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Networks needs Smart Out of Band with Automation.

First Day, Everyday and Worst Day.

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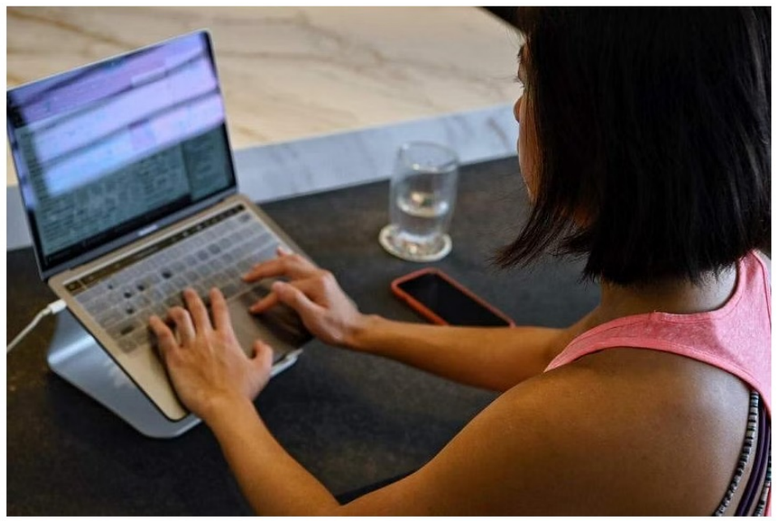
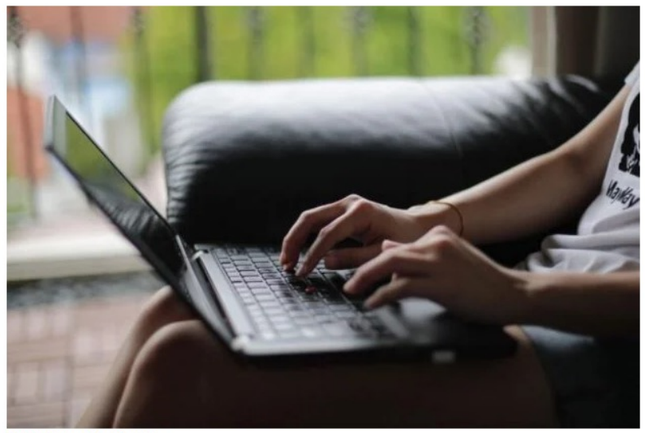
Hybrid work becoming a crucial factor for job applicants in Singapore



The hybrid option is now firmly embedded in our work culture long after Covid-19 pandemic restrictions were lifted. PHOTO: ST FILE

Most PH job seekers now prefer hybrid, remote work setup

By: Alden M. Monzon - @inquirerdotnet Philippine Daily Inquirer / 05:50 AM March 02, 2023



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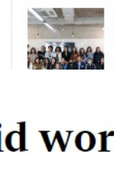
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Poll shows majority of HR personnel prefer hybrid working system

By Bernama - July 4, 2022 @ 4:06pm

A poll revealed that a majority of human resource (HR) personnel prefer a flexible, hybrid working model that includes working from home even when the whole business environment returns to normal. - File pic

OPINION • EDITORIAL

The future is hybrid work

Motorists sit in a traffic jam in Jakarta in this undated photo. (Antara/Galih Pradipta)

Need for agile & resilient networks has accelerated

Hybrid work is here to stay

Traffic patterns fluctuated

Rarely used apps are now everyday apps

Business criticality of network increasing and IT budget for networking decreasing driving automation

More Hardware to manage remotely

Need for more Agile and Resilient Networks

The world went through a seismic shift
Networks need to be more resilient and respond to technology needs of the business

Smart OOB Delivering Value Throughout Network Lifecycle

DEPLOY

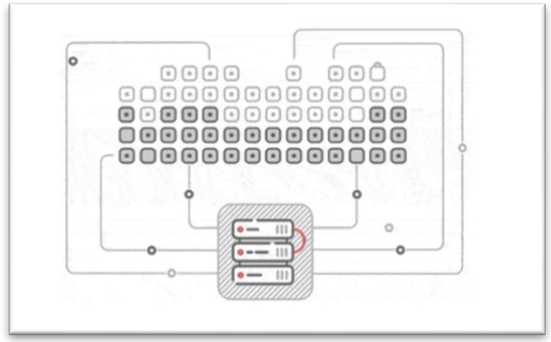
Enable the first day

- Save time on physical and virtual network deployment with Zero Touch Provisioning
- Securely store network configs and image files
- Save time with cellular enabled *Smart* OOB devices

