

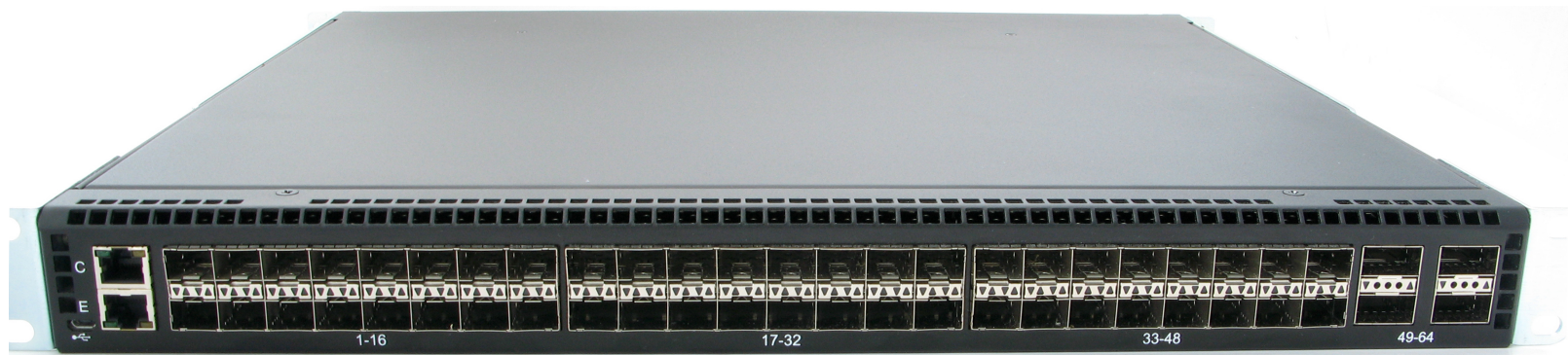
Approximating Data-plane Algorithms on the Programmable Switch

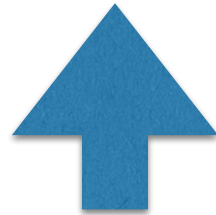
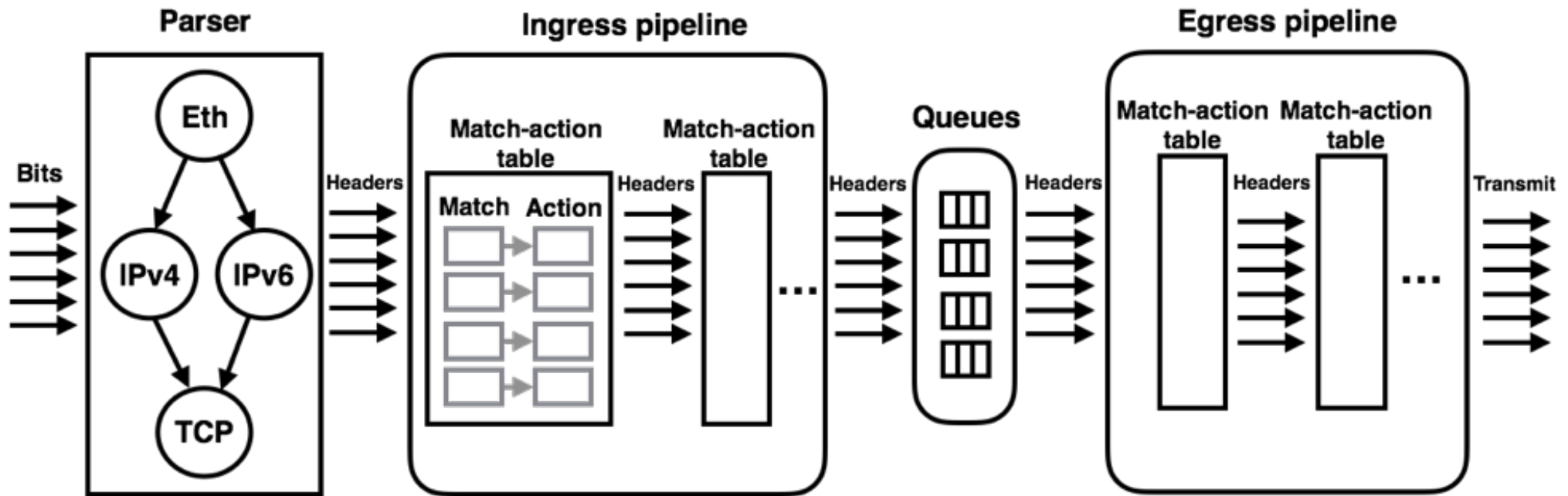
Ming Liu

