ACM ICN 2020 Tutorial:

Practical NDN Application Development and Seamless Deployment

On Enabling An Auto-Configured NFD at Edge

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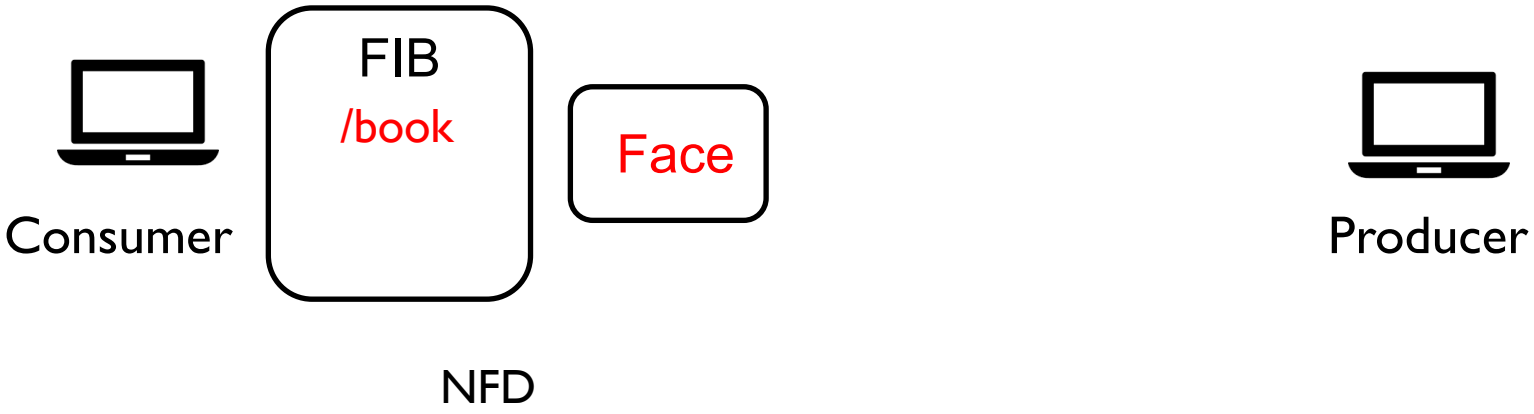
NFD Configuration

- Manual Configuration
  - Security: who is trusted to add route
  - Face: set up connectivity **nfdc face create remote ether://[08:00:27:01:01:01] local dev://eth2**
  - Route **nfdc route add /book ether://[08:00:27:01:01:01**

Make it auto-configured!

