DEVNET Create

Automation gone wrong

Lessons learned from screwing up your network automation

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API & Programmability Lead, Cisco EMEAR

@squ4rks

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API & Programmability Lead, Cisco EMEAR

Starting to program at the age of 10 Marcel now works with Cisco's big customers and partners in EMEAR on everything related to APIs & Programmability.

He loves NetDevOps and has recently written a book on using python for network automation.

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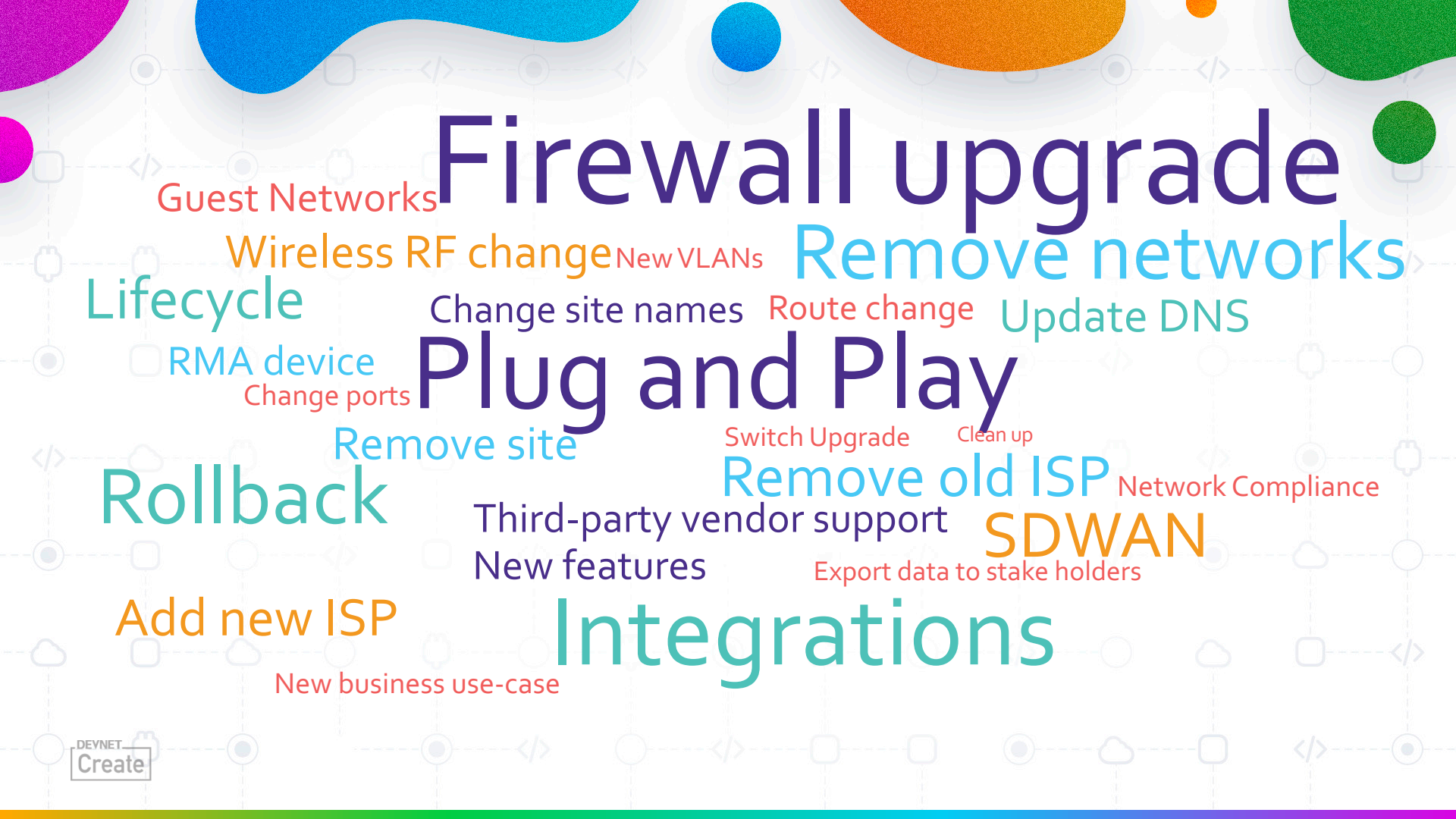
Firewall upgrade
Guest Networks
Wireless RF change
New VLANs
Remove networks
Lifecycle
Change site names
Route change
Update DNS
RMA device
Plug and Play
Change ports
Remove site
Switch Upgrade
Clean up
Rollback
Remove old ISP
Network Compliance
Third-party vendor support
SDWAN
New features
Export data to stake holders
Add new ISP
Integrations
New business use-case
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Changes happen rarely

