

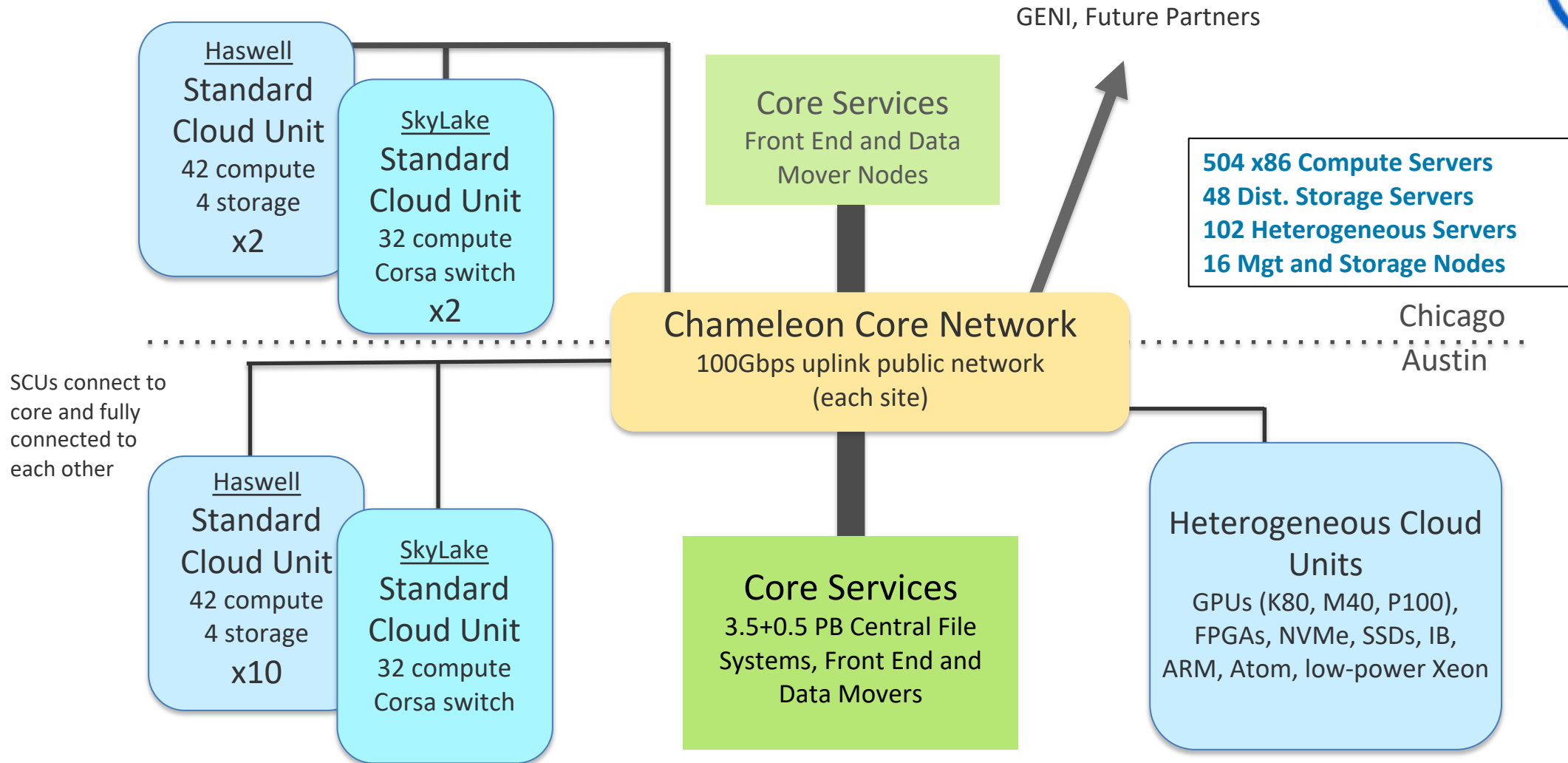


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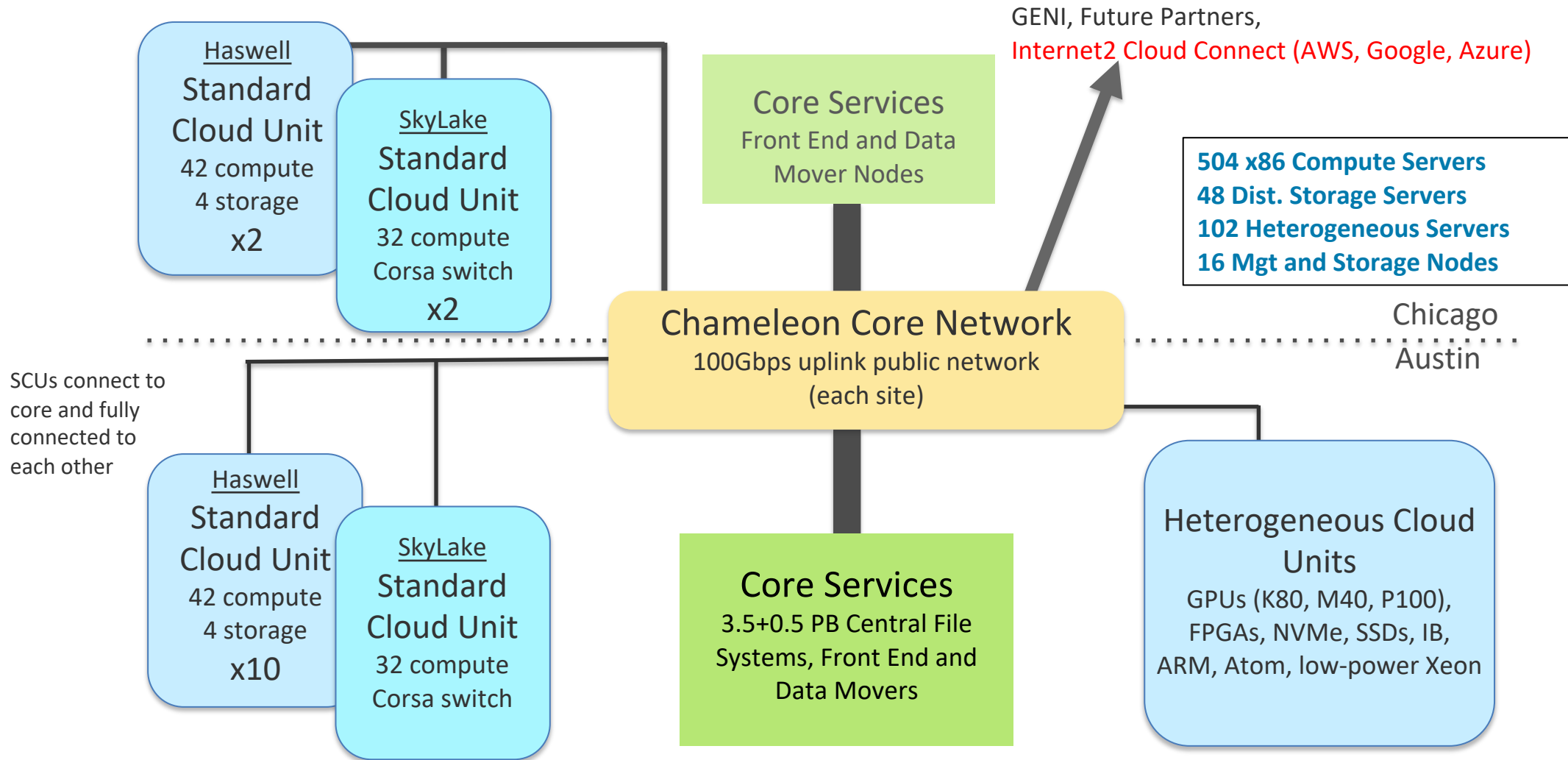
Experimenting with AWS Direct Connect using Chameleon, ExoGENI, and Internet2 Cloud Connect

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Chameleon Infrastructure



Chameleon Infrastructure



Direct Public Cloud Connections

▶ Public cloud services

- AWS Direct Connect, Microsoft Azure ExpressRoute, Google Dedicated Interconnect

▶ Similar to GENI stitching

- ExoGENI stitchports
- Chameleon direct stitching

▶ Challenges

- Requires BGP (layer3) vs. pure layer2
- Cost of physical connection
- Difficult configuration (BGP, regional/campus VLANs).

