

ANGA COM 2025 | Axians In-Booth Theater

Juniper WAN Automation with AI

Marian Putala, Consulting Sales Engineer, Juniper

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Juniper WAN Automation with AI

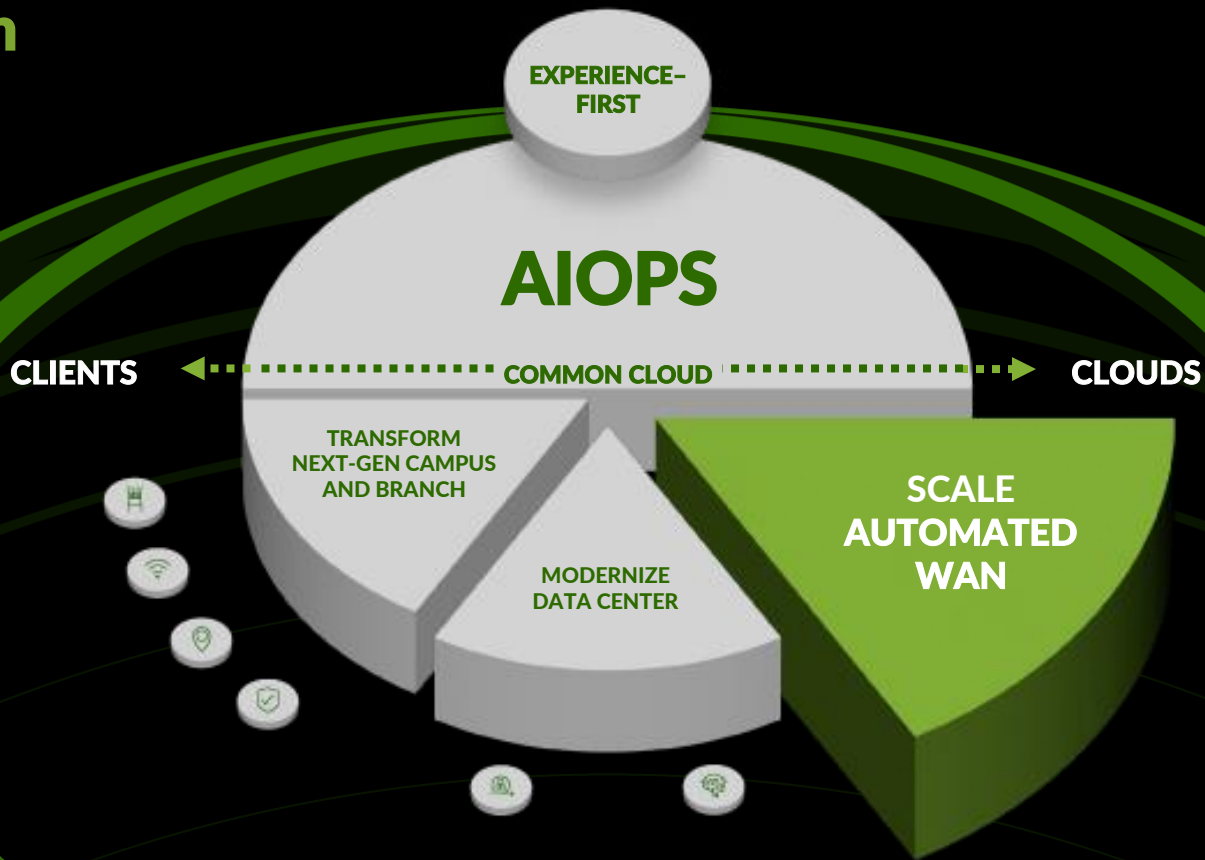
Marian Putala & Helmut Ammon

Juni 2025



**We make
every
connection
count.**

AI-NATIVE NETWORKING PLATFORM
Serving critical use cases



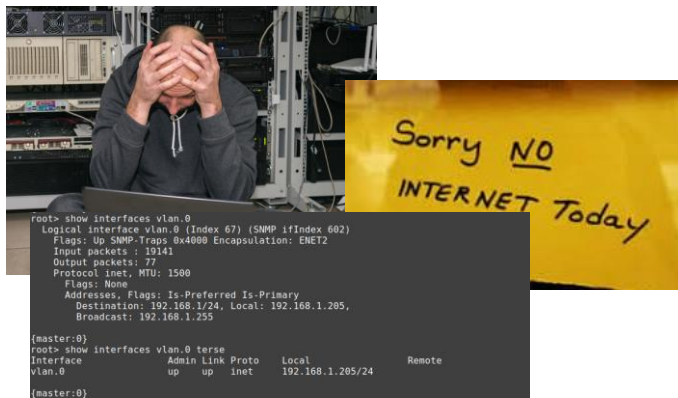
Intent-based service orchestration

Design and provision in minutes

ORCHESTRATE

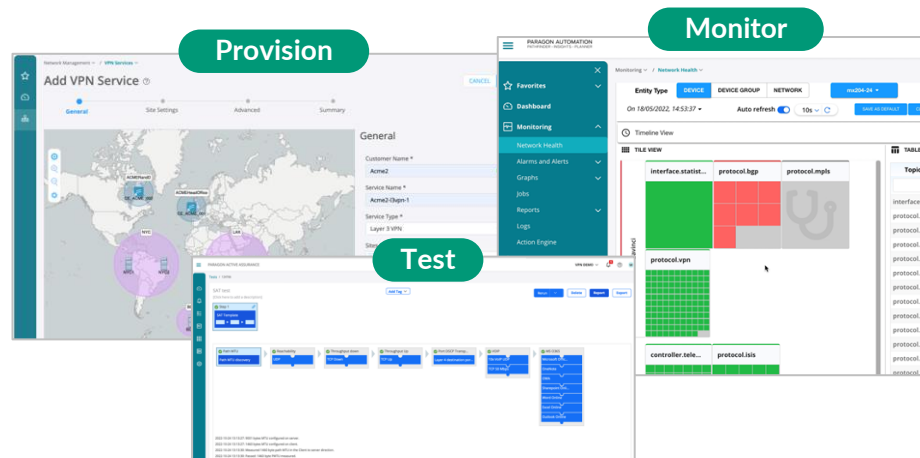
Intent-based service
orchestration

How it's always been



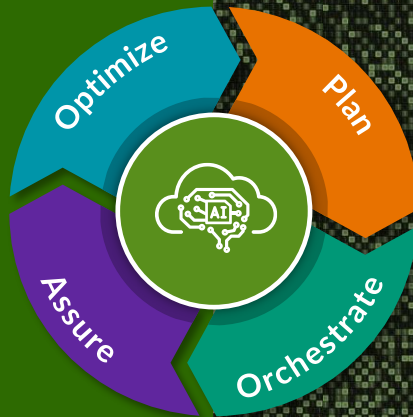
- ✗ CLI scraping.
- ✗ Service are static with long delivery times.
- ✗ Knowledge limited to a few experts.
- ✗ Lots of human errors.
- ✗ Configure and hope for the best.

How it's done with Paragon Automation



- ✓ Model driven; intent based, GUI & API, stateful.
- ✓ Services are dynamic and changes takes minutes.
- ✓ Abstracts complexity, lower skills needed.
- ✓ Repeatable, predictable, and error free.
- ✓ Integrated service testing and monitoring.

What is your need?