Change seen as failure

All changes are big and complex

Problem occurs during change

The team isn't practiced

Change is (seen as) high risk

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Changes happen often

Problems are identified and resolved fast

All changes are small

Problem occurs during change

The team is well practiced

Change is low risk

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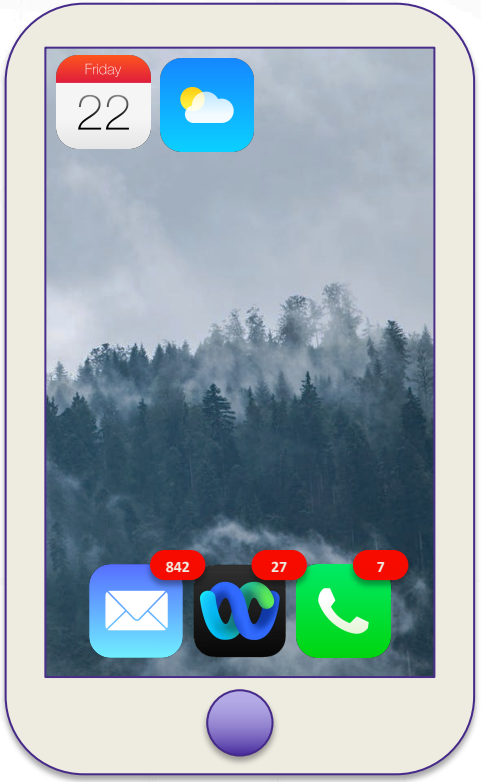

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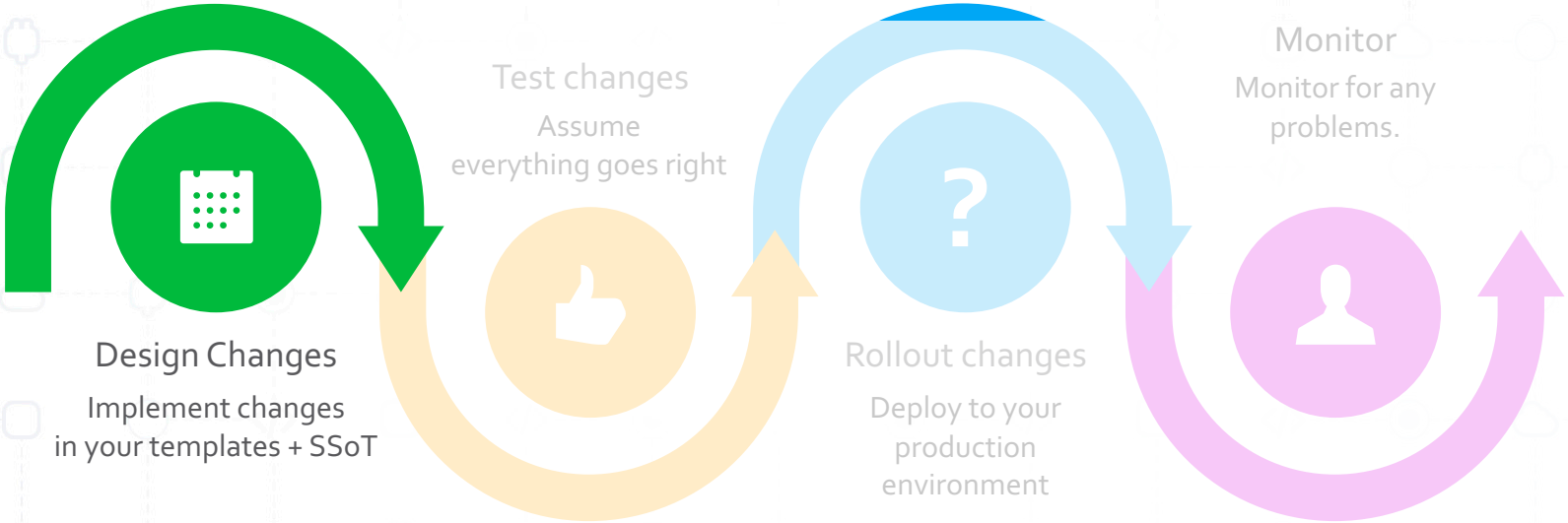
The first rule of technology used in a business is that automation applied to an efficient operation will magnify the efficiency.

The second is that automation applied to an inefficient operation will magnify the inefficiency.

- Bill Gates

Steps of a NetDevOps Pipeline



Design Changes

Implement changes in your templates + SSoT

Test changes

Assume everything goes right

Rollout changes

Deploy to your production environment

Monitor

Monitor for any problems.

