Network Trends

1.7.1

Recent Trends

You know a lot about networks now, what they are made of, how they connect us, and what is needed to keep them reliable. But networks, like everything else, continue to change. There are a few trends in networking that you, as a NetAcad student, should know about.

As new technologies and end-user devices come to market, businesses and consumers must continue to adjust to this ever-changing environment. There are several networking trends that affect organizations and consumers:

- Bring Your Own Device (BYOD)
- Online collaboration
- Video communications
- Cloud Computing

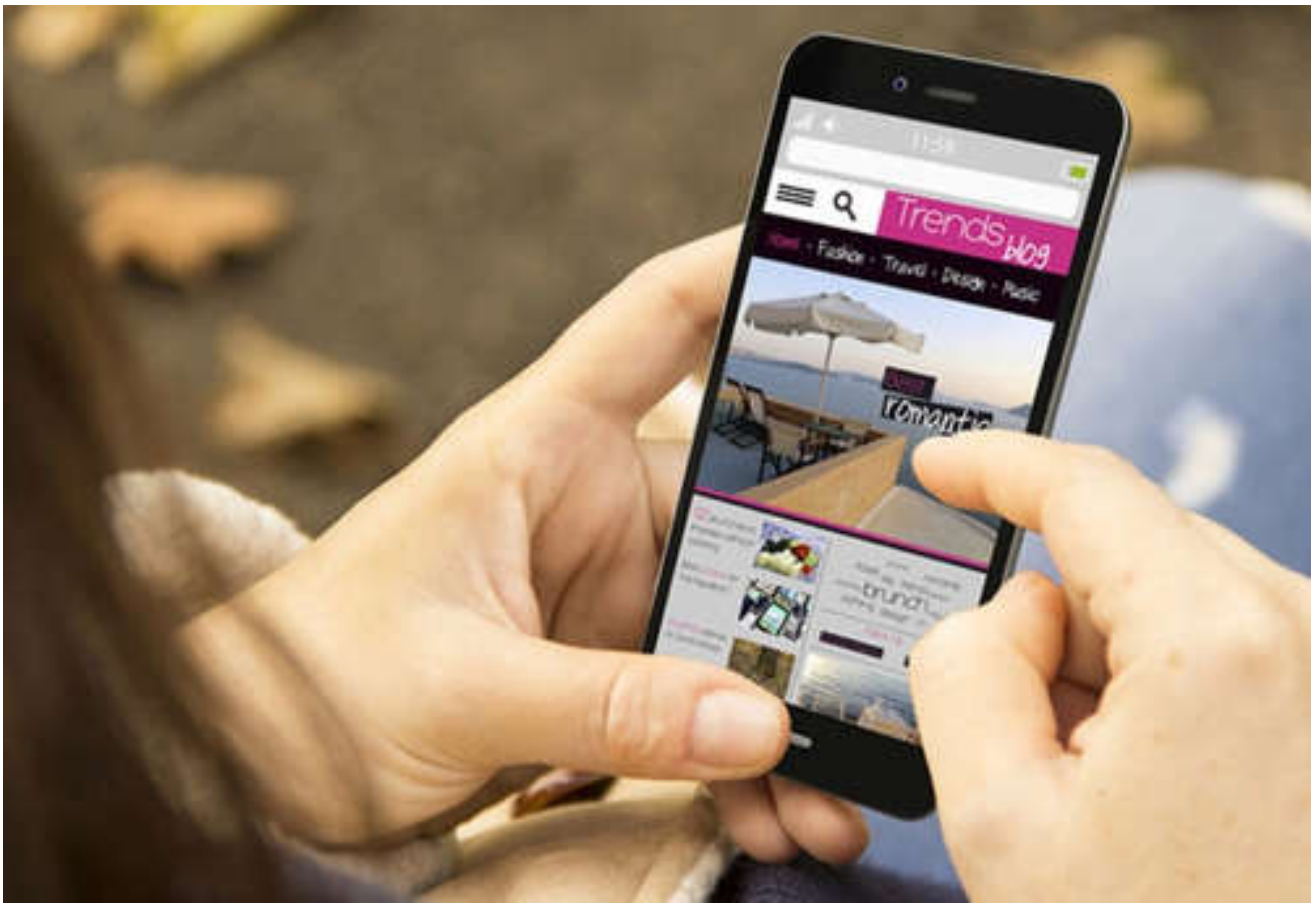
1.7.2

Bring Your Own Device (BYOD)

The concept of any device, for any content, in any manner, is a major global trend that requires significant changes to the way we use devices and safely connect them to networks. This is called Bring Your Own Device (BYOD).

