



Bundesministerium
für Wirtschaft
und Klimaschutz

SCS-VP04 & dNation



presentation for



Canonical

About Matej



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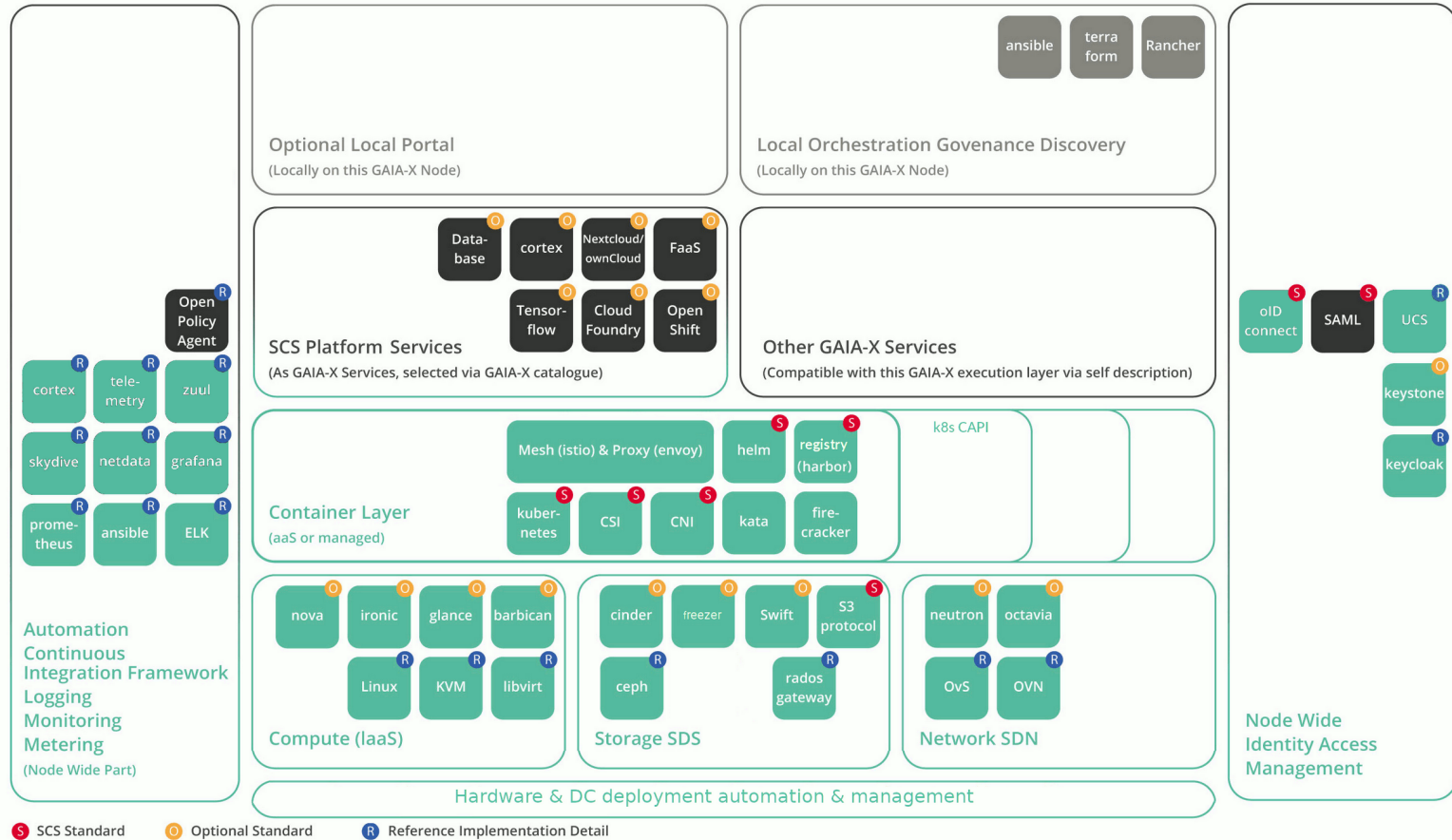
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Sovereign Cloud Stack

