ccnGen: A High-speed Generator of Bidirectional CCN Traffic Using A Programmable Switch

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Junji Takemasa, Ryoma Yamada, Yuki Koizumi, Toru Hasegawa
Osaka University

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1.6-Tbps Interest-Content Generation with $2^{32}$ Names

**Challenges of CCN traffic generation with a programmable switch**

- Hardware packet generator (pktgen) of the switch only generates unidirectional traffic
- A large number of (e.g., $2^{32}$) names do not fit into O(10)-MByte SRAM of the switch

**ccnGen**

- Bidirectional traffic generation
  - Sending Interest and returning Content with two pipelines
    - **Consumer**: 1) generates Interest’s header in pktgen and 2) appends a name in pipeline
    - **Producer**: 3) appends pre-defined payload to received Interest in pipeline
- $2^{32}$ name generation
  - Combining 8 name components chosen from $2^4$ components stored in pipeline
  - $(2^4)^8=2^{32}$ name patterns only with a few 1-KB memory footprint