University of Washington

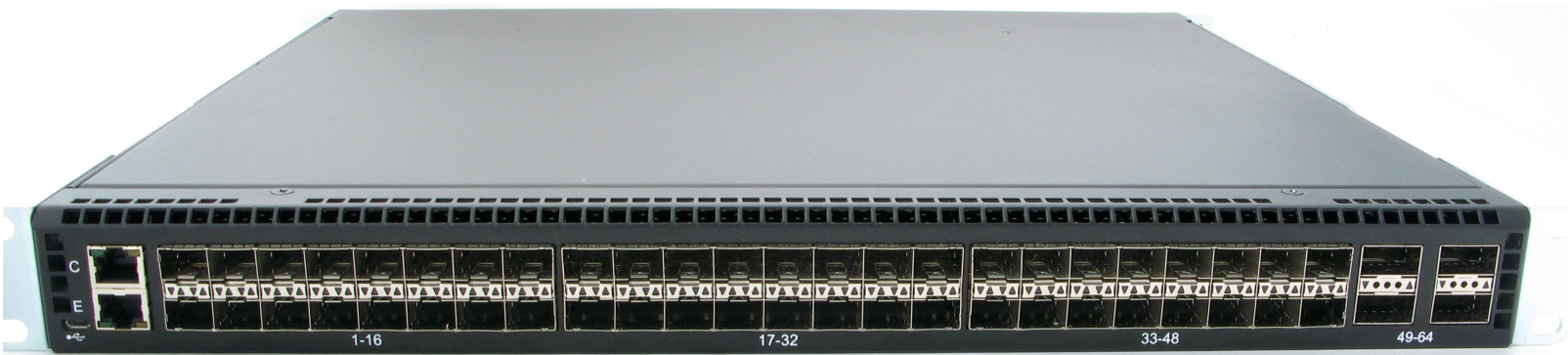
with *Naveen Kr. Sharma, Jacob Nelson,
Arvind Krishnamurthy, Luis Ceze*