- Open-source
- Standardized
- Modular



SCS-VP04 Networking



Software for Open Networking in the Cloud



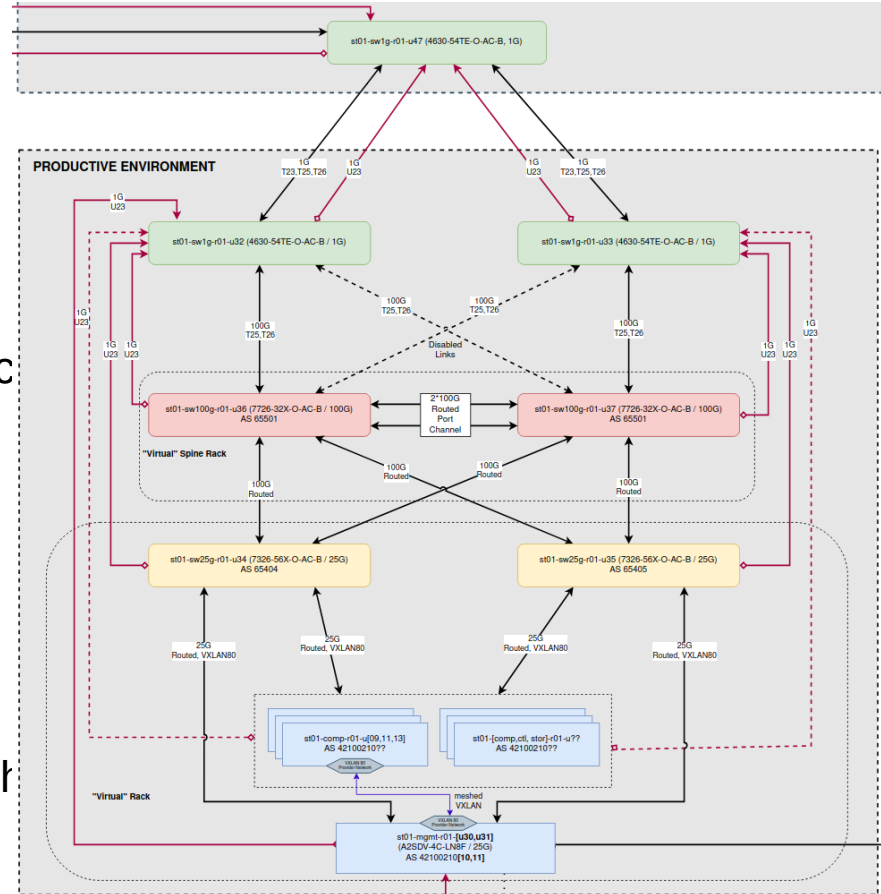
- Free and Open Source network operating system based on Linux
- Decouples hardware and software, promoting interoperability in network solutions
- Supported by more than 100 switch platforms and all major ASICs
- Highly extensible through a container-based architecture and standardized APIs
- dNation is contributing to the upstream SONiC repositories through the SCS project to improve this open-source platform
 - **PR20333** Support configuring source IPv6 for routes
 - **PR3565** Fix handling of optional fields in get_bgp_peer function

Challenge: Auto-provisioning and management of SONiC switches



- SCS environment - 4 types of Edge-core switch
- AS4630-54TE (1G), AS5835-54X (10G)
- AS7326-56X (25G), AS7726-32X (100G)
- Community version of SONiC
- Set up a pure L3 (BGP) underlay
- Integrated FRR configuration on SONiC switch

