NETWORK AUTOMATION FORUM

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL® Company

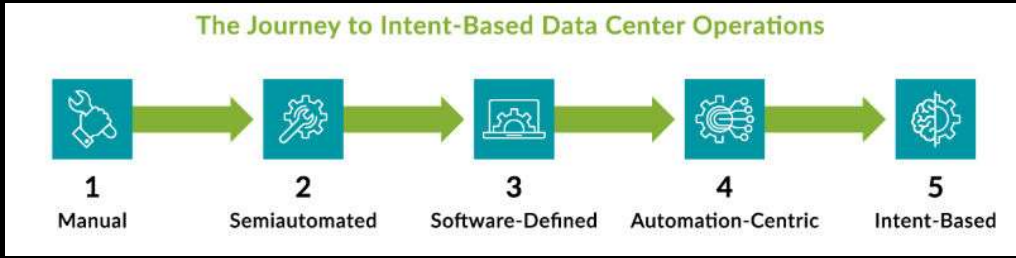
Intent-Based MPLS Router and WAN Provisioning

Matthew Deibel - Southern California Edison
IT Grid Automation Manager

AUTOCON 2

THE NETWORK AUTOMATION CONFERENCE

Intent Based Networking



Manual - CLI, SNMP, and basic and discrete tools

Semiautomated - Scripts and rules-based management

Software-defined - A software abstraction of the network infrastructure

Automation-centric - Automating provisioning, configuration, deployment, and orchestration

Intent-based - Automated actions that keep the network aligned with dynamic business intent

What and Why?

Goal: Have an efficient deployment model for new Nokia MPLS routers and MPLS services that would enable an aggressive refresh schedule without compromising configuration integrity.

Challenges:

Legacy TDM Transport migrating to MPLS transport

Aging infrastructure for critical Grid applications

Brand new deployment model with new pain points

How did we overcome:

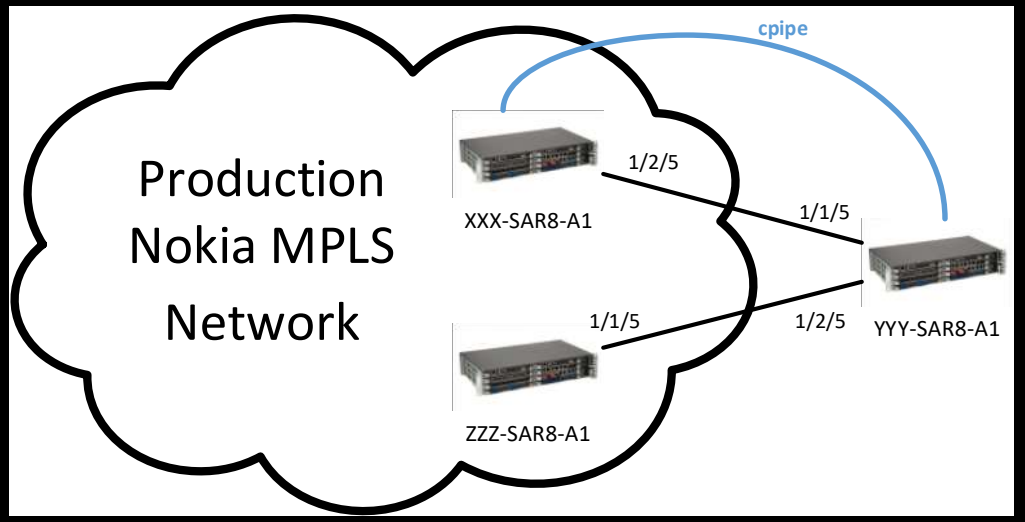
Highly standardized HLD / LLD

Internal automation capabilities

A simple use case

Add one router and one service into an existing production network. How would you accomplish this today?