AWS Direct Connect

► Cloud

- VPC
- EC2 Instance
- Virtual Private Gateway

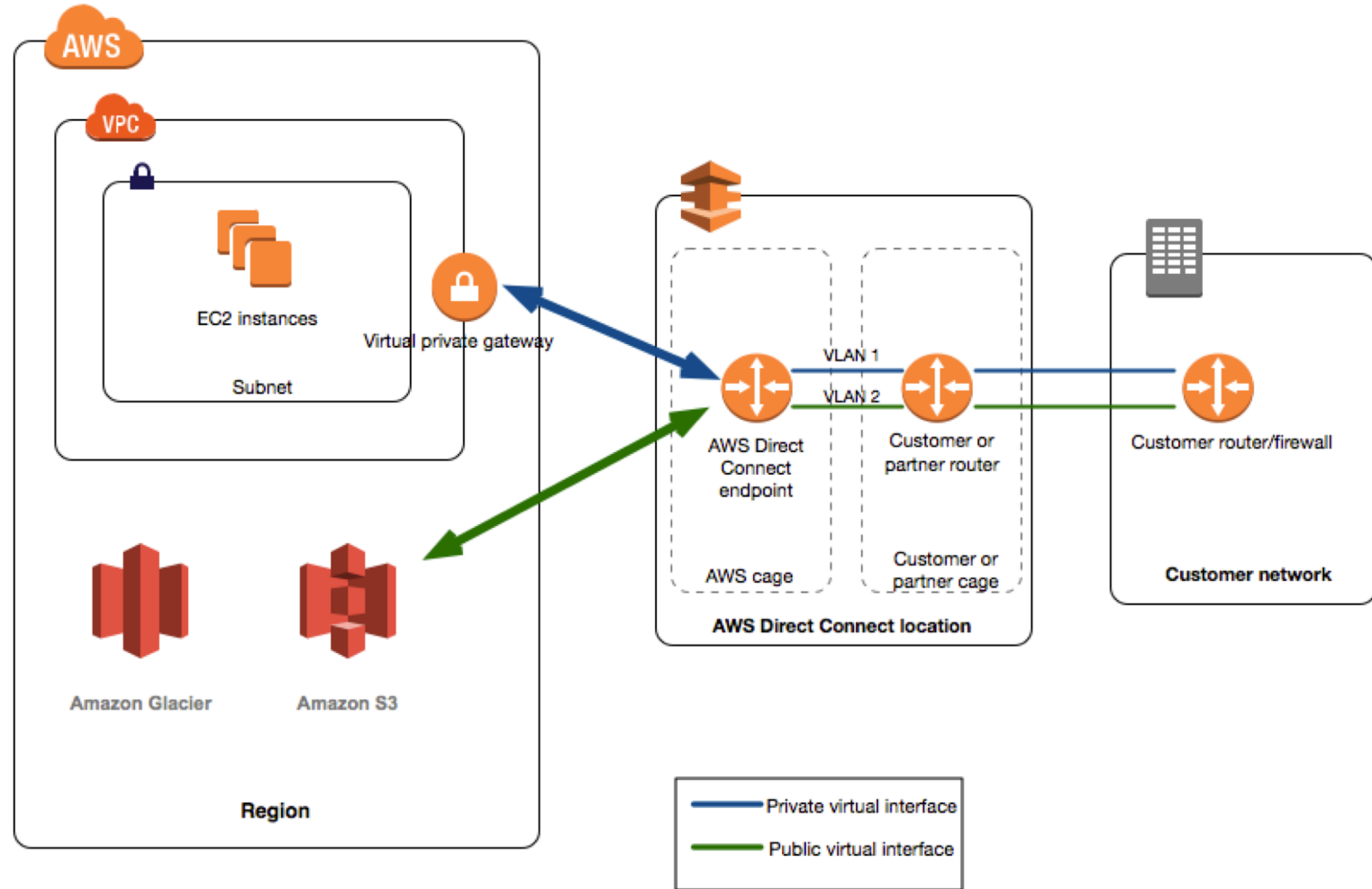
► Direct Connect

Location

- Physical layer2 meeting point

► Customer Network