Click for use case version mapping




MOP Automation






PLAN

- Strategic network planning 
- Risk-failure analysis, scenario planning 





ORCHESTRATE

- Intent-based service orchestration 
- Device lifecycle management 
- Device onboarding 

ASSURE

- Trust and compliance 
- Network observability 
- Active assurance 

OPTIMIZE

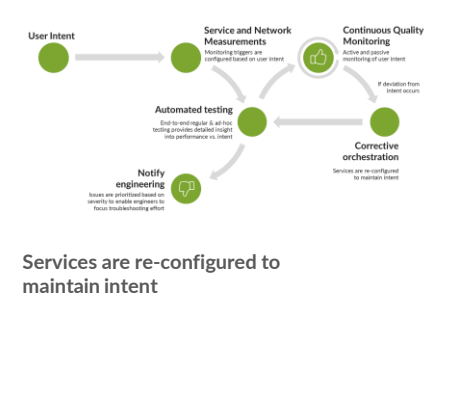
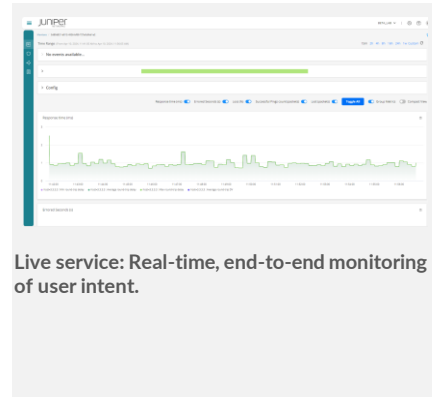
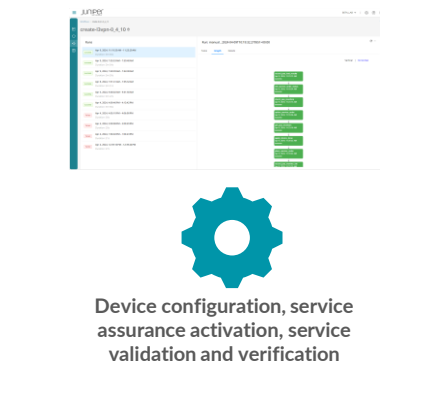
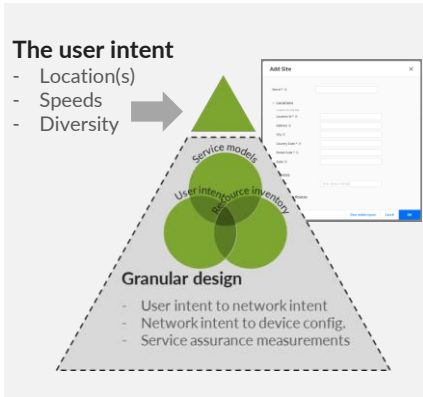
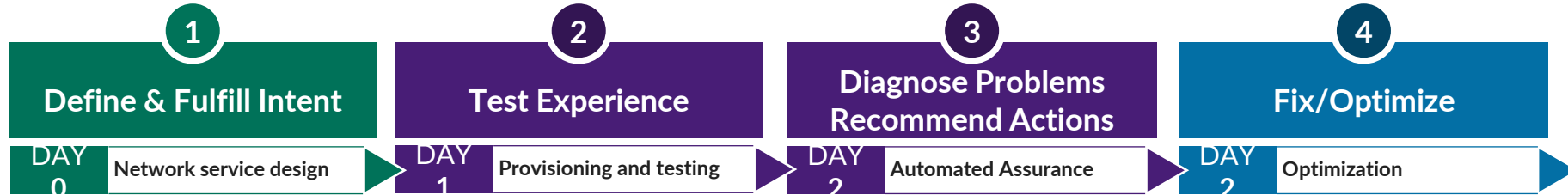
- Policy-based routing 
- Autonomous capacity optimization 
- Power efficiency Optimization* 
- Closed loop remediation 

*Power efficiency optimization is a use case intended for future releases of Juniper Paragon Automation



Intent-based service orchestration

Automation that eliminates human error while accelerating deployment times from weeks to days, by combining assurance, orchestration and optimization capabilities into one use case.



- ✓ **Model based** for repeatable results
- ✓ **Standards aligned** for resilience, efficiency & performance
- ✓ **Configurable / Customizable** for rapid self-service localization

✓ **Right first time:** services automatically configured and tested from day 1.