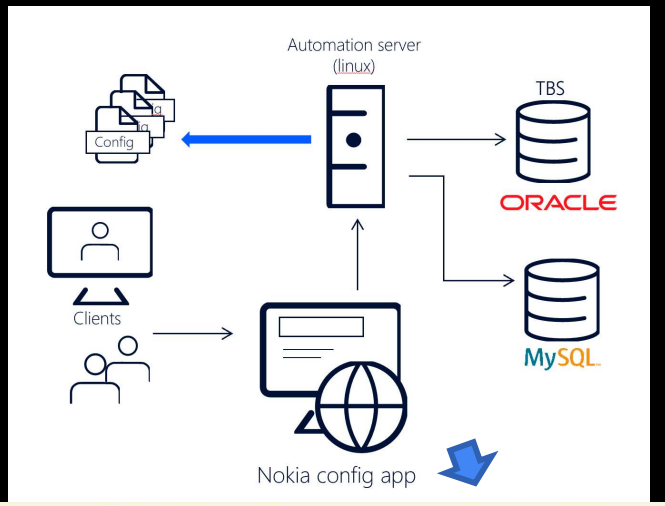
- Who creates the configuration file?
- How do they create it?
- What standards are they following?
- How do you load the configuration onto the device?
- How do you discover the device once in the field?



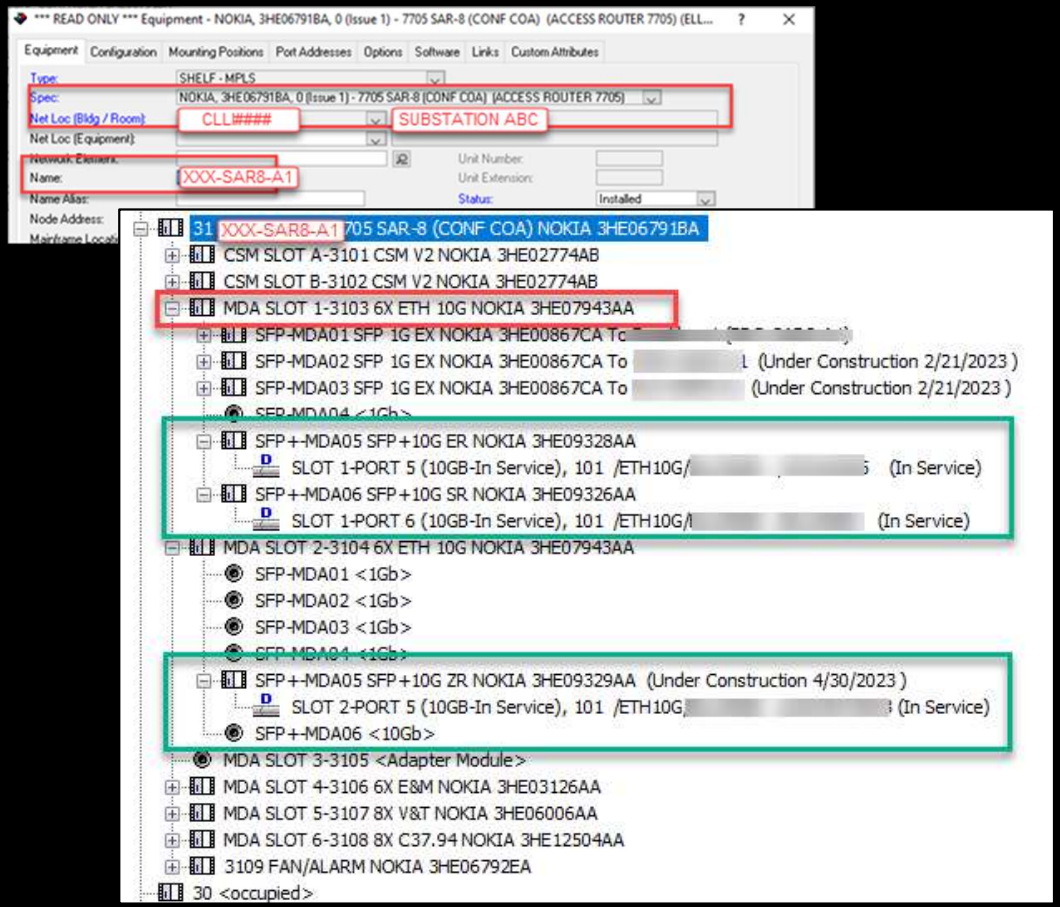
Device Configuration Automation

How was it built:

- Linux / docker container
- Web app developed using React/Python
- Oracle Metasolv (TBS) - Planning tool database for configuration data
- MySQL - Application database



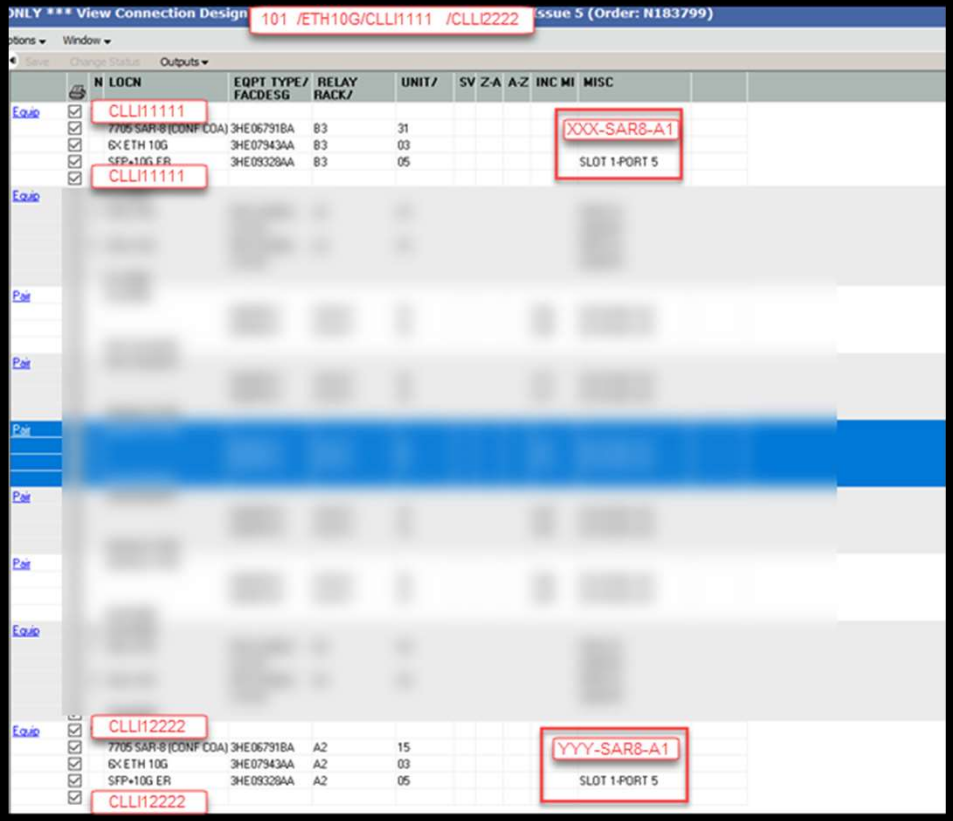
Step 1: Equipment Info



Config template

```
/configure system
        name "XXX-SAR8-A1"
        location "SUBSTATION ABC"
         clli "CLLI####"
        load-balancing
            lsr-load-balancing lbl-ip
            system-ip-load-balancing
        exit
.....


/configure
     card 1
           card-type iom-sar
           no shutdown
     exit

/configure card 1
    mda 1
           mda-type a6-eth-10G
           fabric-stats-enabled
           network
               ingress
                   fabric-policy 100                #10G Policy
specific to this mda-type
                   queue-policy "SCE:High-Speed"       # See
QOS Section.
               exit
           exit
           access
               ingress
                   fabric-policy 100
               exit
           exit
           no shutdown
      exit


.....
```