MANAGE

Deliver value everyday

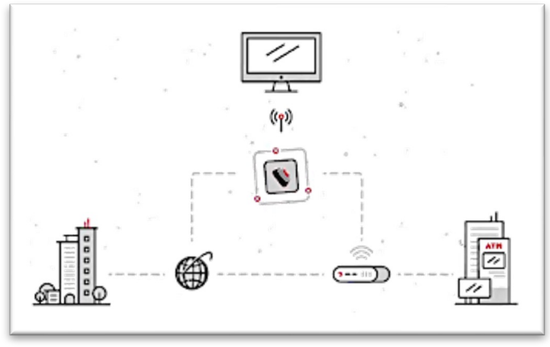
- Presence and proximity to managed devices
  - Secure physical connection to physical appliances
  - Secure virtual connection to virtual appliances
- Hosting platform (Docker) for applications and scripts
- Independent OOB network for managing and monitoring your network infrastructure



REMEDIATE

Minimize the worst day

- Network resilience with *Smart* OOB™ and failover to cellular
- Secure access to physical and virtual devices when the network is down
- Expedite access to affected infrastructure and automate recovery



However, the Network Professionals' challenges persist

45% of network professionals find responding to disruptions a top network challenge*

31% of network professionals find identifying root causes and quickly remediating security or performance issues as their biggest technology challenge**

25% of IT leaders believe automation will have the biggest impact on networking over the next five years**

*Cisco, Global Networking Trends Report, 2022
**Cisco, Global Networking Trends Report 2020
**Gartner, Andrew Lerner, Ted Corbett, 2022 Market Guide for Network Automation, Gartner, 22 February 2022

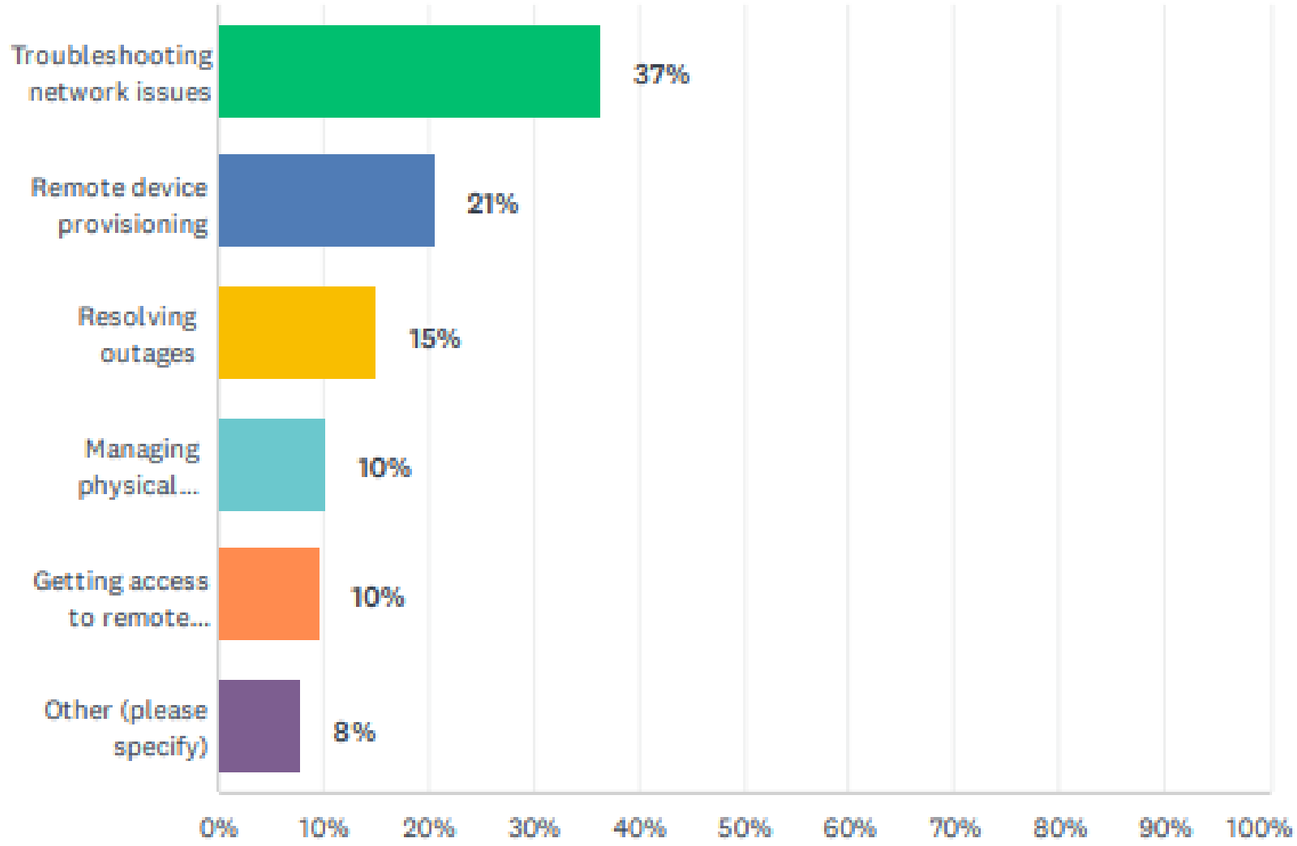
Cisco Live Amsterdam Messaging Research February 2023

