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Consumer-Producer API for Named Data Networking

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How do we develop NDN apps?

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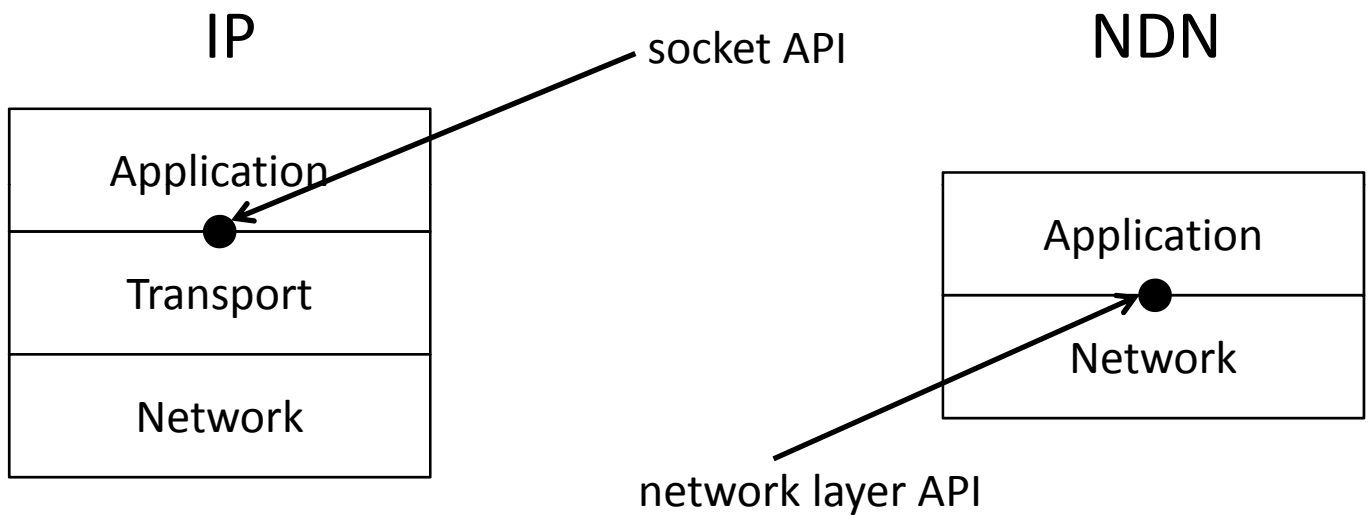
Libraries: NDN-cxx, NDN-cpp

Figure 1. Interest / Data API ☺

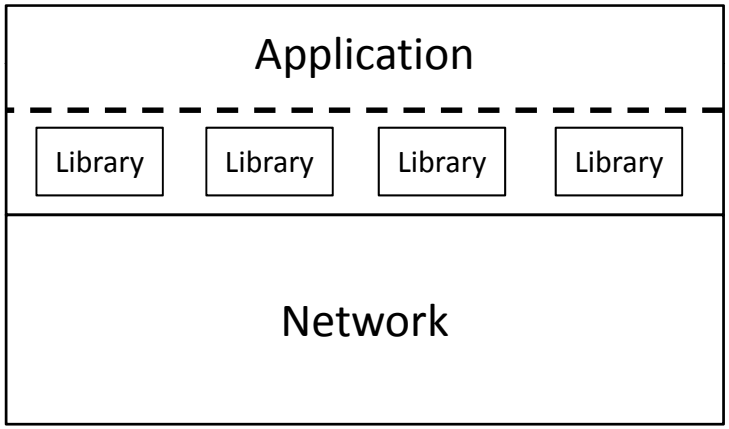
Can we have more effective API ?



Socket API offers:

- Point-to-point channel
- Reliable transmission
- Flow / congestion control
- Segmentation
- Ordering and reassembly

