

# GENI ShadowNet Demo: Internet in a Slice

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## Project Goals

- Deploy virtualizable commercial routers into the ProtoGENI backbone for use by GENI users, and as the basis for a new ProtoGENI measurement infrastructure.
- Add software support to these virtual routers that will enable per-slice monitoring and measurement.
- Develop tools and interfaces that will allow slice users to control the new measurement infrastructure and access the measurement data collected in simple and easy to use ways.

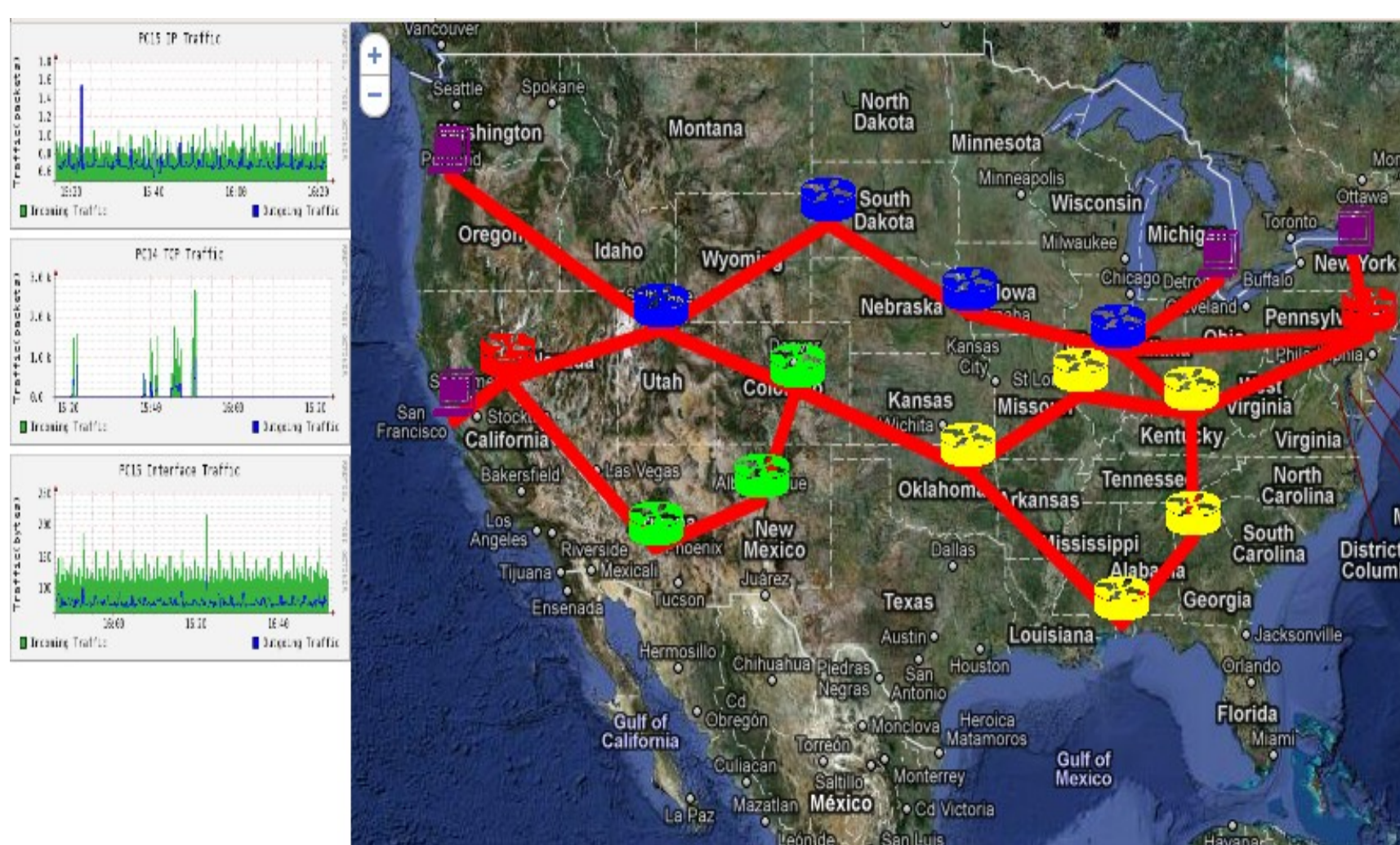
## Demo Overview

The demo shows how GENI ShadowNet can be used to emulate an internet that consists of multiple ASes running realistic intra- and inter-domain routing protocols. It uses Juniper logical routers to create a set of networks (ASes) that have all the essential components and commercial protocols that make up the Internet. We show how traffic is affected by BGP routing policy at the routers and show how measurement data is collected from the routers.

