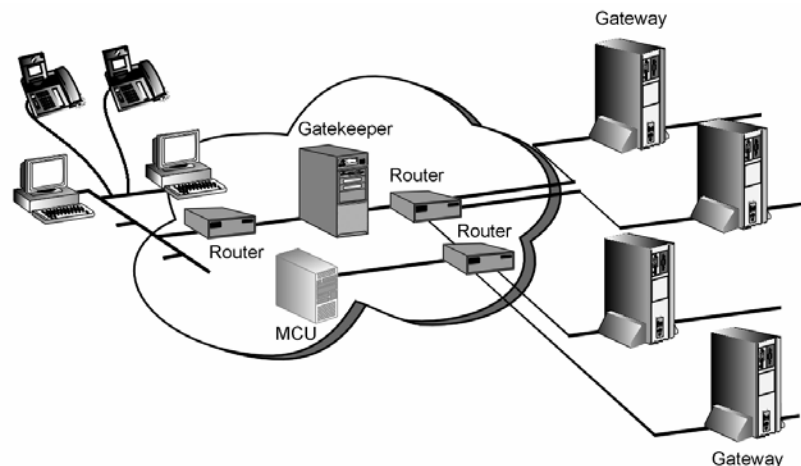


Summary

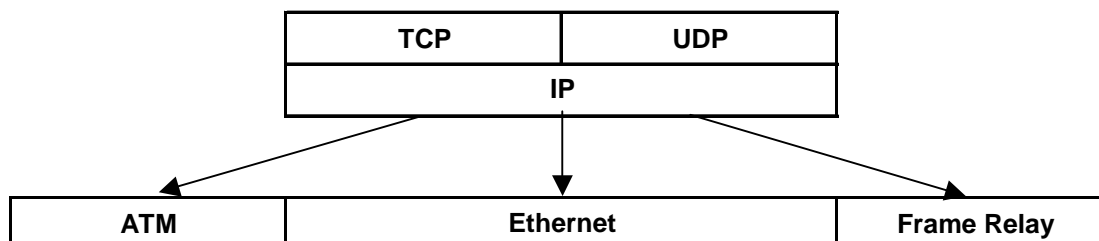
Voice over Internet Protocol (VoIP) is a growing technology, which provides telephone calls over an Ethernet data network. The explanation of the process of sending voice over an Ethernet LAN demonstrates the value of a low Ethernet error rate. The improvement of performance due to higher quality cabling of the network would enhance the quality of VoIP, providing a more complete voice data stream and a clearer voice received.

Discussion

There are several components of a VoIP network, the actual phone or computer that provides VoIP capabilities, the Local Area Network (LAN), the Gateway and the connection to a MAN/WAN or public telephone service. This paper discusses the performance of VoIP within the LAN.



When a person speaks on a VoIP phone, the voice is translated into data and sectioned into blocks of data to be sent. The voice data is put into a UDP packet (User Datagram Protocol) at the transport layer. This UDP is then encapsulated into an IP packet at the network layer.



IP data packets can be sent on many different link layer protocols, including Ethernet, ATM, Frame Relay and even PPP over Sonet. Currently 99% of IP traffic either begins or ends over Ethernet, which provides best effort delivery of packets. TCP/IP retransmits lost packets, however UDP/IP packets are not retransmitted and packets lost at the Ethernet layer are not recovered. For voice data packet traffic using UDP/IP, a low error rate at the Ethernet layer is key to avoiding losses in the voice stream.

The Data Communications Competence Center has performed many evaluations of Ethernet data traffic over UTP cabling. In many of these studies Category 6 UTP has performed better than Category 5e UTP cabling, as seen in ‘*DCCC03040901.EFT Pulse EMI In Comparison of CAT5e to CAT6*’. The better performance is seen by a decreased number of packets dropped or lost. Due to this, a LAN that is connected with higher performing cable would be more efficient for data transfers, delivering clearer voice when using VoIP and providing better video transfers.

Conclusions

Since the voice IP packets of VoIP are transmitted over Ethernet in the same manner as data IP packets, the performance advantages that have been seen in studies using Ethernet data packets would also apply to VoIP. Higher performance VoIP and a clearer delivered voice would be provided by a higher quality cable due to its lower packet error rate.

Table 1: Definitions of Acronyms	
Abbreviation	Description
VoIP	Voice over Internet Protocol
LAN	Local Area Network
MAN	Metropolitan Area Network
WAN	Wide Area Network
UTP	Unshielded Twisted Pair



Data Communications Competence Center

Nexans' Data Communications Competence Center, located at the Berk-Tek Headquarters in New Holland, Pennsylvania, focuses on advanced product design, applications and materials development for networking and data communication cabling solutions. The Advanced Design and Applications team uses state-of-the-art, proprietary testing and modeling tools to translate emerging network requirements into new cabling solutions. The Advanced Materials Development and Advanced Manufacturing Processes teams utilize sophisticated analytical capabilities that facilitate the design of superior materials and processes. The Standardization and Technology group analyzes leading edge and emerging technologies and coordinates data communication standardization efforts to continuously refine Nexans' Technology Roadmap. An international team of experts in the fields of cable, connectors, materials, networking, standards, communications and testing supports the competence center. The competence center laboratories are a part of an extensive global R&D network that includes eight competence centers, four application centers and two research centers dedicated to advanced technologies and materials research.