Extending ExoGENI Slice-based L2 Network Transit Service to Chameleon

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Integrating Edge Clouds with Chameleon

Edge clouds, cloudlets:
Smart cities, IoT, data gathering, low-latency apps

Compute Cloud
ExoGENI
Cross-Slice Stitching on ExoGENI
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Stitching to Chameleon Nodes

Stitching points of presence on ExoGENI and Chameleon nodes
Cross-Slice Stitching is Useful

- Bandwidth provisioned links

- Direct cross-slice networking at L2: flexible for inter-domain network services
  - Elastic NFV services
  - Software defined exchange (SDX)

SDX (+/-)
Automated and Safe Stitching

- Automated stitching

- Safe Stitching
  - Authorized stitch operation
  - User-specified stitch policy
  - User-specified traffic policy
SAFE Authorization for SDX

Slice Controller

A’s Policy
SAFE

SDX policy
SAFE

B’s Policy
SAFE

Safe Sets
SAFE-based slice controller

SAFE (Secure Authorization for Federated Environments)

- SAFE application
- SAFE policy: Datalog
- SAFE server
- SAFE sets
Use Case: Network Transit Service for ExoGENI and Chameleon Users
A simple stitching policy

**Stitching policy**

allowStitchFrom(?Alice) :- acceptPA(?PA), ?PA: project(?Project), ?PA: projectMember(?Alice, ?Project).

allowStitchFrom(alice)?
Cross-Slice Stitching

1. post Stitch
2. OK
3. Stitch Request
4. Authorize
5. OK
6. PerformStitch
7. Response

Network Alice
SDX
ExoSM
Alice
SAFE
SAFE
Safe Sets
Cross-Slice Networking Policies

connect(Alice, Bob) :-
  Alice: allowTrafficFrom(Bob),
  Bob: allowTrafficFrom(Alice).

Alice: allowTrafficFrom(bob).
Bob: allowTrafficFrom(alice).
Conclusion

- L2 network stitching yields high-speed network path between slices
- Secure connections between slices
- Inter-domain network service and super facilities
Q&A