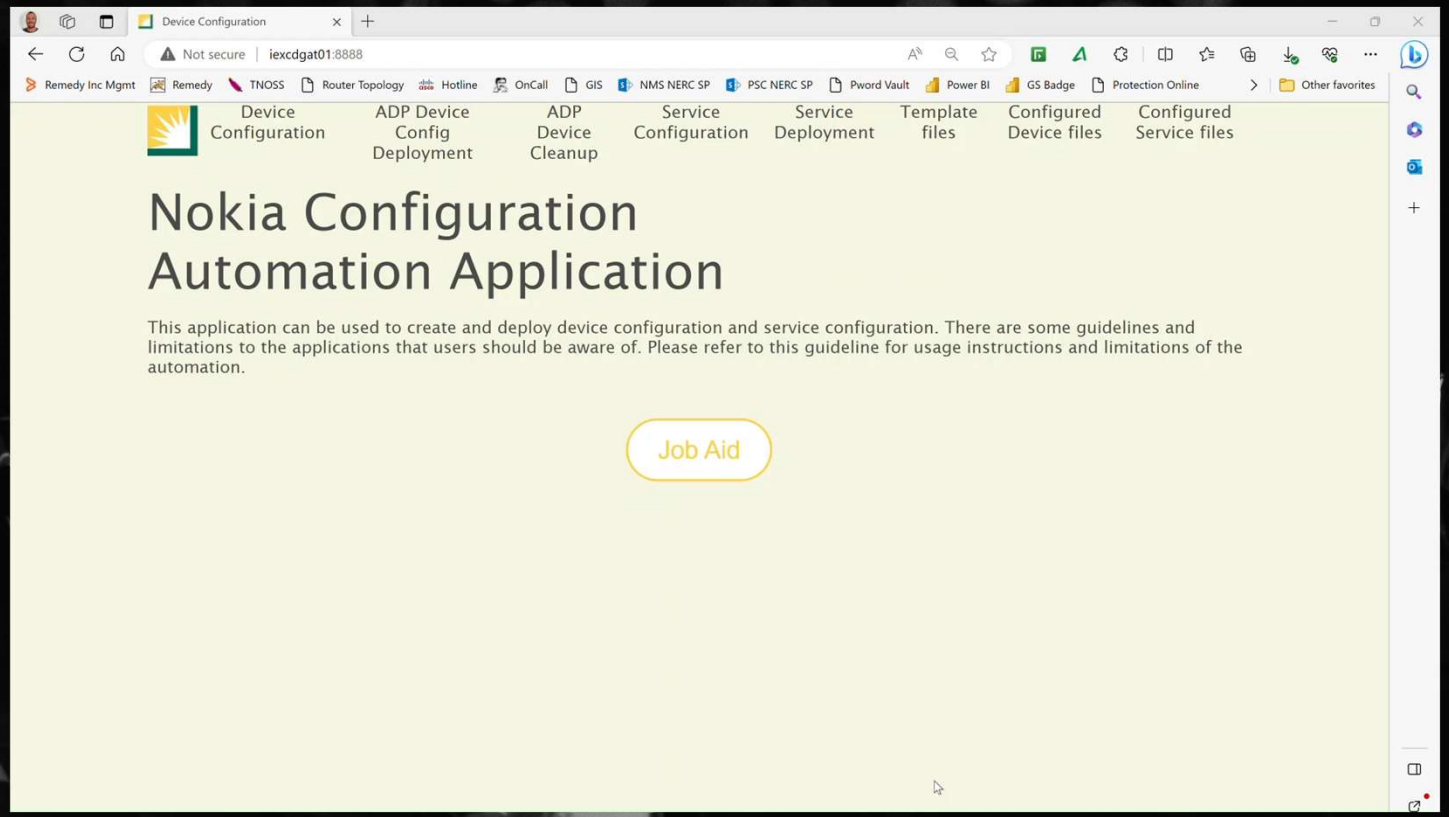
Step 2: WAN Provisioning



Port/Interface/ISIS/MPLS/RSVP Configuration Template

```
#Gbe network ports (ethernet ports)

/configure port 1/1/5
 shutdown
 description "101  /ETH10G/CLLI1111   /CLLI2222"
 ethernet
  mode network
……..

/configure router interface "XXX-SAR8-A-1/1/5"
      description "10G-To: "XXX-SAR8-A-1/1/5"
      address <###.###.###.###>/30
      qos 2
      bfd 30 receive 30 multiplier 3 type np
      no shutdown
exit all

/configure router if-attribute
       srlg-group "YYY-to-XXX" value "168001001"


/configure router
          isis
                interface " "XXX-SAR8-A-1/1/5 "
                level-capability level-1
                no shutdown
             exit
             no shutdown
        exit

/configure router
        mpls
            resignal-timer 30
            interface " "XXX-SAR8-A-1/1/5 "
                no shutdown
            exit
            no shutdown
        exit
