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)
Automated and Safe Stitching

➢ Automated stitching

➢ Safe Stitching
  ▪ Authorized stitch operation
  ▪ User-specified stitch policy
  ▪ User-specified traffic policy
SAFE Authorization for SDX
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).

**Project Authority**

project(myProject).
projectMember(alice, myProject).

**SDX**

Stitching request

allowStitchFrom(alice)?
Cross-Slice Stitching

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

Network Alice

ExoSM

SDX

Alice

SAFE

Safe Sets

SAFE
Cross-Slice Networking Policies

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

Alice
allowTrafficFrom(bob).

Bob
allowTrafficFrom(alice).

Alice
Bob
SDX
Slice Controller
OpenFlow
SAFE
Safe sets
connect(Alice, Bob)?
Conclusion

➢ L2 network stitching yields high-speed network path between slices

➢ Secure connections between slices

➢ Inter-domain network service and super facilities
Q&A