Closer look at NDN



Challenges

Integration of libraries requires near-expert knowledge of NDN

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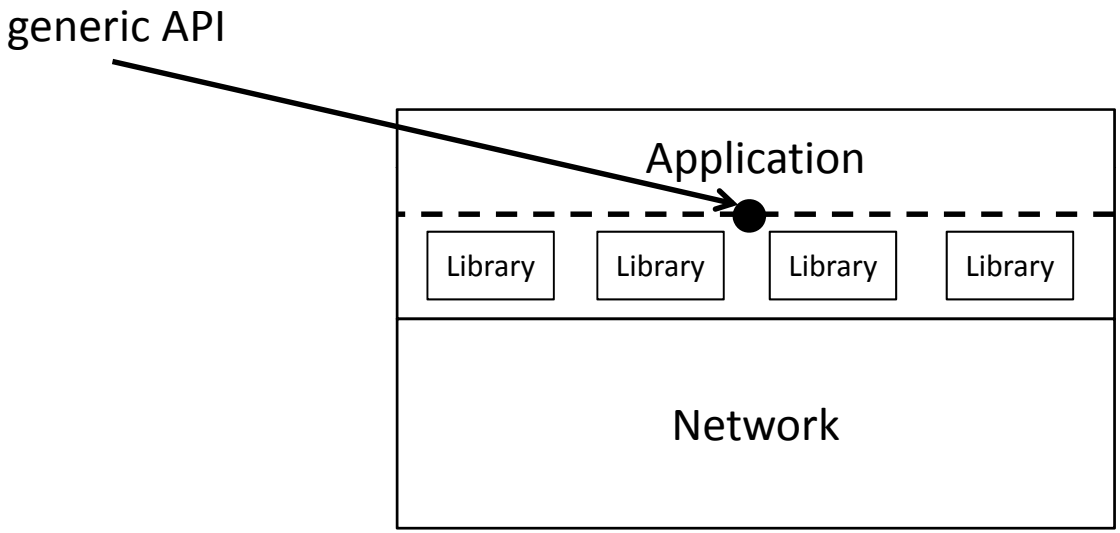
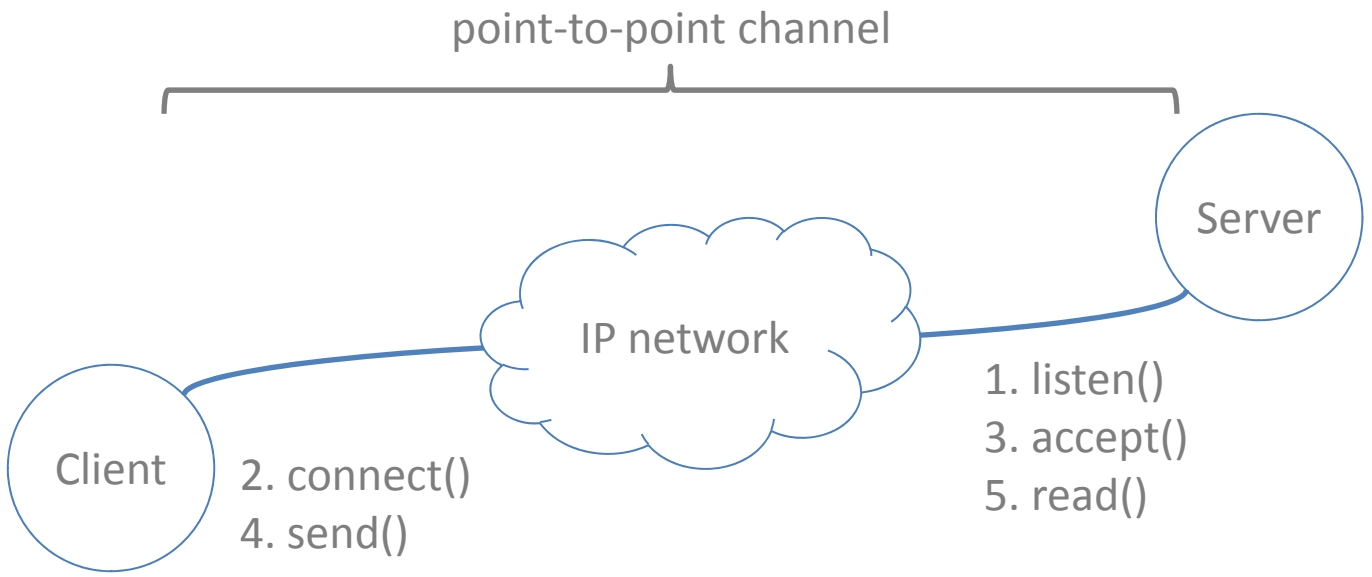
Is it possible?



To assist non-expert application developers fully exploiting NDN capabilities without a deep understanding of its network layer machinery.

Point-to-point model (IP)



Data transfer parameters are the property of the communication channel

Socket abstraction

Keeps the state of communication channel

- **Protocol machinery** in use
- **state**: listen/connect, read/write
- send and receive **buffers**
- send and receive **timers**
- TCP maximum **segment size**
- ….

