shows three remote devices attached to the host's modem in a multipoint configuration. Through proper addressing, the host can send a poll message to Remote Device. A and receive a message in response to the poll. Using other addresses, the host can also send a poll message to Remote Device B or C.
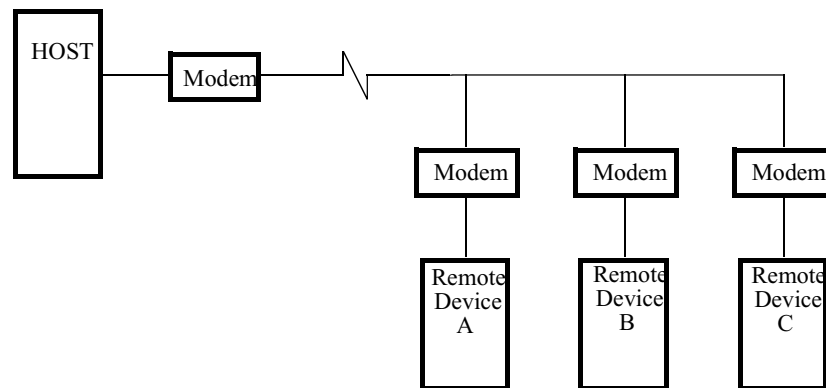
Figure 1. Transparent Polled Async Devices

In a typical asynchronous environment, data enters the Vanguard PAD and is transmitted across the network when certain data forwarding requirements are met, for example:

- Data Forwarding Character is encountered
- Idle Timer expires
- Dynamic Data Forwarding is enabled
- Packet is full

Intercharacter delay, the delay between characters transmitted at the remote end, is inconsequential. However, in a Transparent Polled Async environment, excessive intercharacter delay may cause the remote user device to conclude incorrectly that the end of the message has been reached. To ensure that data is transmitted properly in this application, a Vanguard PAD must not begin to transmit a message to a user device until it has received the entire message from the network. This is accomplished through proper use of the Data Forwarding Criteria and Message Assembly parameters. Refer to the section Configuration for information on these parameters.

TPA 2K Frame Size Increase

Overview

During normal operation of the Transparent Polled Async (TPA) option, data packets pass through a network uninterrupted. However, when passing larger TPA packets over a network, the transfer of data becomes bursty and segmenting of data packets occurs. To avoid segmenting data packets, set up the PAD node for uninterrupted delivery of data packets up to 2K in size by enabling the TPA 2K Frame Size feature.

With the exception of the Vanguard 6560, all Vanguard products support the TPA 2K Frame Size Increase.

Enabling TPA 2K Frame Size

Follow these steps to configure TPA 2K Frame Size Feature:

Step	Action
1	If the node is a 6520, enable the CSK for the TPA option on this node.
2	Enable the CSK for the TPA 2K Frame Size feature on the node. ■**Note** See the *Vanguard Configuration Basics Manual* for details on enabling a CSK.
3	Select **Configure -> PAD Profile Table -> #114 PAD Mode** from the CTP Main menu, and press Return.
4	Set the PAD Mode parameter to 1 for a host node or 2 for a remote node.
5	Boot the node. Performing a Node boot implements changes to the PAD node, but it is not always necessary. Perform one of the following boot procedures: | *If you...*	*Perform...*
---	---
Changed a PAD Profile that is already attached to the PAD Port	A Table and Record boot.
Are attaching a PAD Profile to a PAD port.	A Port boot.
Created a Profile that you want to attach to a port.	A Table and Record boot and then a Port boot.	

