



# Access Control for a Database-Defined Network

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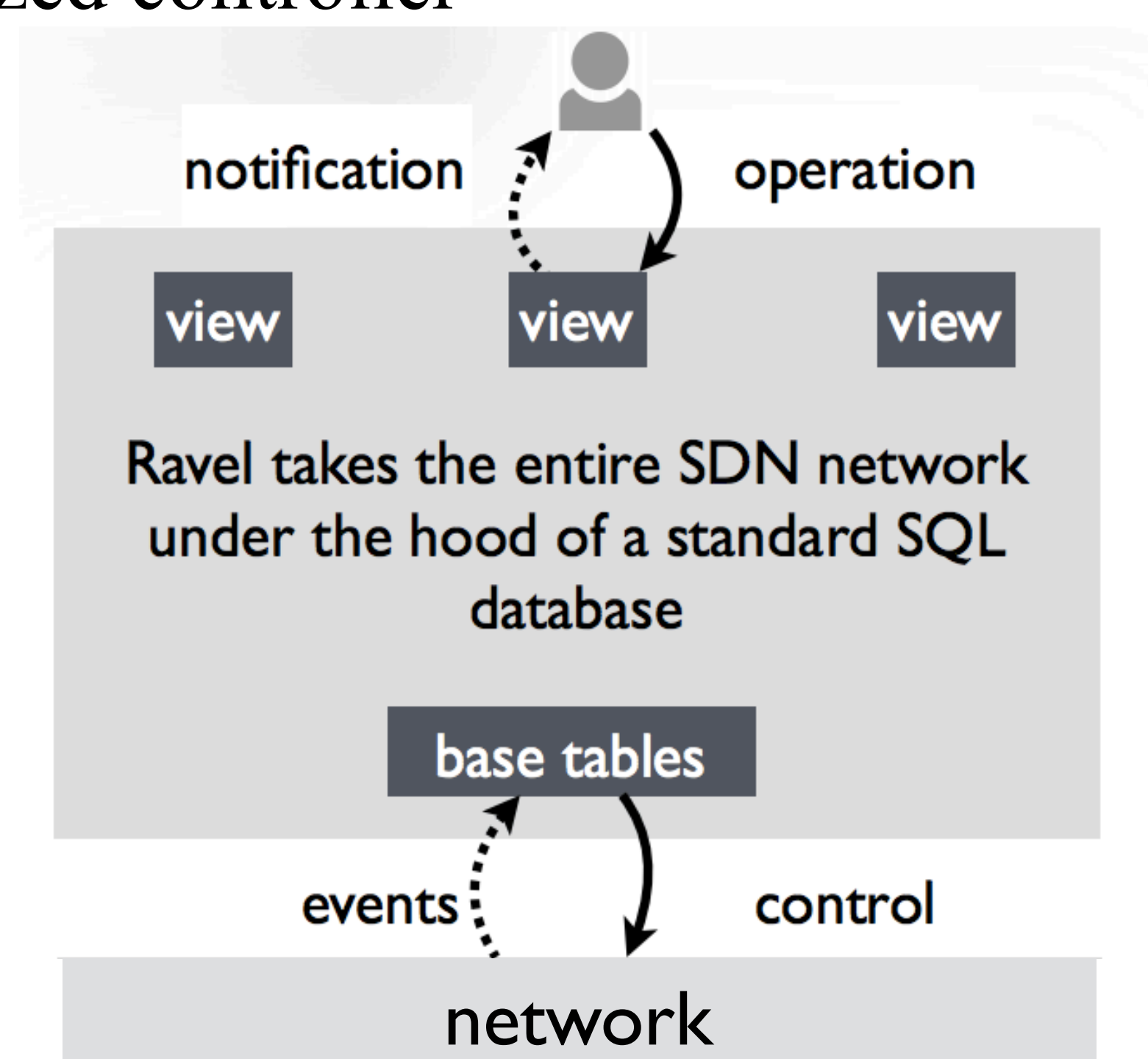


## Introduction

- **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
- 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

