



Layer 2 Provisioning with AutoGOLE/SENSE

5th Global Research Platform Workshop (5GRP)

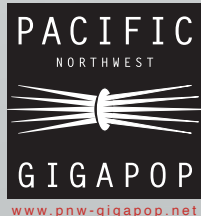
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Network Architect, CENIC

September 16, 2024



With support from the
National Science Foundation
(Award #2029306)



Pacific Wave International Research & Education Exchange Project

- Joint project of CENIC (California regional R&E network) and PNWGP (US Pacific Northwest regional R&E network)
- Open Exchange supporting both commercial and R&E peers
- Currently serve 29 countries across the Pacific connecting to the Western US
- Supported in part by a grant from the US National Science Foundation (Award 2029306)





Core Pacific Wave POPs

US West Coast

- Westin Building, 2001 Sixth Ave, Seattle, Washington 98121
- 818 W 7th, Los Angeles, California
- 600 W 7th, Los Angeles, California
- 1 Wilshire (624 S. Grand), Los Angeles, California
- 1380 Kifer Road, Sunnyvale, California 94086
- 529 Bryant Street, Palo Alto, California 94301

Tokyo, Japan

- NTT Otemachi, 2-3-5 Otemachi, Chiyoda-ku, Tokyo 100-0004, Japan
- KDDI Otemachi, 1-8-1 Otemachi, Chiyoda-ku, Tokyo 100-0004, Japan