✓ **Right all the time:** End-user experience monitored continually with built-in active assurance built-in

How do you know...

...if your service is still up?

...if the quality of your service is still good?

...if you can quickly and reliably deliver new services on your network?

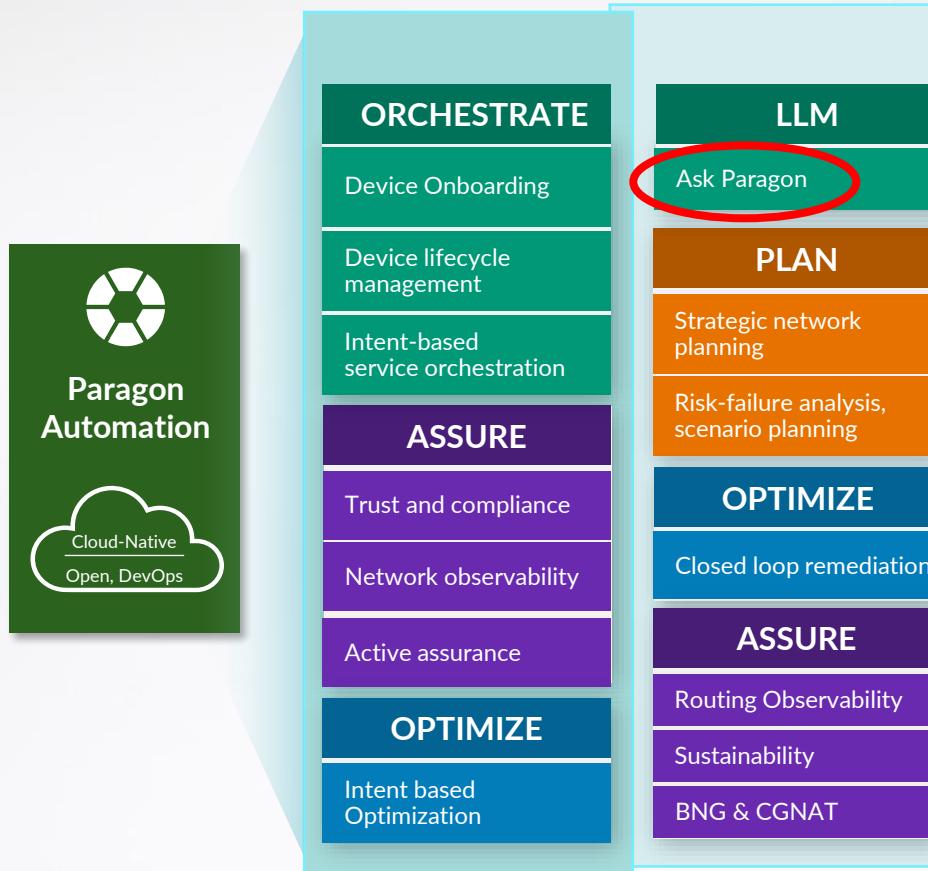




ASK PARAGON



Juniper Paragon

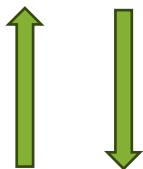


Ask Paragon

LLM e.g. OpenAI

- Off-the-shelf LLM: *no additional Juniper-specific or network-specific training was needed!*
- Enterprise version for privacy

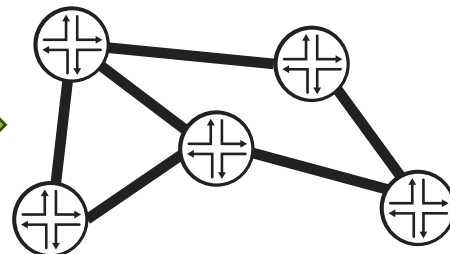
- Prompt
- List of functions
- User's question
- Outputs of function calls



- Function calls
- Response to user's question



User



Network

Scope of Ask Paragon

It's well-known that LLMs can make mistakes or hallucinate.