We surveyed 126 network engineers, network admins, network team leads, and site reliability engineers before and after breakout sessions during Cisco Live Amsterdam (February 7th -9th 2023.)

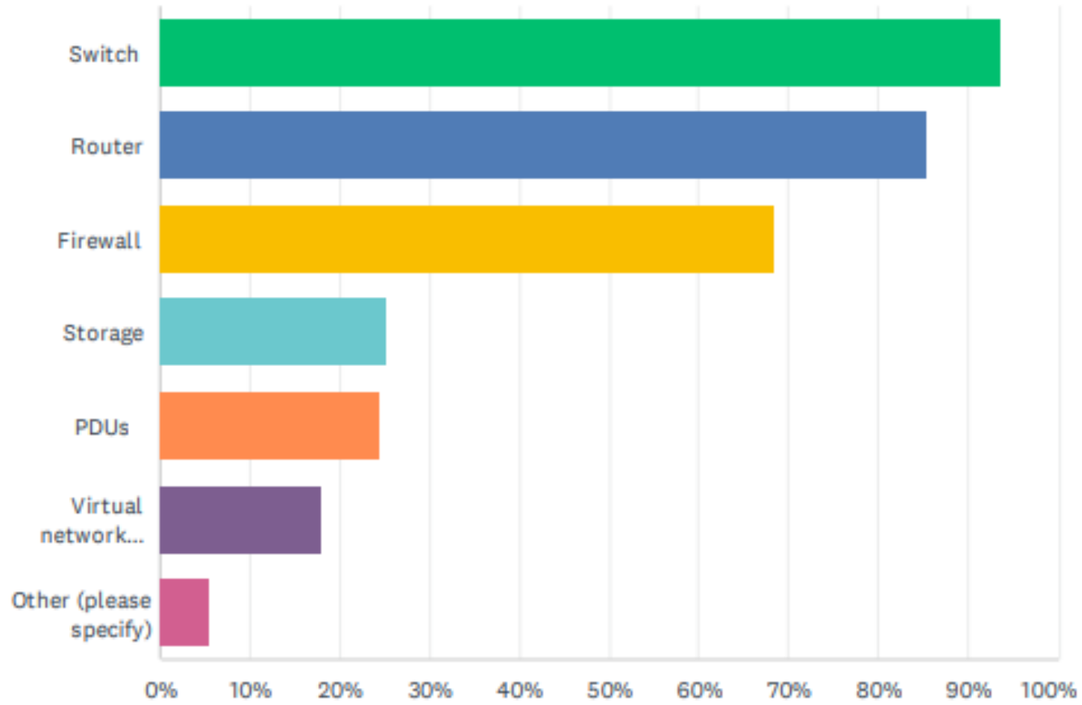
Our anonymous survey included 5 close-ended multiple questions and we achieved 100% completion rate with it.

We plan to use the findings of this survey to inform and influence: Internal alignment on “How does our target audience use an OOB network?”

