Stellula: An Integrated Information Plane

Liting Hu, Karsten Schwan, and Michael A. Kozuch

Why?

1. Spare capacity from private clouds could be offered to others.

2. Lack of trust and diverse policies of administrators.

3. Site-specific Infrastructure.

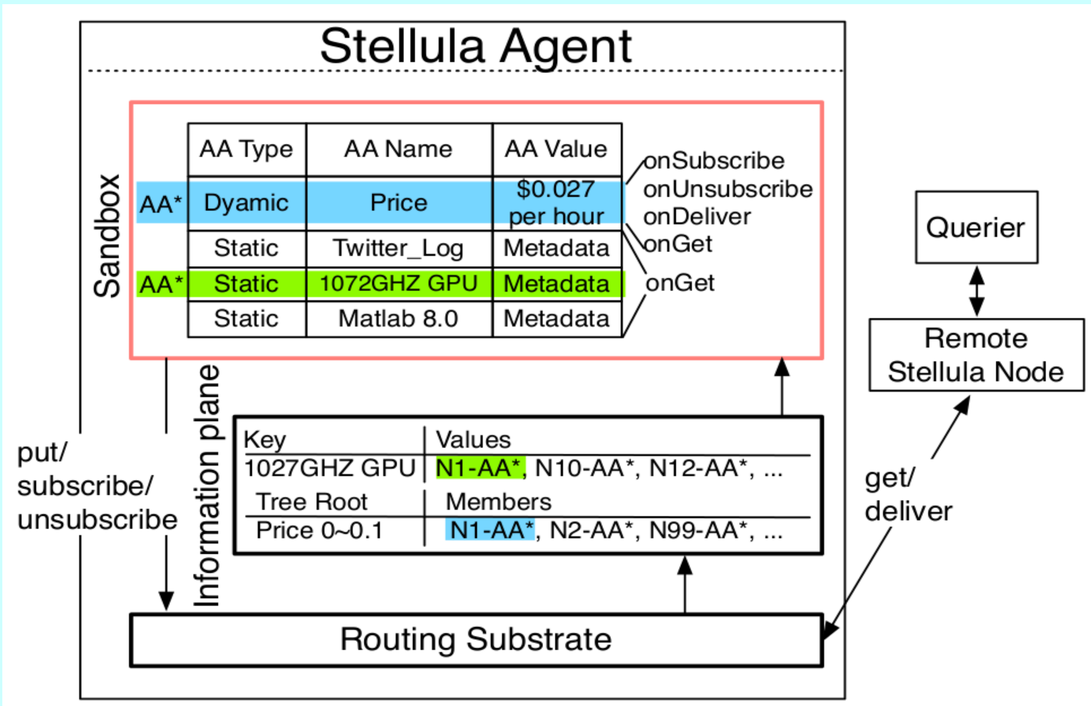
Our Proposal - Stellula

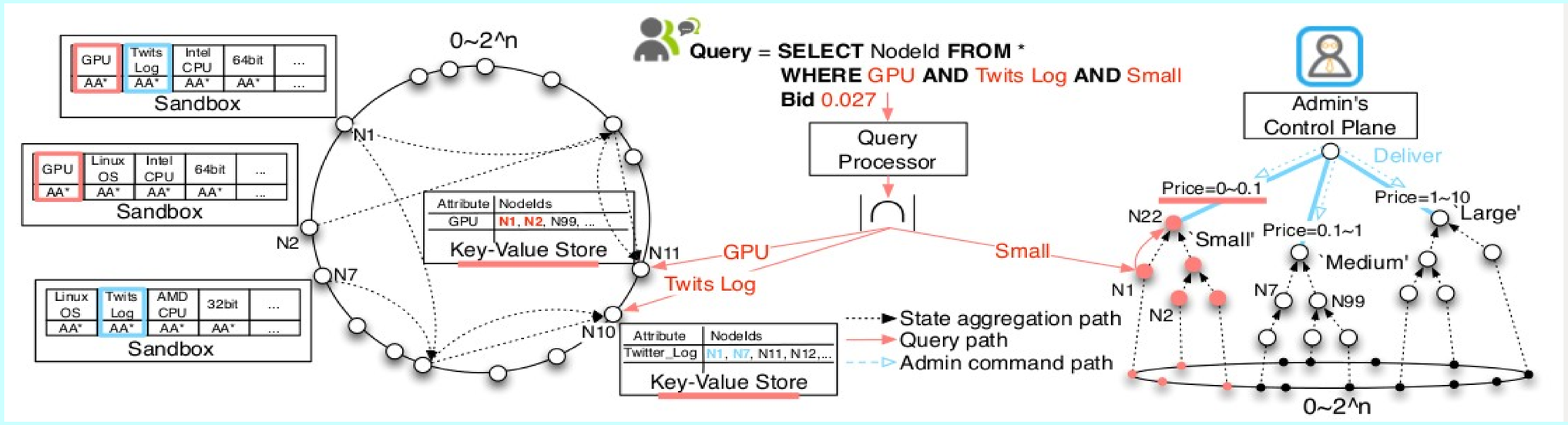
Fully-distributed resource discovery/brokerage mechanism.

Administrators can program policies for attributes.

Exploit sandbox for security and decentralized overlay for scalability

Stellula Agent Architecture





Static attributes are saved into an `active' key-value store.

Composite query is parsed as atomic queries to search.

Dynamic attributes are organized as trees.

