Slide 1

Data System Terminology

The emphasis in digital communications up to this point has been directed toward the sampling of analog data and the representation in terms of digital formats. There is still another broad area of digital communications in which the individual words represent *alpha-numeric* characters. This includes data transmission between two computers, between a computer and a terminal, and most of the internet communications. This general area is referred to as *data communications*.

Slide 2

Synchronous versus Asynchronous Transmission

- *Synchronous transmission* is achieved by means of a master clock or timed reference.
- *Asynchronous transmission* (also called *start-stop transmission*) is achieved by having the beginning of each digital word initiate short-term synchronization at the receiver.

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Slide 3

Parallel versus Serial Transmission

- In *parallel transmission*, each of the symbols constituting a character has a separate path, and all symbols are sent simultaneously.
- In *serial transmission*, only one channel is used and the various symbols are transmitted in sequence.
- In general, parallel transmission is faster, but it requires more channels.

3

Slide 4

Text versus Binary Data

- Transmission of alphanumeric data is referred to as *text data*.
- Digitized audio and video data are referred to as *binary data*.

4

Slide 5

Simplex or Duplex

- A *simplex* connection is one in which transmission is always in a fixed direction.
- A *half-duplex* connection is one which transmission can take place in either direction, but not simultaneously.
- A *full-duplex* connection is one in which transmission can take place in both directions simultaneously.

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Slide 6

UART versus USART

- The term *UART* stands for *universal asynchronous receiver-transmitter*. It is a circuit that can convert parallel data to serial data for transmission over a single line at the sending end and can convert the serial data back to parallel data at the receiving end.
- The term *USART* stands for *universal synchronous/asynchronous receiver-transmitter*. It performs the same function as the UART, but it also works with synchronous data.

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Slide 7

Summary

- The term *data communications* refers to the process of transmitting alpha-numeric characters encoded in digital form.
- The area of data communications is a rapidly growing area and is at the heart of internet transmission.
- Various definitions are used to describe the different types of data communications.