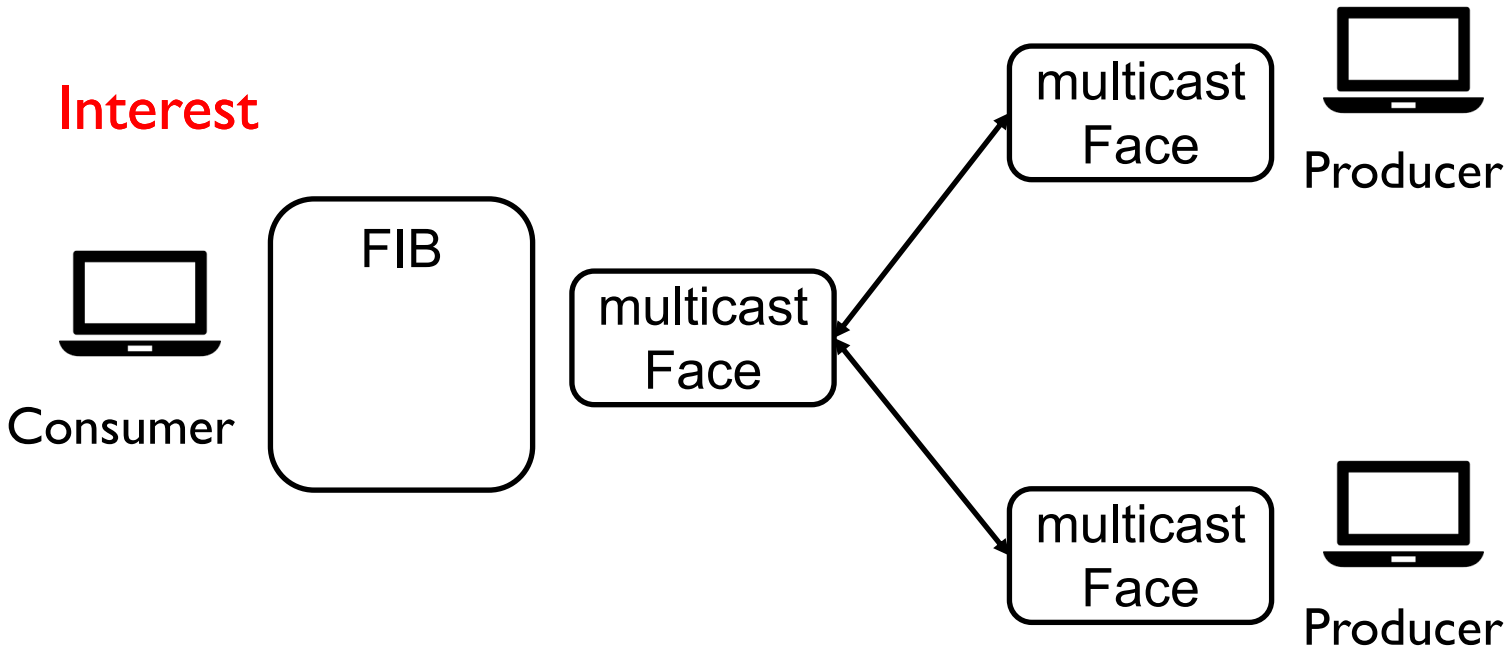


NFD Auto-Configuration

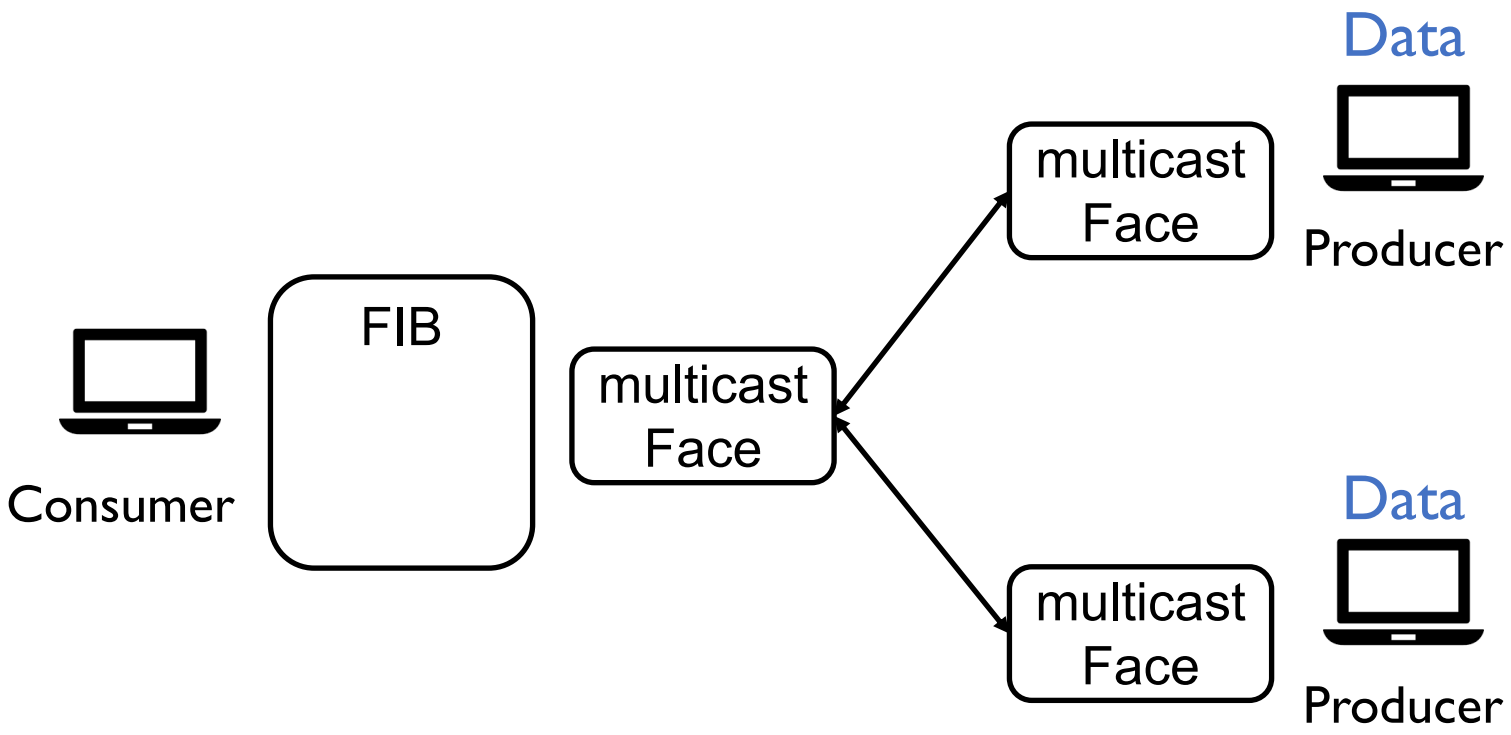
- Use Self-learning
  - How to discover data without routes?
    - Broadcast Interest to all potential Faces
  - How to set up Face?
    - Use multicast Face first, and learn unicast Face on Data reception
  - How to avoid broadcast overhead?
    - Set up routes towards specific Face on Data reception

