Consumer-Producer API for Named Data Networking

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**Socket API**

- bind() & listen() - establish packet demultiplexing
- connect() & accept() - set up a reliable stream (TCP)
- send() - segmentation, retransmission and flow/congestion control
- read() - packet ordering and reassembly
  + UDP and RAW socket API calls

**NDN API**

- Retrieval of single- and multi-segment content
- Reliable and unreliable transmission
- Setting up a demux point
- Packaging of content in Data packets: segmentation, etc.
- Plugging in user-defined security and verification actions
- Monitoring events related to transmission of data

**Consumer context**

associates a name prefix with consumer-specific data fetch parameters controlling Interest transmission and Data packet processing.

**Producer context**

associates a name prefix with producer-specific data transfer parameters controlling Interests demultiplexing and Data packet production.

**File sharing**

1. Pseudocode 1: Sharing a file
   - `h <- producer("broadcastpp@filesync")`
   - `setcontext(h, packet_size, 1024)`
   - `send(file)`
   - `function PROCESSINTEREST(name):`
   - `return True`
   - `end`
   - `end`

2. Pseudocode 2: Downloading a file
   - `h <- consumer("broadcastpp@filesync", RELIABLE, SEQUENCE)`
   - `setcontext(h, receive_buffer_size, 2098)`
   - `setcontext(h, content_callback, ProcessContent)`
   - `consumer(h, "files\177report.pdf")`
   - `function PROCESSCONTENT(buf): context`
   - `return True`
   - `end`
   - `end`

**Video streaming**

1. Pseudocode 3: Producing video
   - `h <- producer("video@ucla/stream")`
   - `setcontext(h, packet_size, 8KB)`
   - `setcontext(h, send_buffer_size, 100MB)`
   - `send(data)`
   - `function PROCESSINTEREST(name):`
   - `return True`
   - `end`

2. Pseudocode 4: Consuming video
   - `h <- consumer("video@ucla/stream", UNRELIABLE, SEQUENCE)`
   - `setcontext(h, receive_buffer_size, MB)`
   - `setcontext(h, content_callback, ProcessContent)`
   - `consumer(h, "video\177stream.data")`
   - `function PROCESSCONTENT(buf): context`
   - `return True`
   - `end`

**Lighting control**

1. Pseudocode 5: NDN protocol for lighting panel
   - `h <- producer("lighting@rgb/White")`
   - `setcontext(h, packet_size, 2KB)`
   - `setcontext(h, content_callback, ProcessContent)`
   - `consumer(h, "color\177led\177rgb/White")`
   - `function PROCESSCONTENT(buf): context`
   - `return True`
   - `end`

2. Pseudocode 6: NDN protocol for lighting panel (continued)
   - `function VERIFYINTEREST(name):`
   - `return True`
   - `end`

**Additional Notes**

- Interest name: client
- Interest version: v1
- Interest lifetime: 0
- Interest security: 0
- Interest prefix: prefix
- Interest content: content