BYOD enables end users the freedom to use personal tools to access information and communicate across a business or campus network. With the growth of consumer devices, and the related drop in cost, employees and students may have advanced computing and networking devices for personal use. These include laptops, notebooks, tablets, smart phones, and e-readers. These may be purchased by the company or school, purchased by the individual, or both.

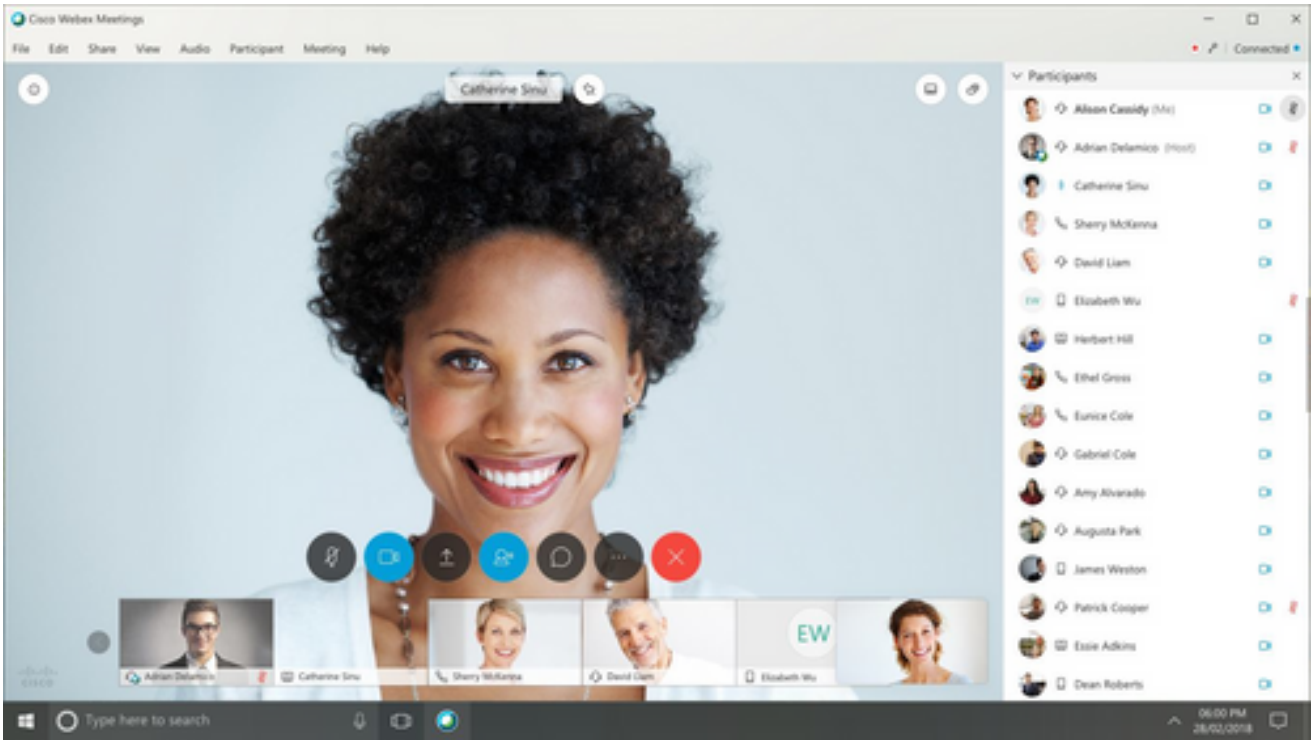
BYOD means any device, with any ownership, used anywhere.



1.7.3

Online Collaboration

Individuals want to connect to the network, not only for access to data applications, but also to collaborate with one another. Collaboration is defined as “the act of working with another or others on a joint project.” Collaboration tools, like Cisco WebEx, shown in the figure, give employees, students, teachers, customers, and partners a way to instantly connect, interact, and achieve their objectives.