So at present, Ask Paragon is not allowed to make changes to the network, it is only allowed to retrieve information about the network.

```
ask-paragon> : can you make changes to the network?
```

```
No, as a Paragon Automation assistant, I cannot directly make changes to the network. My role is primarily to assist with network monitoring tasks, provide insights, and fetch information about network devices and VPNs using Paragon Automation tools. If you need to make changes to the network, you would need to use other systems or processes designated for network configuration and changes, or you might execute commands yourself with the necessary privileges and permissions.
```

LLM Connector Configuration



Name *

GPT4o-model

Provider *

Azure Open AI

Model *

Azure Open AI

Open AI

Ollama

API Key

Base URL *

https://yoururl.openai.azure.com/

API Version *

2024-08-01-preview

Active



Delete

Save

Cancel

LLM Connector Configuration



Name *

Provider *

Model *

API Key

Base URL *

API Version *

Active



Delete

Save

Cancel

← URL of your company's LLM instance

Troubleshoot Devices

Troubleshoot Devices

Urgent Action Needed

5 ▲ 150% vs last week

Action Needed

0 No change vs last week

Hostname	Severity	IPv4 Address
BOGOTA-MX-204	Urgent Action Needed	10.83.154.7
SFO-ACX-03	+ Urgent Action Needed	10.83.152.250
MADRID-ACX-04	Urgent Action Needed	10.83.152.251
SINGAPORE-ACX-05	+ Urgent Action Needed	10.83.152.252
rtme-ptx10001-36mr-13	Urgent Action Needed	10.83.154.60

5 items

List the devices in my network

llm connector

```
Using http://10.99.178.76:8000/ as PAPI URL
Using http://10.108.204.47:12000/ as API aggregator URL
Using http://10.106.140.23:9000/ as Insights config-server URL
Using http://10.99.65.158:9000/ as Insights api-server URL
Using http://10.96.219.8:11000/ as Foghorn config management service URL
Using http://10.108.31.162:80/rpc/v1/execute as octalk rpc
Welcome to Ask Paragon. Send a message or type /? for help
Conversation history is being reorded in the file: /root/ask-paragon/logs/20240701-185357_1111_logfil
e.log
ask-paragon> :
ask-paragon> : Can you please list the devices in my network?
```

Message	Can you please list the devices in my network?
Response (17.3s)	<ul style="list-style-type: none"> Running: get_device_list() <p>Here are the devices in your network:</p> <ol style="list-style-type: none"> Name: BOGOTA-MX-204 <ul style="list-style-type: none"> MAC: 485a0d56d018 Model: MX204 Alerts: Critical: 5 Connected: Yes Name: SFO-ACX-03 <ul style="list-style-type: none"> MAC: 8828fb0ef680 Model: ACX7024 Alerts: Critical: 4, Informational: 2, Minor: 2 Connected: Yes Name: MADRID-ACX-04 <ul style="list-style-type: none"> MAC: 8828fb0f6e80 Model: ACX7024 Alerts: Critical: 6, Informational: 2 Connected: Yes Name: SINGAPORE-ACX-05 <ul style="list-style-type: none"> MAC: 8828fb100680 Model: ACX7024 Alerts: Critical: 4, Minor: 1 Connected: Yes Name: rtme-ptx10001-36mr-13 <ul style="list-style-type: none"> MAC: d081c55f3946 Model: PTX10001-36MR Alerts: Critical: 5, Warning: 9 Connected: No

ask-paragon> :

