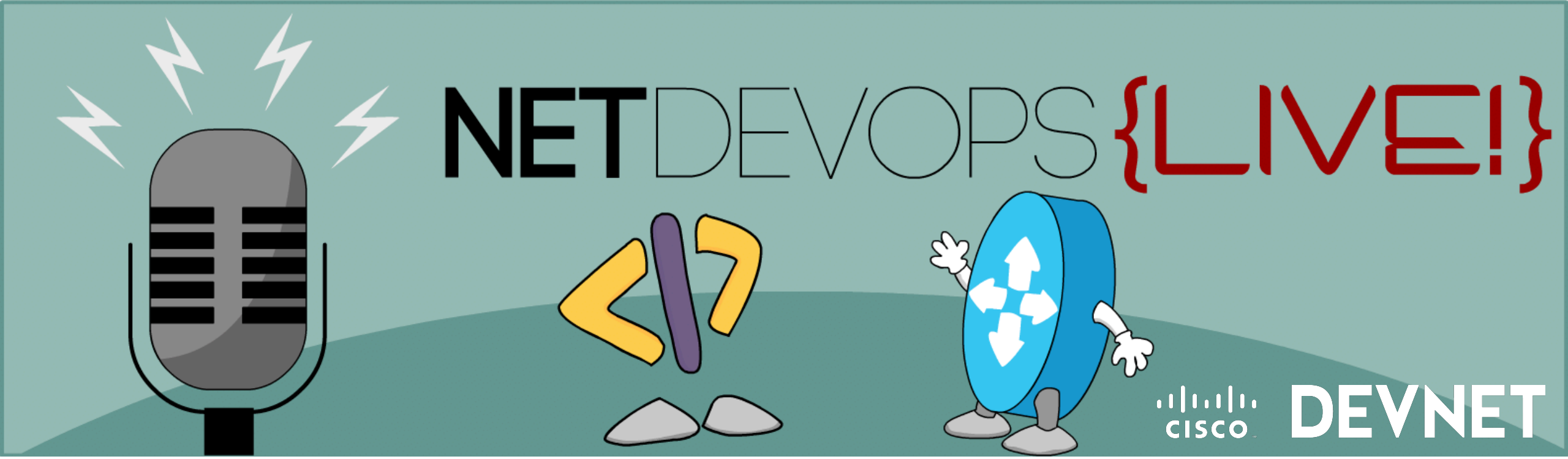

Is Your Network Working? Guess No More!
with Python Testing Powered by pyATS & Genie

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Technical Solution Architect, pyATS Genius, NetDevOps Evangelist

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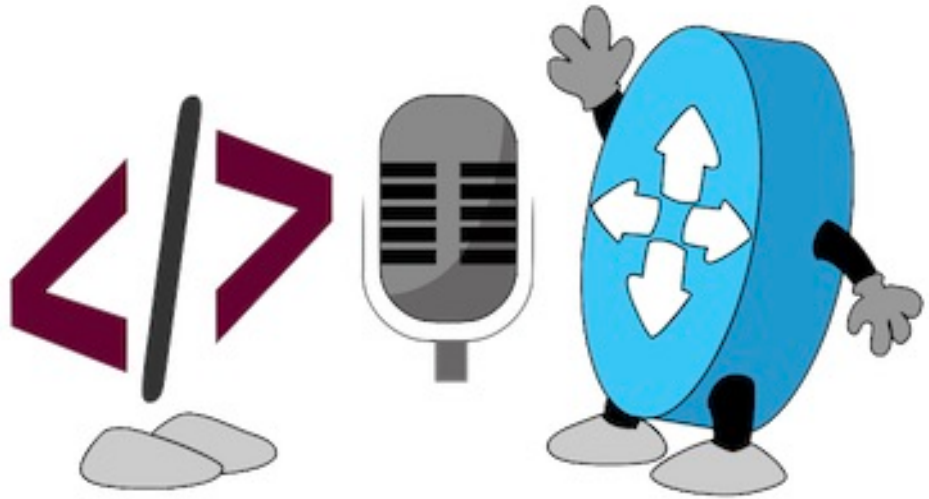
Technical Leader, pyATS Architect

