

SPARTA

Scalable Per-Address Routing Architecture

Colin Dixon*, Brent Stephens^, Wes Felter*, John Carter*, Alan Cox^

* IBM Research — Austin
^ Rice University

The Problem:

The network needs of data centers are beyond what traditional networks offer:

- Scale to 100s of thousands of hosts
- Use all available bandwidth
- Allow for host mobility
- Be self-configuring

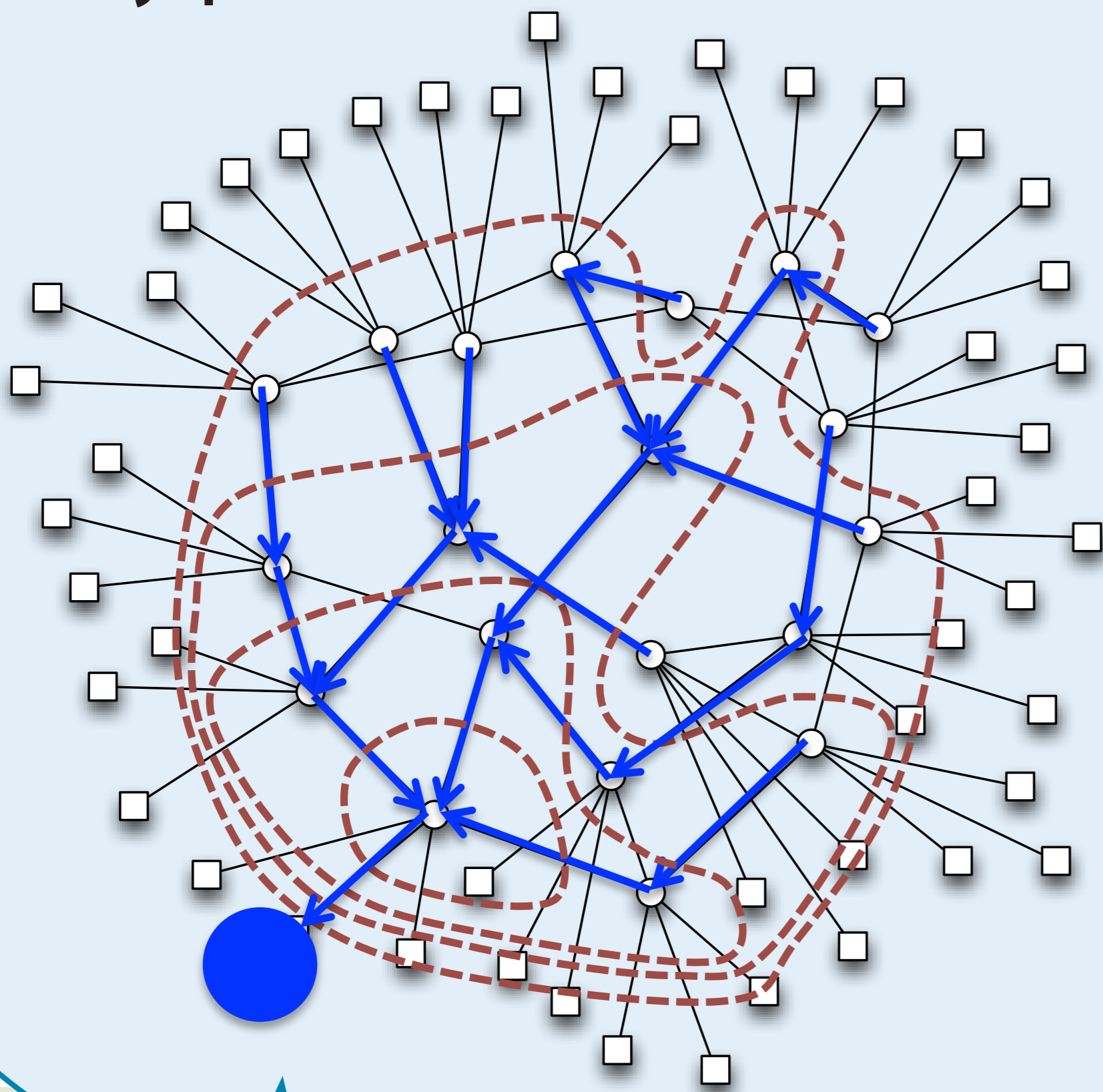
The Requirements:

In addition, to ease deployment, a good solution should:

- Use existing, commodity hardware
- Respect Layering, i.e., don't repurpose header fields
- Be independent of topology

SPARTA Spanning Trees:

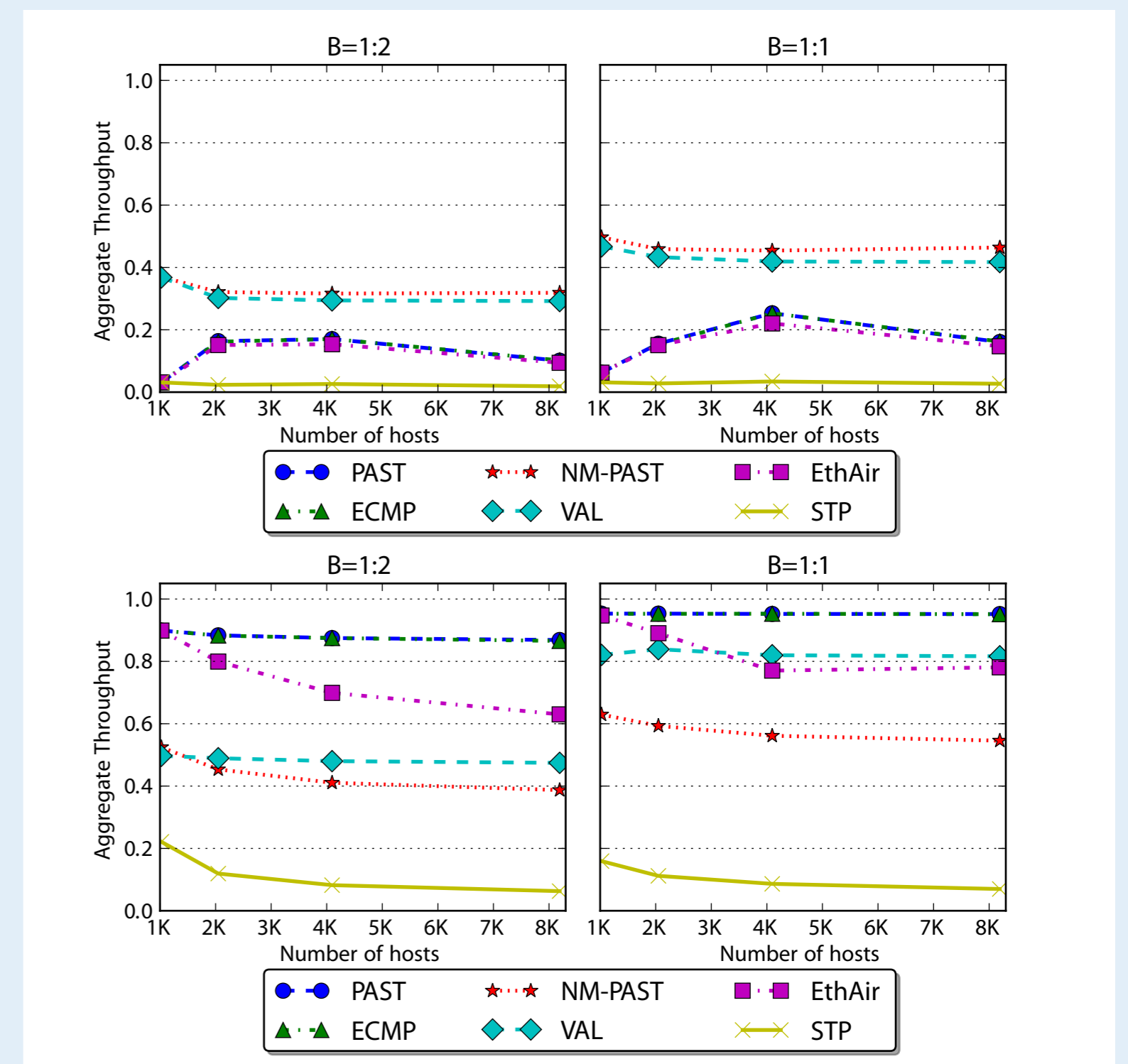
Use the large, L2 exact-match table to build spanning trees with one entry per-host on each switch.



Performance

Stride
(Adversarial)

Uniform
Random
("Easy")



Architecture	Functional Requirements				Design Requirements		
	Mobility	High BW	Self Config	Scales	No H/W Changes	Respect Layers	Topo Ind
Ethernet with STP	✓	X	✓	X	✓	✓	✓
IP (e.g. OSPF)	X	✓	X	✓	✓	✓	✓
MLAG [29]	✓	✓	✓	X	✓	✓	✓
SPAIN [30]	✓	✓	✓	X	✓	X	✓
PortLand [33]	✓	✓	✓	✓	✓	✓	X
VL2 [14]	X	✓	X	✓	✓	X	X
SEATTLE [23]	✓	X	✓	✓	✓	✓	✓
TRILL [36]	✓	✓	✓	X	X	✓	✓
EthAir [37], VIRO [21]	✓	X	✓	✓	✓	✓	✓
PAST	✓	✓	✓	✓	✓	✓	✓