Troubleshoot Devices

Troubleshoot Devices

Urgent Action Needed

5 ▲ 150% vs last week

Action Needed

0 No change vs last week

Hostname	Severity	IPv4 Address
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5 items

```

llm connector
Using http://10.99.178.76:8000/ as PAPI URL
Using http://10.108.204.47:12000/ as API aggregator URL
Using http://10.106.140.23:9000/ as Insights config-server URL
Using http://10.99.65.158:9000/ as Insights api-server URL
Using http://10.96.219.8:11000/ as Foghorn config management service URL
Using http://10.108.31.162:80/rpc/v1/execute as octalk rpc
Welcome to Ask Paragon. Send a message or type ?? for help
Conversation history is being reorded in the file: /root/ask-paragon/logs/20240701-185600_2397_logfil
e.log
ask-paragon> :
ask-paragon> :
ask-paragon> :
ask-paragon> : What is the Junos version on BOGOTA-MX-204?
  
```

Message	What is the Junos version on BOGOTA-MX-204?
Response (8.9s)	<ul style="list-style-type: none"> Running: get_device_list() Running: execute_junos_rpc(cli_operational_command=show version, router_mac=485a0d56d018) <p>The Junos version on BOGOTA-MX-204 is 23.2R2.18.</p>

ask-paragon> :

What is the Junos version on MX-204?

Troubleshoot Devices

Most power-hungry device in my network?

Hostname	Severity	IPV
<input type="checkbox"/>	<input type="text" value="Search"/>	<input type="text" value="Urgent Action Needed 5 C x"/>
<input type="checkbox"/>	<input type="text" value="+ 1 ..."/>	<input type="text" value="Q"/>
<input type="checkbox"/>	<input type="text" value="Urgent Action Needed"/>	<input type="text" value="10.8"/>
<input type="checkbox"/>	<input type="text" value="+ Urgent Action Needed"/>	<input type="text" value="10.8"/>
<input type="checkbox"/>	<input type="text" value="Urgent Action Needed"/>	<input type="text" value="10.8"/>
<input type="checkbox"/>	<input type="text" value="+ Urgent Action Needed"/>	<input type="text" value="10.8"/>
<input type="checkbox"/>	<input type="text" value="Urgent Action Needed"/>	<input type="text" value="10.8"/>

5 items

```
Using http://10.99.178.76:8000/ as PAPI URL
Using http://10.108.204.47:12000/ as API aggregator URL
Using http://10.106.140.23:9000/ as Insights config-server URL
Using http://10.99.65.158:9000/ as Insights api-server URL
Using http://10.96.219.8:11000/ as Foghorn config management service URL
Using http://10.108.31.162:80/rpc/v1/execute as octalk rpc
Welcome to Ask Paragon. Send a message or type /? for help
Conversation history is being reorded in the file: /root/ask-paragon/logs/20240701-190121_3166_logfil
e.log
ask-paragon> :
ask-paragon> :
ask-paragon> : Which router in my network is consuming the most power?
Failed to get device details 500 Server Error: Internal Server Error for url:
http://10.108.31.162:80/rpc/v1/execute
```

Message	Which router in my network is consuming the most power?
Response (18.7s)	<ul style="list-style-type: none">Running: <code>get_device_list()</code> <p>Running:</p> <ul style="list-style-type: none"><code>execute_junos_rpc(router_mac=485a0d56d018, cli_operational_command=show chassis power)</code><code>execute_junos_rpc(router_mac=8828fb0ef680, cli_operational_command=show chassis power)</code><code>execute_junos_rpc(router_mac=8828fb0f6e80, cli_operational_command=show chassis power)</code><code>execute_junos_rpc(router_mac=8828fb100680, cli_operational_command=show chassis power)</code> <p>Based on the power consumption data collected from the routers, here is how they rank in terms of power consumption:</p> <ol style="list-style-type: none">MADRID-ACX-04 is consuming the most power with 90W.SFO-ACX-03 and BOGOTA-MX-204 are tied with a consumption of 88W each.SINGAPORE-ACX-05's power consumption data wasn't retrieved successfully. <p>Therefore, MADRID-ACX-04 is consuming the most power in the network.</p>

```
ask-paragon> : █
```

Does it understand CONFIGURATIONS on my network?