Season 2, Talk 8

https://developer.cisco.com/netdevops/live

What are we going to talk about

- Recap: What the heck is pyATS & Genie?
- pyATS/Genie vs. <insert tool>
- Out-of-box feature models & platform support
- Stateful Network Validation:
  - CLI: No programming experience required
  - RobotFramework: English-like testcases
  - Raw, unadulterated Python

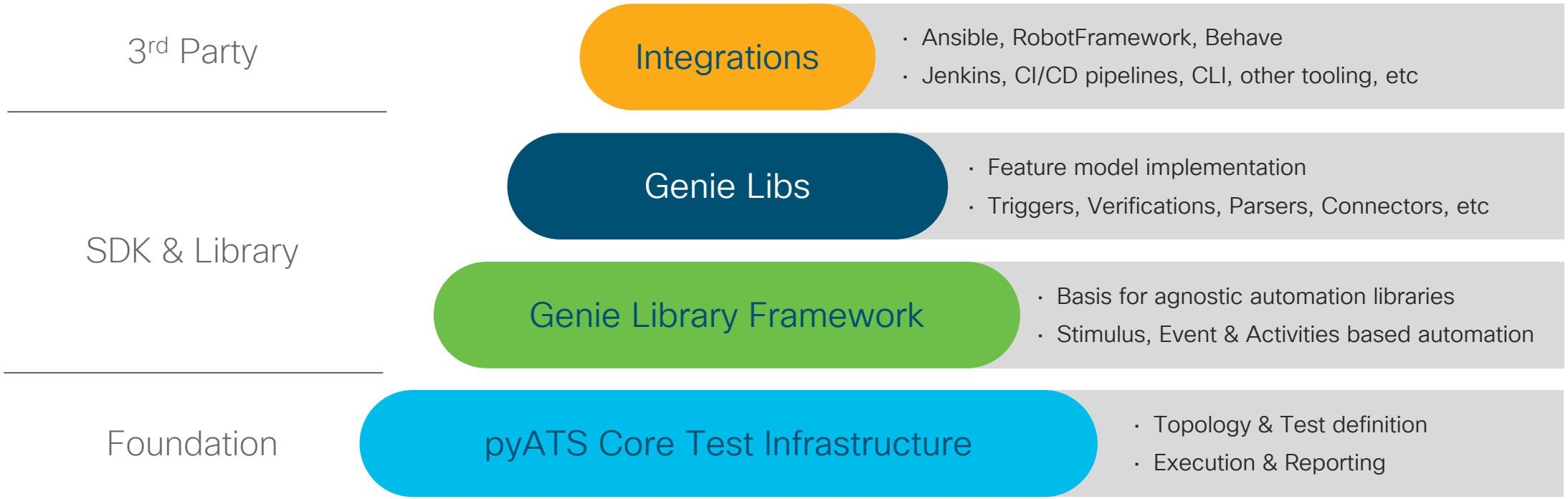


Recap: pyATS & Genie

- De-facto Cisco engineering test infrastructure since 2014
  - CI/CD test automation across various platforms running IOS, IOSXE, IOSXR, NXOS, NGFW, Cable…
  - 3000+ Engineering developers, 5mil+ LoC, 2mil+ test runs per month
  - Active development & support by the same team that built the infrastructure
- Released to DevNet in 2017, all libraries open-source under Apache 2.0 License
- Full coverage of the infrastructure in NetDevOps Live Season 1 Episode 8
- The core of pyATS & Genie is platform, feature and management protocol agnostic
- Specific platform, device, and feature support are done via:
  - Plugins & extensions
  - Library implementations – loaded via an abstraction layer