Collaboration is a critical and strategic priority that organizations are using to remain competitive. Collaboration is also a priority in education. Students need to collaborate to assist each other in learning, to develop the team skills used in the workforce, and to work together on team-based projects.

Cisco Webex Teams is a multifunctional collaboration tool that lets you send instant messages to one or more people, post images, and post videos and links. Each team 'space' maintains a history of everything that is posted there.

1.7.4

Video Communications

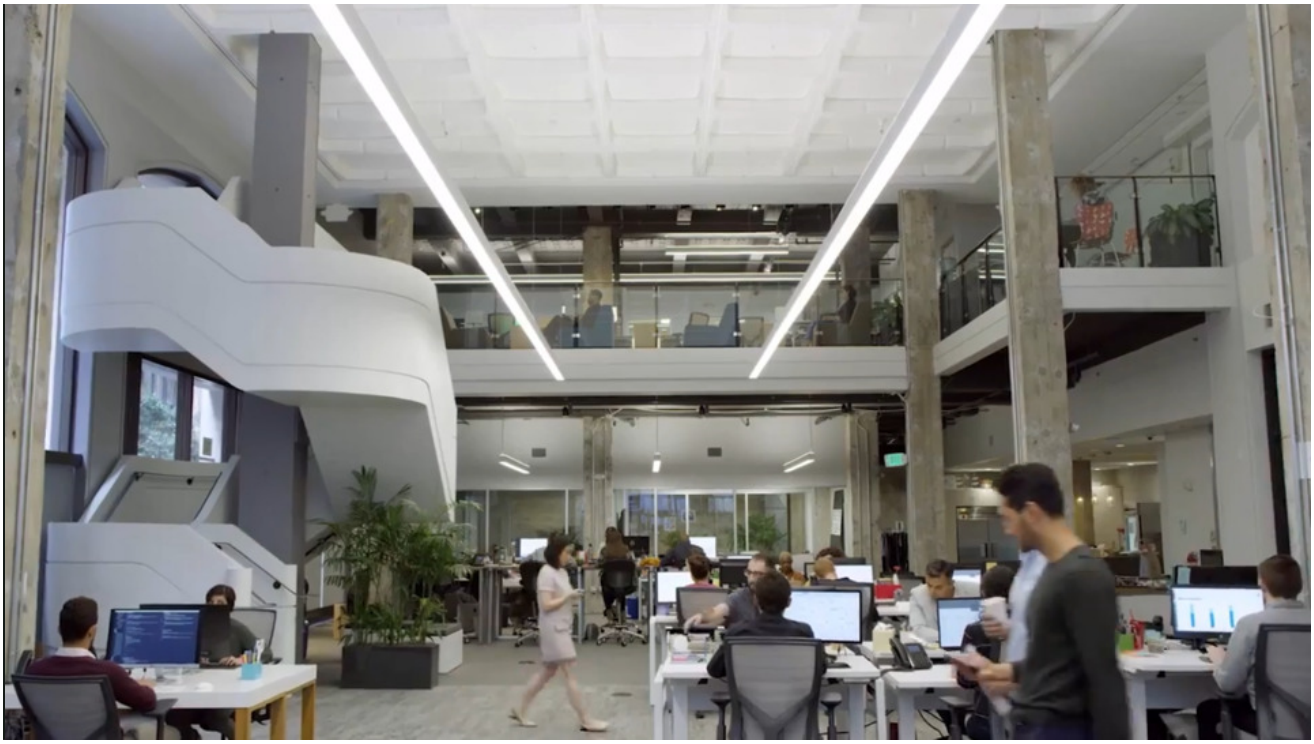
Another facet of networking that is critical to the communication and collaboration effort is video. Video is used for communications, collaboration, and entertainment. Video calls are made to and from anyone with an internet connection, regardless of where they are located.

Video conferencing is a powerful tool for communicating with others, both locally and globally. Video is becoming a critical requirement for effective collaboration as organizations extend across geographic and cultural boundaries.

1.7.5

Video - Cisco Webex for Huddles

Click Play in the figure to view how Cisco Webex is incorporated into everyday life and business.