Juniper Paragon

Examples:

- VPN config analysis
- Understanding config diffs

Service Instances 🔗

Service Instances

<input type="checkbox"/>	Name ▾	Customer ▾	Service Design	Design Version
<input type="checkbox"/>	sales	AKME	I3vpn	0.5.43

1 items 🔄

List my vpns

```
Using http://10.99.178.76:8000/ as PAPI URL
Using http://10.108.204.47:12000/ as API aggregator URL
Using http://10.106.140.23:9000/ as Insights config-server URL
Using http://10.99.65.158:9000/ as Insights api-server URL
Using http://10.96.219.8:11000/ as Foghorn config management service URL
Using http://10.108.31.162:80/rpc/v1/execute as octalk rpc
```

Service Instances 🔗

Service Instances

<input type="checkbox"/>	Name ▾	Customer ▾	Service Design	Design Version
<input type="checkbox"/>	sales	AKME	l3vpn	0.5.43

1 items 🔍

```

Using http://10.99.178.76:8000/ as PAPI URL
Using http://10.108.204.47:12000/ as API aggregator URL
Using http://10.106.140.23:9000/ as Insights config-server URL
Using http://10.99.65.158:9000/ as Insights api-server URL
Using http://10.96.219.8:11000/ as Foghorn config management service URL
Using http://10.108.31.162:80/rpc/v1/execute as octalk rpc
Welcome to Ask Paragon. Send a message or type /? for help
Conversation history is being reorded in the file: /root/ask-paragon/logs/20240626-0
1643_9839_logfile.log
ask-paragon> :
ask-paragon> :
ask-paragon> : list my vpns

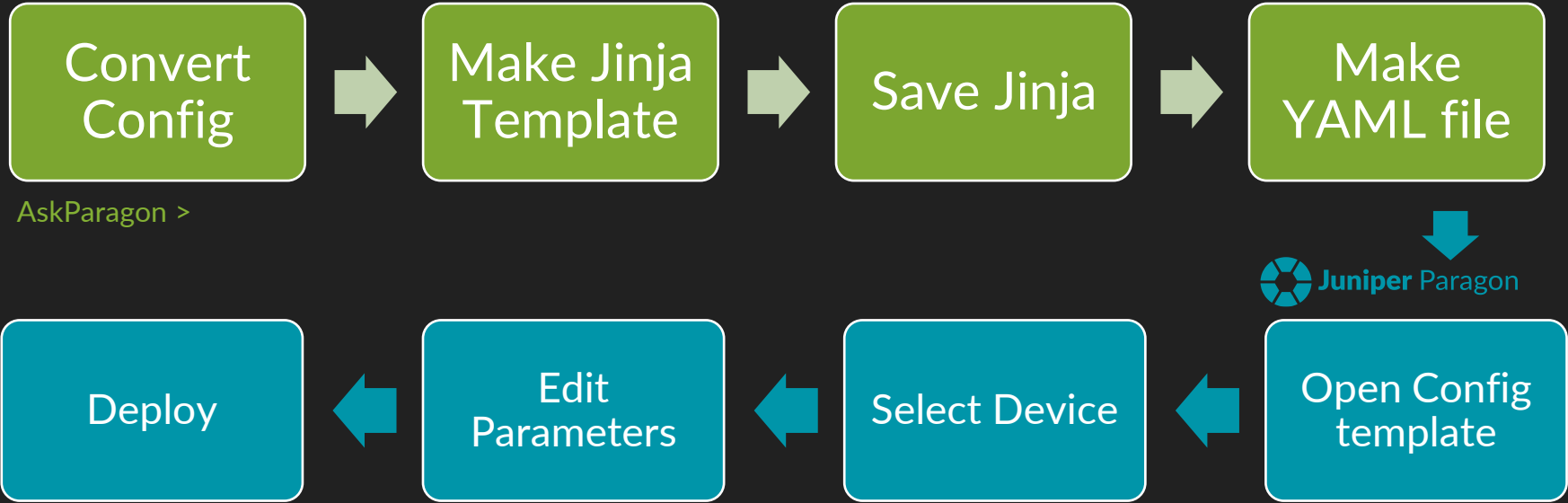
```

