

# Increasing Efficiency of Datacomm

- Front-End Processors
- Port-Sharing Devices
- Line Splitters & Remote Intelligent Controllers
- Multiplexers
- Data Compression
- Inverse Muxes
- Multidrop

DC 5 - 2



# Port-Sharing Devices AKA concentrator Allows DTEs to share ports sequentially Can therefore support more terminals









- Time-Division Muxes
- Character and Bit Interleaving
- Statistical Time Division Muxes
- Frequency Division Muxes

#### **Multiplexers**

Time-Division Multiplexing (TDM)

- Share larger bandwidth among slower devices
  - E.g., 4 terminals running at 2400 bps can MUX the *branch ports* through a single 9600 bps *trunk line*
- Pure TDM has sum of DTE bps = trunk bps
- Wastes bandwidth because very rare to have all terminals active at same time

DC 5 - 8

#### **Multiplexers**

**Character and Bit Interleaving** 

- How are branch data streams sent through trunk?
- Character interleaving
  - one character per branch port sent through trunk
  - always same order
  - if nothing to send, waste the slot

Bit interleaving

similar idea but breaks data into bits

DC 5 - 9

DC 5 - 7

## Multiplexers

Statistical Time Division Muxes

- Usually known as stat muxes
- Does not use fixed time slots
- Send data + address to indicate which channel's data are being sent
- Calculates how much time to reserve as function of previous activity per channel
- Can buffer I/O
- Effectively link many terminals at high speed even though they cannot all simultaneously exchange data with host

DC 5 - 10

# **Multiplexers**

Frequency Division Multiplexing

- Many different frequency carriers simultaneously
- Each frequency carries a specific channel
- Cost of FDM rises as number of channels in trunk
- Variation is Statistical Frequency Division Multiplexing (SFDM) which requires expensive equipment

DC 5 - 11

#### **Data Compression**

- Data compression is adjunct to multiplexing
- Many proprietary methods for reducing number of bits sent through trunk
- Thus more information sent at higher speed without having to pay for more lines or faster trunk

DC 5 - 12



### Multidrop

- Every message addressed to specific DTE
- If terminals close together can simplify cabling
- Can even be routed through phone lines
- Is a very simple form of Local Area Network



#### Homework

- Read Chapter 5 of your textbook in detail, adding to your workbook notes as appropriate.
- Review and be prepared to define or expand all the terms listed at the end of Chapter 5 of your textbook (no hand-in required)
- Answer all the exercises on pages 110 of the textbook using a computer word-processing program or absolutely legible handwriting (hand in after quiz tomorrow morning)
- Scan Chapters 6, 7 & 8 in preparation for tomorrow's class

DC 5 - 15