1.7.6

Cloud Computing

Cloud computing is one of the ways that we access and store data. Cloud computing allows us to store personal files, even backup an entire drive on servers over the internet. Applications such as word processing and photo editing can be accessed using the cloud.

For businesses, Cloud computing extends the capabilities of IT without requiring investment in new infrastructure, training new personnel, or licensing new software. These services are available on-demand and delivered economically to any device that is anywhere in the world without compromising security or function.

Cloud computing is possible because of data centers. Data centers are facilities used to house computer systems and associated components. A data center can occupy one room of a building, one or more floors, or an entire warehouse-sized building. Data centers are typically very expensive to build and maintain. For this reason, only large organizations use privately built data centers to house their data and provide services to users. Smaller organizations that cannot afford to maintain their own private data center can reduce the overall cost of ownership by leasing server and storage services from a larger data center organization in the cloud.

For security, reliability, and fault tolerance, cloud providers often store data in distributed data centers. Instead of storing all the data of a person or an organization in one data center, it is stored in multiple data centers in different locations.

There are four primary types of clouds: Public clouds, Private clouds, Hybrid clouds, and Community clouds, as shown in the table.

Cloud Types

Cloud Type	Description
Public clouds	Cloud-based applications and services offered in a public cloud are made available to the general population. Services may be free or are offered on a pay-per-use model, such as paying for online storage. The public cloud uses the internet to provide services.
Private clouds	Cloud-based applications and services offered in a private cloud are intended for a specific organization or entity, such as a government. A private cloud can be set up using the organization's private network, though this can be expensive to build and maintain. A private cloud can also be managed by an outside organization with strict access security.
Hybrid clouds	A hybrid cloud is made up of two or more clouds (example: part private, part public), where each part remains a distinct object, but both are connected using a single architecture. Individuals on a hybrid cloud would be able to have degrees of access to various services based on user access rights.
Community clouds	A community cloud is created for exclusive use by specific entities or organizations. The differences between public clouds and community clouds are the functional needs that have been customized for the community. For example, healthcare organizations must remain compliant with policies and laws (e.g., HIPAA) that require special authentication and confidentiality. Community clouds are used by multiple organizations that have similar needs and concerns. Community clouds are similar to a public cloud environment, but with set levels of security, privacy, and even regulatory compliance of a private cloud.

