

Writing Sample

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Certification Training

Characteristics of Telephone Systems

Your understanding of how telephony fits into a converged network is an important concept to grasp when designing networks. The telephony model starts with basic telephone systems concepts. In this topic, you will become familiar with the characteristics of telephone systems.

Understanding the characteristics of telephone systems is the first step toward working with more complex systems within a converged network environment. With this foundation, you will be able to determine the technical characteristics of different telephone systems.

Analog Telephony

Analog telephony occurs as sound waves are generated when you speak and travel through the air as analog signals. When the waves hit your ear, they are converted back into signals that your brain recognizes. The telephone builds on that; when you speak into the telephone it converts your analog voice into electronic signals that get sent over copper wires. The telephone receiving the call then converts the electronic signal back into analog sounds that the recipient's brain recognizes.

IP Telephony

IP telephony, or *Internet Protocol telephony*, is a common phrase used to describe the technologies that use packet-switched connections to carry voice, fax, and other types of data that traditionally were transmitted over the dedicated circuit-switched connections of the PSTN. IP telephone calls are sent as packets of compressed data on shared lines, thereby avoiding the fees of using the PSTN. An IP packet contains a series of bits consisting of control data and user data. The control header feeds the network navigation information for the packet, and the user data accommodates the compressed voice data.

Supporting Fact - IP Telephony Regulations

IP telephone services are relatively unregulated by government. In the United States, the Federal Communications Commission (FCC) regulates telephone-to-telephone calls, but as of yet, they do not intend to place regulations on connections via IP telephony service providers.

Legacy Hybrid

A *legacy hybrid* is a network method which allows companies the ability to extend their investment in older equipment, while presenting a platform for introducing new technologies that meet the needs of the business, ultimately achieving a phased-in converged network that achieves both technical and business goals. A typical legacy hybrid solution may involve simply changing internal or external telephone service to VoIP.

Example:

A large construction company with locations around the world is looking at ways to reduce costs while helping its employees work more efficiently with their international colleagues. When the technology department examined the ways that the employees communicated, they cited that most of the employee interaction was via telephone and email. Tearing down the old network and installing a new one was going to be way too costly all at once, so they decided to utilize some parts of their large PBX system in an effort to save costs.

They chose to incorporate some digital telephones and add a business grade cable service to provide their VoIP lines to integrate with their legacy PBX. This allowed some users to keep their TDM (Time-division Multiplexing) telephones while at the same time allowing computer telephony technologies to emerge, saving the company tolls accrued by long distance calls.

Activity - Discussing the Characteristics of Telephone Systems

Scenario: Experiences with telephony technology will vary from person to person. In this activity, you will break into groups and discuss telephony and network technologies, and then share your findings with the entire group.

1. How is your home computer connected to the Internet? What are the pros and cons of that type of connection?

2. Have you ever used a VoIP-based telephone technology? What type? How was service delivered? Discuss where the data was converted between digital and analog.
3. Predict what might happen to your company network once VoIP is introduced.