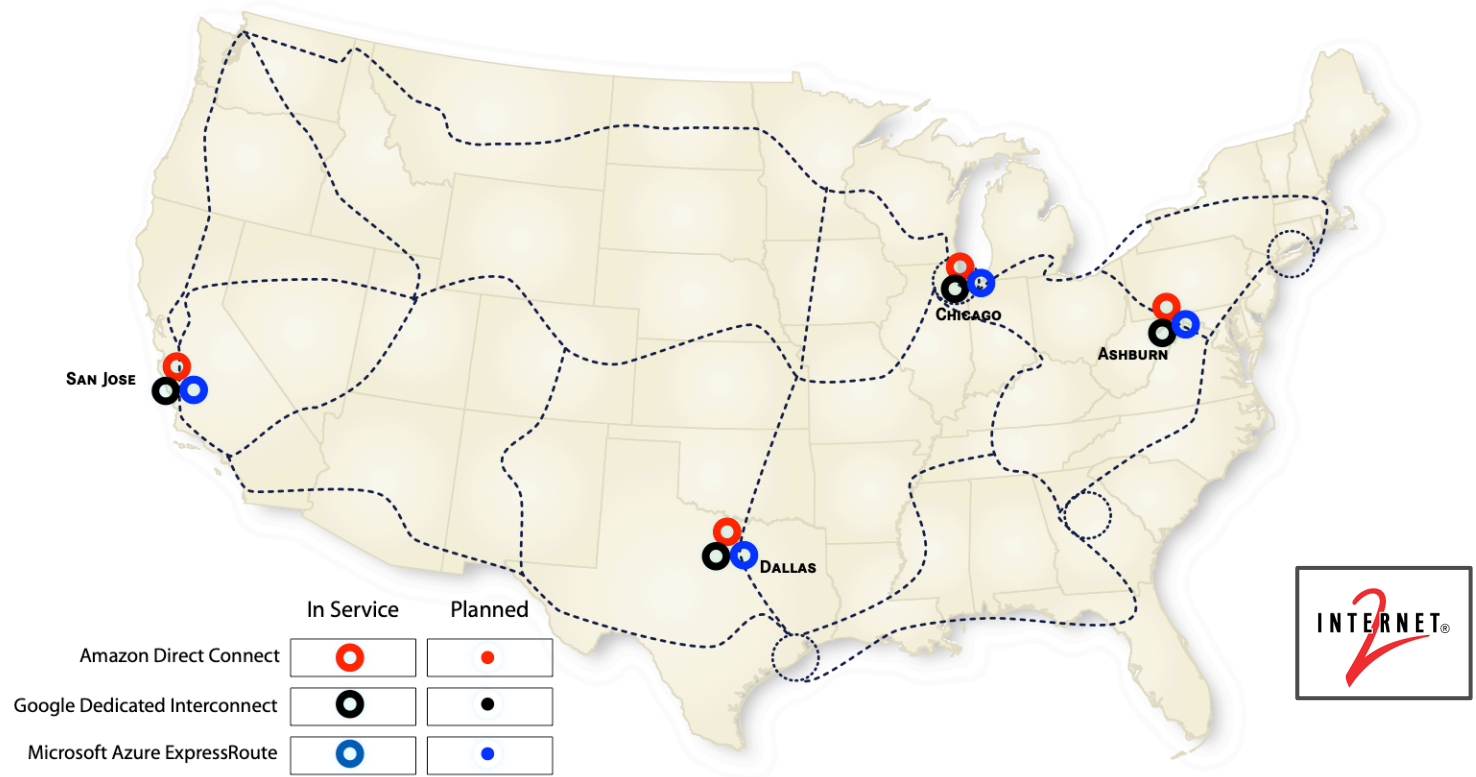
- BGP Router



Internet2 Cloud Connect

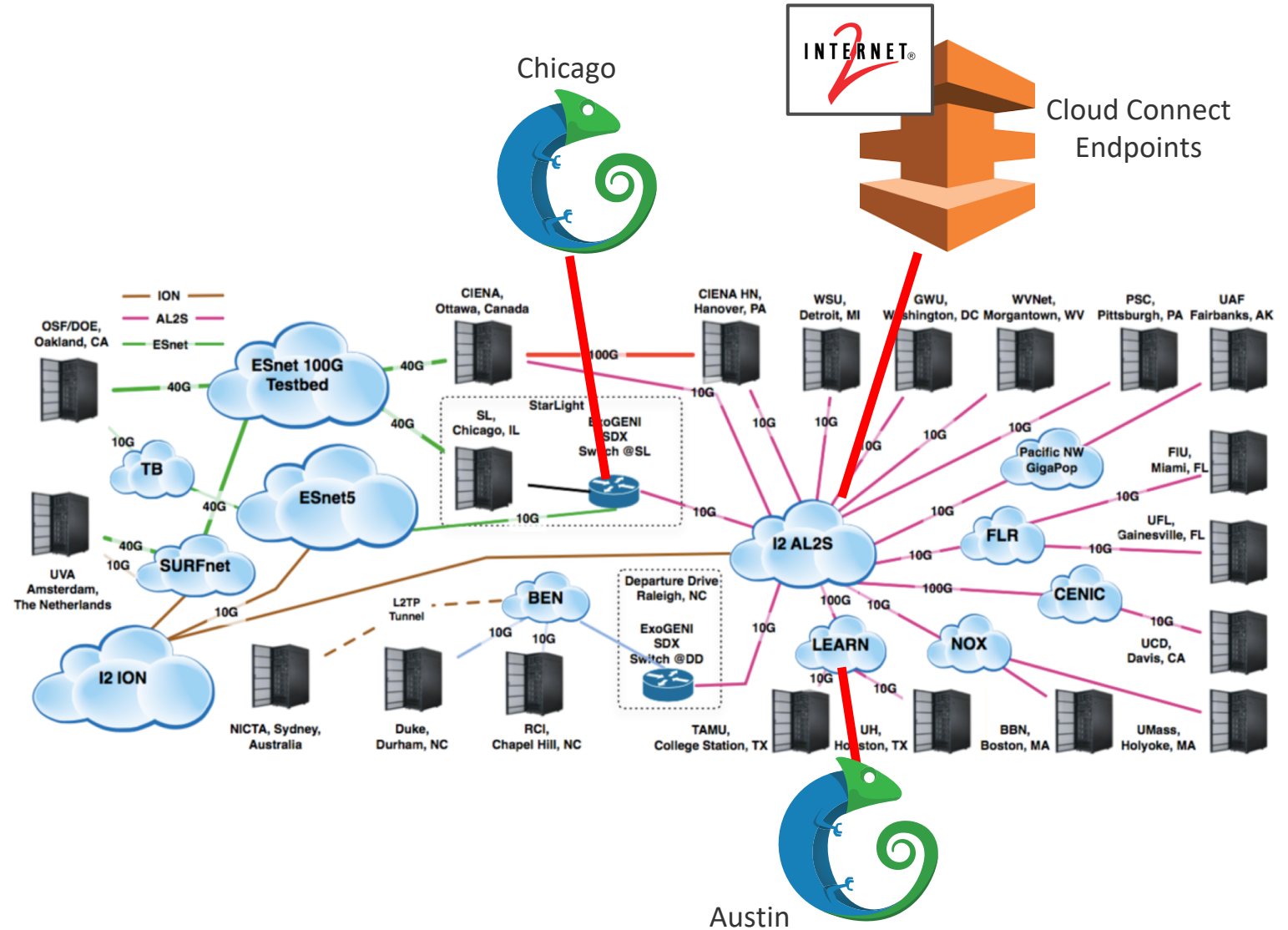
- ▶ Shared Direct Connect Locations
- ▶ AWS, Google, Azure
- ▶ OESS API (AL2S)