1.7.7

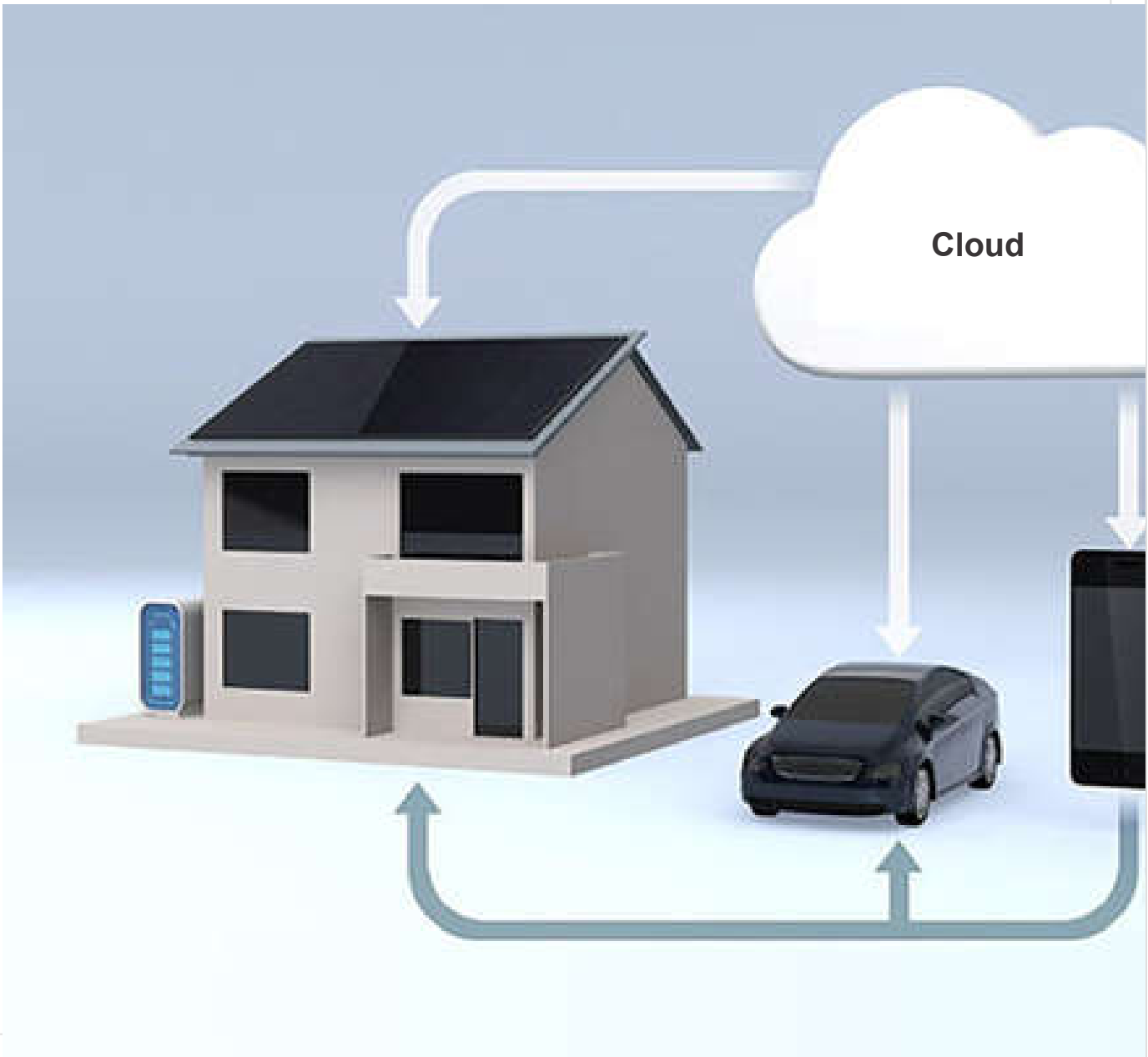
Technology Trends in the Home

Networking trends are not only affecting the way we communicate at work and at school, but also changing many aspects of the home. The newest home trends include 'smart home technology'.

Smart home technology integrates into every-day appliances, which can then connect with other devices to make the appliances more 'smart' or automated. For example, you could prepare food and place it in the oven for cooking prior to leaving the house for the day. You program your smart oven for the food you want it to cook. It would also be connected to your 'calendar of events' so that it could determine what time you should be available to eat and adjust start times and length of cooking accordingly. It could even adjust cooking times and temperatures based on changes in schedule. Additionally, a smart phone or tablet connection lets you connect to the oven directly, to make any

desired adjustments. When the food is ready, the oven sends an alert message to you (or someone you specify) that the food is done and warming.