DESIGN CHANGES WITH ROLLBACK IN MIND

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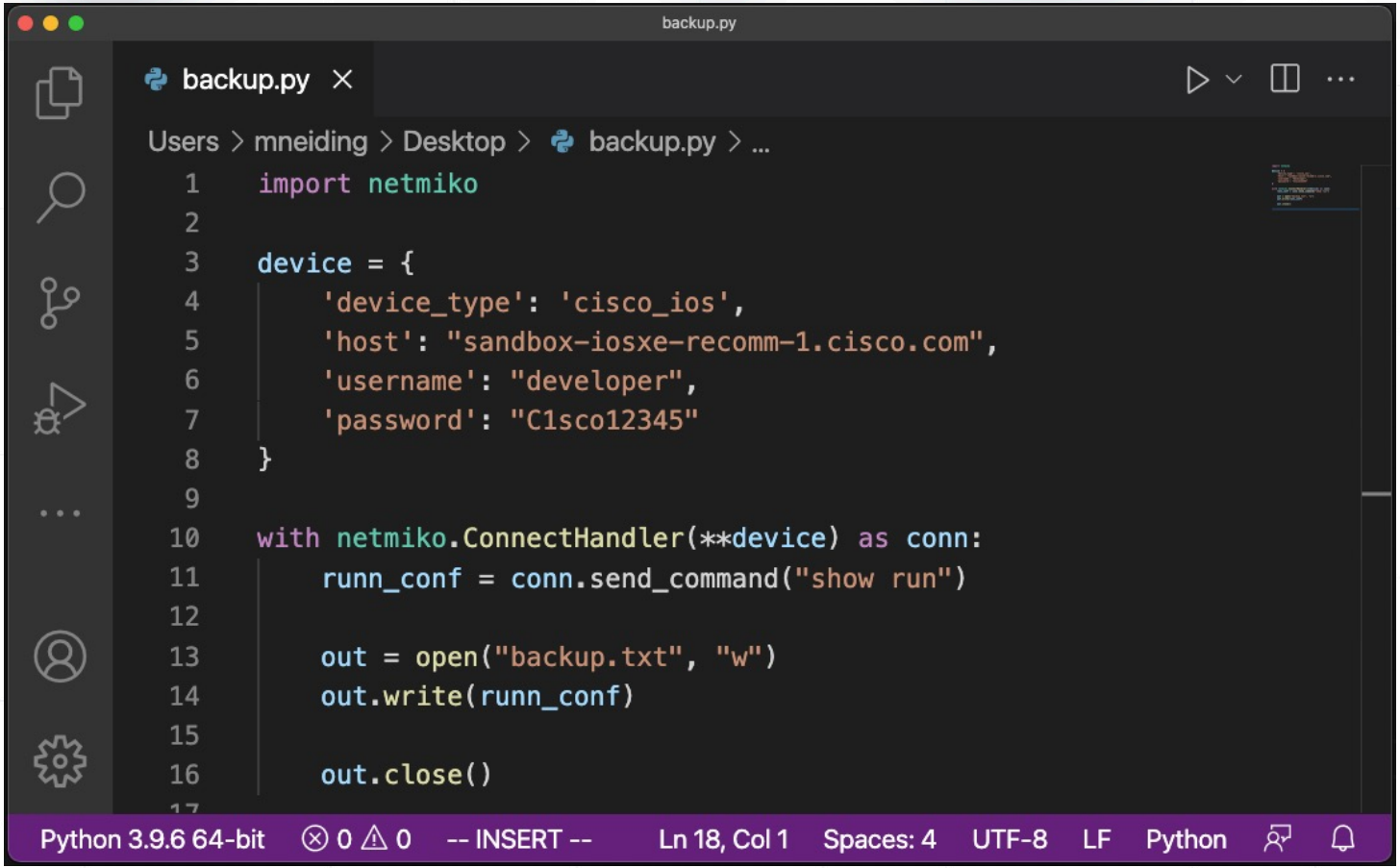

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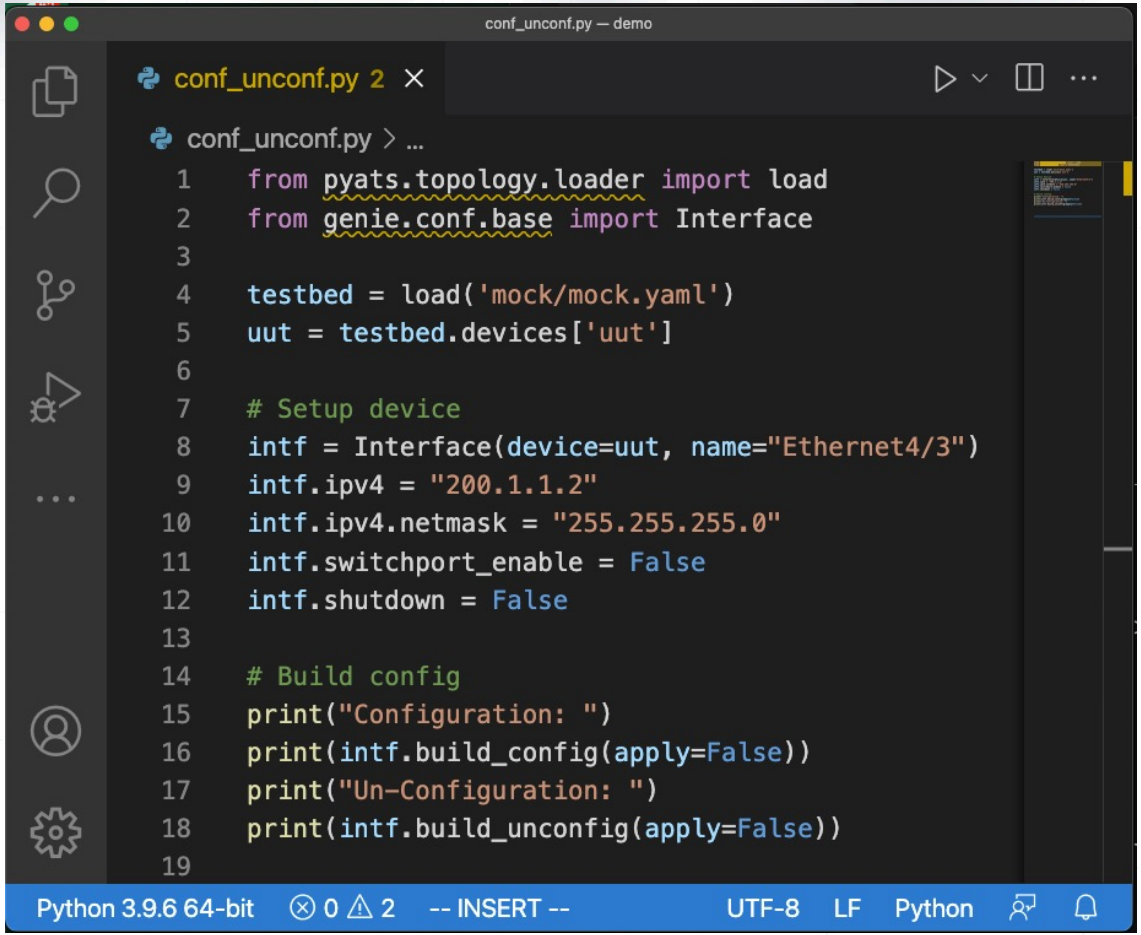