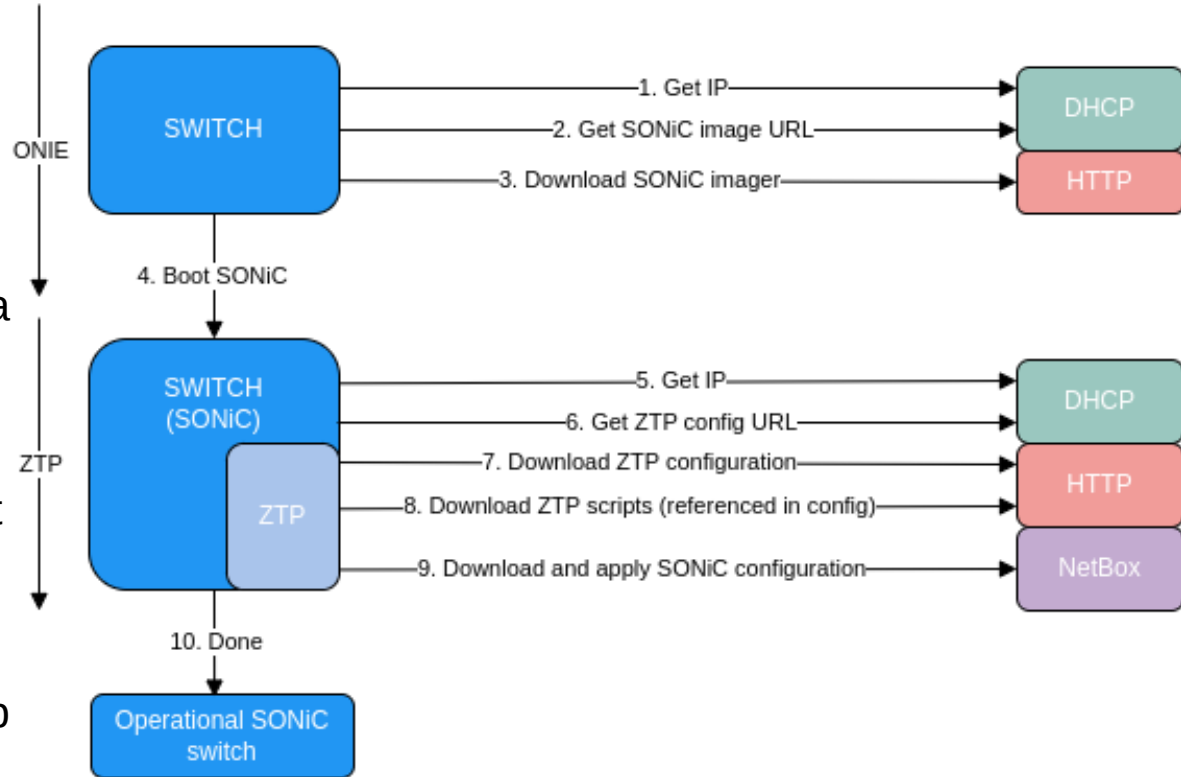
Enlarged version of picture



Solution: ONIE & ZTP & NetBox



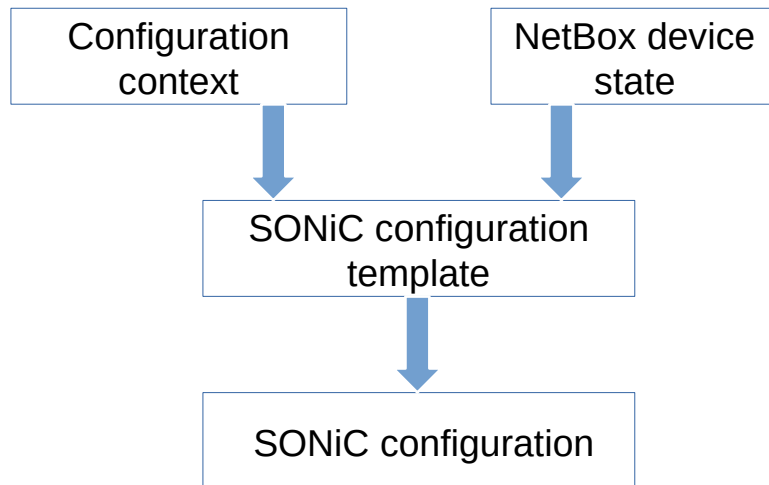
- System that automates the provisioning and management of a fleet of SONiC switches
- Zero-Touch Provisioning (ZTP), Open Network Install Environment (ONIE), and NetBox as our single source of truth.
- Reduce the need for manual setup
- Minimize human error
- Deploy at scale