INTERNET2 CLOUD CONNECT
APRIL 2019

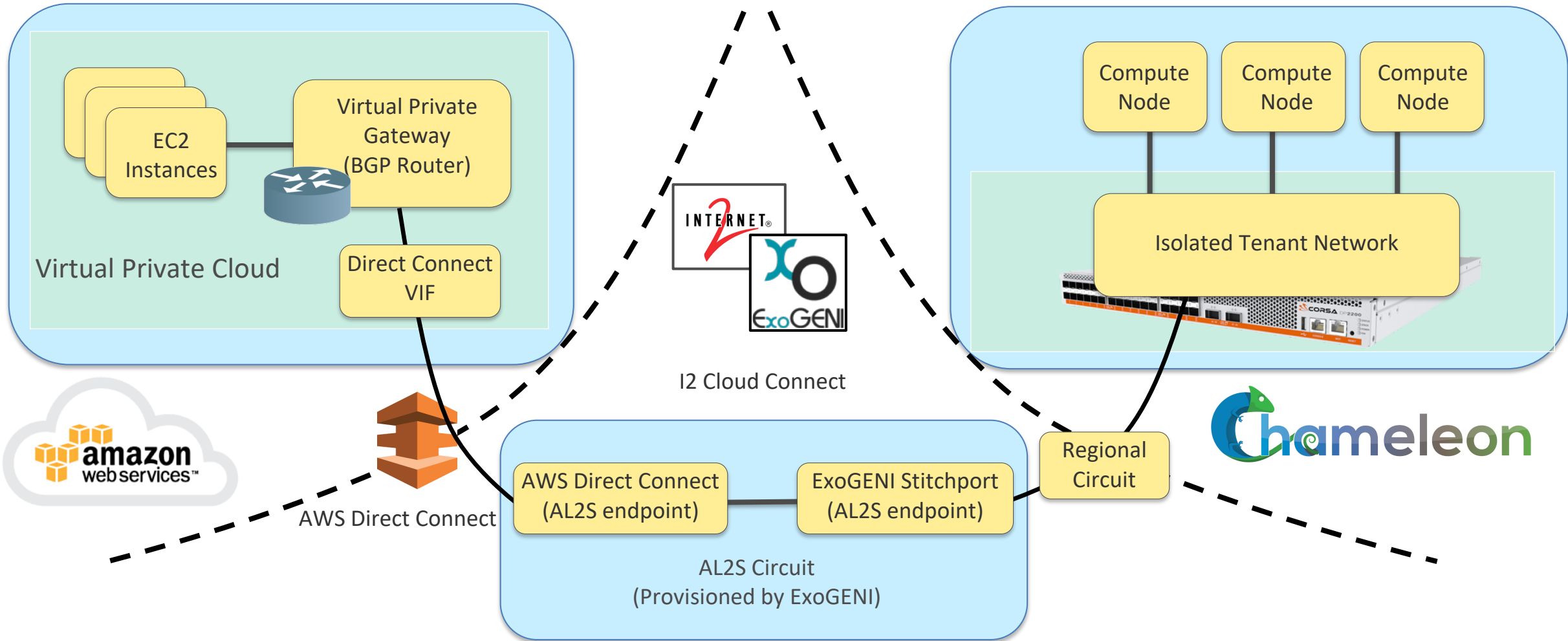


ExoGENI

- ▶ Layer2 stitching between cloud sites
- ▶ Stitchports
 - Campus infrastructure
 - Chameleon
 - Cloud Connect (New!)