## Demo Setup

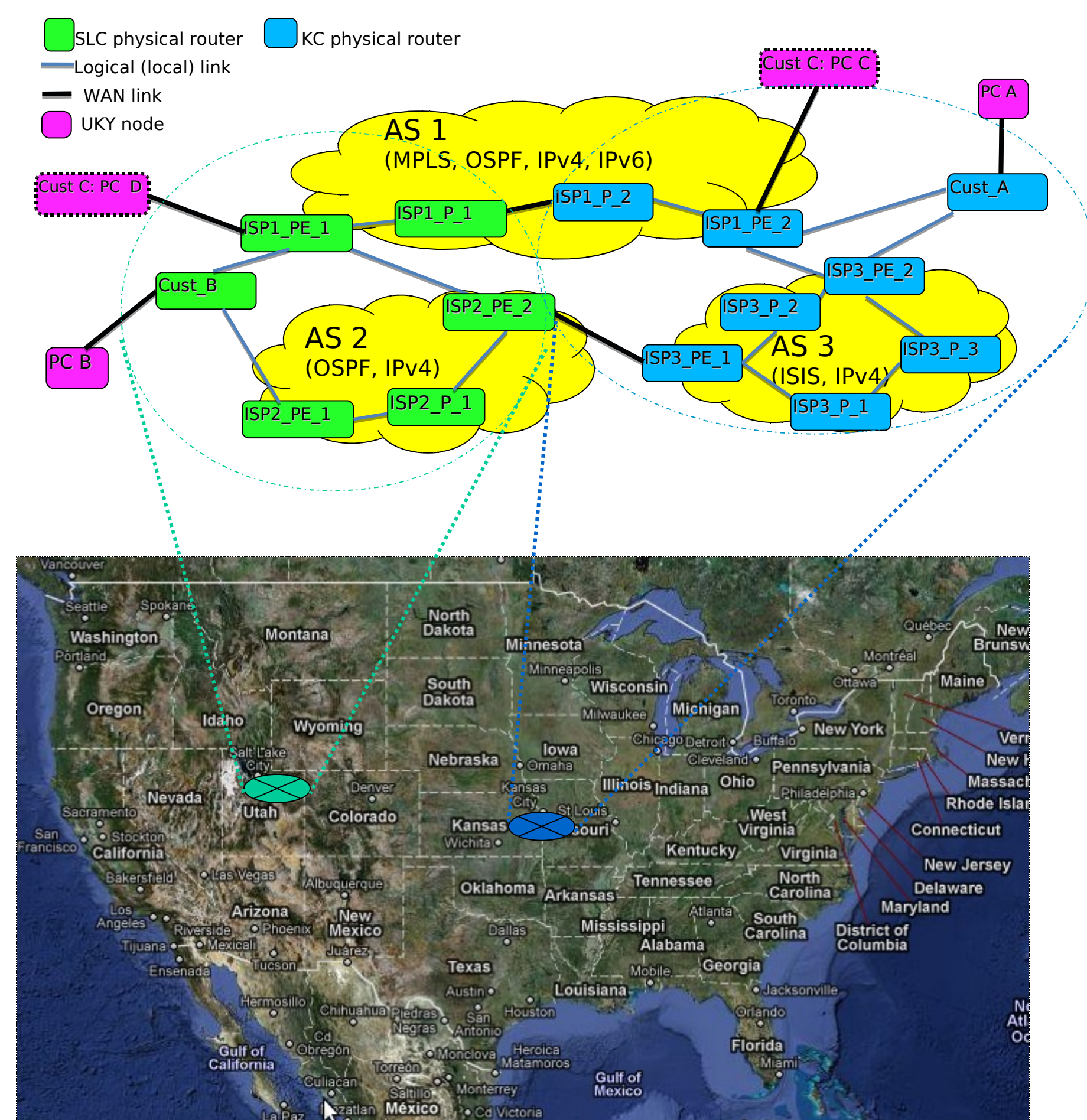
The network topology consists of three ASes, two customer edge routers, and four PCs.

- AS1 consists of four blue routers.
- AS2 consists of three green routers.
- AS3 consists of five yellow routers.
- In addition, we have two red customer edge routers and four purple customer PCs connected to the network.



## Protocols Involved

- AS1 uses MPLS and OSPF in the core, and supports both IPv4 and IPv6. It consists of two core routers (ISP1\_P\_1 and ISP1\_P\_2) and two edge routers (ISP1\_PE\_1 and ISP1\_PE\_2).
- AS2 supports IPv4, runs OSPF and is routed (i.e., needs BGP in the core). It has one core router and two edge routers.
- AS3 supports IPv4, runs ISIS and is routed.



## Implementation

- The two routers from AS1, three routers of AS2 and the edge router of customer B (in green) are implemented as logical routers on a single physical Juniper router at Salt Lake City.
- The other two routers from AS1, five routers from AS3 and the edge router of customer A (in blue) are implemented by logical routers on a single physical router at Kansas City.
- ION connections connect the Kentucky PCs to the customer routers, while VLANs connect the SLC and KC routers together.
- Traffic is sent from end systems. We can change the BGP routing policies at the routers. Measurement data is collected at these routers and graphs can be viewed by end users.