



Access Control for a Database-Defined Network

Temple University REU 2016

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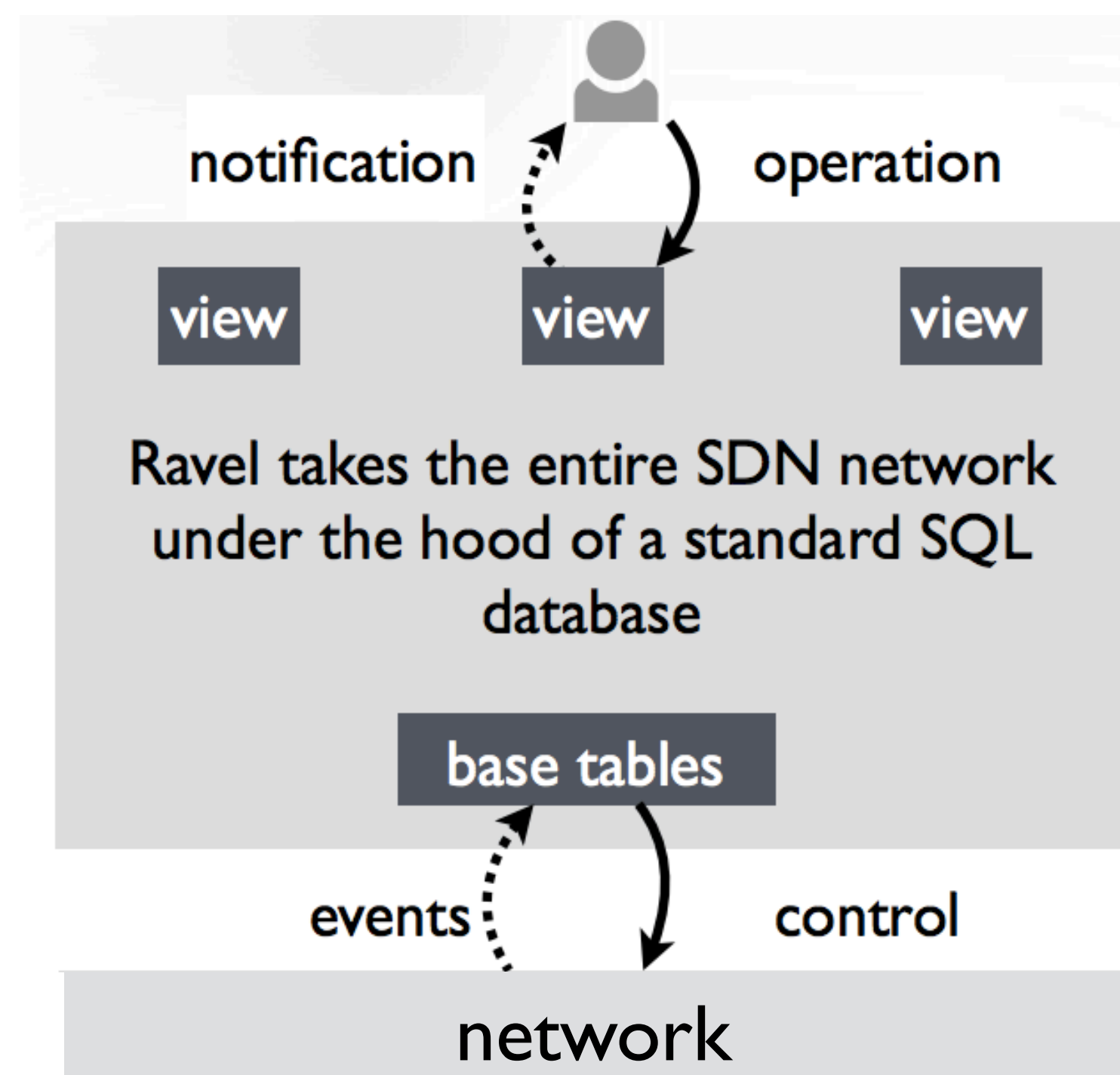


Introduction

- **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
- 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