Solution: NetBox – the source of SONiC configuration



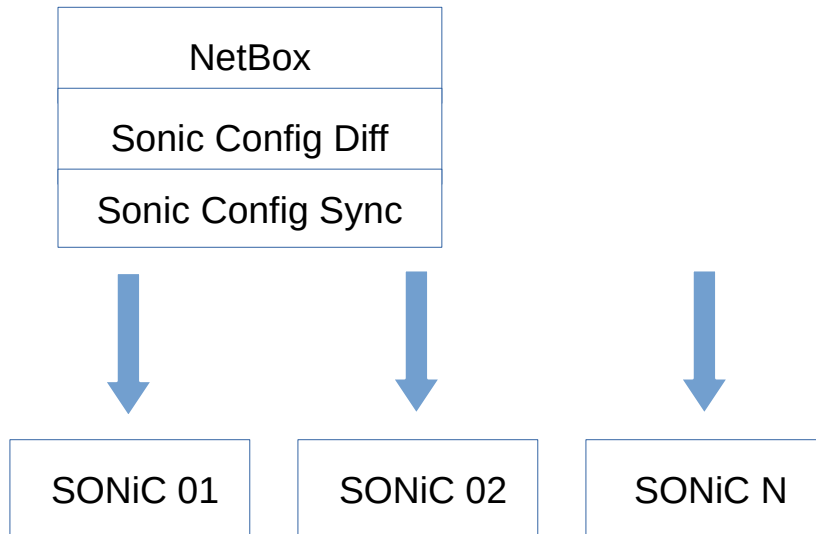
- SONiC switch configuration
 - Configuration template
 - Device state in NetBox
 - Configuration context in Netbox (static settings e.g. NTP servers..)



Solution: NetBox – a management tool for SONiC



- SONiC switch management MVP
 - NetBox - SONiC Config Diff
 - Identifies configuration discrepancies between SONiC devices and NetBox
 - NetBox - SONiC Config Sync
 - Apply updates to the SONiC device based on NetBox configuration



Solution: NetBox – a management tool for SONiC

Devices / ST01

st01-sw1g-r01-u42

Created 2024-11-07 09:40 · Updated 2024-11-08 13:00

DeviceModule Bays2Interfaces55Console Ports1Config Context

Config Compliance

Devicest01-sw1g-r01-u42

StatusCompliant

Devices / ST01

st01-sw1g-r01-u42

Created 2024-11-07 09:40 · Updated 2024-11-08 13:00

+ Add ComponentsBookmarkSubscribeCloneEditDelete

DeviceModule Bays2Interfaces55Console Ports1Config ContextRender ConfigConfig Compliance1ContactsJournalChangelog

Config Compliance

Devicest01-sw1g-r01-u42

StatusDiff

Diff

	@@ -496,9 +496,6 @@		
496	"Vlan35 Ethernet52": {	496	"Vlan35 Ethernet52": {
497	"tagging_mode": "tagged"	497	"tagging_mode": "tagged"
498	},	498	},
499	- "Vlan35 Ethernet56": {		
500	- "tagging_mode": "tagged"		
501	- },		
502	"Vlan36 Ethernet52": {	499	"Vlan36 Ethernet52": {
503	"tagging_mode": "tagged"	500	"tagging_mode": "tagged"
504	},	501	},

Scripts / Sonic_config_sync / SonicConfigSync / 2024-11-11 14:06:49

Results

Log threshold Debug

Started: 2024-11-11 14:06:49 Duration: 0 minutes, 16.69 seconds Completed

Log

LINE	TIME	LEVEL	OBJECT	MESSAGE
1	2024-11-11T14:06:50.294332+00:00	Info	—	Working with device(s): st01-sw1g-r01-u42, st01-sw10g-r01-u38, st01-sw10g-r01-u39, st01-sw100g-r01-u41
2	2024-11-11T14:06:54.461517+00:00	Success	st01-sw1g-r01-u42	NetBox configuration synced.
3	2024-11-11T14:06:59.438992+00:00	Success	st01-sw10g-r01-u38	NetBox configuration synced.
4	2024-11-11T14:07:03.614401+00:00	Success	st01-sw10g-r01-u39	NetBox configuration synced.
5	2024-11-11T14:07:06.582365+00:00	Success	st01-sw100g-r01-u41	NetBox configuration synced.

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Goals for



Support of the community around SONiC

- 884 open PRs upstream

Dynamic SONiC configuration via Openstack

Monitoring: Prometheus exporter for SONiC

- Monsoon: Supports Broadcom Enterprise SONiC only
- sonic-exporter: Community Prometheus exporter, only 1 contributor
- Suits well dNation Monitoring

SCS Community: Talks with universities

Following universities showed interest in our SCS work

- University of Muenster - currently migrating from Cumulus to SONiC
- GWDG - using Cumulus on Nvidia switches at scale, looking at Pica8 on inexpensive Broadcom switches
- University of Bamberg - dynamic OpenStack/Kubernetes cluster spanning across multiple universities