Supported Protocols

Overview

The TPA option can be used with other protocols on the same MX25 or X25 lines. In Figure 2, an MX25 link and an X.25 link are used in a small network to switch Transparent Polled Async, Bisync, and SDLC data.
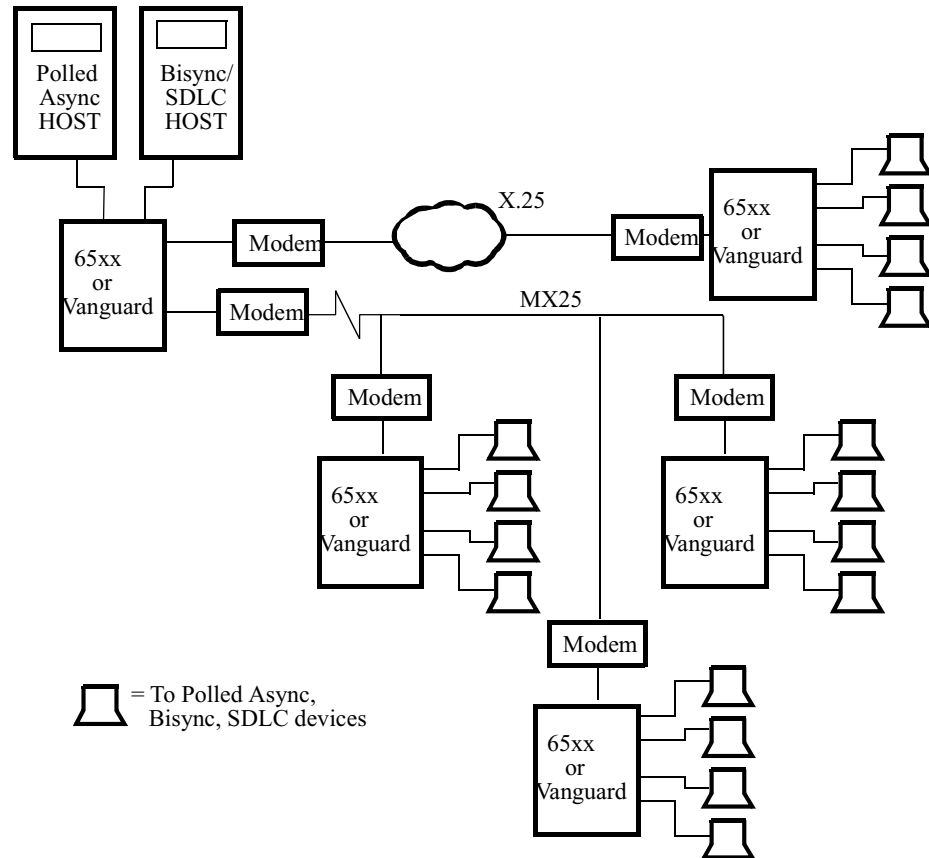
Figure 2. Transparent Polled Async Used with Other Protocols in a Network

Switched Carrier

In a Switched Carrier environment, the transmitting device raises the RTS signal, sends an asynchronous message, and then drops the RTS signal. When a Vanguard device sends the asynchronous message to the remote device, the device raises the DCD signal, sends the asynchronous message, and then drops the DCD signal. This action of performing Switched Carrier operations is configurable using the EIA Signalling Action parameter.

Configuration

Overview

This section explains how to configure Transparent Polled Async (TPA) on Vanguard platforms. Refer to the *Vanguard Configuration Basics Manual* for information on logging on and accessing the Main menu from the CTP.

Figure 3 illustrates the PAD Profile parameters required to accommodate the different TPA environments. TPA parameters are enabled only when the parameter PAD Mode is set to 1 or 2 and cannot be used unless the TPA option has been purchased and enabled on the node.

Creating a PAD Profile

Overview   To create a TPA PAD Profile, select Copy/Insert Record from the Main menu. Using the Copy Special PAD Profile from PROM function, you can copy default TPA PAD profiles. There are two default TPA PAD profiles:

- TPA_HOST – (for the Host PAD)
- TPA_RMOT – (for Remote PADs)

Once a default profile is copied, it can then be modified to meet your requirements. Copying default profiles is the recommended method of creating PAD Profiles because parameters not needed in polled environments are disabled. TPA PAD profiles can also be newly created rather than modified by using the Configure PAD Profile Table function.

Follow These Steps...   To create a new PAD profile:

Step	Action
1	Select **Configure** from the Main menu.
2	Select **PAD Profile Table** from the Configure menu.

Main Menu

Configure

PAD Profile Table

- Profile Name
- #1 PAD Recall
- #2 Echo
- #3 Data Forwarding Character
- #4 Idle Timer Delay