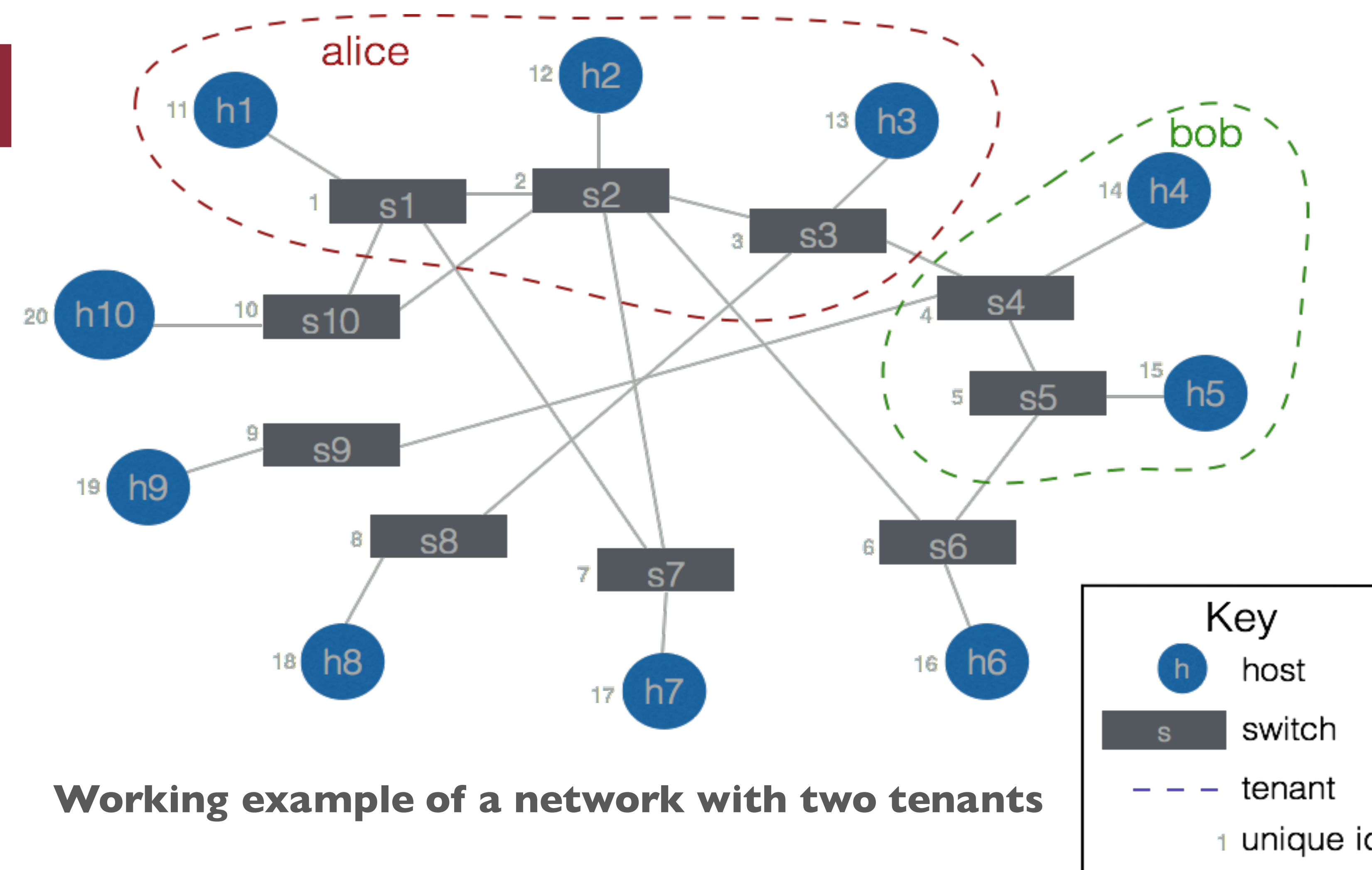


**Ravel is the realization of SDN by database**

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