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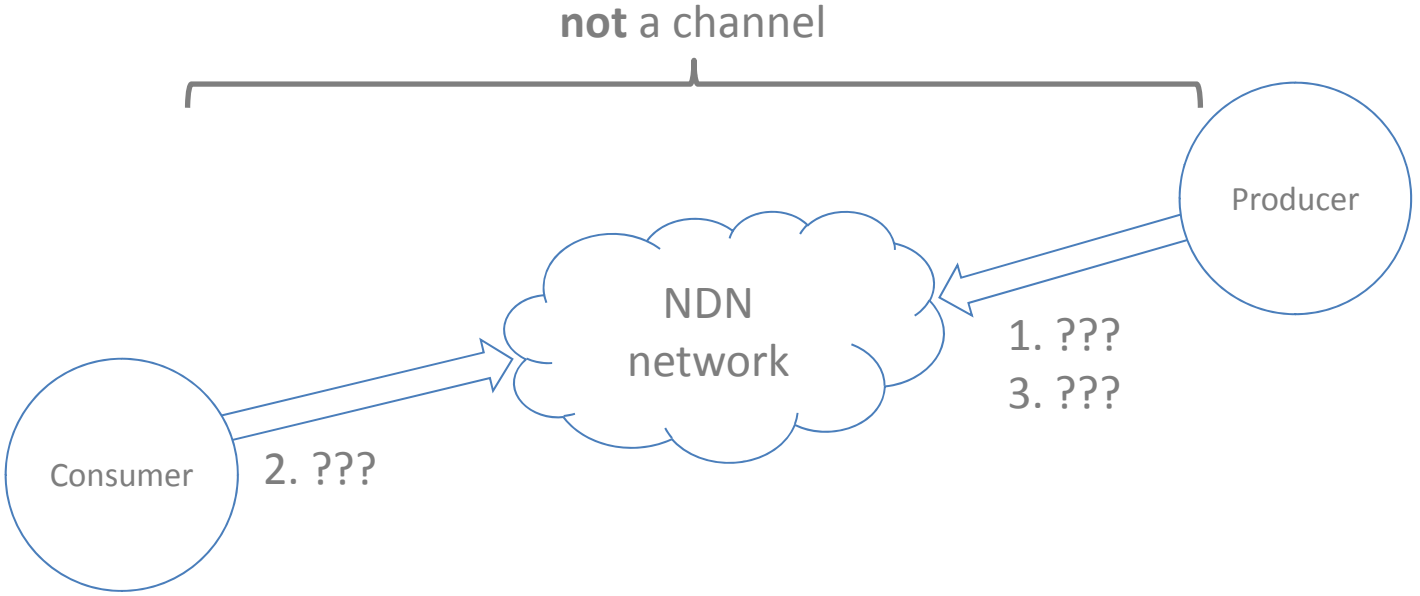
Distribution model (NDN)



What are the parameters (state) of information distribution?
What are the API calls ?

Consumer-specific parameters

1. Selectors
2. Security
   - Data verification
   - Securing Interests
3. Fetching
   - Reliable transmission
   - Sequencing
4. Processing
   - Send / receive buffers
   - Reassembly

Producer-specific parameters

1. Security
   - Securing Data
   - Interest verification
2. Demultiplexing
   - Namespace (prefix) registration
3. Processing
   - Content segmentation
   - Send / receive buffers
4. Caching

New programming abstractions

1. Consumer context
2. Producer context

Context — keeps the state of data transfer under a specific name prefix

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Consumer context

- Associates NDN name prefix with consumer-specific data transfer parameters
- Controls how Interests are expressed and how returning Data packets are processed

Initialization	**consumer** (name prefix, type, sequencing) ➔ handle
Primitives	**consume** (handle, name suffix) **stop** (handle) **close** (handle) **setcontextopt** (handle, option name, value) **getcontextopt** (handle, option name)

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Producer context

- Associates NDN name prefix with producer-specific data transfer parameters
- Controls how data is produced and secured, and how Interests are demultiplexed.

Initialization	**producer** (name prefix) ➔ handle
Primitives	**produce** (handle, name suffix, content) **setup** (handle) **close** (handle) **setcontextopt** (handle, option name, value) **getcontextopt** (handle, option name)

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Summary

Consumer and producer contexts

- Offer a richer set of functions than sockets
- are tailored for NDN distribution model
- include communication protocols for faster app development
- will include versioning protocols

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Thank you!

See the poster to get more info!