Parameters #3, #4, #114 through #118 are used in conjunction with

- #114 PAD Mode
- #115 Data Forwarding Criteria
- #116 Short Timer Duration
- #117 EIA Signalling Action
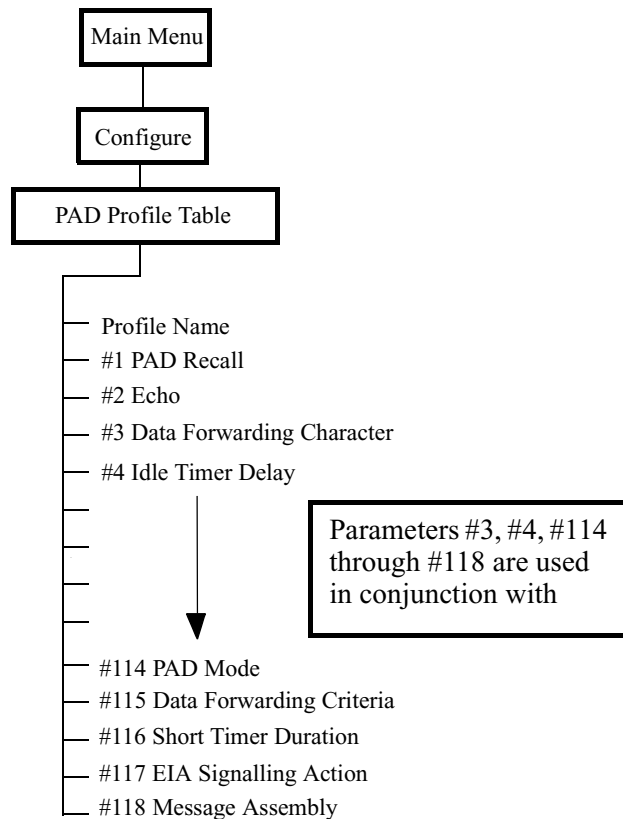- #118 Message Assembly

Figure 3. Transparent Polled Async PAD Profile Parameters

PAD Profile Table Parameters

List of Parameters   Listed below are descriptions of the PAD Profile parameters that must be configured when using Transparent Polled Async. Refer to the *Configuring for APAD/ATPAD Manual* for a complete listing of PAD Profile parameter descriptions.

Data Forwarding Character (#3)

Range:	0 to 127
Default:	2
Description:	Selects the ASCII characters used for data forwarding. **NOTE:** A setting of zero disables this parameter.
	■**Note** Refer to the *Vanguard Configuration Basics Manual* for the ASCII Table.

Idle Timer Delay (#4)

Range:	0 to 255
Default:	0
Description:	Selects forwarding idle timer delay in increments of 50 milliseconds. A setting of 0 disables the Idle Timer.

PAD Mode (#114)

Range:	0 to 2
Default:	0
Description:	This parameter selects PAD Operational Mode • 0: Normal PAD Operation • 1: Transparent Polled Async Host PAD • 2: Transparent Polled Async Remote PAD
	■**Note** Normal PAD operation deactivates Parameters #115 through #118. To operate TPA, or use the TPA 2K Frame Size Increase feature, set Parameter #114 to 1 for Host PAD and 2 for Remote PAD.

Data Forwarding Criteria (#115)

Range:	0 to 2
Default:	0
Description:	Specifies the criteria for determining the end of an asynchronous message sent from an asynchronous device. When Data Forwarding Criteria settings are satisfied, the asynchronous message is sent into the X.25 network. • 0: Normal. Select Data Forwarding Character (#3) or Idle Timer Delay (#4). **NOTE:** These two parameters should not be used simultaneously. • 1: Short Timer. Short Timer Duration (#116) is used to provide a short idle timer delay in place of the standard idle timer period. • 2: RTS Signal Drop. The asynchronous message is terminated when the RTS signal is dropped by the attached device and data is automatically forwarded. No other settings are required. ■**Note** If parameter #115 is set to 2, you cannot have the port record connection type = DIMO, DIMOa, or DIMOb, because when RTS drops the connection is broken. Refer to the *Vanguard Basics Manual* for descriptions of connection types.

This table provides a quick reference for identifying which parameter is used when the Data Forwarding Criteria (#115) parameter is set to 0, 1, or 2.

When Data Forwarding Criteria (#115) is set to...	*The Following Parameter Is Used...*
0	Data Forwarding Character (#3) or Idle Timer Delay (#4)
1	Short Timer Duration (#116)
2	No specific parameter used. Data is automatically forwarded when the RTS signal drops.
■**Note** When Data Forwarding Criteria (#115-0) is used, select either #3 or #4. These parameters should not be used simultaneously.	

Short Timer Duration (#116)

Range:	0 to 255
Default:	0
Description:	Selects Short Timer duration in milliseconds (used with #115). During receipt of an asynchronous message, if a character has not been received in the time period defined by Short Timer Duration, the message is determined to be complete and is sent into the X.25 network.
	Using a Short Timer instead of an Idle Timer when running high-speed asynchronous data usually results in better response times due to the smaller granularity. However, using Short Timer will increase CPU utilization as compared with the same application using the Idle Timer.
	• 0: Disabled
	• 1–255: Duration in milliseconds

EIA Signalling Action (#117)

Range:	0 or 1
Default:	0
Description:	This parameter selects EIA Signalling action.
	• 0: None
	• 1: Raise DCD before transmission and drop DCD after transmission.