## Security

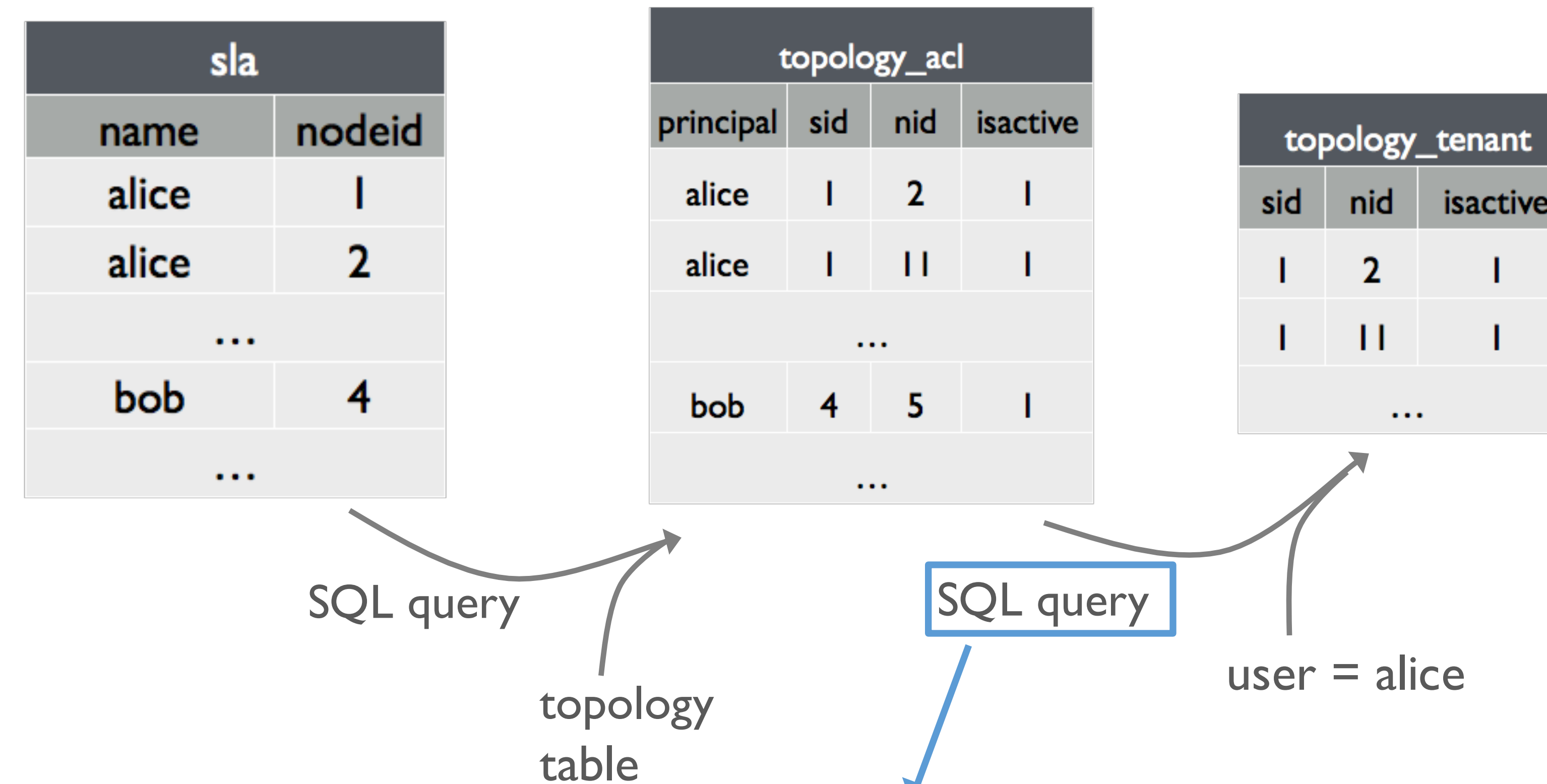
- Ravel does not yet have security implemented
- This project adds access control, a specific aspect of security