[1] Shi, Junxiao, Eric Newberry, and Beichuan Zhang. "On broadcast-based self-learning in named data networking." *2017 IFIP Networking Conference (IFIP Networking) and Workshops*. IEEE, 2017.
[2] Liang, Teng, et al. "Enabling Named Data Networking Forwarder to Work Out-of-the-Box at Edge Networks." 2020 IEEE International Conference on Communications Workshops (ICC Workshops). IEEE, 2020.

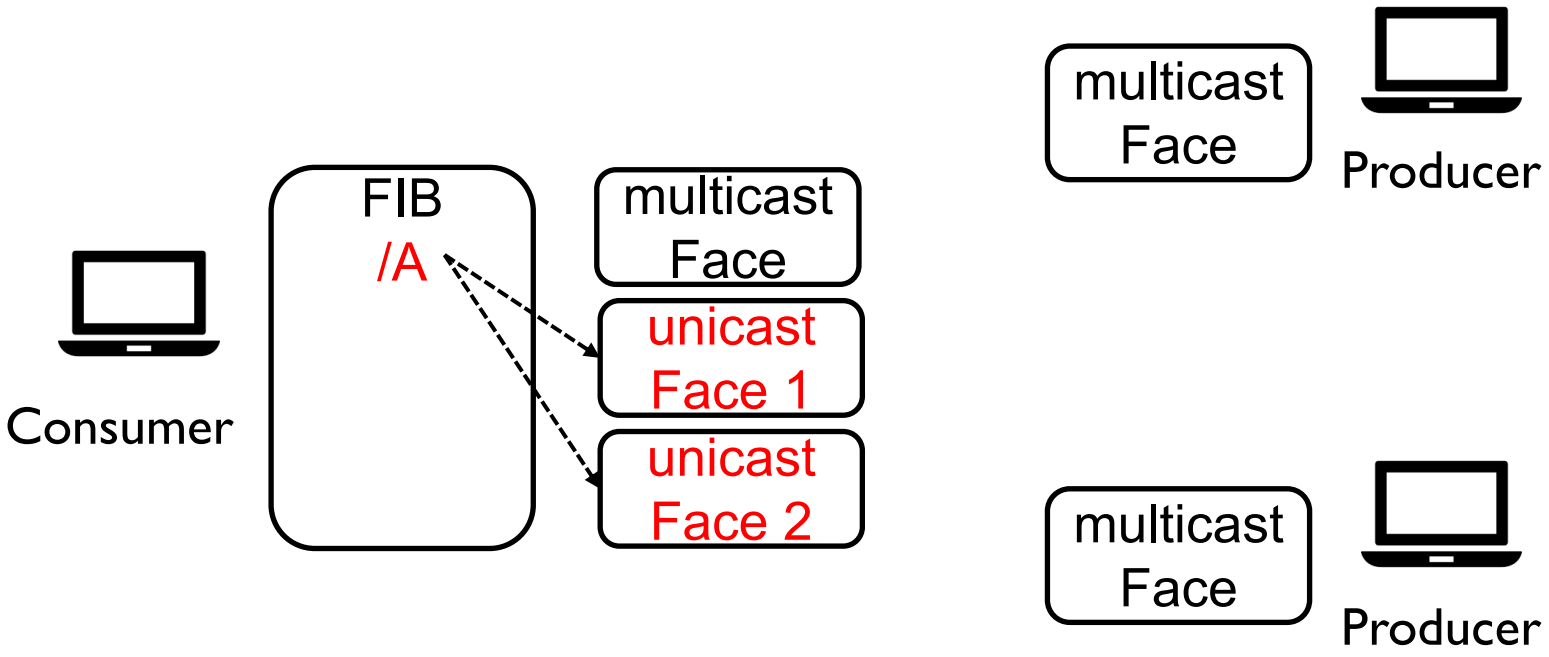
