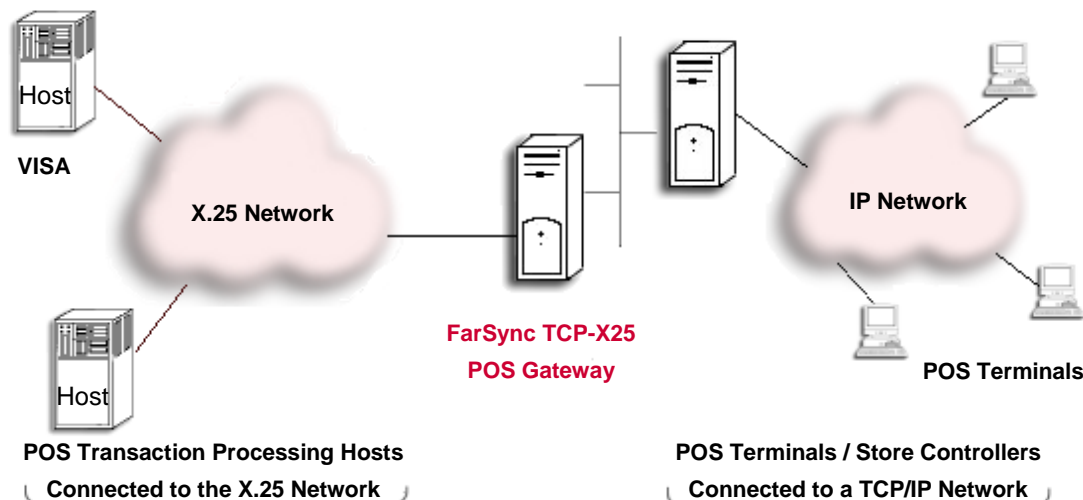


Typical network configuration using the FarSync TCP-X25 POS Gateway



Key Features

- POS support for APACS 30, APACS 40, ISO 8583, SIBS, HGEPOS and CTL (Card Tech Ltd)
- General Purpose TCP to X.25 data translation including fixed routes, dynamic routing, RFC1006 and Cisco RBP compatibility
- High performance, non stop operation - up to 500 POS transactions per second
- Up to 16 X.25 lines on each POS Gateway
- Multiple POS Gateways providing Resilience with Load Balancing
- Simple configuration with the Configuration Application or by text files

Overview

Some modern Point-Of-Sale (POS) terminals, store controllers and other types of electronic money transfer processing equipment connect via TCP/IP whilst many existing POS transaction processing Hosts, such as VISA, have X.25 interfaces. Similarly in some cases the reverse situation exists. The FarSync TCP-X25 POS Gateway provides a reliable means of interconnecting POS equipment to electronic money transfer central processing systems where there is a requirement for a specialist Gateway between TCP/IP and X.25 networks.

The Gateway supports ISO 8583, APACS 30, APACS 40, HGEPOS, SIBS and CTL. There are 3 versions of the POS Gateway providing scalable solutions, starting with a small scale single store version supporting up to 10 simultaneous transactions to the MAX version allowing up to 4,000 simultaneous transactions.

The best in class general purpose TCP to X.25 data and connection translation facilities provided with the product make the Gateway suitable for a very wide range TCP to X.25 requirements, not just POS requirements.

The Gateway, which operates as a Windows service on Windows Server 2003, XP or 2000, is designed for non-stop operation. Almost all changes to the configuration are applied dynamically with no need for reloading.

Two or more Gateways can be used in a load balanced, resilient configuration that has no single point of failure.

Where a standalone rack mountable appliance is preferred to a software solution the FarLinX TCP-X25 POS Gateway should be used, see separate datasheet.

Applications

- Interconnection of X.25 POS Terminals to TCP/IP connected host/s
- Interconnection of TCP/IP connected POS Terminals to X.25 connected host/s
- General purpose Gateway to interconnect TCP/IP and X.25 networks

POS Gateway Operation

The Gateway provides connection establishment and data packetisation services for APACS, ISO 8583, SIBS, CTL and HGEPOS systems to allow POS terminals operating over TCP/IP to interface to X.25 connected hosts. An X.25 session is established for the POS transaction when the TCP session for a transaction is established. Very flexible and wide ranging general purpose options for mapping TCP to X.25 data are included in the product. The Gateway provides routing facilities to select the appropriate Host from those available and maintains X.25 sessions to the Host as required.

APACS Options

APACS connections over X.25 can operate in 2 different ways, TPAD-HOST Mode and T/T-TPAD Mode. The FarSync TCP-X25 POS Gateway supports both modes and also transparent conversion between the modes.

TPAD-HOST Mode

APACS messages are sent without a LRC in TPAD-HOST mode, no APACS control frames eg ACK, DLE EOT are required. The transaction consists of a pair of APACS messages. An X.25 virtual circuit is established by the Gateway at the start of each transaction and cleared by the Gateway at the end of the transaction.