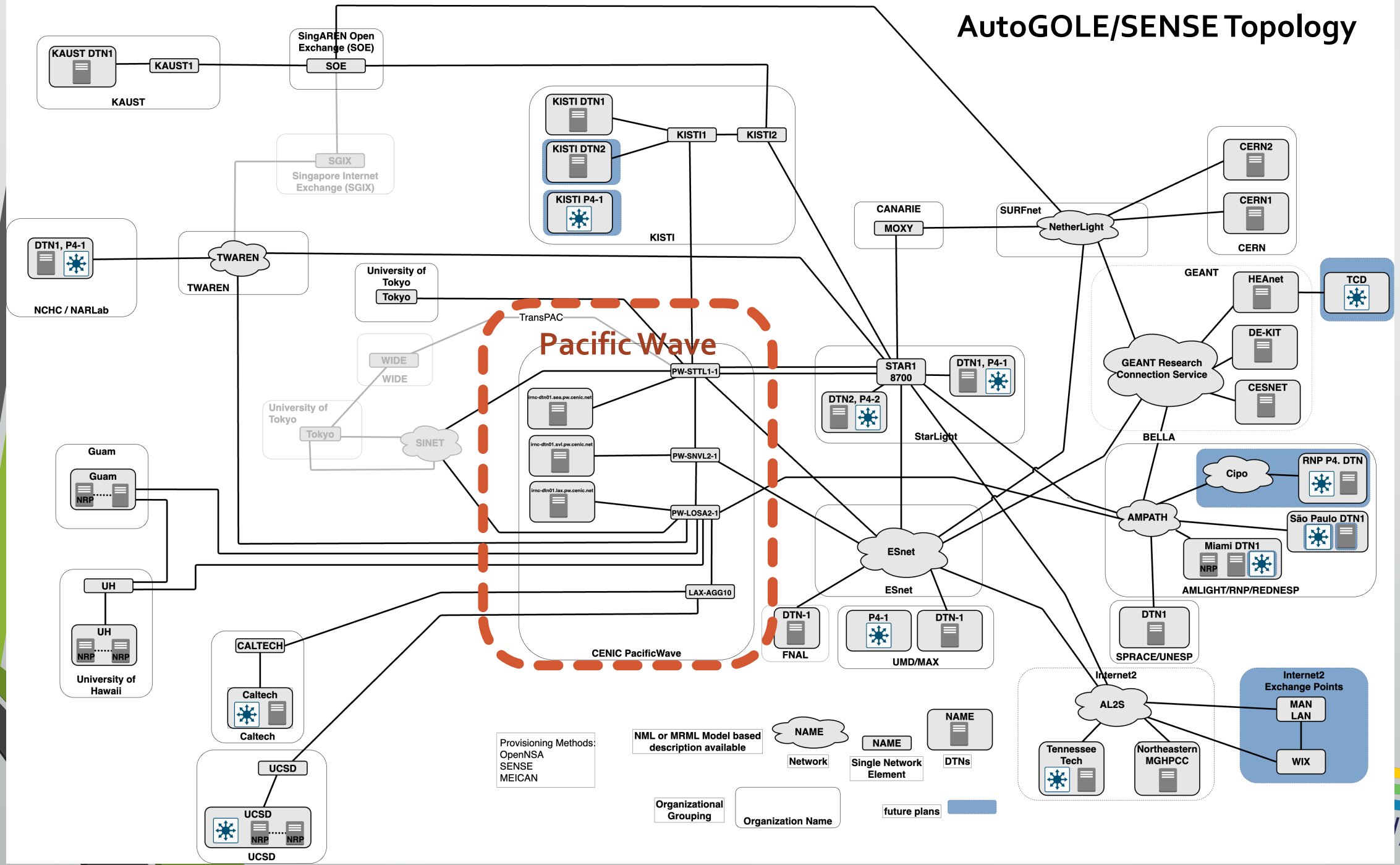
Current Participants

- AARNet
- Amazon
- CANARIE
- CENIC
- CSTNET
- CUDI
- DREN
- ESnet
- FABRIC
- GEMnet
- Google
- Internet2
- JGN (NICT)
- KISTI/KREONET
- Los Nettos
- Microsoft
- NASA NREN
- PNWGP
- PREGINET
- REANNZ
- SINET
- TransPAC
- Transtelco
- TWAREN
- UltraLight

AutoGOLE/SENSE

- AutoGOLE/SENSE provides automated on-demand provisioning of private layer 2 circuits (VLANs) between participating institutions.
- Pacific Wave has migrated our legacy OpenNSA instances to modern Kubernetes infrastructure in LA and Sunnyvale.
- Easy configuration and management with Gitlab and Ansible AWX, supported by CENIC's Systems Engineering team.

AutoGOLE/SENSE Topology



SENSE Orchestrator

INSTANCES

DETAILS ▾

VISUALIZATION

System Refresh On

ACCOUNT

LOGOUT

urn:ogf:network:lsanca.pacificwave.net:2016:pw-losa2-1

PREVIOUS

NEXT

hasBidirectionalPort (13)

