

X.25 over IP



Background

X.25 networks were introduced in the 1980s and have largely been superseded by IP networks. X.25 was used for Satellite transmission as well as national networks. The network provided a DCE interface; and the equipment a DTE interface i.e. the connection is asymmetric. In order to fulfil the requirements of a customer's X.25 DTE equipment, a supporting interface must emulate the DCE network. Similar to an IP address, X.25 used NUA addressing. Often the called party used the calling address to validate the call. An emulation is therefore required to transport this information end to end or map IP to NUA addressing. X.25 also uses packet trains of data that must not only be carried over X.25 but often must be regenerated exactly as was presented. X.25 has a virtual circuit concept on each connection. IP however has port usage that reflects the actual operation of the connection. X.25 Networks were used as point to point interconnections (one-to-one) and as a complex network to one or more data centres (many-to-one).

Solutions

There are essentially two basic solutions models available.

One solution transports the entire X.25 protocol from end to end over the IP framework. This is a simple solution called XOT. It works, yet is inefficient, and possibly incurs timing issues. Obviously it demands the continuation of a legacy X.25 switch at a data centre.

The second method is that of relaying the X.25 information. This entails accommodating the X.25 protocol at the DTE end and removing data from Data Packets. This data is then carried over the IP network. At the remote end a reconstitution of the Data Packet train is made and delivered by a DCE emulator to the far DTE.

A third variant is that of the second method above, but without re-constituting the X.25 data at the one end. The benefit of this approach is that X.25 data is delivered to an IP centre as IP traffic. The centre would not need to know that the remote site still thinks that it is talking to an X.25 centre. X.25 could therefore be removed entirely from the centre in this approach. It is possible to implement initially the second method and then subsequently to move to this solution.

Environments

Where the requirement is for two sites that formally used X.25 to interconnect then two small SymRelay units suffice. Where the network is a data centre with many remote DTEs e.g. an ATM network for banks then a more robust unit, the SymTRAN, must be used.

The SymRelay is a low cost unit that supports one link (optionally 2 with limitations). It can handle multiple virtual circuits mapping these to multiple IP ports over the LAN.



A SymRelay

Note: Where a 'proof-of-concept' is required, the low cost one-to-one connection of one SymRelay linked to another via an IP network can be easily used to demonstrate viability.

Technical Specifications



SymRelay

The SymRelay is a low cost unit that connects one DTE to the IP network. Whilst there are several options for the product typically it has one V.24(RS232) DCE port and one Ethernet LAN port. It is powered using an external power supply.

SymRelay Component	Specification
X.25 Ports	1 (V.11 or V.24)
Physical Interface X.25	DTE or DCE presented DB15/DB25 Female
HDLC link speed (maximum)	256 Kbps
Clocking for V.24	External or Internal
Link level protocol	X.25 LAPB (CCITT 1984)
Virtual Circuits	8 default optionally 32
LAN presentation	RJ45 connector
Ethernet protocol	IEEE 802.3
LAN protocol	TCP/IP with Telnet
Storage	Flash 1Mbyte
Configuration	Via Telnet and Proprietary Configurator
Power Supply	External 220/240 V AC
Status Indicators	Power, diagnostics
Dimensions (Width, Depth, Height)	250mm, 180mm,50mm
Power consumption	12V, 1A

SymTRAN

The SymTRAN is a 1U or 3U height 19 inch rack mounted unit. It runs Linux with embedded intelligent DTSX X.25 card(s) supporting up to 16 X.25 links. The LAN interface also accommodates a console access for configuration. The SymTRAN is configured according to the requirements of a centre or network hub. Its capacity is dependent on the storage, RAM, Interfaces that are used. It is fully compatible with the SymRelay units outlined above.

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