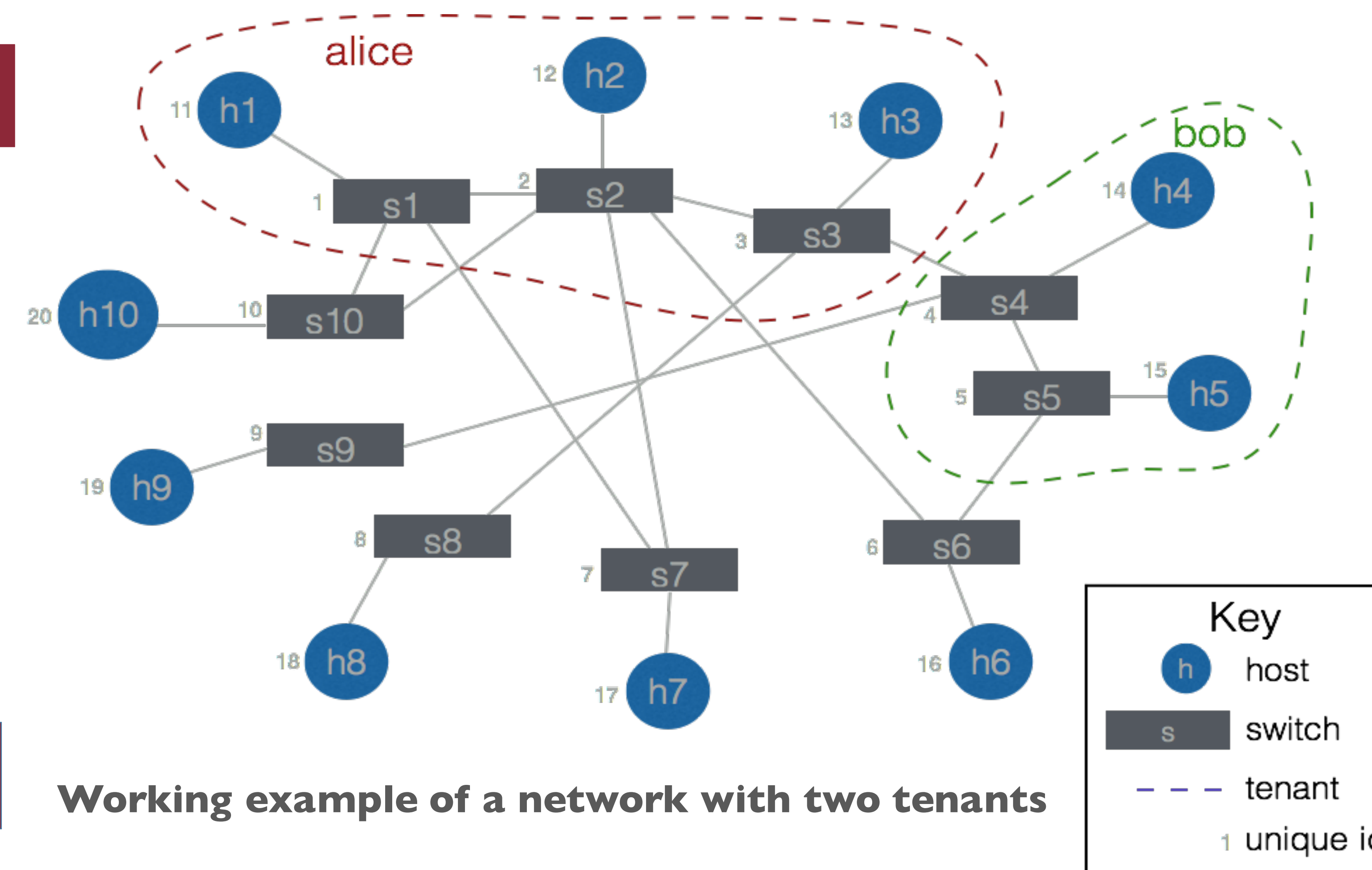


Ravel is the realization of SDN by database

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