hasService

urn:ogf:network:lsanca.pacificwave.net:2016:pw-losa2-1:switch:EVTs.A-GOLE

hasServiceDefinition

urn:ogf:network:lsanca.pacificwave.net:2016:pw-losa2-1:sd:EVTs.A-GOLE

name

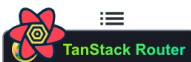
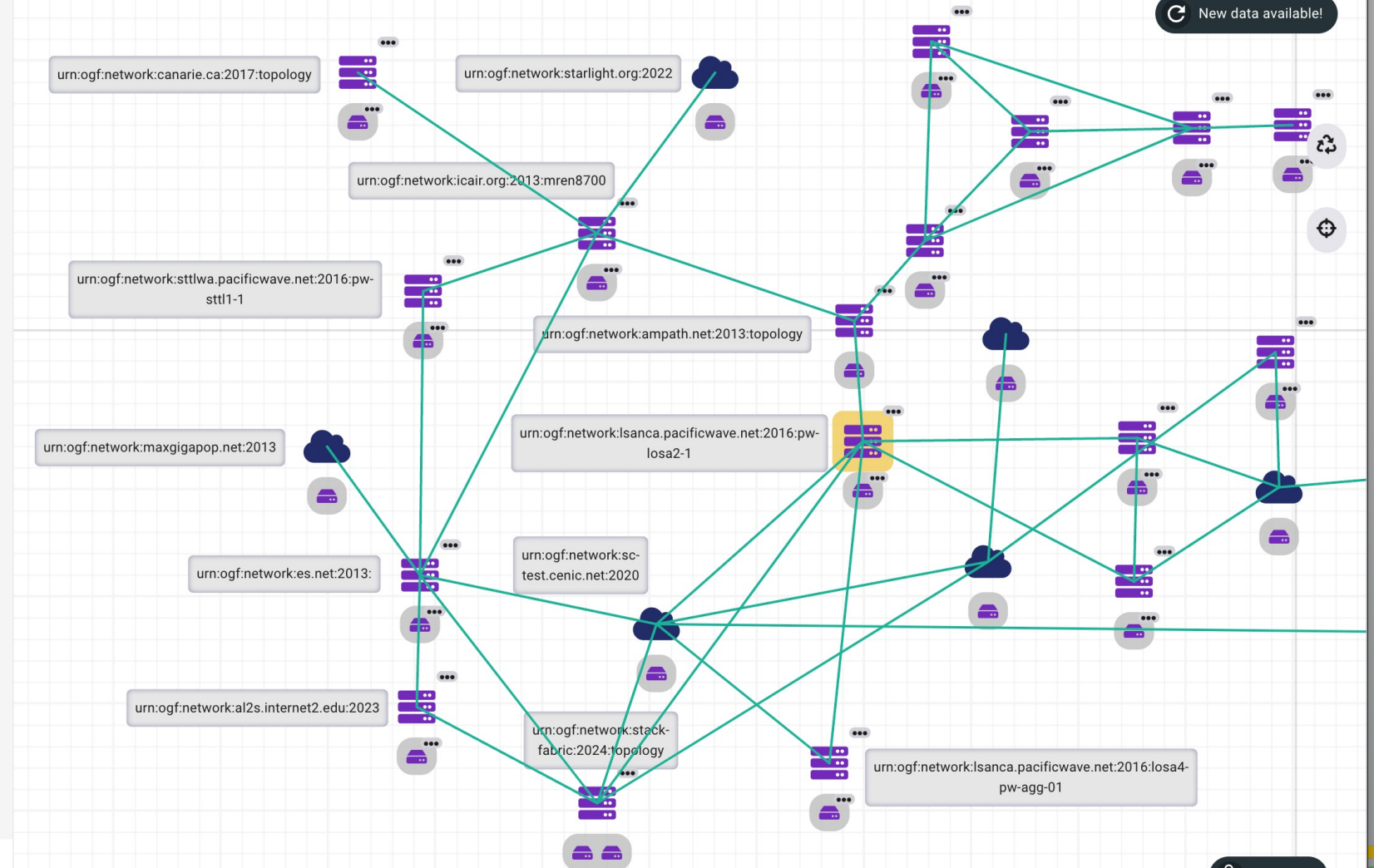
lsanca.pacificwave.net:2016:pw-losa2-1

type

Topology

version

2024-09-13T19:22:31.135099Z

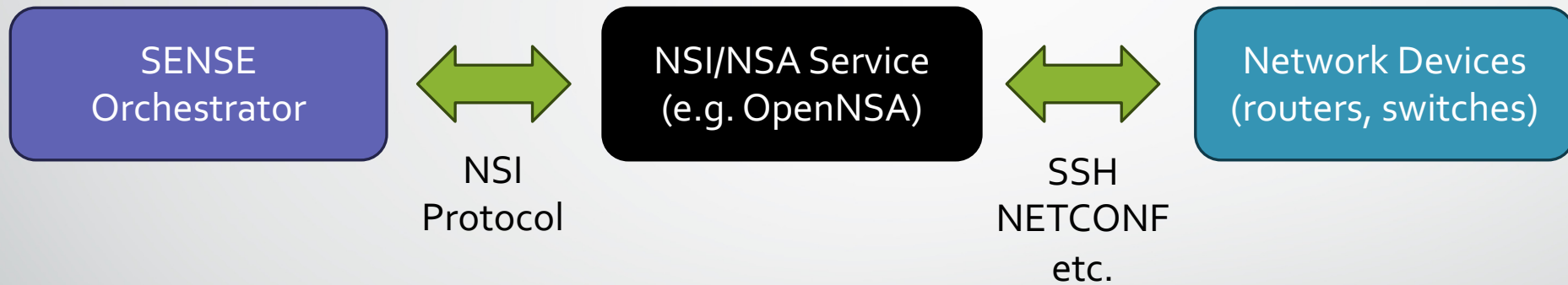


Instances

Search

Clipboard

Orchestration



github.com/BandwidthOnDemand/nsi-node

BandwidthOnDemand / nsi-node Public

Notifications Fork 1 Star 3

<> Code Issues Pull requests Actions Projects Security Insights

master 1 Branch 0 Tags

Go to file

<> Code

About

customazible NSI node with Safnari + PCE + DDS + OpenNSA + NSI Requester + envoy proxy