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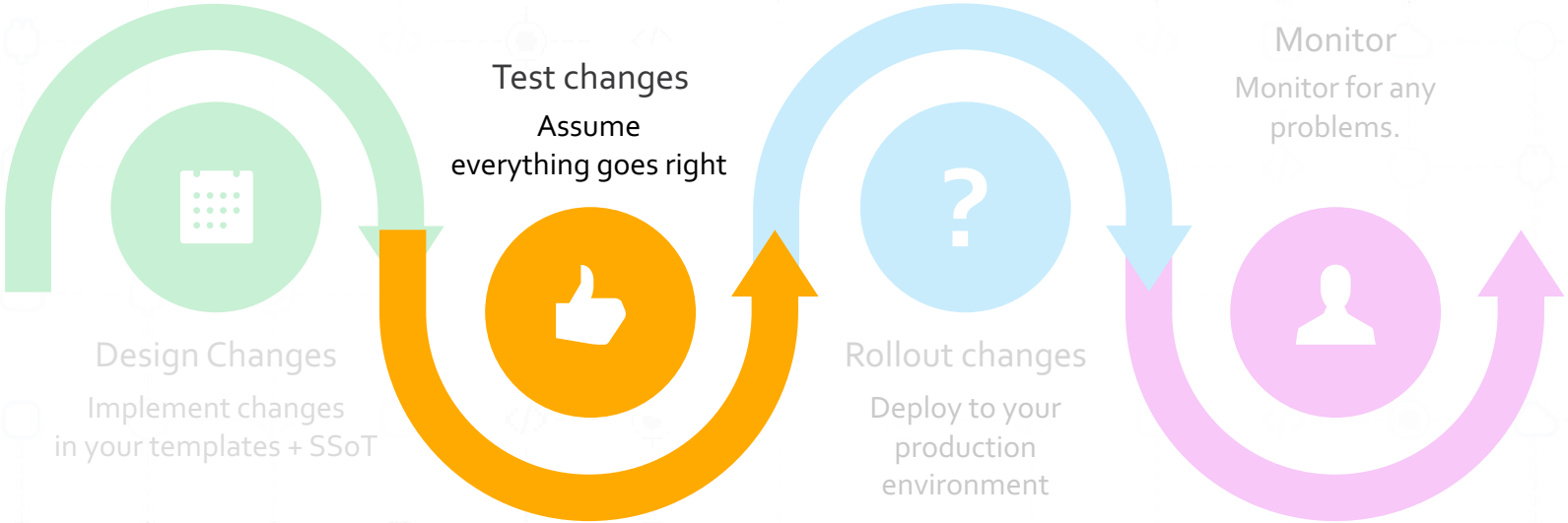
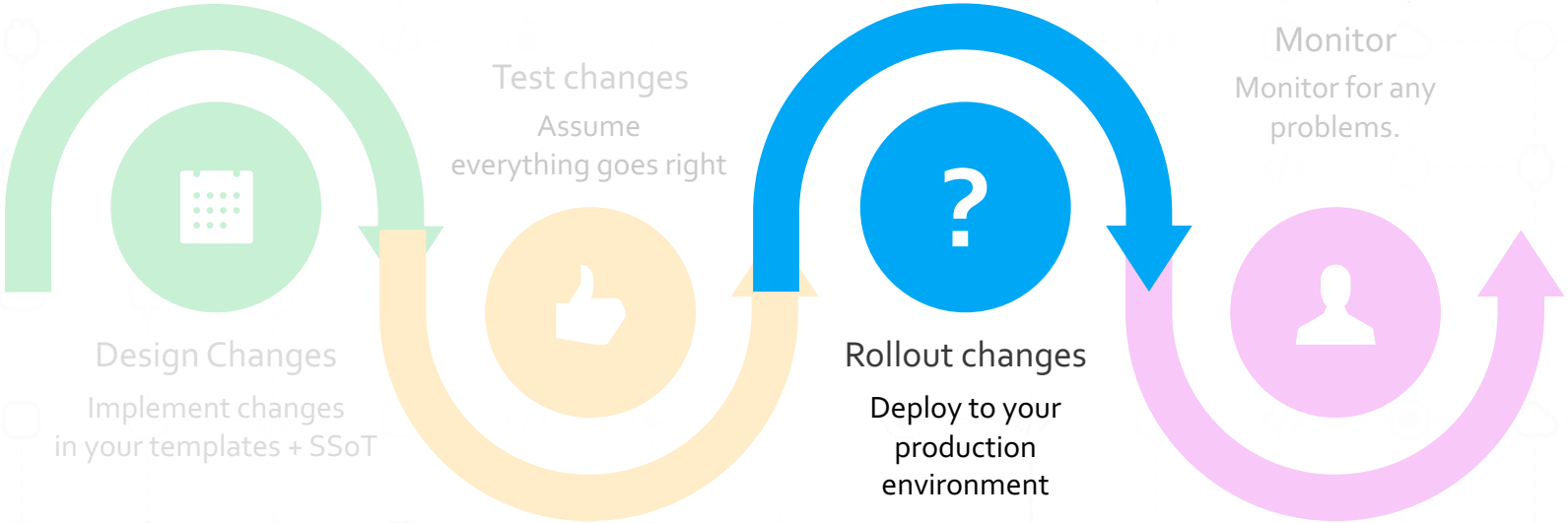
Steps of a NetDevOps Pipeline