```

Demo


Device Configuration
Not secure
iexcdgat01:8888
Remedy Inc Mgmt
Remedy
TNOSS
Router Topology
Hotline
OnCall
GIS
NMS NERC SP
PSC NERC SP
Pword Vault
Power BI
GS Badge
Protection Online
Other favorites
Device Configuration
ADP Device Config Deployment
ADP Device Cleanup
Service Configuration
Service Deployment
Template files
Configured Device files
Configured Service files
Nokia Configuration Automation Application
This application can be used to create and deploy device configuration and service configuration. There are some guidelines and limitations to the applications that users should be aware of. Please refer to this guideline for usage instructions and limitations of the automation.
Job Aid

Demo

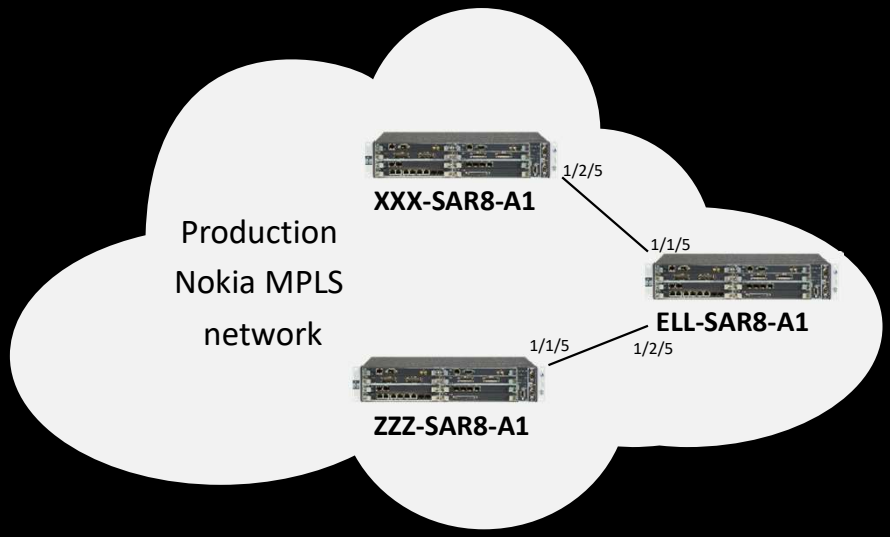
Device Configuration | ADP Device Config Deployment | ADP Device Cleanup | Service Configuration | Service Deployment | Template files | Configured Device files | Configured Service files