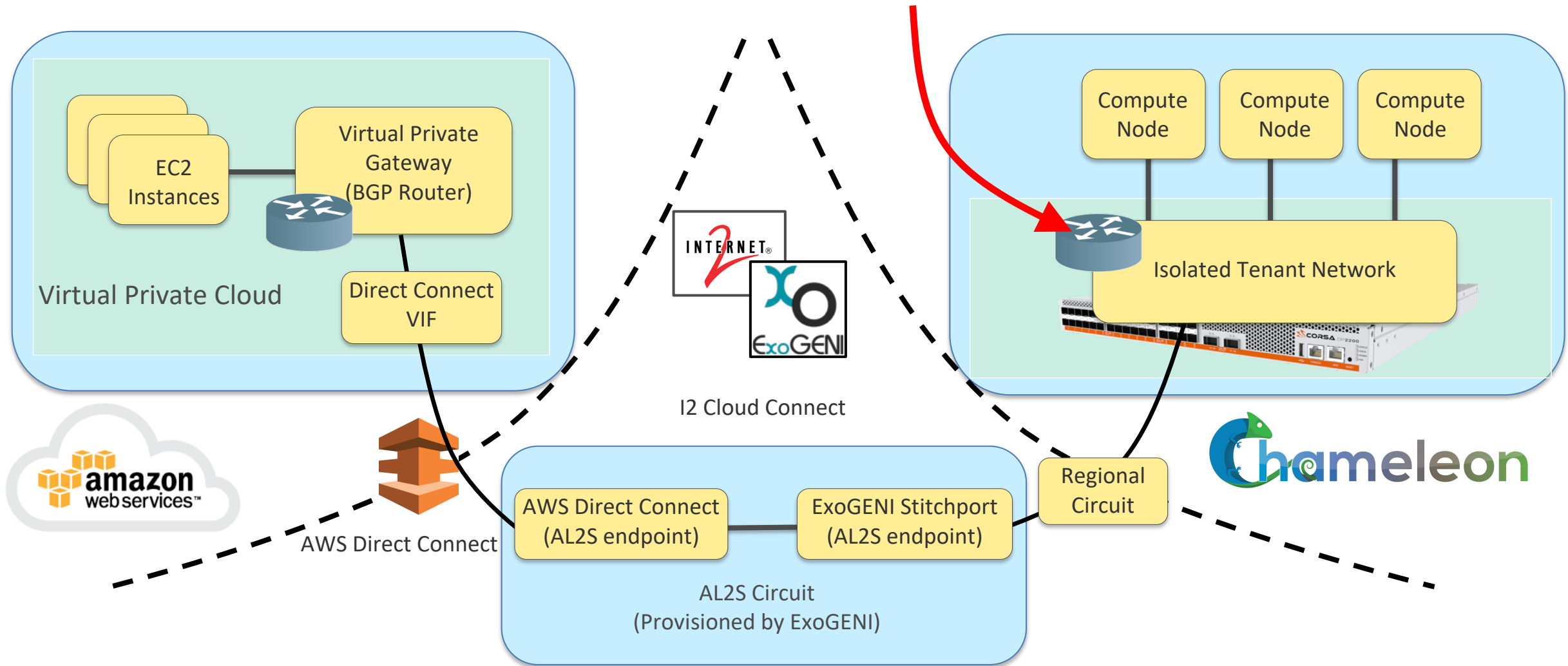


Targeted Infrastructure



Targeted Infrastructure

Problem: We need a BGP router!