Programmable Network Switch

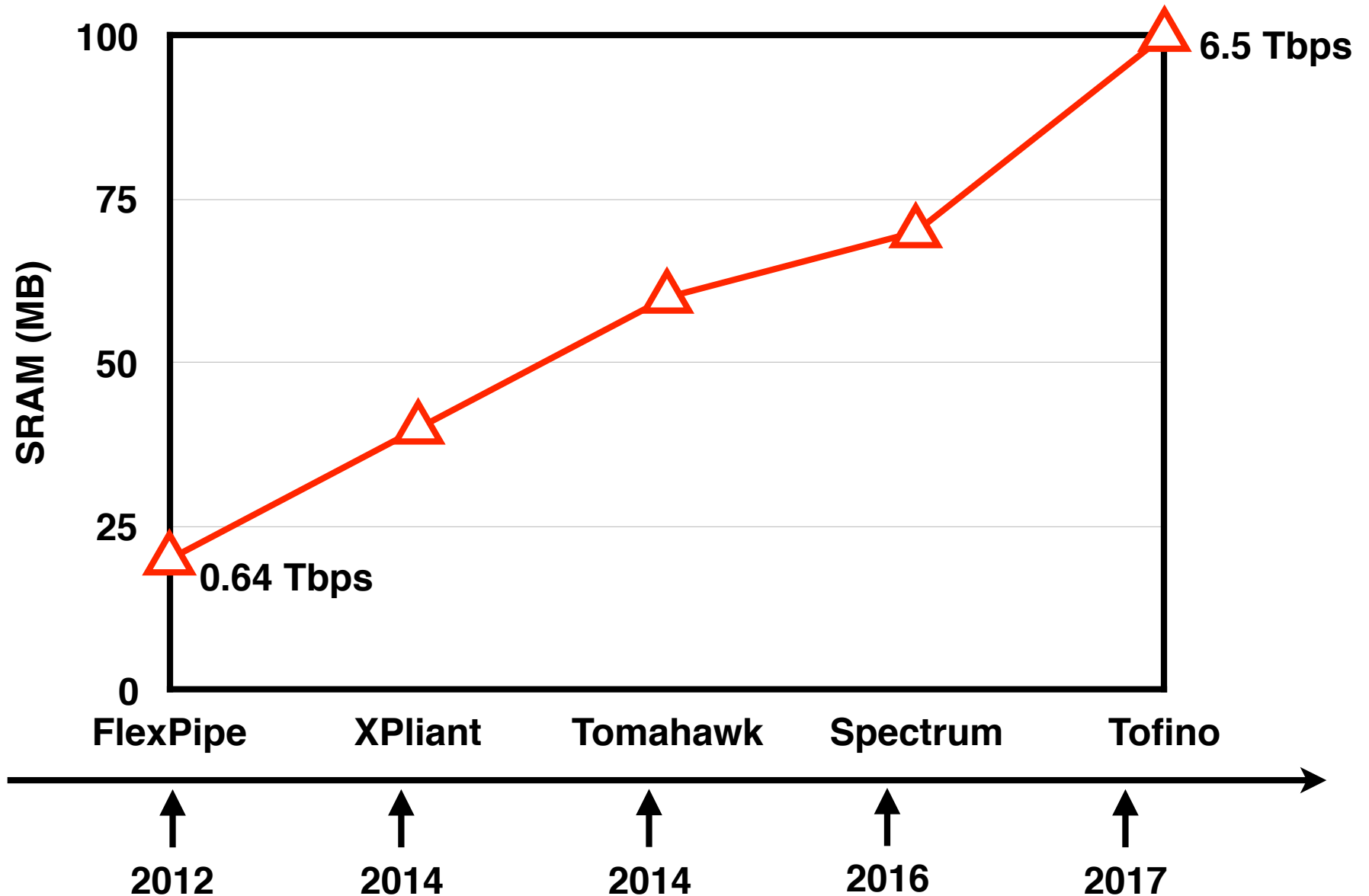




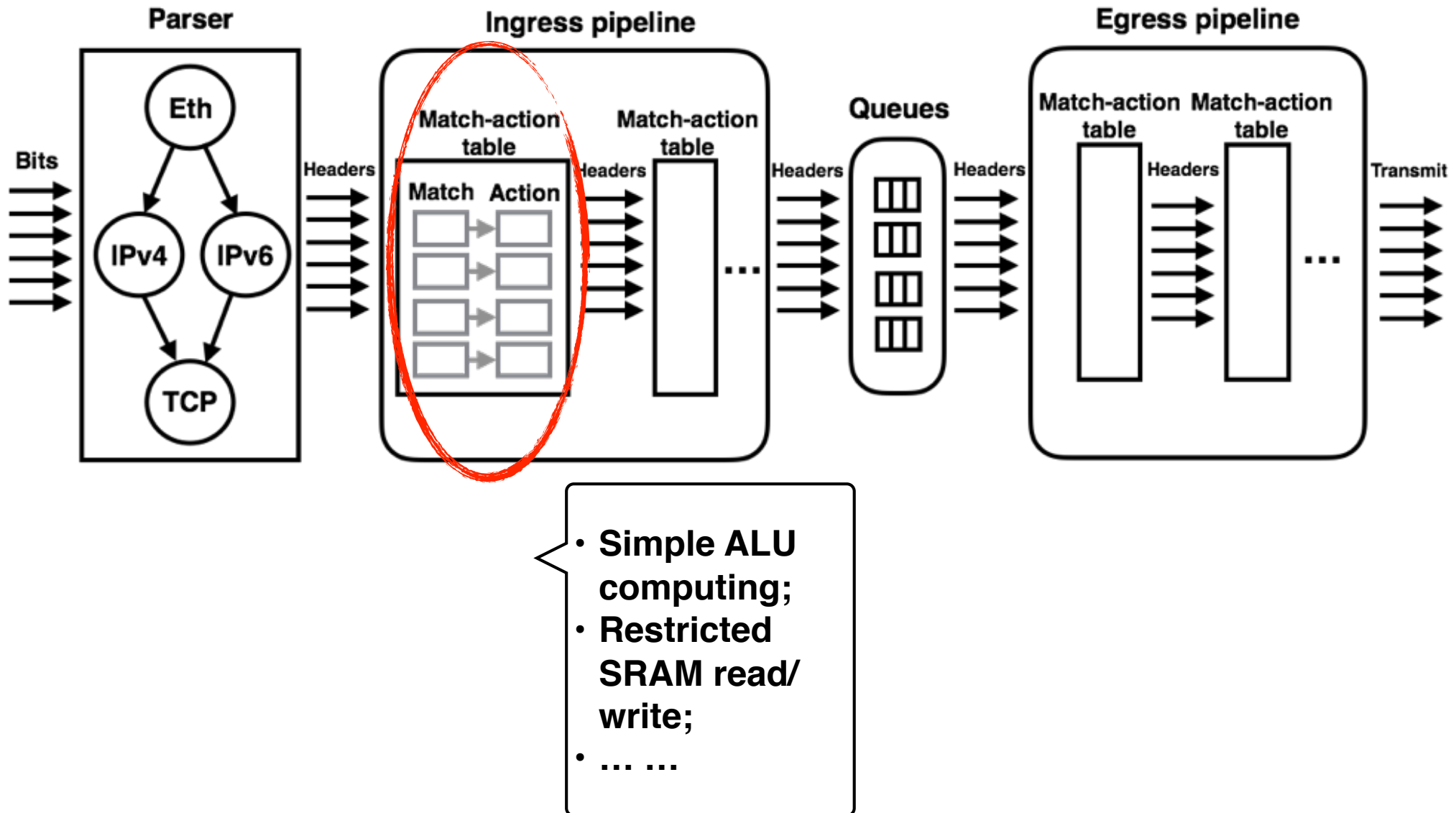
Programmable Network Switch



❖ Challenge 1: Switch SRAM size is increasing slower than the switch capacity.



❖ Challenge 2: The switch only supports limited line-rate arithmetic and stateful computations.



Data-plane Approximation