MAKE SURE YOU ARE ACTUALLY TESTING

Steps of a NetDevOps Pipeline



OPTIMIZE FOR SPEED

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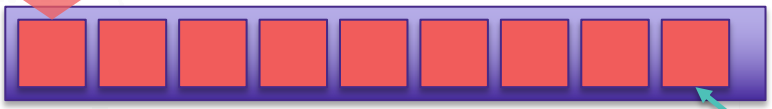
```
interface Ethernet4/3
  no shutdown
  no switchport
```

```
Host:  switch01.switches
Username: admin
Password: 0dfkj04kj2$
```

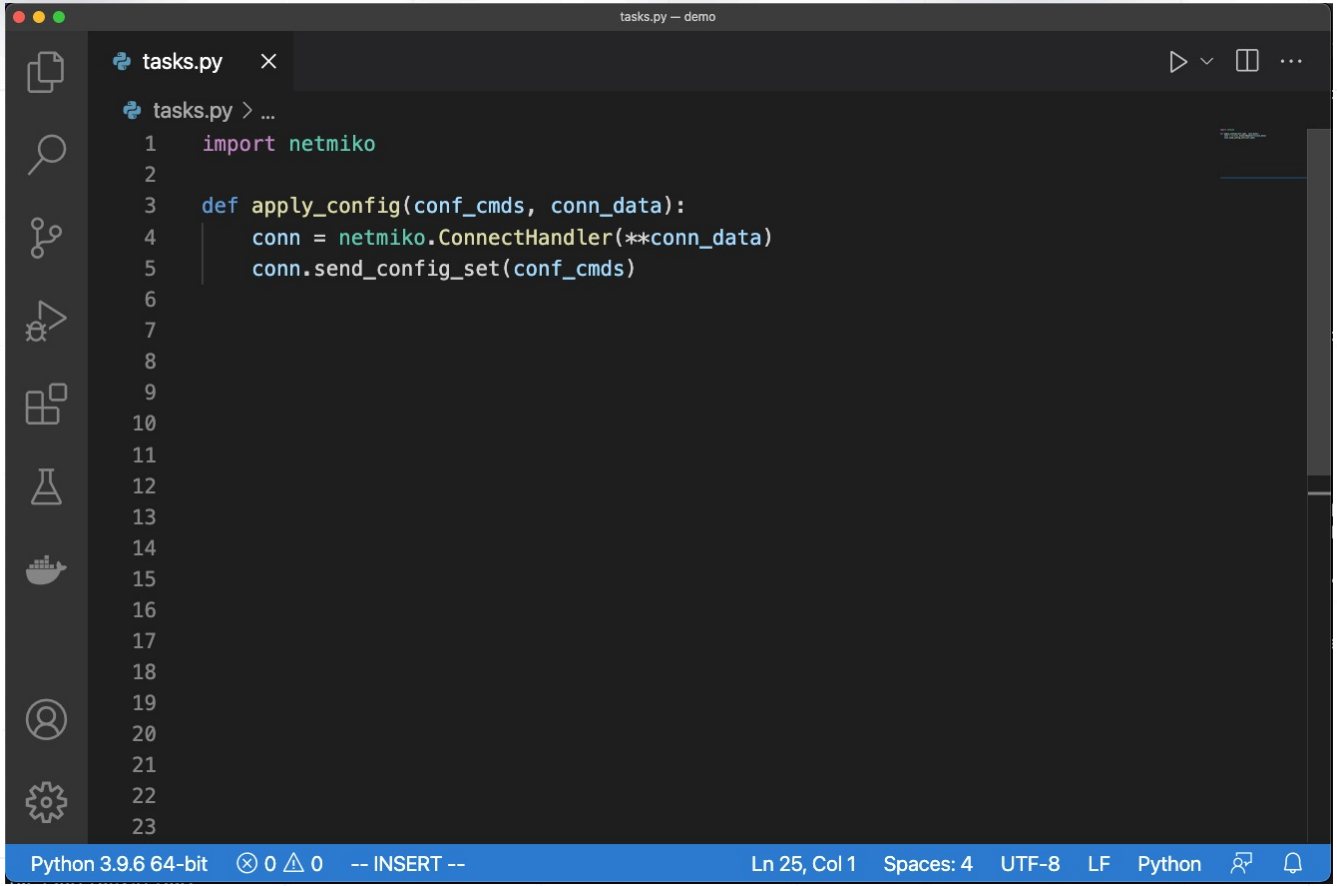
```
apply_config()
```

Queue:



switch01

Worker #1



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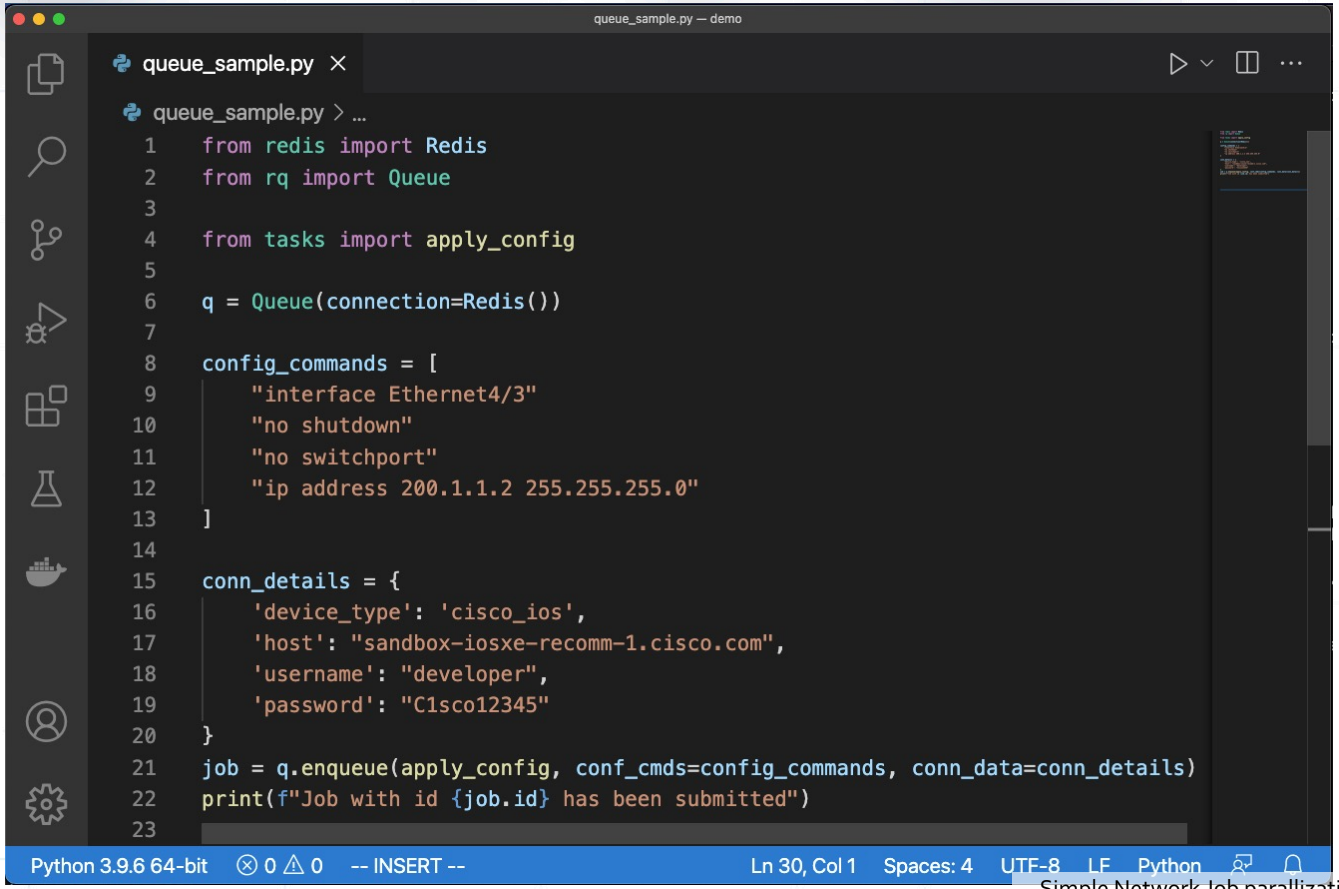