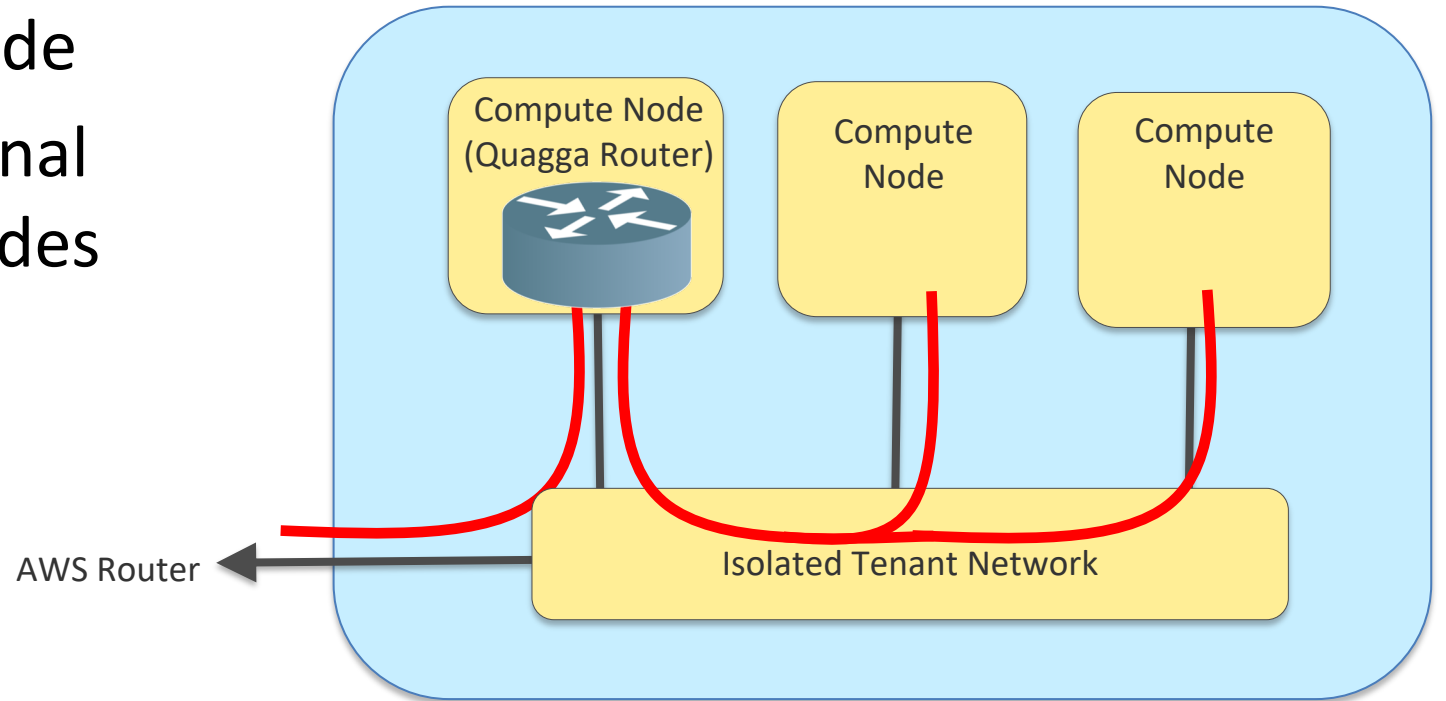
Option 1: Software BGP Router

► Quagga

- Hosted in compute node
- Routes between external circuit and internal nodes

► Pros/cons

- Simple to setup
- Limited performance



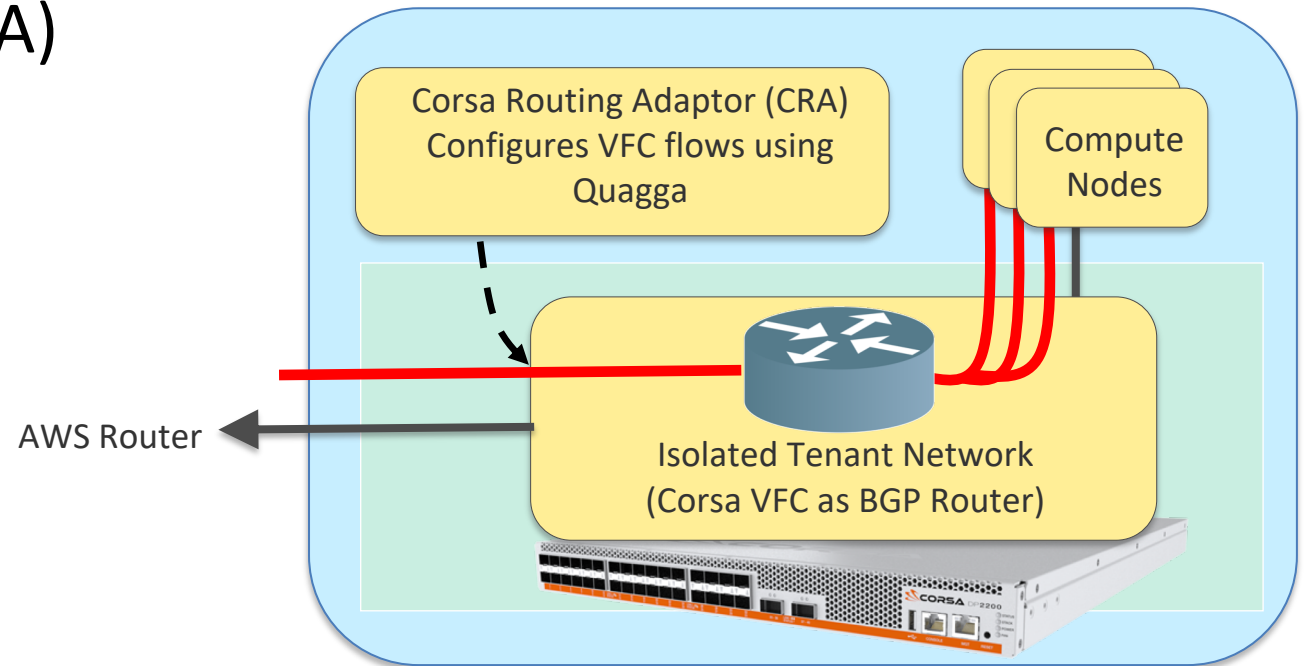
Option 2: Hardware BGP Router (SDN)

