Big Data Infrastructure

where *speed* matters

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About Me

- PhD, City University of Hong Kong (QS 57th worldwide)
    - ⋆ 1 US Patent and 1 Start-up
- SICSA Next Generation Internet Fellow (Glasgow Uni)
    - ⋆ Built a cloud and big data testbed (two best paper awards)
- Senior Lecturer
    - ⋆ Wants to do better!

Big Data Infrastructure

- How Big is “Big Data”?
  - > 1 TB
  - Simple C/C++ code with legacy database beats “Big Data Analytics” systems in speed for small datasets.
  - Not able to leverage parallelism
- Components for Big Data infrastructure
  - Compute cluster(s); Data analytics tools; File systems/ databases

Big Data Infrastructure

Compute Clusters	Data Analytics Tools	File Systems/ Databases
	Hadoop framework	

(Virtual)
Machine
cluster(s);
High
performance
computing
(HPC) clusters;
	MapReduce
	Spark;
	Storm;
	MapR;
	Pig;
	…
		HDFS;
		S3;
		GFS;
		Cassandra;
		HBase;
		BigTable;
		MongoDB;
		…

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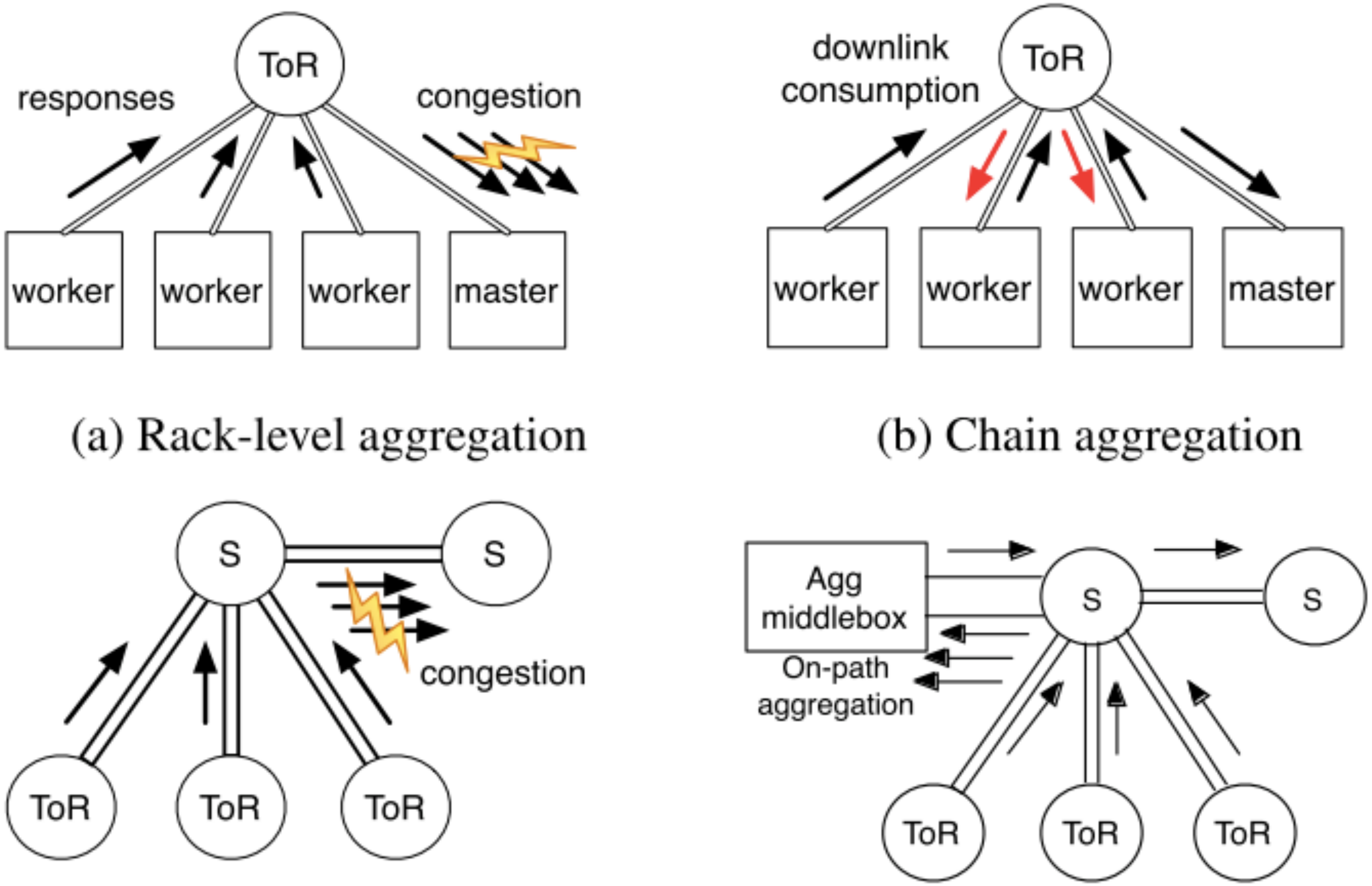
My research interests