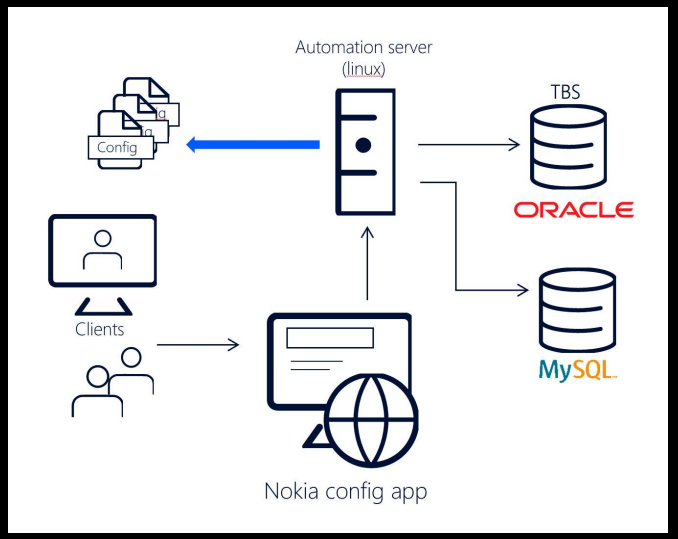
ELL-SAR8-A1

File Name	Created date	Download
XXX-SAR8-A1 _FarEnd_Ports_to_ELL-SAR8-A1	08/14/2023 09:27PM	
ZZZ-SAR8-A1 _FarEnd_Ports_to_ELL-SAR8-A1	08/14/2023 09:27PM	
ELL-SAR8-A1	08/14/2023 09:27PM	

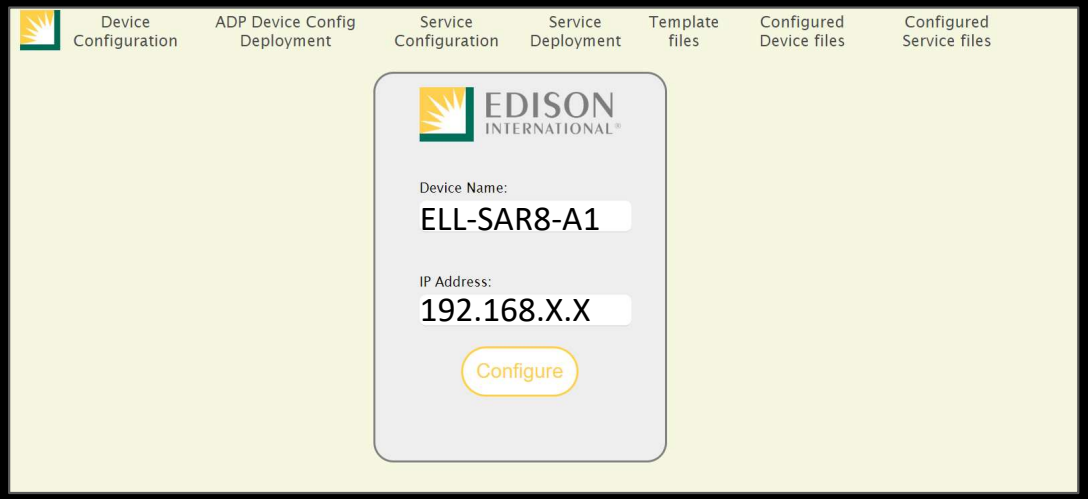
Process Improvements

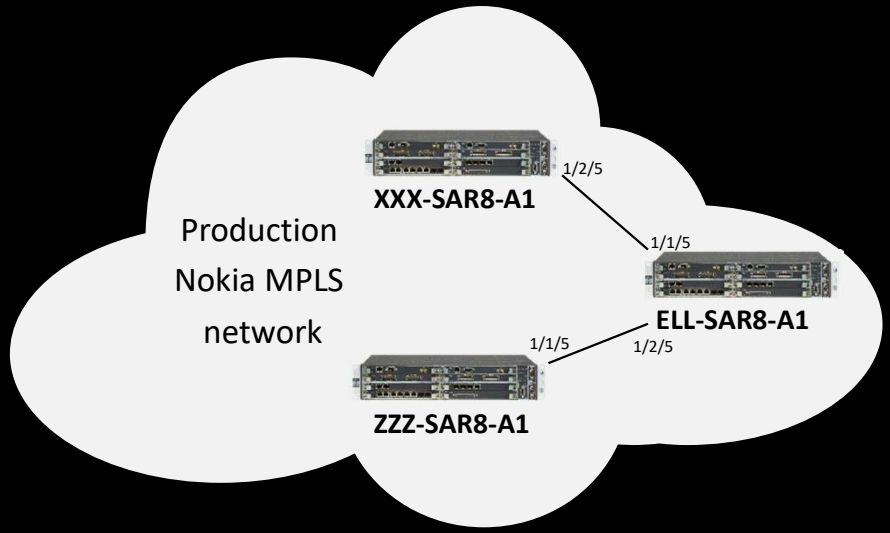
- Engineer completes planning and design in TBS
- Engineer goes to front-end web page
- Engineer enters device name, leaves IP blank, and selects configure
- Engineer receives device configuration file and reviews for issues before submitting installation job package