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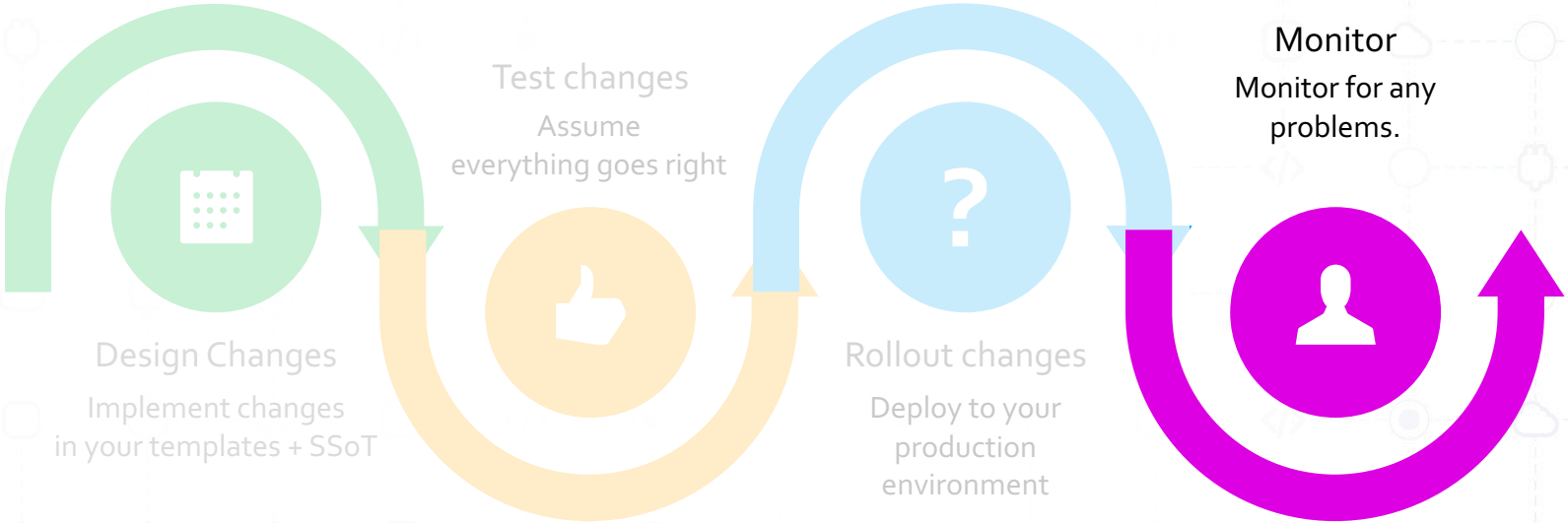
Simple Network Job parallization with RQ by mneiding - https://github.com/squ4rks/network_conf_ parallel

Steps of a NetDevOps Pipeline



BUILD A MONITORING SOLUTION THAT CAPTURES EVERYTHING

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Device Health Monitoring

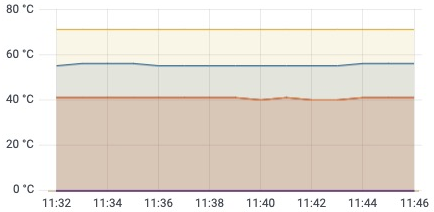
SOURCE All | NAME All | VRF All

Health

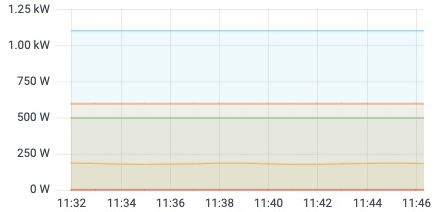
Version
17.3

Last Boot
2021-02-16 12:42:13

Fan Speed

Temperature


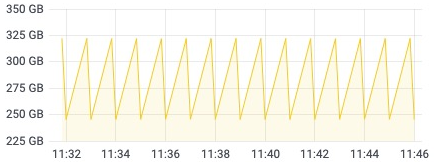
	max	avg	current
HotSpotTempSensor1	71 °C	71 °C	71 °C
InletTempSensor1	41 °C	41 °C	41 °C
OutletTempSensor1	56 °C	55 °C	56 °C
Switch1	41 °C	41 °C	41 °C

Power


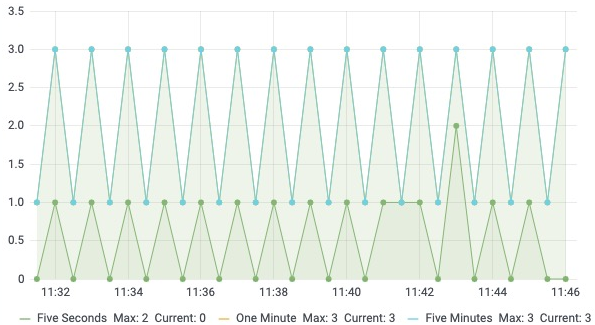
	avg	current
available_power	501 W	501 W
consumed_system_power	186 W	184 W
power_budget	1.100 kW	1.100 kW
power_allocated	599 W	599 W