Example 1



(a) Rack-level aggregation

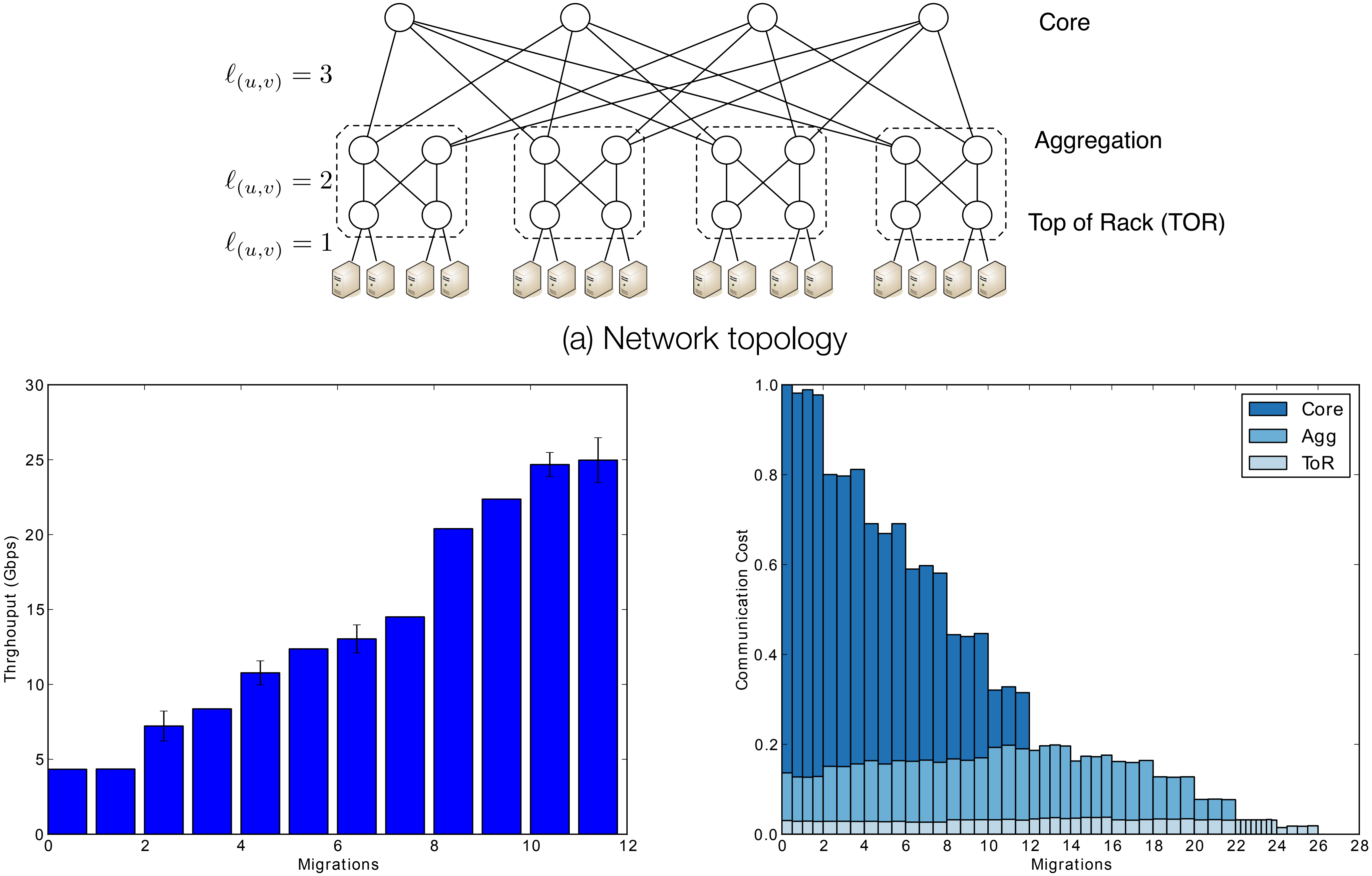
(b) Chain aggregation

(c) Cross-rack aggregation

(d) On-path aggregation

On-path data aggregation

Example 2



(a) Network topology

(b) Aggregate throughput

(c) Link utilisation at different layers

Traffic-aware virtual machine migration

?

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