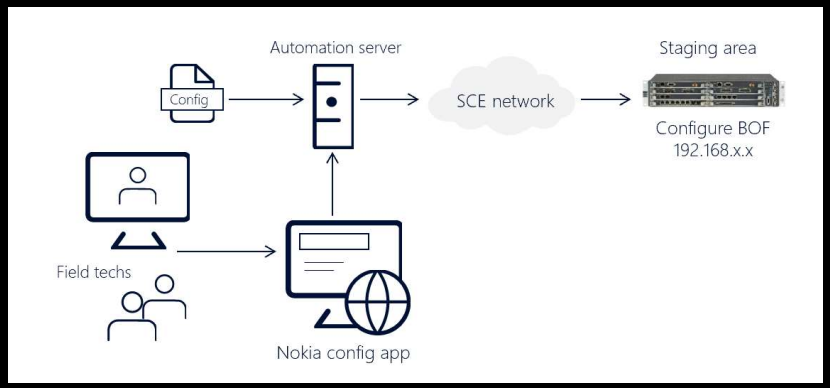


Process Improvements



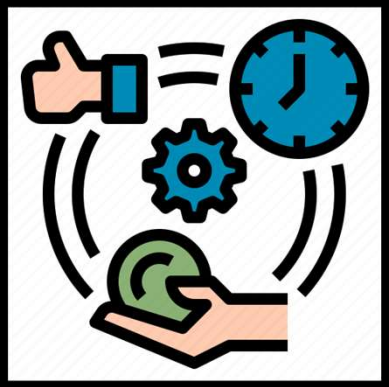


- Tech self-service staging and configuration deployment
- Tech performs physical installation of router in field
- Centralized configuration team (NOC) applies config to upstream routers and device comes online
- NOC uses NSP to complete operational readiness tasks

