End-to-End Argument in System Design

- Paper type: classic
- Concerns with the design of the communication systems
- Argues that low-level functionality should be chosen carefully

File Transfer Example

- Scenario
- How to deal with unreliability
- Two different approaches
- Example

Comparison of Hop-by-Hop and End-to-End Approaches

- Functionality aspects
- Performance aspects
- Why the hop-by-hop approaches might be bad

Example 2: Delivery Guarantee

- Should the communication system provides acks for messages

Example 3: Secure Transmission

- Application encryption versus communication subsystem encryption

Example 4: Duplicate Message Suppression

- Who should discard duplicate messages

Example 5: FIFO Delivery

- What is the value of the communication system providing FIFO delivery?

Example: the SWALLOW System

Identifying the End-Points

- different end points under different circumstances

Application of the Argument in Other Areas

- Datagram, virtual circuits and connectionless protocols
- Tape-reliability problems for file systems
- RISC
- Operating system contexts
  - "open" operating system
- Layered system design

Arguing against End-to-End Argument?

- Should we always follow this in system design?