Network Layer

Services

- End-to-end transmission
- Services should be independent of the subnet technology
- Uniform numbering plan==> addressing
- Routing
- Connectionless
  - Datagram
- Connection Oriented
  - Virtual circuit

Network Layer

Services

- Connectionless
  - Put the intelligence at the edges of the network
  - Edges do not believe the network is 'reliable'
  - Like the post office

Network Layer

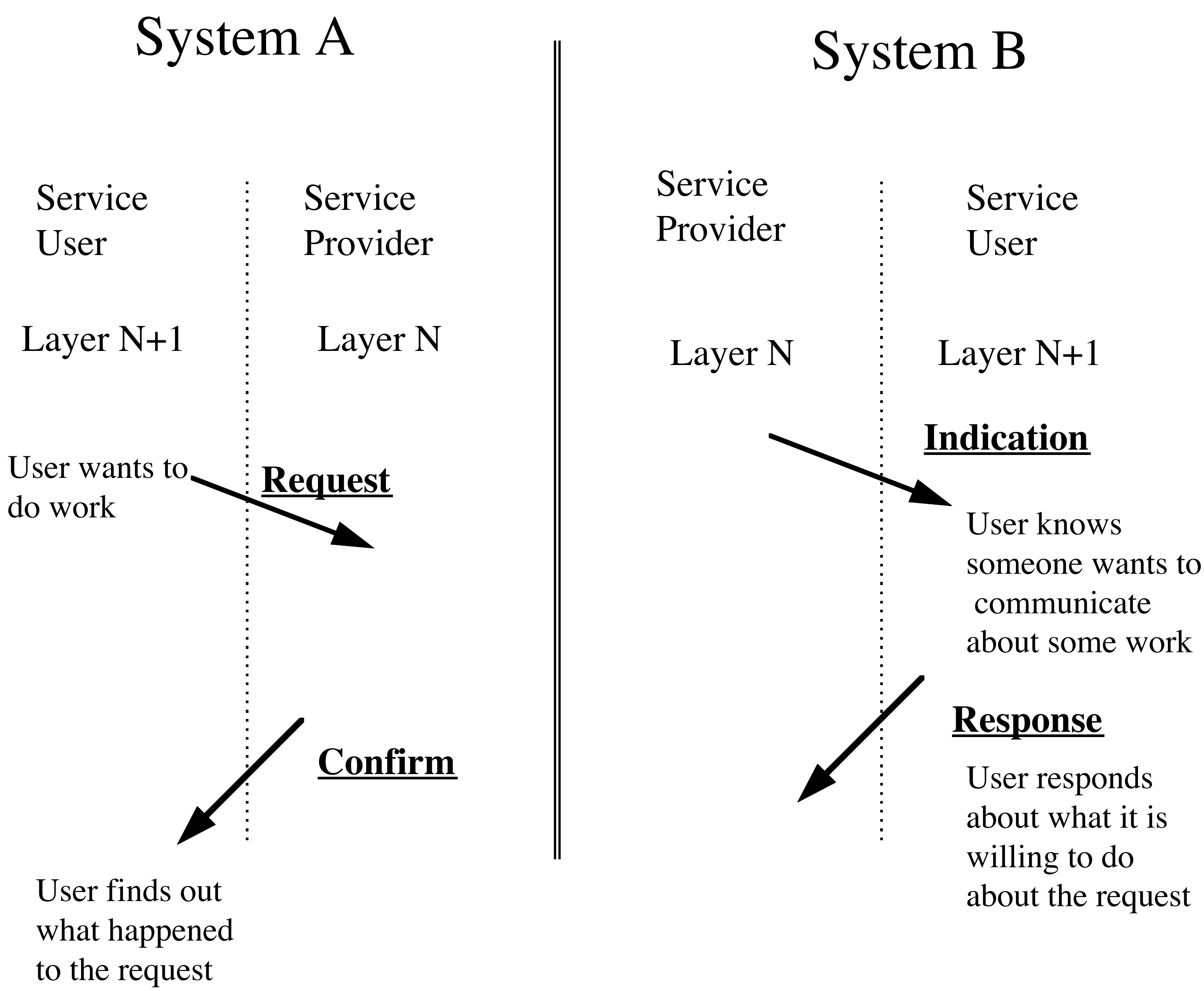
Services

- Connection Oriented
  - Put the intelligence in the network
  - Network ‘adds’ value by providing a reliable connection-oriented service
  - Functions
    - Call set-up
    - Negotiates services
    - No errors
    - Flow control
  - Like the telephone system
  - The network has the intelligence and the users are charged for its use

Network Layer

General Services

- Service primitives



Network Layer

Service Primitives

- Primitives have:
  - Type
    - CONNECT.request
  - Parameters
    - What hosts, rates, etc.
- Confirm/Response not always used

Network Layer

Service Primitives

- Example: Connection-Oriented Services
  - CONNECT.req->want connection (off-hook)
  - CONNECT.ind-> signal called connection (ring)
  - CONNECT.resp-> accept/reject call (hang-up)
  - CONNECT.conf-> caller told called will accept
  - DATA.req -> send data (talk)
  - DATA.ind -> data received
  - DISCONNECT.req-> release (hang-up)
  - DISCONNECT.ind-> caller hears hang-up

Network Layer

OSI Network Service Primitives

- N-Connect.request => call set up
  - callee -> address of called party
  - caller -> address of calling party
  - ack_wanted -> true/false
  - exp_wanted -> priority
  - QoS -> quality of service
    - What the caller wnts
    - Minimum acceptable
  - User_data

Network Layer

OSI Network Service Primitives

- N-Connect.indication
- N-Connect.response
- N-Connect.confirm
- N-DISCONNECT.request
- N-DISCONNECT.indication
  - Includes reason for disconnect
- N-DATA.request
  - Sends data
- N-DATA.indication

Network Layer

OSI Network Service Primitives

- N-RESET primitives are used to report problems
  - Transport layer to resolve the problems
- N-Unit.data -> primitives for connectionless services
  - No flow control
  - No error control
- N-facility
  - Used to check on average delivery characterstics
- N-report
  - Used to report problems back to network