# X.25 Basics

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*Tutorial Introducing X.25*

*Packet switching has been around for over 25 years and has been used to serve many different user groups. But in the past few months, Patton has noticed an increased demand for data communications equipment connected to packet switched networks, especially equipment connected to X.25 networks. So we thought that our readers would enjoy reading a brief introduction to packet switching and its use in X.25 networks.*

***Packet Switching***

*An X.25 network transfers data via packet switching. With this method, information is taken from many different users and combined into discrete data packets. These data packets are then forwarded to the Packet Data Network (PDN). Each data packet is quickly routed through the network "cloud" to its destination using self-contained routing information.*

*Packet switching uses "virtual" circuits; the data is characterized into packets which are switched in a logical fashion over a circuit shared by many different subscribers. Unlike circuit switching, where the user actually has exclusive use of the circuit (a dedicated connection), a packet switched user has a "virtual" connection. The connection only appears to be dedicated. Instead of creating a permanent link between parties, the packet-switched circuit is set up on demand and lasts for the duration of that call only.*

*A primary advantage of the X.25 network is that packet switching offers a significant cost savings compared to circuit switching. It is similar to dial-up for data but your business will only have to pay for the time that the caller is talking.*

***X.25 Networks***

*Originally designed as a secure method for the transport of voice traffic over analog lines, CCITT X.25 (as well as X.3, X.28, X.29, X.75 and X.480) specifies how terminals talk to packet forming devices, how these packet assemblers talk to packet switches, and how packet switching nodes talk to each other.*

*In an X.25 network, a Packet Assembler/Disassembler (PAD) assembles individual asynchronous transmissions from many DTEs into a single, synchronous X.25 packet. This synchronous packet can be up to 128 data bytes long and resembles an IBM SDLC block with a few extra control bytes.*

*The PAD acts as a point-to-point 56 Kbps statistical multiplexer and uses buffers to send packets to an X.25 switch. This switch separates and routes the packets to their destination according to a predetermined algorithm. Each packet may then take a different route through multiple switches within the X.25 network cloud.*

*Because a large amount of errors are often experienced when using analog lines, X.25 uses an intricate acknowledge and retransmission scheme. As packets move through the network, each switch checks the packets for errors, acknowledges receipt and retransmits as necessary. An X.25 PAD is also used at the receiving end*

*to disassemble the X.25 synchronous packets into individual asynchronous user information.*

***X.25 Applications***

*An X.25 network may be used in a variety of environments. For instance, X.25 is well suited in applications where:*

*1.Communications are primarily asynchronous (though frequent synchronous applications are now being used).*

*2.Line quality may not be good (X.25's error correction capabilities overcome poor line quality).*

*3.Data volume is relatively small and bursty.*

*4.A company wants to use packet switching to decrease transmission expenses.*

***Patton Products Enhance X.25 Nets***

*The X.25 network can host a variety of different devices including CPUs, Teller Machines (ATMs), credit verification terminals or other DTEs. This diversity means that sometimes multi-vendor networks need to connect dis-similar DTEs or connect to DTE at ranges greater than the interface will support. Patton has a host of interface converters and short range modems to meet these common needs.*

**7622 Rickenbacker Drive, Gaithersburg, MD 20879 USA**
Phone: +301-975-1000 or Fax: +301-869-9293