Message	list my vpns						
Response (20.0s)	<ul style="list-style-type: none"> Running: get_vpns() <p>Running:</p> <ul style="list-style-type: none"> get_customers() get_vpns() Running: <pre>get_service_instances(customer_ids=['171aab6e-2d96-11ef-b53b-... '2b05fd7a-2d96-11ef-b830-9e7b06da58d0', '853a7e25-2edb-11ef-b53b-82bdd05df89d', 'eec1b03c-2edc-11ef-b53b-82bdd05df89d', 'bdb409b0-32a4-11ef-b830-9e7b06da58d0'])</pre> 						
	<table border="1"> <thead> <tr> <th>Design ID</th> <th>Instance ID</th> <th>VPN Name</th> </tr> </thead> <tbody> <tr> <td>l3vpn</td> <td>sales</td> <td>bdb409b0-sales</td> </tr> </tbody> </table>	Design ID	Instance ID	VPN Name	l3vpn	sales	bdb409b0-sales
Design ID	Instance ID	VPN Name					
l3vpn	sales	bdb409b0-sales					

ask-paragon> : █



CISCO



JUNIPER

Troubleshoot Devices ?

Urgent Action Needed

◆ **4** ▲ 300% vs last week

Action Needed

■ **0** No change vs last week

<input type="checkbox"/>	Hostname ▾	Severity ▾	IPv4 Address
<input type="text" value="Search"/> ◆ Urgent Action Needed 4 D X +1 ... <input type="text" value="Search"/>			
<input type="checkbox"/>	BOGOTA-MX-204	◆ Urgent Action Needed	10.83.154.7
<input type="checkbox"/>	SFO-ACX-03	◆ + Urgent Action Needed	10.83.152.2
<input type="checkbox"/>	MADRID-ACX-04	◆ Urgent Action Needed	10.83.152.2
<input type="checkbox"/>	SINGAPORE-ACX-05	◆ Urgent Action Needed	10.83.152.2
4 items			

Message

Please write a yaml file to be used with jinja template. fill all the variable values in it and put placeholders for the values that are not 1:1 map. Kindly display it as well

Response
(29.8s)

- Running:
file_save(file_name=Junos_vpls_template_variables.yaml, str_data=...)

The YAML file with the variables for the Jinja template has been successfully created and saved as **Junos_vpls_template_variables.yaml**. Below is the content of the file, ready to be used with the Jinja template:

```
# Junos VPLS Template Variables
vpls_instance_name: VPLS-InterOP
interface_name: ge-0/2/0
vlan_id: 600
route_distinguisher: auto # Placeholder; adjust based on network design
rt_import_export: 100:600
ve_id: 5
ve_range: 11
site_name: InterOP-Site
bgp_group_name: BGP-VPLS-Group
bgp_local_address: 2.2.2.2 # Placeholder; set to actual router BGP interface IP
bgp_neighbor: 5.5.5.5
bgp_peer_as: 100
```

This YAML file maps all the key variables required by the Jinja template to configure a Junos device for VPLS setup, based on the provided Cisco configuration. Variables that might not have a direct 1:1 mapping or require adjustment based on specific network design are marked as placeholders for further customization.

ask-paragon> : █

Customer snapshot

Over 300 customers trust Juniper Paragon to manage the world's most demanding networks





THANK YOU

JUNIPER
NETWORKS

Driven by
Experience™

**Vielen Dank
für Ihren Besuch!**

**Wie hat Ihnen der
Vortrag gefallen?**

Titel: Juniper WAN Automation
with AI Referent: H. Ammon & M.
Putala, Juniper



Jetzt abstimmen