Decentralized Architecture

Queries are accepted as a distributed, site-autonomous fashion.

Queries can be processed by nearby nodes in parallel.

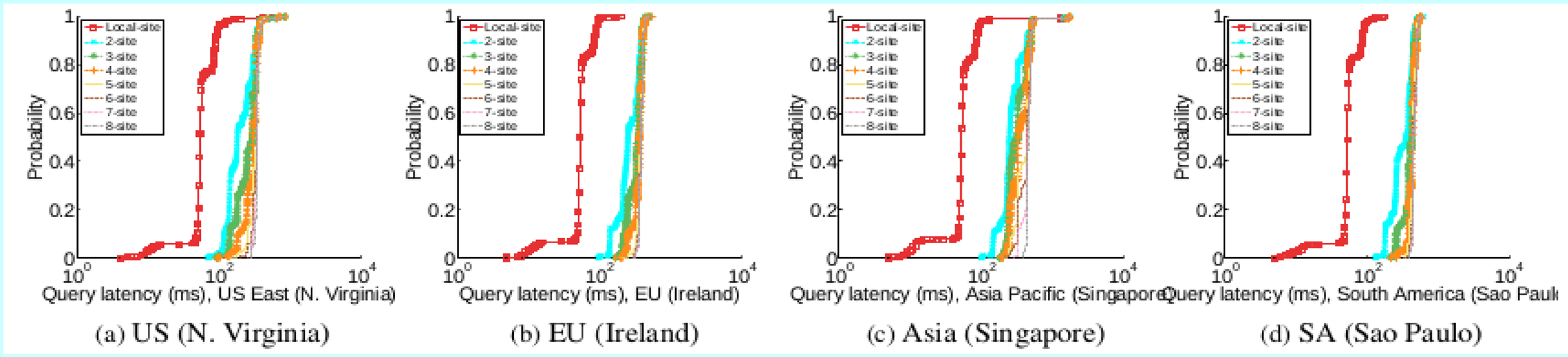
High throughput yet weak consistency.

Animate Attribute (AA)

A resource attribute is not merely a key-value pair but with handlers like onGet, onSubscribe.

Support customizing each site's policies.

Support adding or removing attributes on the fly.



CDF of latencies for composite queries issued by users in Virginia, Ireland, Singapore and Sao Paulo , while each query randomly asks for resources from 2-site ~ 8-site.

Stellula enables customizable policies and fast resource discovery

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