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

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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