Message Assembly (#118)

Range:	0 or 1
Default:	1
Description:	Message Assembly (#118) controls the transmission of a message received from the X.25 network to an attached device.
	• 0: Disabled. If Message Assembly (#118) is disabled, message transmission begins as soon as the first packet arrives from the X.25 network.
	• 1: Enabled. If Message Assembly (#118) is enabled, the entire message is buffered at the remote PAD before it is transmitted to the attached device. Buffering the message eliminates the possibility of intercharacter delays being introduced which could cause the attached device to misinterpret the end of the message.

Enabling a PAD Profile

How To...

Once a TPA PAD Profile has been created for a PAD port, the profile can be designated as the current running profile for the PAD port. This is done by executing a Table and Node Record boot, followed by a boot of the specific port.

Refer to the Administration section for information about using the Boot command.

Administration

Overview
This section describes the Boot command, which is used to enable the PAD Profile. Also described here are the statistics available for Transparent Polled Async (TPA). Complete information on all other statistics are described in the *Vanguard Configuration Basics Manual*.

Boot Command

Overview

Booting updates a node's operational parameters by using the parameters stored in configuration memory (CMEM).

Follow These Steps...

To designate a TPA PAD Profile as the current running profile for the PAD port:

Step	*Action*
1	Select **Boot** from the Main menu.
2	Select **Table and Node Record** from the Main menu; the Boot menu is redisplayed.
3	Select **Port** from the Boot menu and complete the process by booting the specific port.

For More Details...

For more information regarding the Boot command, refer to the *Vanguard Basics Manual.*

Detailed PAD Port Statistics

Statistics Command

The Statistics command lets you to monitor the status of different parts of the network. Use the information appearing on the Detailed Port Statistics screens shown in this section to monitor the operation of a node

To View...

To view the Detailed Port Statistics:

Step	Action
1	Select **Status/Statistics** from the Main menu.
2	Select **Detailed Port Statistics** from the Status/Statistics menu.

The three screens shown in Figures 4, 5, and 6, display useful information about the selected port.

```
Node:                    Address:            Date:           Time:
Detailed PAD Statistics: Port 3                          Page:  1 of 3


Port Number: 3        Port Type:  ASYNC PAD    Port Status: Up
Port Speed:  9600     Port State: X28          Port Utilization Out: 20%

Physical:
Parity Errors :  0    Overrun Errors : 0        Framing Errors : 0


 Data Summary:
                  IN        OUT                         IN      OUT
Characters:    403425    484115     Characters/sec:      5       6
Packets:        80685     80696     Packets/sec:         1       1
Number of Packets Queued: 0

EIA Summary:                           INPUT           OUTPUT
                                   DTR RTS  MB P14    DSR DCD RI CTS
  State: Connected (SIMPLE          L   L   L   L      H   H   L  H



Press any key to continue ( ESC to exit ) ...
```

Figure 4. Detailed PAD Port Statistics - Page 1

```
Node:                    Address:            Date:           Time:
Detailed PAD Statistics: Port 3                              Page:  2 of 3

 Call Summary:
  Current Status: Disconnected
  Time until next auto-call attempt: 0 secs
  Number of auto-call attempts: 0
  Last clear cause code: 0 (Cleared by other end)
  Last clear diagnostic code: 0 (No more information)

 Last Inbound Call:
  Called Address:
  Calling Address:
  Facilities:
  CUD:

 Last Outbound Call:
  Called Address:  1020002
  Calling Address: 1010003
  Facilities:
  CUD: 01000000

Press any key to continue ( ESC to exit ) ...
```

Figure 5. Detailed PAD Port Statistics - Page 2

```
Node:                    Address:            Date:           Time:
Detailed PAD Statistics: Port 3                              Page: 3 of 3


Current Running Profile:
 1:1     2:1     3:2     4:0     5:0     6:5     7:2     8:0
 9:0     10:0    11:14   12:1    13:4    14:0    15:1    16:8
 17:24   18:18   19:2    20:255  21:7    22:0
 100:0   101:0   102:0   103:17  104:19  105:0   106:0   107:0
 108:0   109:0   110:0   111:0   112:0   113:0   114:2   115:2
 116:0   117:0   118:0   119:0




Press any key to continue ( ESC to exit ) ...
```

Figure 6. Detailed PAD Port Statistics - Page 3

PAD Port Statistics This table explains the terms used in PAD Port Statistics screens to help you interpret the Statistics displays.