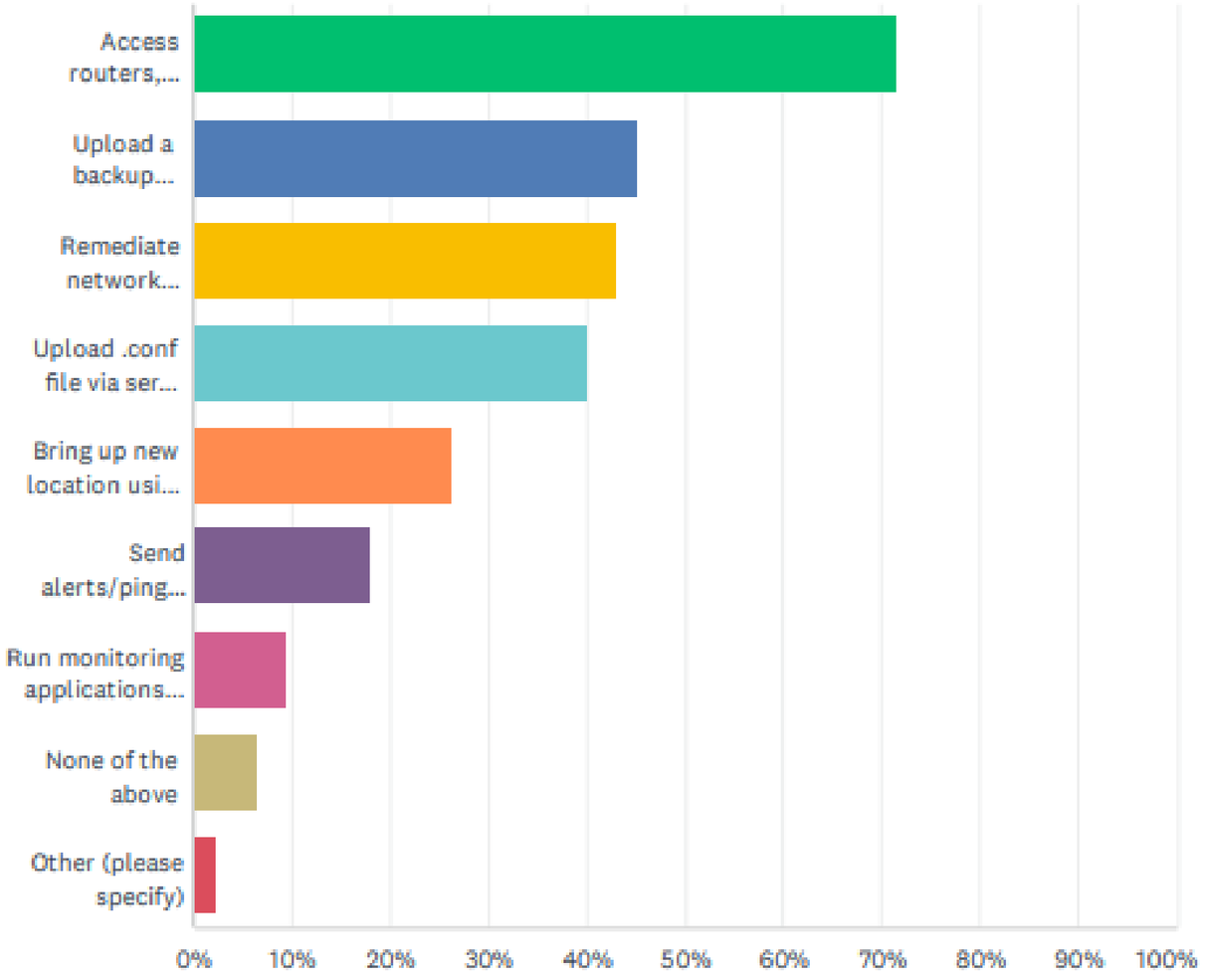
Troubleshooting network issues is the hardest part of managing a network



Network professionals manage BOTH physical and virtual assets with their OOB network management solutions