Readme

BSD-3-Clause license

Activity

Custom properties

3 stars

5 watching

1 fork

Report repository

Releases

No releases published

Packages

No packages published

Languages

Shell 93.3% Smarty 6.7%

hanstrompert update example values.yaml ✓ a5a564d · last year 119 Commits

docs	add SuPA and PolyNSI to README	last year
examples	update example values.yaml	last year
templates	initial NSI node Helm chart with Safnari, PCE, DDS and en...	3 years ago
.gitignore	initial documentation (#1)	3 years ago
.helmignore	reverted removal of postgresql from subcharts	3 years ago
Chart.yaml	upgrade nsi-node to 0.1.23	last year
LICENSE	initial NSI node Helm chart with Safnari, PCE, DDS and en...	3 years ago
README.md	add deploy.sh to create needed configmap(s) and secret...	last year
check-certificates.sh	skip non-file certificates (including broken symlinks)	3 years ago
create-config.sh	add deploy.sh to create needed configmap(s) and secret...	last year
deploy.sh	add deploy.sh to create needed configmap(s) and secret...	last year

README BSD-3-Clause license

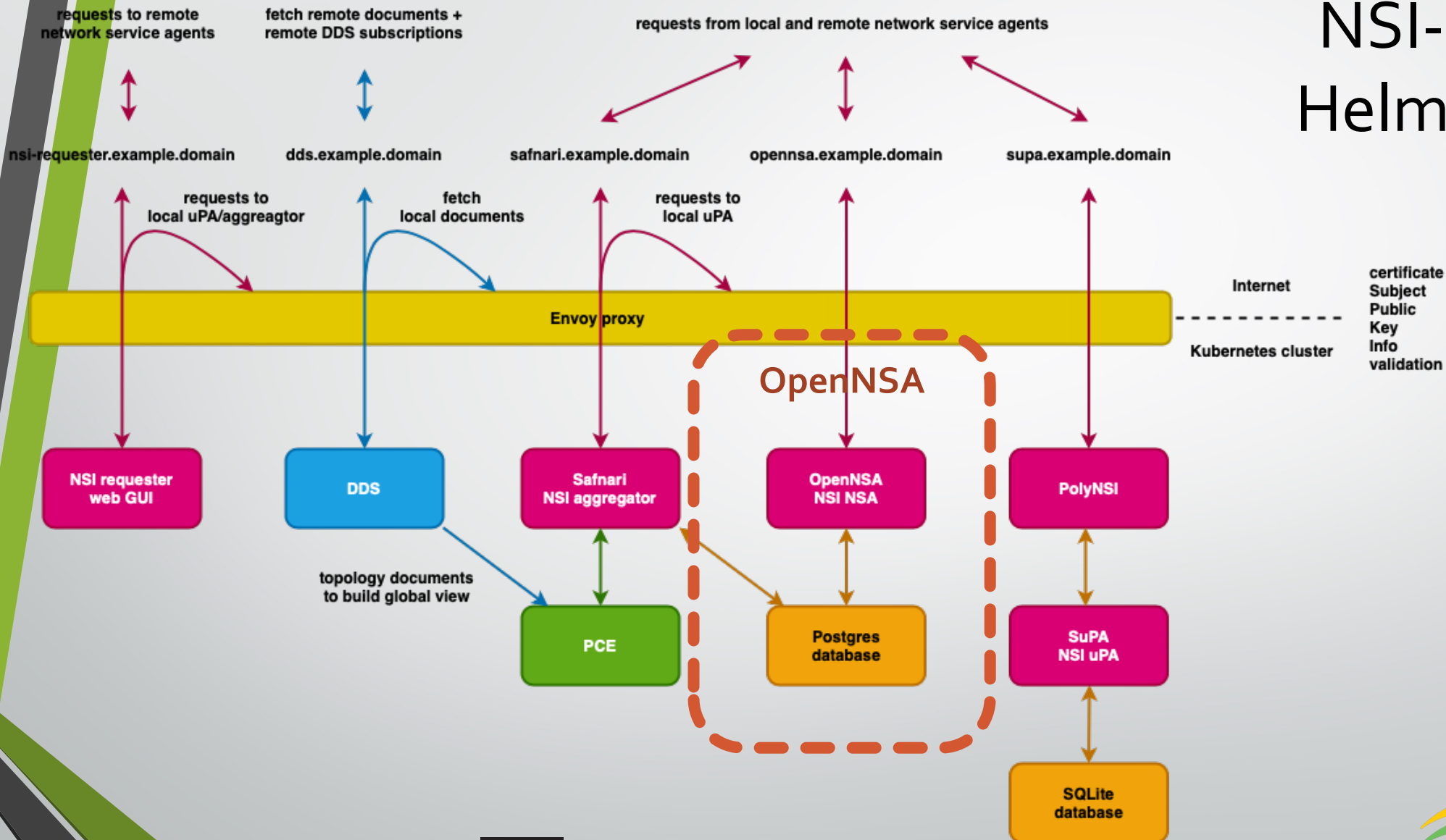
NSI-node

NSI-node is a [Helm](#) chart to install a configurable combination of the NSI aggregator [Safnari](#) and [PCE](#), [Document Distribution Service](#), network service agent [OpenNSA](#), ultimate provide agent [SuPA](#) in combination with NSI SOAP/gRPC proxy [PolyNSI](#), and [NSI requester client](#), together with a [Postgresql](#) database and [Envoy](#) proxy for access authorisation.