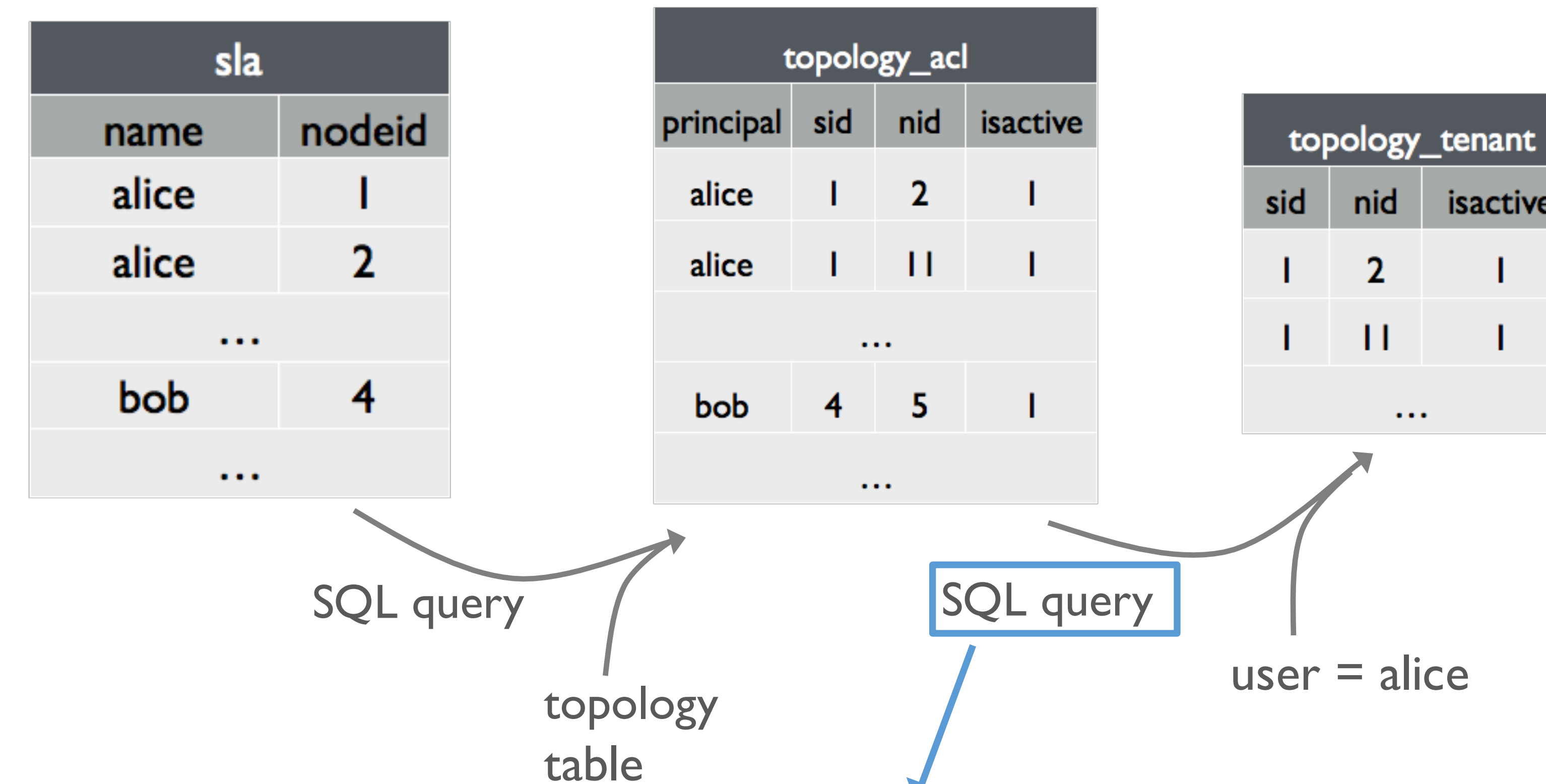
Security

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