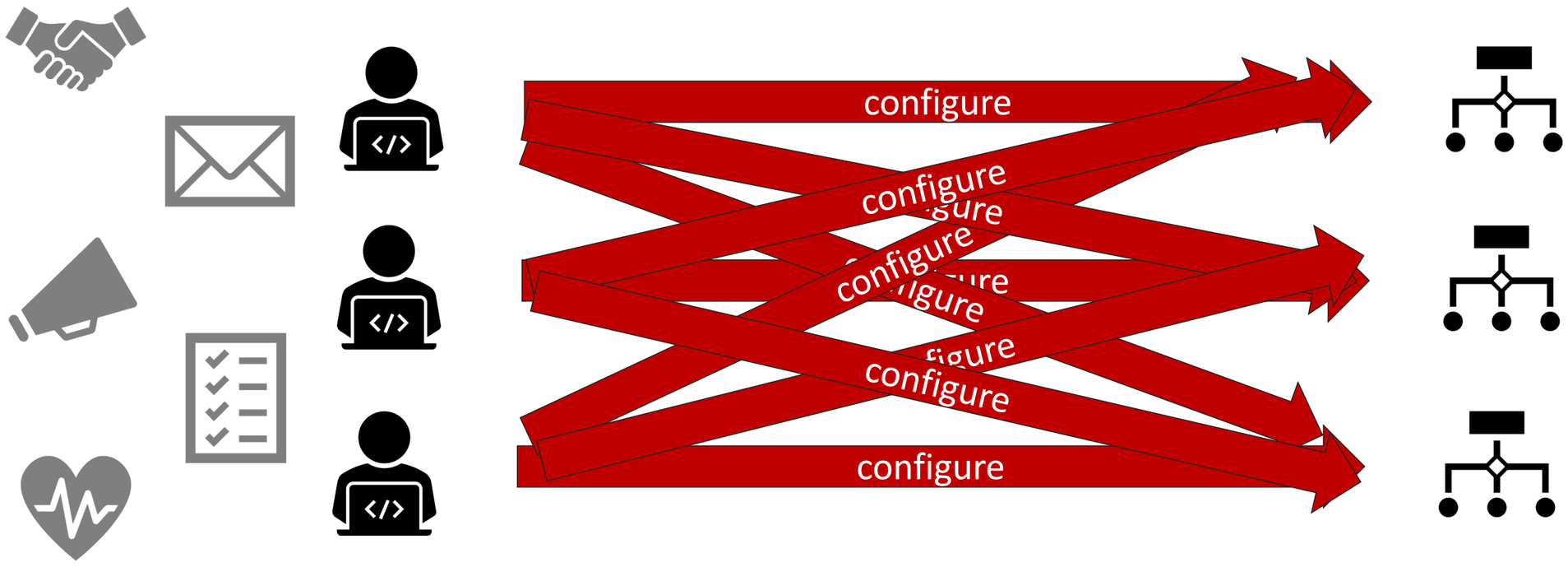


Network professionals use OOB solution to deploy, manage, and remediate



Trouble with configuring via the CLI

- Configs applied and maintained by hand
- Vendor-specific syntax, ever-changing
- Inconsistent configurations, unexplained special cases
- Configurations are forgotten; until... reactive break-fix model
- Workarounds: brute force, diligence, hard work, RANCID
- Fragile scrapers break on upgrades
- Human-oriented interfaces are for humans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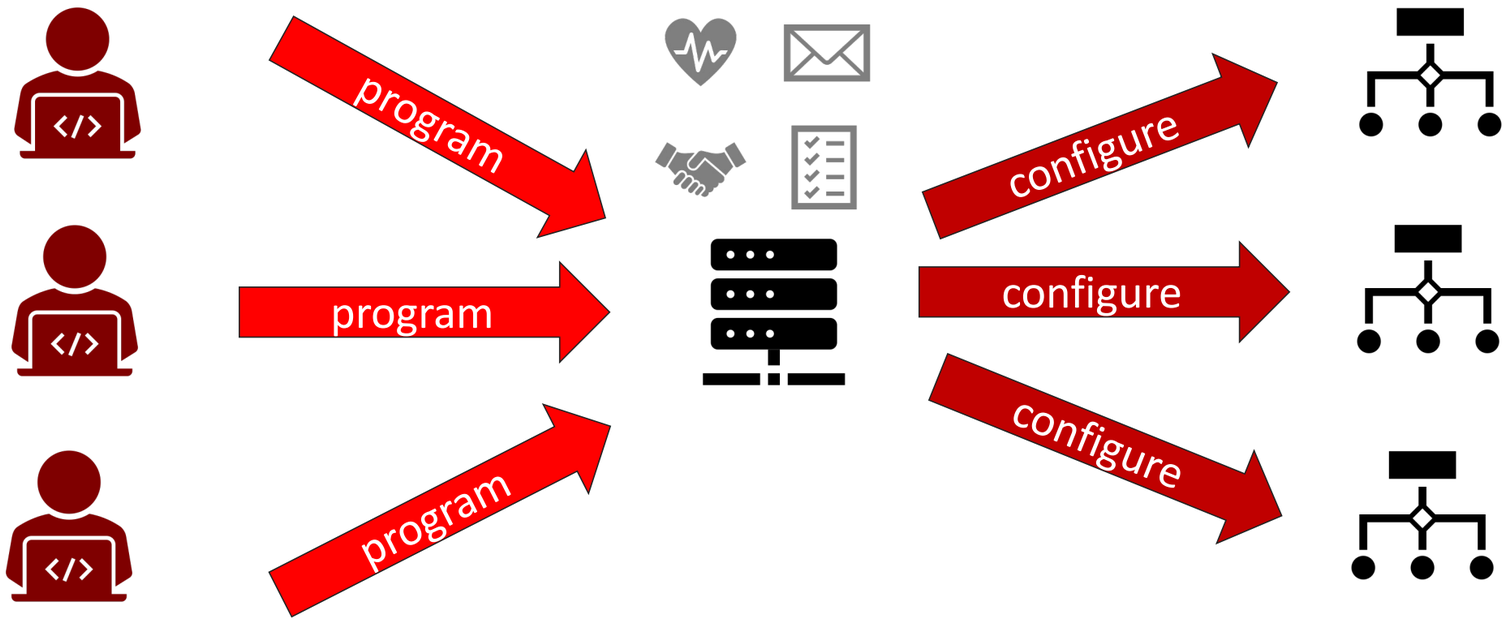