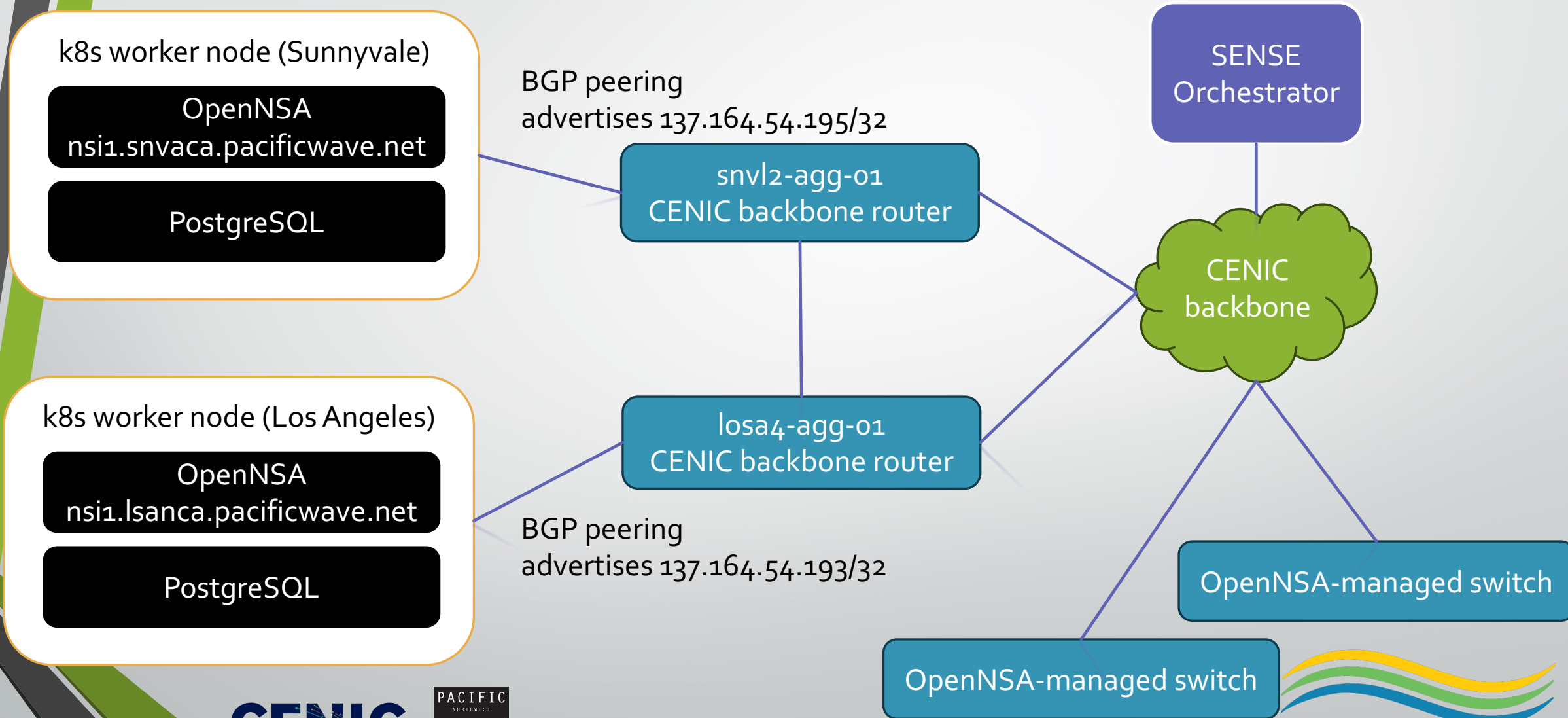
NSI-node Helm chart



NSI-node Helm chart



Kubernetes Topology for OpenNSA



OpenNSA on Kubernetes

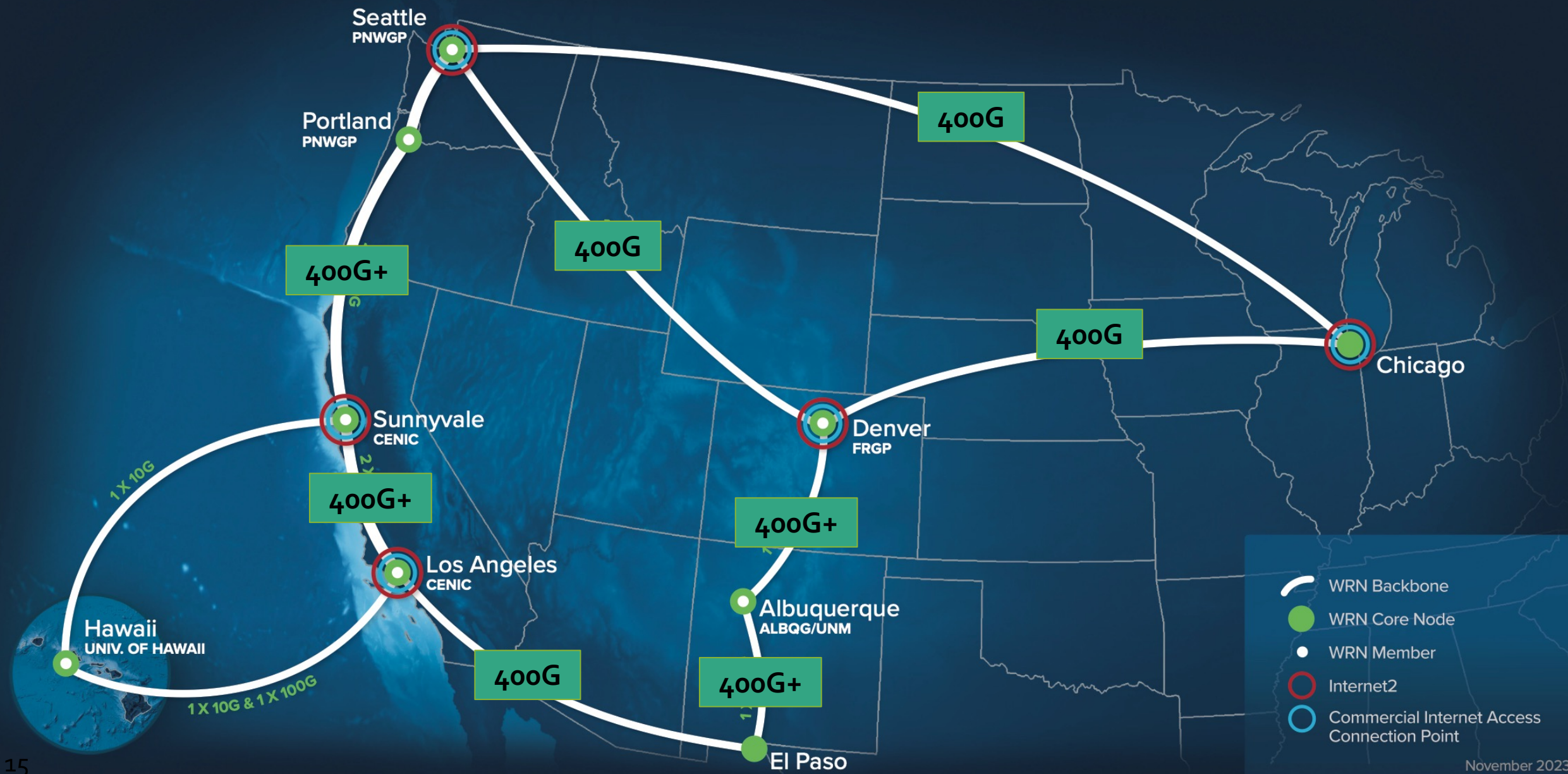
The screenshot shows the AWS-PPM web interface. The left sidebar contains navigation links: Jobs, Schedules, My View, Resources, Templates, Credentials, Projects, Inventories, Inventory Scripts, ACCESS, Organizations, Users, and Teams. The main content area has tabs for DETAILS, PERMISSIONS, COMPLETED JOBS, SCHEDULES, ADD SURVEY, and WORKFLOW VISUALIZATION. The DETAILS tab is active, showing a survey named 'Deploy OpenNSA to lsanca'. The survey configuration includes an INVENTORY field with the value 'irnc-10g01.svl.pw.cenic.net', a LIMIT field, and an EXTRA VARIABLES field with a tab for YAML and JSON. The survey is also associated with a template named 'TEMPLATES 4'.