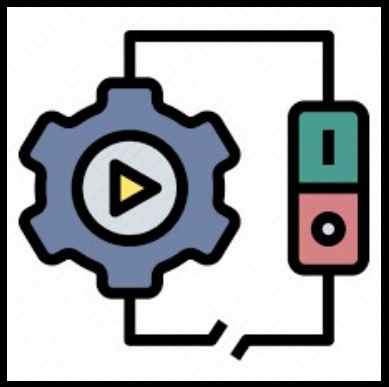


Annual Savings: $1,800,000

Process Efficiency



Data Quality
No Misconfigurations

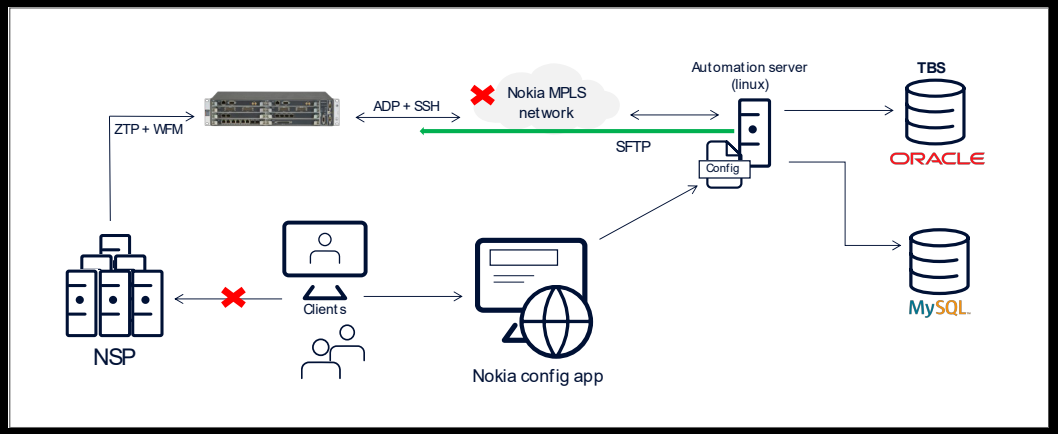


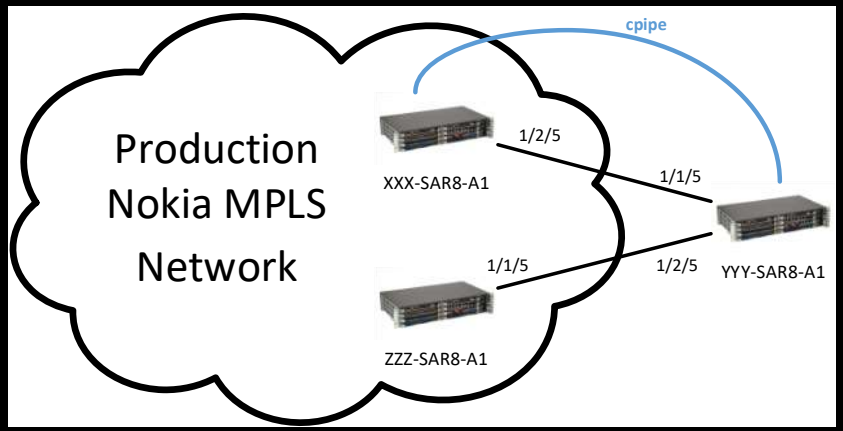
Improved Employee Morale and Engagement

Organizational Enablement

Additional Automation and Next Steps

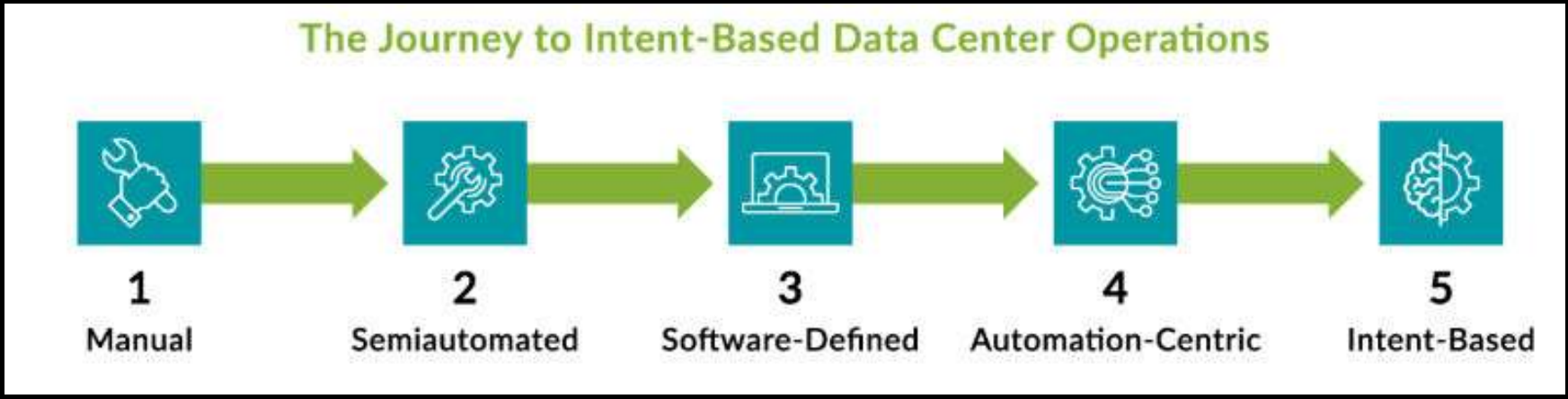
- MPLS Service Configuration Automation
- Zero Touch Provisioning using ADP
- Test Automation
- Itential Workflow Orchestration
- AIOps / Observability + GenAI (Project Orca)





Key Takeaways

- Network Automation is a journey
- Invest in organizational competencies and culture

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Questions?