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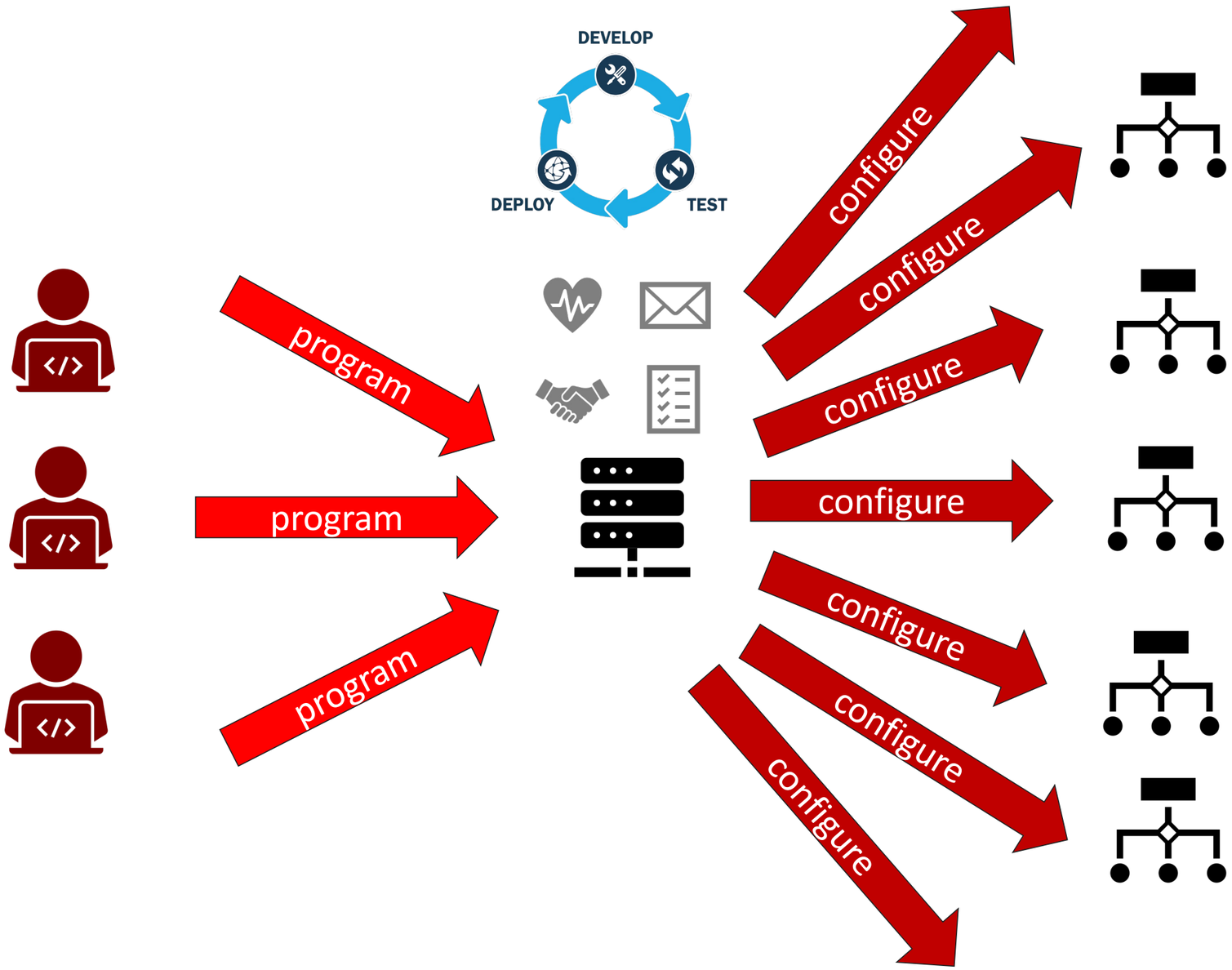
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Automation Trends – it's a journey