Interest Broadcasting



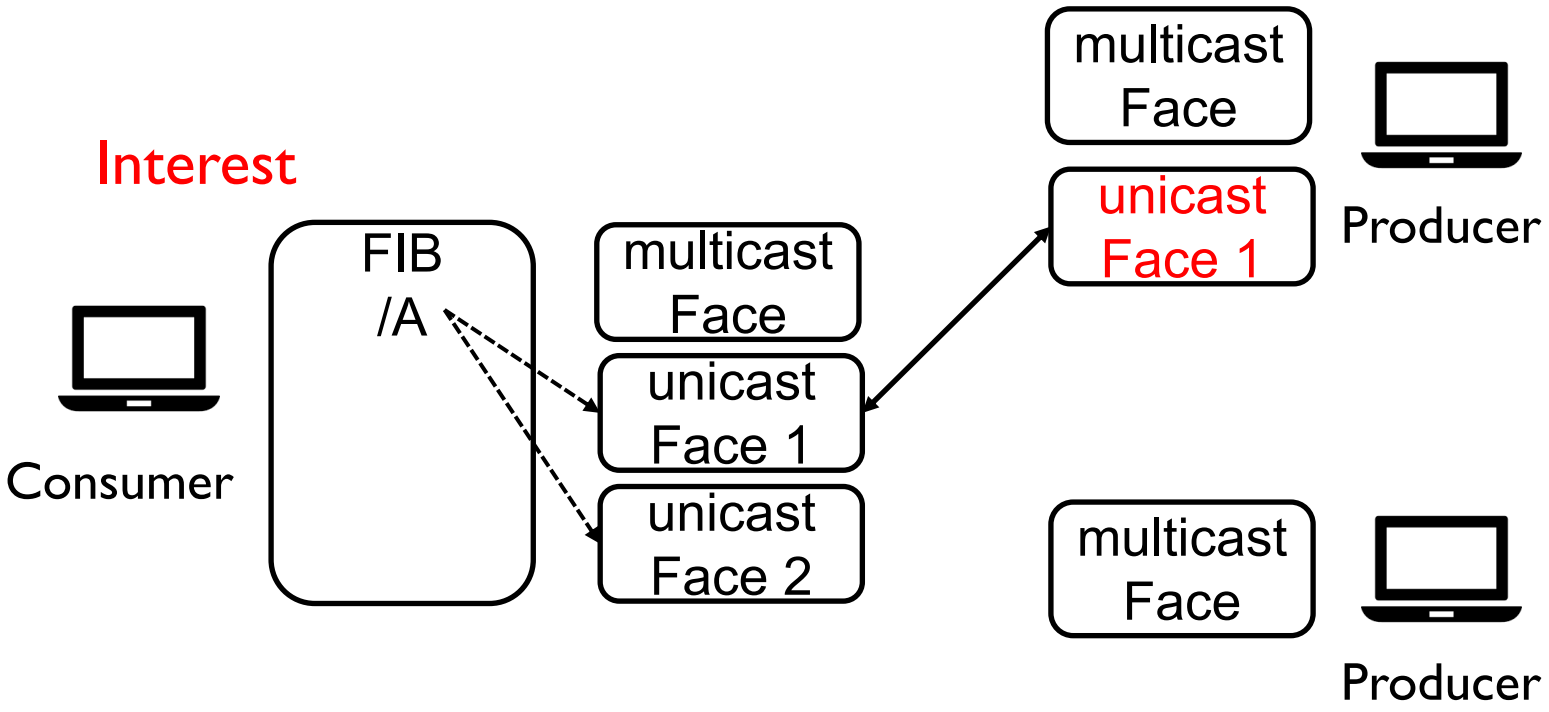
Interest Broadcasting



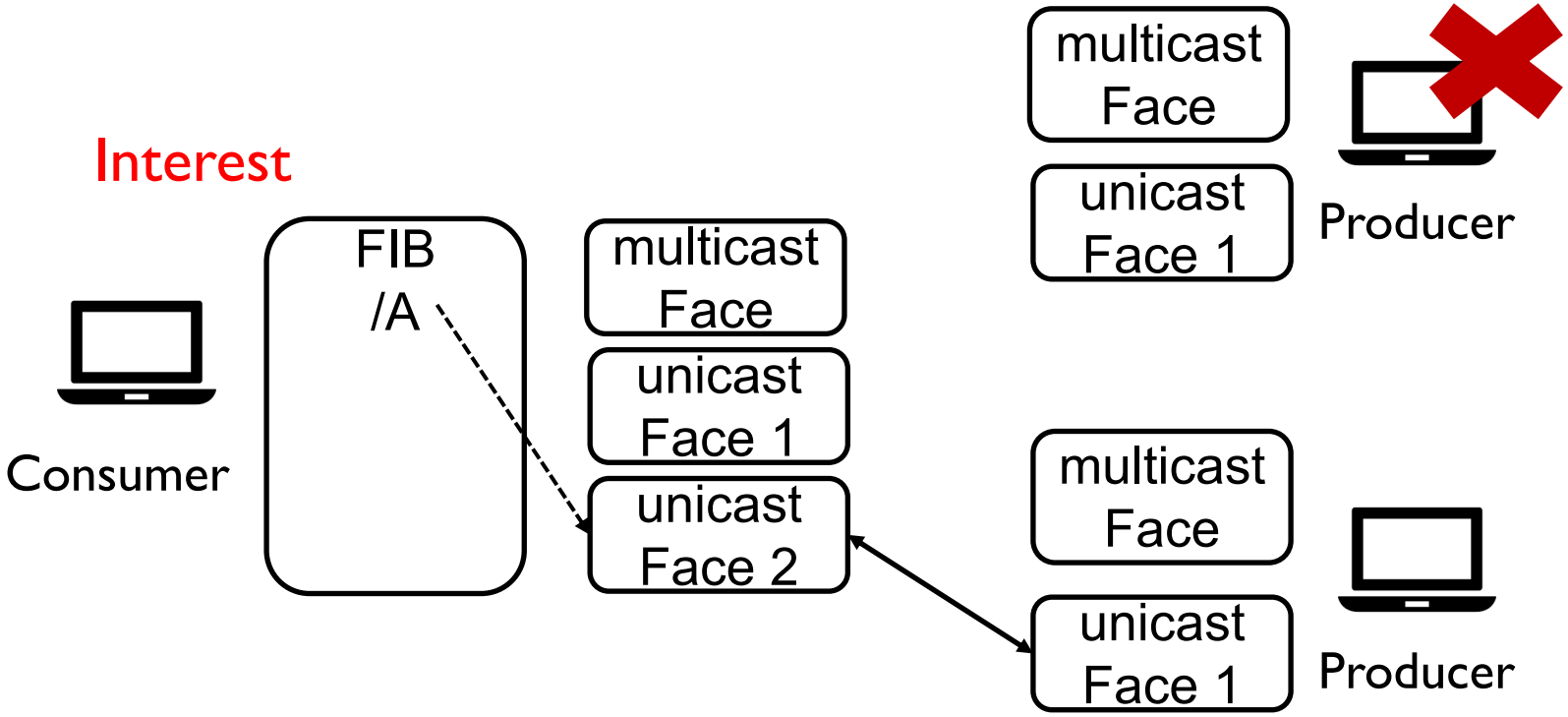
Learning Routes And Face



Integrated with Best-route Strategy



Handling Producer Failure



Hands-on Time

Conclusions

- With self-learning in NDN
  - Consumers can automatically discover and retrieve contents within a LAN without any configuration of faces or routes