The screenshot shows the GitLab web interface. The top bar includes a search bar and user information. The main content area displays a commit titled 'added igrok-la ports to pw-losa2-1 topology' by Christopher Bruton. Below the commit, the file 'opennsa--pw-losa2-1.nrm' is shown with a size of 2.64 KIB. The file content is a YAML configuration for a topology, including sections for 'pw-losa2-1 topology/NRM definitions', 'Example format', 'PacWave participants', 'PacWave infrastructure', and 'Local resources'.

```
1 # pw-losa2-1 topology/NRM definitions
2
3 # Example format
4 #
5 # type      name      remote      label      bandwidth  interface  attributes
6 #
7 # ethernet  ps      -      vlan:1780-1787  1000      em0      -
8 # ethernet  eth     -      -      1000      em8      -
9 # ethernet  port1   NetworkA#portX(-in|-out)  vlan:1781-1787  1000      em1      -
10 # ethernet  port2   NetworkB#portY(-in|-out)  vlan:1782-1787  1000      em2      -
11 # ethernet  sp      NetworkP#portZ(-in|-out)  mpls:10-20      1000      em4      -
12 #
13
14 # PacWave participants
15
16 ethernet  sinet-los_angeles  sinet.ac.jp:2013#topology:(pacificwave_sinet|sinet_pacificwave)  vlan:867,1315-1317
17 ethernet  atlanticwave-100g  ampath.net:2013#topology#pacificwave-la-(-in|out)  vlan:985-989
18 ethernet  hawaii-scldmz      uhnet.net:2021#hawaii-scldmz:pw-losa2-1(-in|-out)  vlan:1779-1789
19 ethernet  guam-gorex         uhnet.net:2021#guam-gorex:pw-losa2-1(-in|-out)  vlan:1784-1788
20
21
22 # PacWave infrastructure
23
24 ethernet  pw-snl2-1          snvaca.pacificwave.net:2016#pw-snl2-1:pw-losa2-1(-in|-out)  vlan:981,1070-1079
25 ethernet  losa4-pw-agg-01    lsanca.pacificwave.net:2016#losa4-pw-agg-01:pw-losa2-1(-in|-out)  vlan:1779-1799
26
27
28 # Local resources
```

Future Enhancements

- Improved monitoring of service availability using Zabbix
- Integration with Cisco Network Services Orchestrator (NSO)
- EVPN-VXLAN orchestration
- Do we keep using OpenNSA?
- Expand coverage to more 400G+ network segments



NA-REX North America Research & Education Exchange Collaboration



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<https://pacificwave.net>