► Corsa SDN

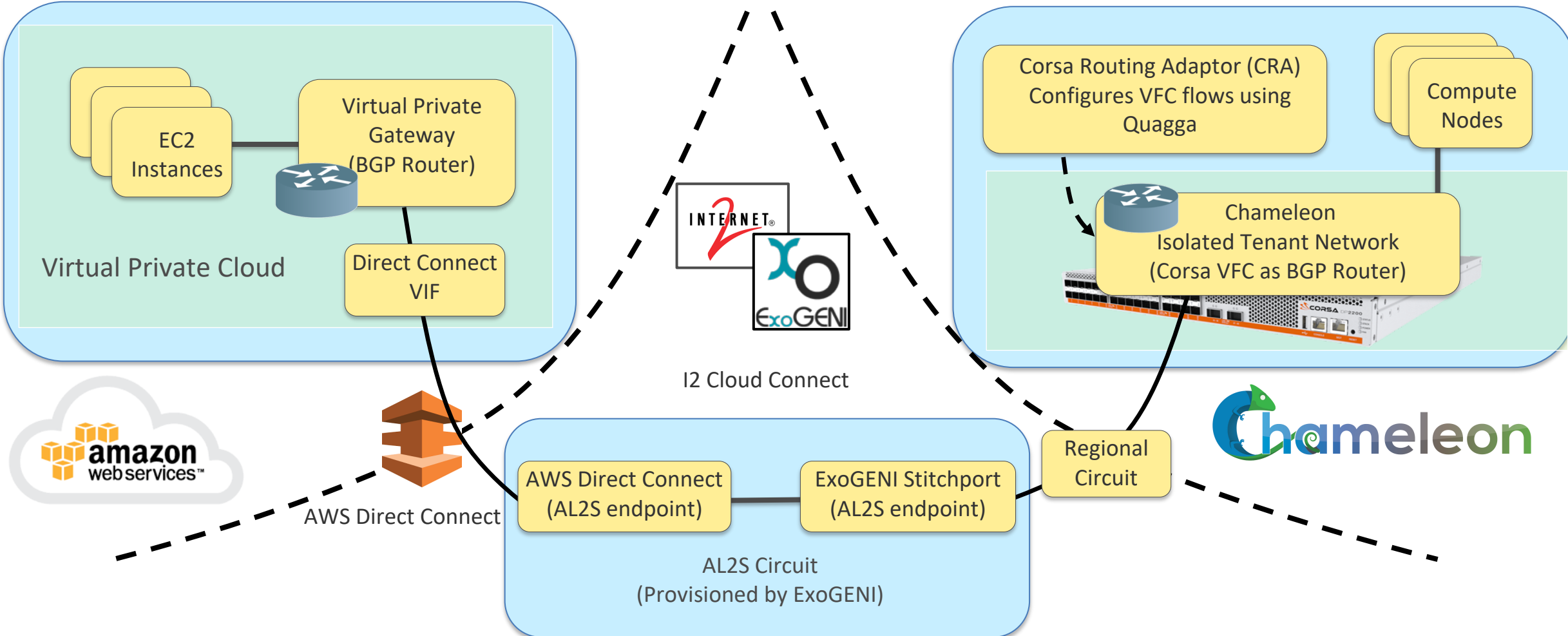
- Corsa Routing Adapter (CRA)
- Configured with Quagga

► Benefits

- Full hardware dataplane



Experiment Infrastructure: End-to-end Hardware Path



Thank You

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