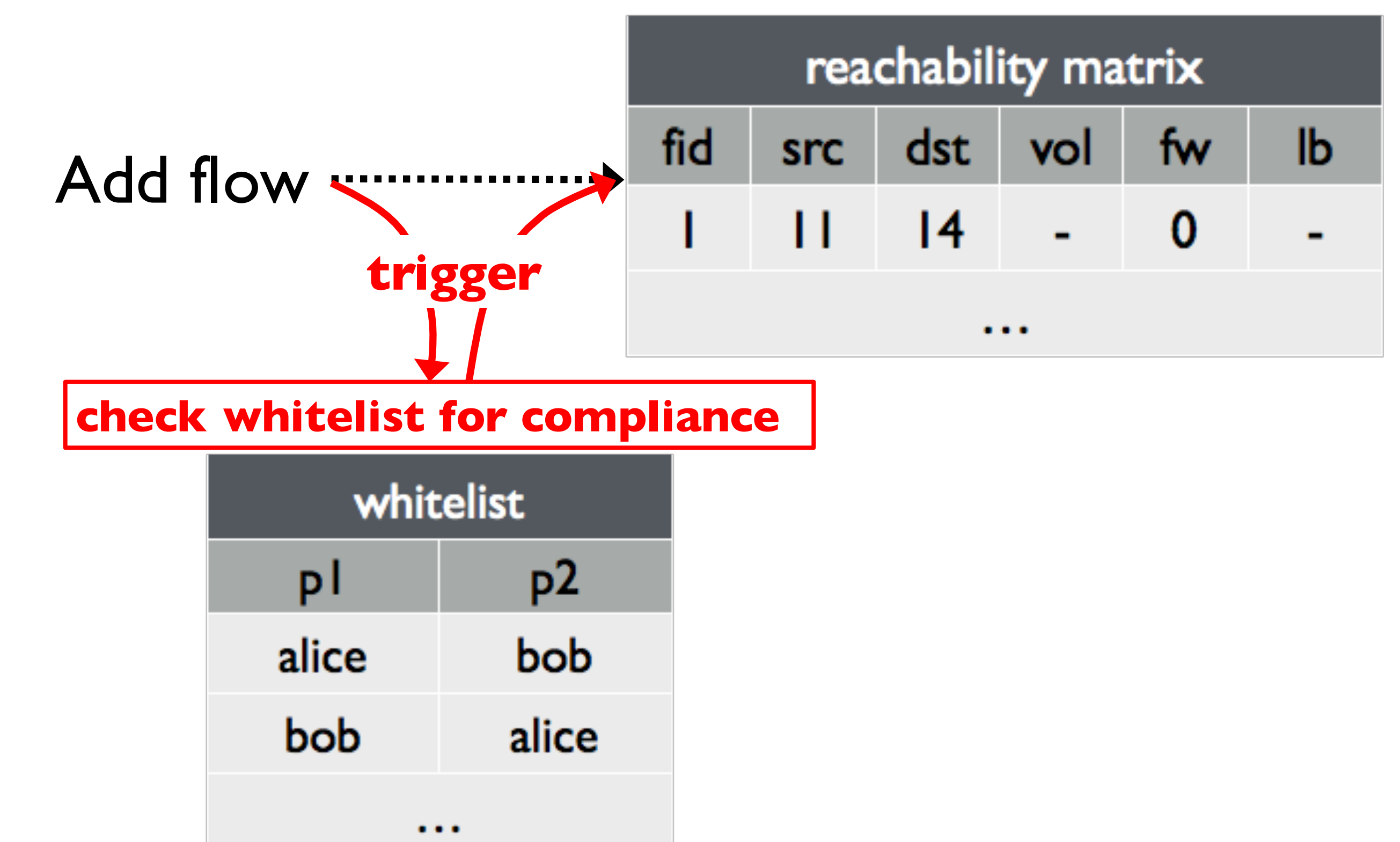
Access Control for Network Resources

Service-level agreement (SLA)