T/T-TPAD Mode

APACS messages are sent complete with the LRC. APACS control frames are used to regulate the flow and termination of the APACS message, each message being acknowledged with an ACK frame. An X.25 virtual circuit is established by the Gateway at the start of each transaction and cleared by the Gateway at the end of the transaction.

HPAD Conversion

APACS messages on the Host side are handled complete with LRC and control frames to acknowledge and regulate the flow. The messages are extracted and handled on the POS Terminal side as simple messages without the LRC and transmitted without the use of control frames. This provides conversion from TPAD-Host mode on the terminal side to T/T-TPAD mode on the Host side.

TPAD Conversion

APACS messages on the Terminal side are handled complete with LRC and control frames to acknowledge and regulate the flow. The messages are extracted and handled on the Host side as simple messages without the LRC and transmitted without the use of control frames. This provides conversion from T/T-TPAD mode on the terminal side to TPAD-Host mode on the Host side.

General Purpose Options

The POS Gateway can support a wide range of TCP to X.25 data translation and connection functions, including fixed and dynamic routing, RFC1006 support and Cisco RBP compatibility. The different modes of operation can be configured on a per connection basis.

Overview of Resilient Operation Configurations

The FarSync TCP-X25 POS Gateway can be deployed in a wide variety of ways to achieve the level of resilience required by the application. The level will depend on the value of the data traffic and the acceptable degree of user intervention required to rectify any problem. The aim with resilience is to **remove single points of failure**. Resilient configurations using more than one POS Gateway also allow **improved performance by sharing the traffic load between several machines**.

Network Line Redundancy

To achieve network line redundancy, **a single FarSync TCP-X25 POS Gateway may operate with two or more X.25 lines**. It can route data over any active line connected to the Gateway so that if one line goes out of operation then the second line continues to be used automatically. Your network provider may also support a number of additional resilient offerings. Examples include diverse routing of cabling into your premises or even connection of network lines to geographically dispersed network nodes.

Communications Equipment Redundancy

To further improve on Network Line Redundancy, **multiple FarSync X.25 cards may be used in a single POS Gateway machine**. This will allow the Gateway to continue operation even if there were a hardware or software fault within one of the communications adapters that prevented it handling calls.

Gateway Redundancy and Load Balancing

For fully resilient operation, two or more FarSync TCP-X25 POS Gateways may be deployed. This can be **either with simple failover from a primary to a backup machine or in a load balancing configuration**.

The FarSync TCP-X25 POS Gateway operates in conjunction with Windows Network Load Balancing (NLB), an integral feature of Windows Server 2003 (also Windows 2000 Advanced Server). **NLB provides failover support for IP based applications and services that require high scalability and/or availability and is ideally suited to improving the availability of the FarSync TCP-X25 POS Gateway**. Load balancing these services ensures there is no single point of failure and that there is no performance bottleneck.

FarSync Gateway Supervisor

The FarSync TCP-X25 POS Gateway utilises the FarSync Gateway Supervisor application to integrate tightly with NLB to extend its basic LAN resilience to also cover the service level as well as the LAN access level. The Gateway Supervisor checks the state of the X.25 network lines and as these change state between fully operational and faulty it selectively enables/disables the server from the NLB pool for the FarSync TCP-X25 POS Gateway service, thus managing the availability of that particular POS Gateway machine. Events such as the connections established are logged on a rotating log file, key events such as loss of an X.25 line are also logged on the Windows event log.

Performance and Expandability

The FarSync TCP-X25 POS Gateway easily handles very high transaction loads. Support for large numbers of X.25 lines and multiple Gateways provides enormous scalable expansion capability and resiliency. The main performance and expansion capabilities of the Gateway are:

- Up to 500 POS transactions per second on each Gateway (MAX version)
- Multiple load balancing Gateways, up to 32 sharing a single IP address
- X.25 line speeds up to 8 Mbits/s
- From 1 to 16 X.25 lines per Gateway
- Support for X.25 Networks, Leased Lines and X.25 Dialup connections
- Up to 2,000 connections per X.25 line (MAX version)
- 3 versions - 10 session, 20 session and MAX (up to 4,000 sessions)
- Up to 4,000 simultaneous connections with the MAX version of the POS Gateway

Connection Routing and Address Mapping

The FarSync TCP-X25 POS Gateway is typically used to route connections to a single acquiring host. It can, however, support routes to 2,000 different X.25 hosts. Similarly, when using the called X.25 address as the routing key, incoming X.25 calls can be routed to thousands of different TCP/IP hosts.

When making connections to the X.25 network, the POS Gateway has the capability of mapping the source IP address to a calling X.25 address, thus allowing the destination X.25 host to identify the connection source uniquely.

The Dynamic routing option allows the X.25 address (NUA) and call parameters to be set by the remote application at the time each X.25 connection is established. X.25 packetisation information is passed to the application.

Configuration Application

The Configuration Application for the POS Gateway allows the TCP interface, X.25 connection, and POS protocol types and the event log levels to be selected. Almost all changes to the configuration are made dynamically so continuous operation of the Gateway can be maintained.