Working example of a network with two tenants

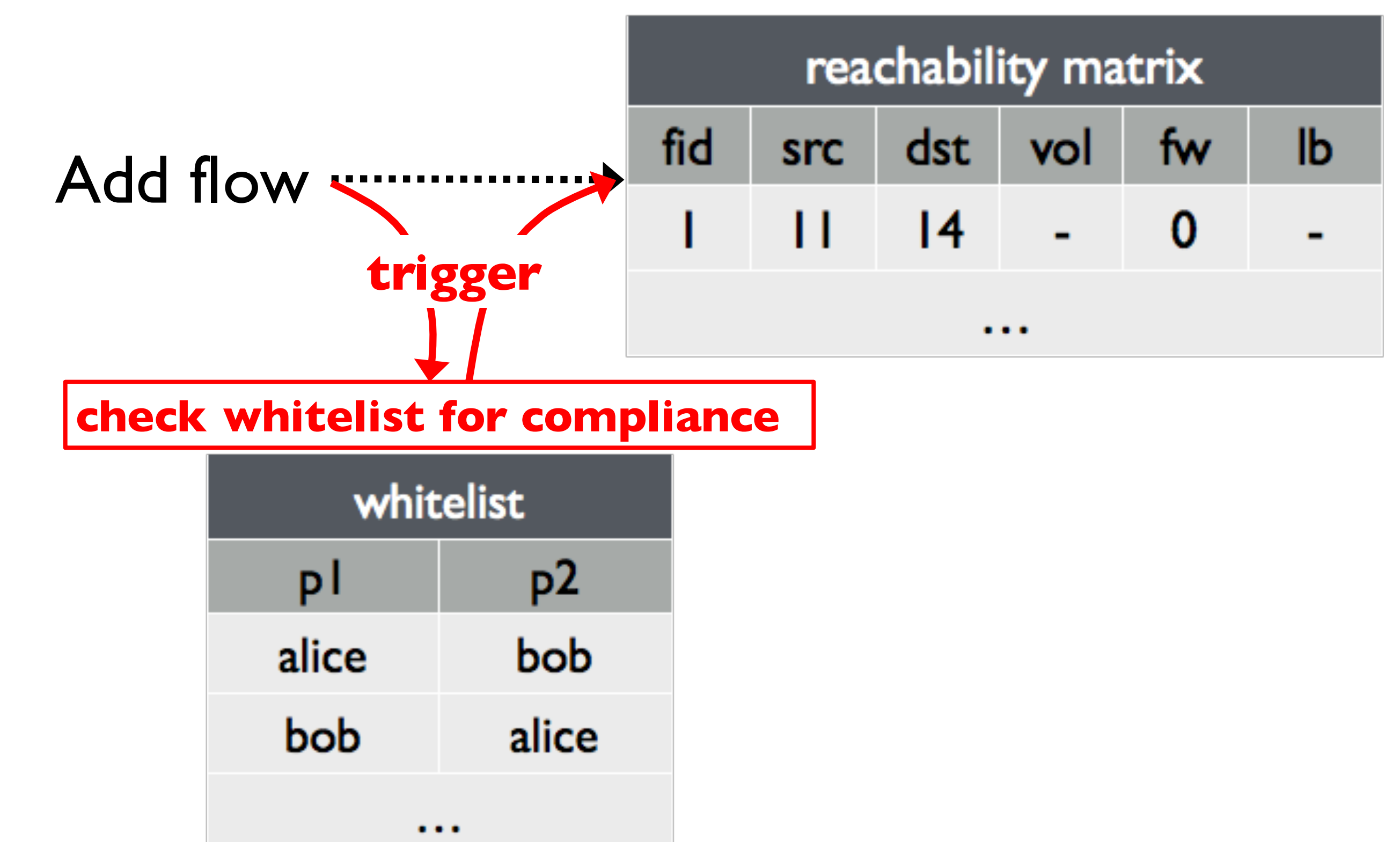
## Access Control for Network Resources

**Service-level agreement (SLA)**



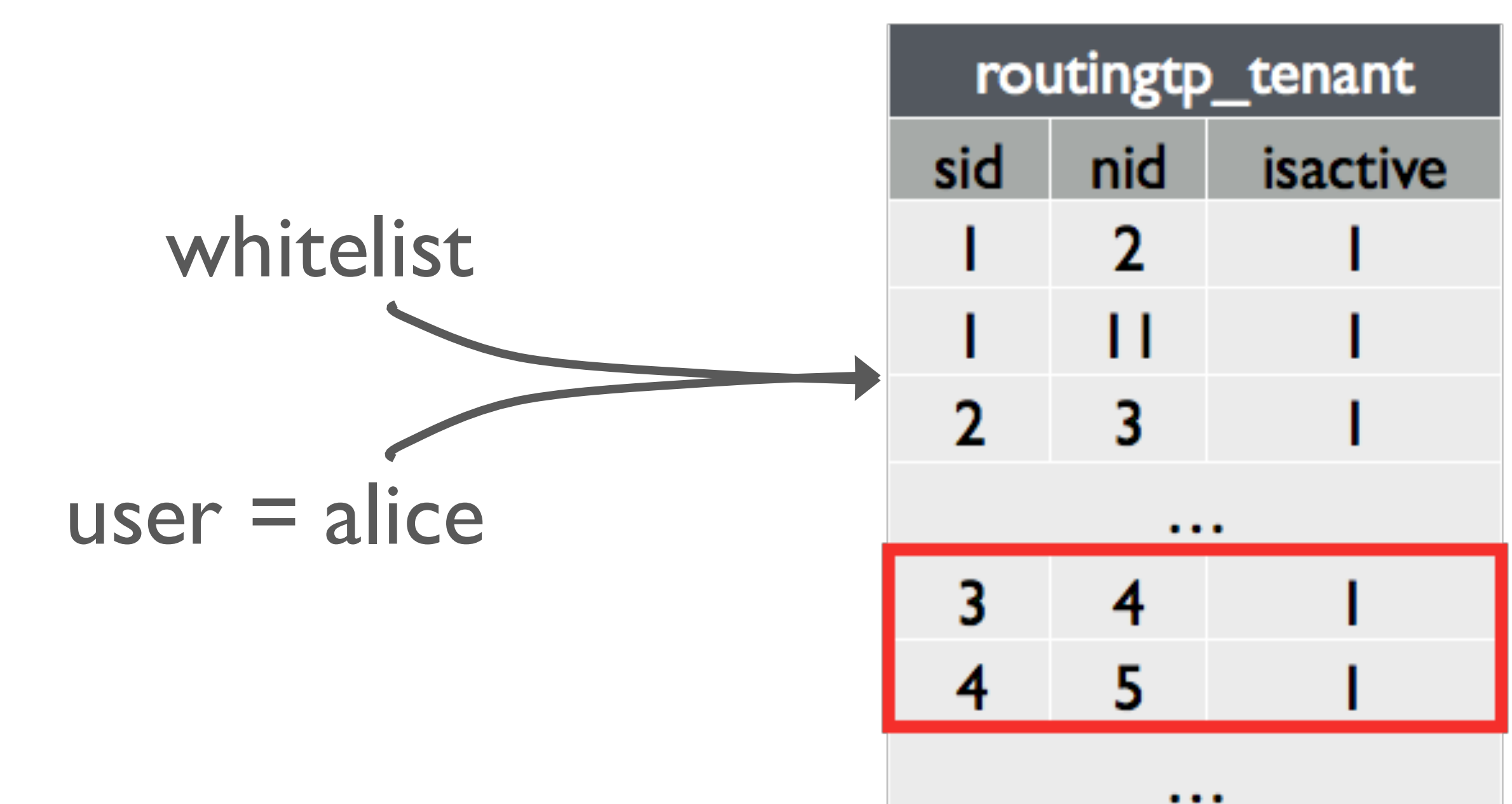
```
CREATE OR REPLACE VIEW topology_tenant AS (  
  SELECT sid, nid, isactive FROM topology_acl  
  WHERE principal = current_user);
```

## 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](http://ravel-net.org)

**Demo:** [github.com/ravel-net/REU-access-control](https://github.com/ravel-net/REU-access-control)