Access Control for a Database-Defined Network

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Introduction

- **Software-defined networking (SDN):** insertion of software to manage network with centralized controller
- **Ravel:** database-defined controller, like many others currently exposes network states to users
- **Security:** Ravel does not yet have security implemented
- **More efforts needed to improve SDN security**
- **This project adds access control application to Ravel**

Database-Defined Network

SDN: control distributed set of devices with a centralized controller

Ravel is the realization of SDN by database

- **SQL interface**
- **Views:** user-defined abstractions for individual applications
- **Orchestration:** coordinate updates between multiple applications

Security

- Ravel does not yet have security implemented
- This project adds access control, a specific aspect of security

Access Control for Network Resources

**Service-level agreement (SLA)**

**Topology table**

**SQL query**

```
CREATE OR REPLACE VIEW topology_tenant AS
(SELECT sid, nid, isactive FROM topology_acl
WHERE principal = current_user);
```

**Challenge: Controlling Network Updates**

**Goal:** Select a path through only nodes compliant with a user’s SLA.

**Ravel: ravel-net.org**

**Demo:** github.com/ravel-net/REU-access-control