Networking Embedded Systems

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LAN System Block Diagram (Rev 1)

• Why do this stuff?
• Types of Networking
• Types of Protocols
• Issues with Networking
ISO Network Layers

- **Layer 1**: Physical Layer: specifies the network hardware like the RS-232, modulation scheme, etc.
- **Layer 2**: Data Link Layer: how to organize data into frames and perform reliable transmission between adjacent nodes
- **Layer 3**: Network Layer: addressing and routing specifications

ISO Network Layers

- **Layer 4**: Transport Layer: reliable end-to-end transfer
- **Layer 5**: Session Layer: remote login, security features such as authentication, etc
- **Layer 6**: Presentation Layer: how to present the data to the user
- **Layer 7**: Application Layer: ftp, etc.

Why Do This Stuff?

- Exchange of Information
- Updates to Software
- New Features
- Remote Control of Devices
- Distributed Systems
Types of Networking

• Serial Ports
  – Emware
    • System uses serial ports to server then to network
• Ethernet
  – Standard hardware cheap, available

More Ways to Network

• Wireless
  – 802.11 (11Mbs)
  – Bluetooth
  – Direct Radio
• Others
  – X10 type
  – CEBus
  – etc.

Types of Protocols

• TCP/IP
• UDP
• Bluetooth Protocols
  – L2CAP
  – SDP
  – RFCOMM
  – GAP - Generic Access Protocols
  – SPP - Serial Port
  – Service Discovery Profile(SDP)
How to Choose A Protocol

- What do you need to do?
- Web?
- JAVA?
- Large Amounts of Data?
- Remote Access?
- Latency Requirements?

Rules of Thumb

- Don't write anything you don't have to. Buy instead of build
- Protocols are complex, use proven solutions
- Don't invent new protocols unless you NEED them

Networking Applications

- Data gathering
- Control
- Updates for Software
- Mobile Agents
- Coordination of Systems
Issues with Networking

- Security
- Reliability
- Security!!! (next week)

Homework Assignment

CS465

Turkey Day is coming!

None today!

Happy Thanksgiving!