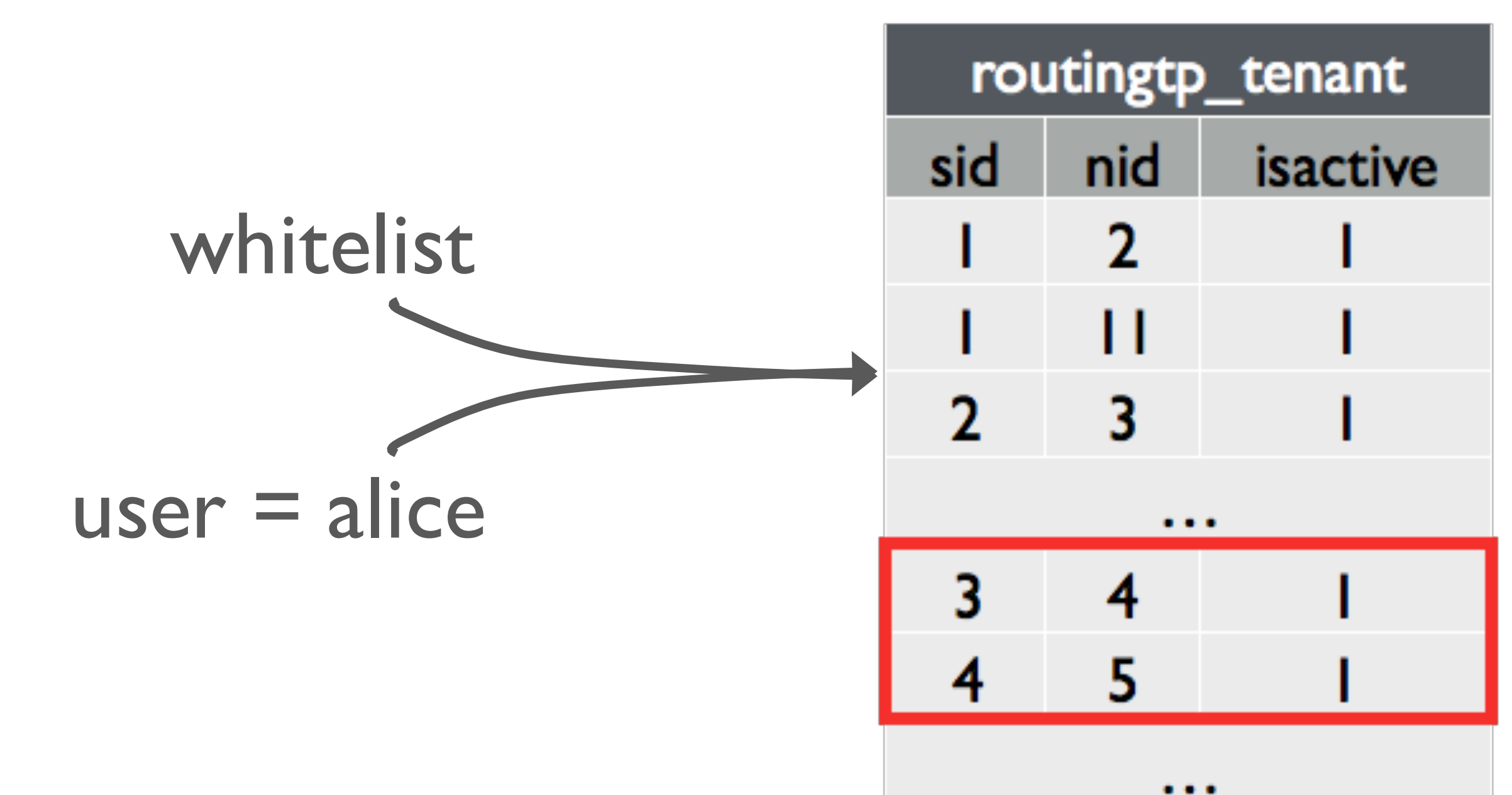
```
CREATE OR REPLACE VIEW topology_tenant AS (
  SELECT sid, nid, isactive FROM topology_acl
  WHERE principal = current_user);
```

Access Control for Network Updates



Challenge: Controlling Network Updates

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



- Create **routingtp_tenant** view to achieve this goal
- Calculate a path that contains only nodes listed in this view

Ravel: ravel-net.org

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