Memory

	avg	current
Processor free	2.322 TB	3.608 TB

Memory


	avg	current
Processor used	283.8 GB	245.6 GB

CPU


CDP

device_name	ip_address	local_intf_name	mgmt_address	port_id	platform_name
APD478.9B49.26E8	10.1.1.1	TwoGigabitEthernet1/0/3	10.1.1.1	GigabitEthernet0	cisco C9115AXI-B
SKYHAWK	202.54.22.54	TwoGigabitEthernet1/0/1	202.54.22.54	GigabitEthernet0/0/1	cisco ISR4321/K9
RACK3-CAT38-14-Cloud	202.54.22.57	GigabitEthernet0/0/0	202.54.22.57	TenGigabitEthernet1/0/16	cisco WS-C3850-24XS
APD478.9B49.26E8	10.1.1.1	TwoGigabitEthernet1/0/3	10.1.1.1	GigabitEthernet0	cisco C9115AXI-B
SKYHAWK	202.54.22.54	TwoGigabitEthernet1/0/1	202.54.22.54	GigabitEthernet0/0/1	cisco ISR4321/K9
RACK3-CAT38-14-Cloud	202.54.22.57	GigabitEthernet0/0/0	202.54.22.57	TenGigabitEthernet1/0/16	cisco WS-C3850-24XS
APD478.9B49.26E8	10.1.1.1	TwoGigabitEthernet1/0/3	10.1.1.1	GigabitEthernet0	cisco C9115AXI-B
SKYHAWK	202.54.22.54	TwoGigabitEthernet1/0/1	202.54.22.54	GigabitEthernet0/0/1	cisco ISR4321/K9
RACK3-CAT38-14-Cloud	202.54.22.57	GigabitEthernet0/0/0	202.54.22.57	TenGigabitEthernet1/0/16	cisco WS-C3850-24XS

IP MAC ARP - Client Health *(2 panels)*

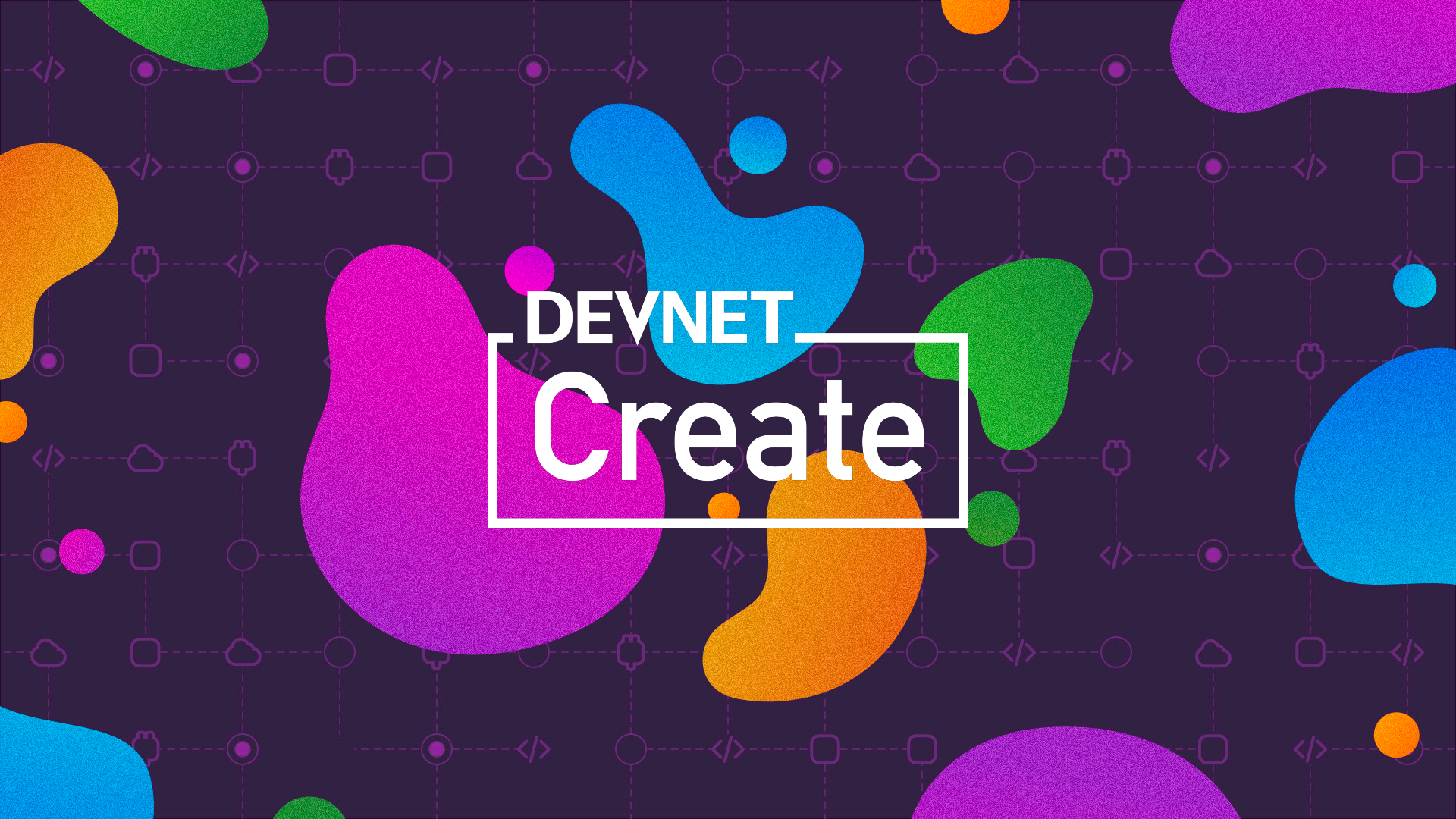
gRPC MDT Details *(1 panel)*

Interface - Cisco Native - Charts *(4 panels)*

Interfaces - Cisco Native - Data Table *(1 panel)*

IFTE Interfaces *(3 panels)*

Device Health Monitoring by jeremycohoe - https://grafana.com/grafana/dashboards/13462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