Gartner predicts that by 2025, 70% of organizations will implement structured automation to deliver flexibility and efficiency, an increase from 20% of organizations in 2021.

"Automation is essential for I&O to scale for the rising demands of digital business," said Yinuo Geng, VP, Gartner. "I&O automation technologies can support IT in enabling speed to market, increasing business agility, ensuring compliance with security and regulatory requirements and optimizing service costs."

The survey found I&O is most often using automation within deployment domains, such as application deployment (47%), I&O workload automation (43%) and end-user device deployment (41%). Ninety percent of respondents that are automating application deployment report that it has provided value.

October 3, 2022

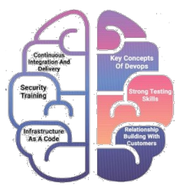
** Gartner, Market Guide for Network Automation Tools, February 2022*

Challenges to implementing Automation

- Network automation network is not without risk

- Mixed environment are harder to automate

- Legacy change control and lack of confidence in tools



- Limited in-house skill or lack of cross functional buy in

Pre-conditions for automation

- Inventory: do you have good detail of all devices?
- Requirements: business's expectation of function level; now & plans
- Standards: which model/vocabulary to use in automation
- Telemetry: feedback channels
- Automation: control channels; tooling
- Trust: get experience, confidently predict automation's behaviour
- other: Budget, Stakeholders, Suppliers

Tools to get started with Network Automation

Ansible is **an open source IT configuration management (CM) and automation platform that** uses human-readable YAML templates. Users can program repetitive tasks to occur automatically, without learning an advanced language.

Puppet is an open source systems management tool for centralizing and automating configuration management (the detailed recording and updating of information that describes an enterprise's hardware and software.)

Terraform is an open-source infrastructure as code software tool that enables you to safely and predictably create, change, and improve infrastructure.

	Provisioning	Monitoring	Security	…
Requirements	?	?	?	?
Automation	?	?	?	?
Telemetry	?	?	?	?
Inventory	?	?	?	?
Standards	?	?	?	?
Suppliers	?	?	?	?
Partners	?	?	?	?
Budget	?	?	?	?
Trust	?	?	?	?

Quick wins with NetOps and Automation

Start Simple	Testing & Troubleshooting	Validation
Read only tasks	Predefine templates for problem determination	Verifies that the network is functioning as designed
Configuration backup / diff	Deploy tools on demand	Are the correct VLANs configured on trunk links?
Information collection and report building	Auto populating trouble tickets with network information.	Do routing tables contain the desired routes?

How to use Network Automation for provisioning

```
#!/usr/bin/env python
from netmiko import ConnectHandler
from getpass import getpass

device1 = {
    "device_type": "cisco_ios",
    "host": "cisco1.lasthop.io",
    "username": "pyclass",
    "password": getpass(),
}

# File in same directory as script that contains
#
# $ cat config_changes.txt
# ----------
# logging buffered 100000
# no logging console

cfg_file = "config_changes.txt"
with ConnectHandler(**device1) as net_connect:
    output = net_connect.send_config_from_file(cfg_file)
    output += net_connect.save_config()

print()
print(output)
print()
```

```
$ python config_change_file.py
Password:

configure terminal
Enter configuration commands, one per line.  End with
CNTL/Z.
cisco1(config)#logging buffered 100000
cisco1(config)#no logging console
cisco1(config)#end
cisco1#write mem
Building configuration...
[OK]
cisco1#
```

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Thank You

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