The sample screen shot taken from the Configuration Application shows the configuration parameters for an APACS 30 X.25 to TCP/IP connection.

Configuration by Text Files

As an alternative to using the Gateway Configuration program, the POS Gateway configuration can be defined in text files. This approach is more scalable, allowing hundreds of routing definitions to be easily configured. As with the Configuration Application changes to the text files can be applied dynamically allowing continuous operation to be maintained.

Section	Field	Value
Common Settings	Name	APACS-30 Host
	Local TCP Port Number	14000
	Message Type	APACS T/T-TPAD
	Local X.25 NUA	15000
Outgoing X.25 Call Settings	Destination X.25 NUA	14000
	X.25 Adapter Number	ANY
	X.25 Line Number	ANY
	X.25 Call User Data (hex)	
	X.25 Facilities (hex)	
X.25 Originated Call Settings	Target Host Name/IP Address	127.0.0.1
	Target TCP Port Number	15000

FarSync X.25 cards

The FarSync TCP-X25 POS Gateway requires the FarSync X25 T-Series or M-Series cards to provide the X.25 connection. One or more of these high performance PCI-X / PCI / PCMCIA cards are required to connect to the physical X.25 line/s that connect to the X.25 network. See the [separate datasheets](#) for further information on the FarSync X.25 cards.

Maintenance Contract

FarSite recognises that this product is often used as a key component in POS transaction systems and as such a guaranteed response to unexpected problems is required. A maintenance contract is available for the FarSync TCP-X25 POS Gateway and FarSync X.25 cards for priority service and rapid problem resolution.

Product Name	FarSync TCP-X25 POS Gateway-10	FarSync TCP-X25 POS Gateway-20	FarSync TCP-X25 POS Gateway-MAX
Product code	FS9103	FS9203	FS9003
Maximum Simultaneous transactions	10	20	4,000

Product Features

POS transaction protocols	APACS 30, APACS 40, ISO 8583 (numerous options), SIBS, HGEPOS, CTL (Card Tech Ltd)
APACS specific protocol variants supported	TPAD-HOST - just APACS messages, no LRC T/T-TPAD - APACS messages with LRC plus control frames (ENQ, AK, DLE EOT, etc) Conversion between TPAD-HOST and T/T-TPAD is supported in either direction
TCP to X.25 translation modes	Fixed and Dynamic Routing (compatible with the DRPD module on the FarSync TCP-X25 Gateway). Full list of modes: APACS TPAD-Host, APACS T/T-TPAD, APACS CTL-Online, APACS Conv-TPAD, APACS Conv-HPAD, Character Stream, ISO 8583 Hdr2, ISO 8583 Hdr4, ISO 8583 (CTL), SIBS, HGEPOS, Cisco RBP, ETX-Terminated, CR-Terminated, Conv Hdr 2-bin, Conv Hdr 2-ascii, Conv Hdr 4-bin, Conv Hdr 4-ascii, parity conversion, RFC1006
Transactions per second	Up to 500 per second on each POS Gateway
Maximum simultaneous transactions	Up to 2,000 on each X.25 line to total of 4,000 across all lines (MAX version)
Resilient configuration	Yes, from 2 to 32 Gateways using Windows Server 2003 configured for NLB and the Gateway Monitor application
Load balancing	Yes, from 2 to 32 Gateways using Windows Server 2003 configured for NLB and the Gateway Monitor application
TCP/IP connections to the POS Gateway	Standard PC LAN cards FarSync WAN cards for leased line / internet / intranet connections using E1, X.21 and V.35 network connections.
Logging key events	Events such as the connections being established and dropped are logged on a daily rotating log file, key operational events such as eg X.25 call fails, X.25 line down, X.25 line up are also logged on the Windows event log.
X.25 cards supported	One or more FarSync X.25 cards must be used with this product, supported cards are: PCI-X / PCI cards - FarSync X25 T1U, FarSync X25 T2U, FarSync X25 T4U, FarSync X25 T2P, FarSync X25 T4P PCMCIA cards - FarSync X25 M1P See the separate FarSync X.25 card datasheets for details
Maximum X.25 lines	Up to 16 lines per POS Gateway
Types of X.25 connections	X.25 networks, Leased Lines and X.25 Dialup
FarSync x.25 card feature summary	X.21, V.35 and V.24 network interfaces 254 SVC and/or PVCs per port, 2,000 per port with expansion pack Speeds up to 8.448 Mbits/s X.25 CCITT Compliance 1980, 84 and 88 Data packet sizes up to 4096 bytes Reverse charging, Closed User Groups (CUG), Network User Identification (NUI), Fast Select, Throughput Class Negotiation Built in Line Monitor
Standalone rack mountable appliance	Where a standalone rack mountable appliance is preferred to a software solution the FarLinX TCP-X25 POS Gateway should be used, see separate datasheet .
Operating systems supported	Windows XP Professional, Windows Server 2003, Windows 2000 Professional, Windows 2000 Server, Windows 2000 Advanced Server, Windows 2000 Datacenter Server