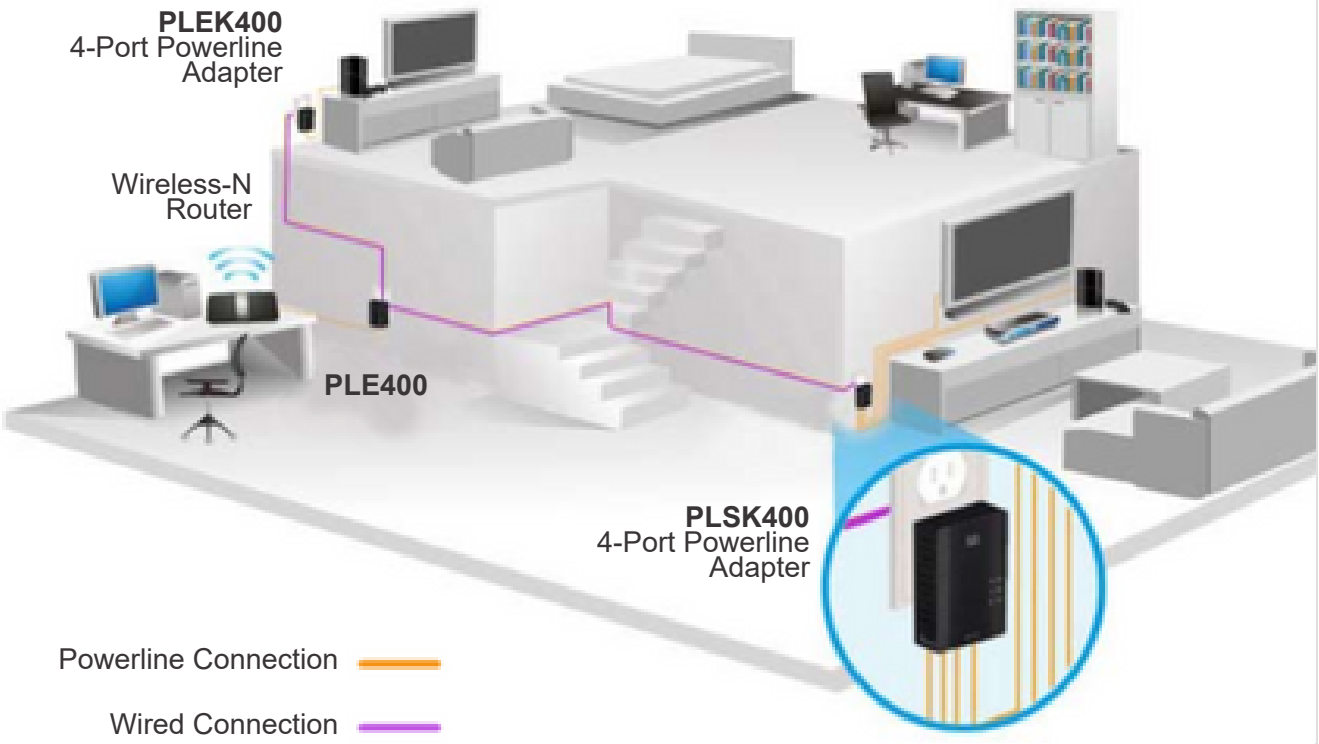
Smart home technology is currently being developed for all rooms within a house. Smart home technology will become more common as home networking and high-speed internet technology expands.



1.7.8

Powerline Networking

Powerline networking for home networks uses existing electrical wiring to connect devices, as shown in the figure.



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same wiring that delivers electricity, powerline networking sends information by sending data on certain frequencies.

Powerline networking is especially useful when wireless access points cannot reach all the devices in the home. Powerline networking is not a substitute for dedicated cabling in data networks. However, it is an alternative when data network cables or wireless communications are not possible or effective.

1.7.9

Wireless Broadband

In many areas where cable and DSL are not available, wireless may be used to connect to the internet.

Wireless Internet Service Provider

A Wireless Internet Service Provider (WISP) is an ISP that connects subscribers to a designated access point or hot spot using similar wireless technologies found in home wireless local area networks (WLANs). WISPs are more commonly found in rural environments where DSL or cable services are not available.

Although a separate transmission tower may be installed for the antenna, typically the antenna is attached to an existing elevated structure, such as a water tower or a radio tower. A small dish or antenna is installed on the subscriber's roof in range of the WISP transmitter. The subscriber's access unit is connected to the wired network inside the home. From the perspective of the home user, the setup is not much different than DSL or cable service. The main difference is that the connection from the home to the ISP is wireless instead of a physical cable.

Wireless Broadband Service

Another wireless solution for the home and small businesses is wireless broadband, as shown in the figure.

This solution uses the same cellular technology as a smart phone. An antenna is installed outside the house providing either wireless or wired connectivity for devices in the home. In many areas, home wireless broadband is competing directly with DSL and cable services.

1.7.10

Check Your Understanding - Network Trends

Check your understanding of network trends by choosing the BEST answer to the following questions.

1. Which feature is a good conferencing tool to use with others who are located elsewhere in your city, or even in another country?

   ◯ BYOD

- Video communications
- Cloud computing

2. Which feature describes using personal tools to access information and communicate across a business or campus network?

- BYOD
- Video communications
- Cloud computing

3. Which feature contains options such as Public, Private, Custom and Hybrid?

- BYOD
- Video communications
- Cloud computing

4. Which feature is being used when connecting a device to the network using an electrical outlet?

- Smart home technology
- Powerline
- Wireless broadband

5. Which feature uses the same cellular technology as a smartphone?

- Smart home technology
- Powerline
- Wireless broadband

Check Show Me

Reset

1.6 Reliable Networks

1.8 Network Security