Term	Description
Port Number	Specifies a specific port in the network diagram
Port Type	Indicates the type of port. **■Note** Async PAD is the only port type that supports the Transparent Polled Async option
Port Status	Specifies the current port status • Up: Port is operational • Disabled: Port has been disabled
Speed	Message transmission speed in bits per second
Port State	Specifies the current state of the port: • PAD: Port has call established • X28: Port in X.28 command mode • Password: Port is waiting for password entry
Port Utilization	Factor determined by comparison of volume (characters per second) of data and clock rate for a specified port
Physical	• Parity Errors: Number of parity errors detected since last boot or statistics reset • Overrun Errors: Number of overrun errors detected since last boot or statistics reset • Framing Errors: Number of framing errors detected since last boot or statistics reset
Data Summary	• Characters In: Number of characters received since last boot or statistics reset • Characters Out: Number of characters transmitted since last boot or statistics reset • Packets In: Number of packets received since last boot or statistics reset • Packets Out: Number of packets transmitted since last boot or statistics reset • Characters/Sec: Average number of characters sent per second • Packets/Sec: Average number of packets sent per second • Number of Packets Queued: Current number of packets buffered since last boot or statistics reset

Term	*Description* (continued)

EIA Summary	State: The current state of the EIA signals. For a complete listing of EIA states, refer to the *Vanguard Basics Manual.*
	
	 • Input:
	   DTR (Data Terminal Ready)
	   RTS (Request to Send)
	   MB (Make Busy)
	   P14 Ignored
	
	 ■**Note**
	 These signals are monitored by the Control Terminal Port.
	 • Output:
	   DSR (Data Set Ready)
	   DCD (Carrier Detect)
	   RI (Ring Indicator)
	   CTS (Clear to Send)
	
	 ■**Note**
	 These signals are generated by the Vanguard port.

Call Summary	Current Status: • Connected: Call is connected • Disconnected: Call is disconnected • Called: PAD Port is being called • Calling: PAD Port attempting to establish a call • Clearing: Call is in process of being cleared • Local Copy: PAD Port is in local copy mode • Time until Next Autocall Attempt: Specifies the time interval between Autocall attempts in seconds • Number of Autocall Attempts: Specifies the number of times the Host PAD or the Remote PAD attempts to call when Autocalling is enabled • Last Clear Cause or Last Clear Diagnostic Code: These messages explain why the last call was cleared. For more information, refer to the *Vanguard Configuration Basics Manual.*
Last Inbound Call	• Called Address: Works in conjunction with the link's Inbound Called Address for inbound calls • Calling Address: Works in conjunction with the link's Inbound Calling Address for inbound calls • Facilities: Parameter and option settings that are checked during inbound call processing • CUD: Specifies that the subaddress for the call is carried in the Call User Data (CUD) field of a call request

Term	Description *(continued)*
Last Outbound Call	• Called Address: Works in conjunction with the link's Outbound Called Address for outbound calls • Calling Address: Works in conjunction with the link's Outbound Calling Address for outbound calls • Facilities: Parameter and option settings that are checked during outbound call processing • CUD: Specifies that the subaddress for the call is carried in the Call User Data (CUD) field of a call request
Current Running Profile	List of current profile values

PAD Profile Table Configuration Worksheet

Entry Number						
Profile Name						
#1 PAD Recall						
#2 Echo						
#3 Data Forwarding Character						
#4 Idle Timer Delay						
#5 Device Flow Control						
#6 Service Signals Control						
#7 Break Signal Operation						
#9 Padding after Carriage Return						
#10 Line Folding						
#12 PAD Data Restraint						
#13 Line Feed Insertion after CR						
#14 Padding after LF						
#15 Editing						
#16 Character Delete						
#17 Line Delete						
#18 Line Display						
#19 Editing Type						
#20 Echo Mask						
#21 Parity Treatment						
#22 Page Wait						
#100 Break Character						
#101 Echo Substitution Toggle Character						
#102 Echo Substitution Character						
#103 XON Character						
#104 XOFF Character						
#105 Control Signal (EIA-232-D) Data Restraint						
#106 Network Parity						
#107 Idle Disconnect Timer						
#108 Disconnect Character						
#109 Form Feed Padding						
#110 ESC Forwarding Delay						
#111 Echo Control						
#112 Dynamic Data Forwarding						
#113 Hewlett-Packard flow control						
#114 PAD Mode						
#115 Data Forwarding Criteria						

#116 Short Timer Duration						
#117 EIA Signalling Action						
#118 Message Assembly						

Index