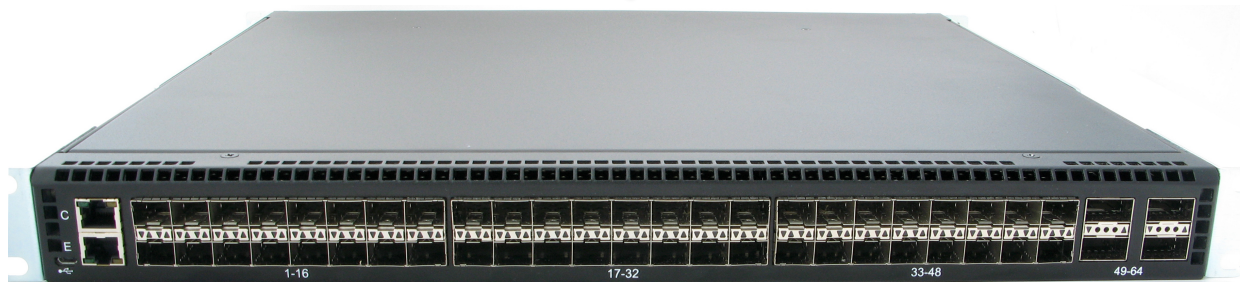
Data-plane algorithms:

- ✓ Bloom filter
- ✓ Heavy Hitters
- ✓ Flowlets
- ✓ RCP
- ✓ Sampled NetFlow
- ✓ Adaptive Virtual Queue
- ✓ DNS TTL change tracking
- ✓ CONGA
- ✓

+

Key ideas:

- ❖ Approximate arithmetic computations via on-switch line-rate action units;
- ❖ Approximate port/flow statistics in the SRAM;



Programmable Network Switch