Cisco Test Automation Ecosystem

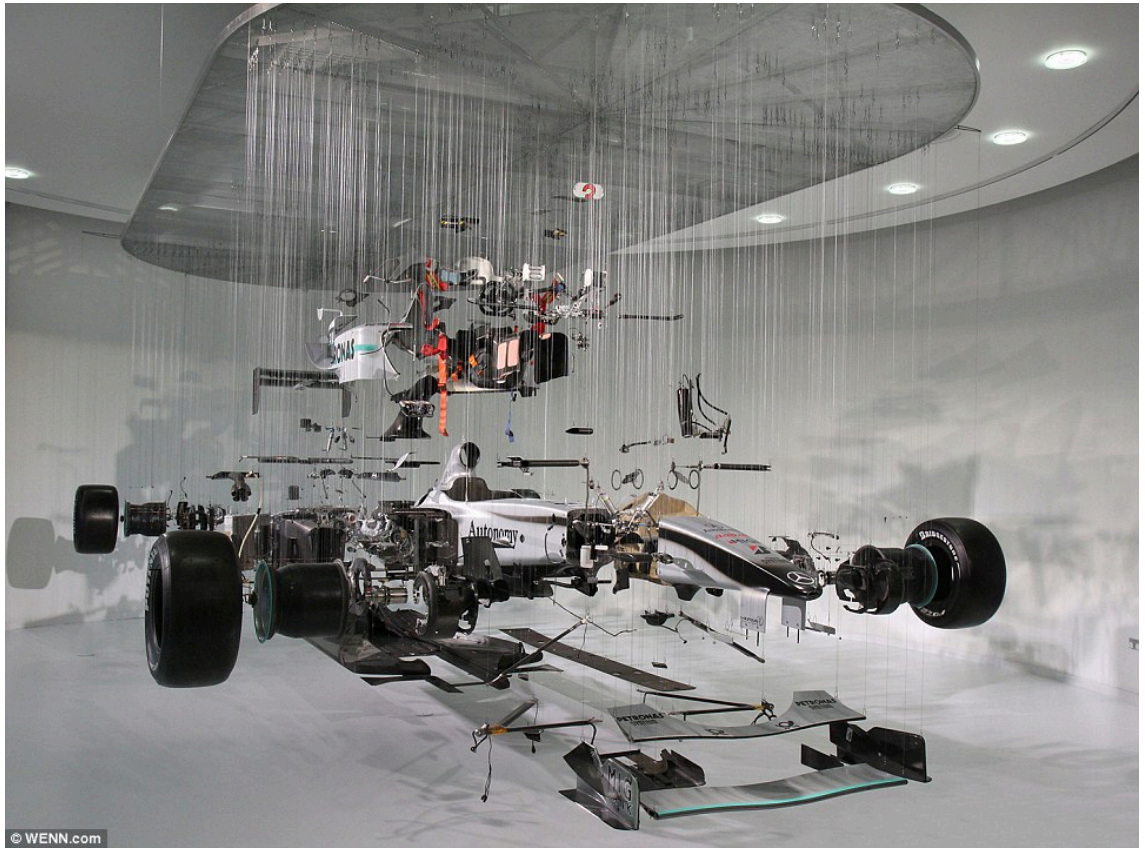
Solution Layout



Why not <insert-tool-here>?

- unittest, pytest & nose: test framework
  - Testcase definition & execution
  - Geared more towards unit testing (small, quick tests with independent setup/teardown)
- Ansible, Chef, Puppet: provisioning, deployment & management
- RobotFramework, Behave: ATDD/BDD specific solution, English-like statements
- Netmiko, Paramiko, Ncclient: connection protocol implementations
- Textfsm: CLI scraping infra

“Specialized Components”
vs.
“End-to-End Solution”



Infrastructure “Mapping”

Function	pyATS | Genie Component	Equivalent
Test Definition, Execution	AEtest	pytest, unittest, nose
Topology/Device Descriptor	Topology YAML	-
Connection + Services	Unicon, Netconf Connector	Paramiko, Netmiko, Pexpect (connection only)
Archive, Reporting	Easypy	-
Python Library	Genie Libs: ready-to use parser, models	Chef/Ansible/Puppet (cfg mgmt) NAPALM
Parser Framework	Genie.Parsergen, Genie.Metaparser	Textfsm Regex
Event-Driven, Data-Driven Reusable automation	Genie Triggers, Verifications	-
For Non-Programmers	Genie CLI	-

Open-Source Libraries

- The core of pyATS & Genie is light weight & platform, feature and protocol agnostic
- All platform, device, and feature implementations are open-source:
- Connection plugins & extensions
- Libraries - feature models, parsers, data-driven testcases are loaded via an abstracted library layer (eg: https://github.com/CiscoTestAutomation/genieparser)

- Example:
  - IOSXE (eg asr1k, cat9k)
  - Junos
  - NXOS (eg n9k, n7k)
  - NSO
  - IOSXR (eg asr9k)
  - NGFW (eg, asa)
  - ...

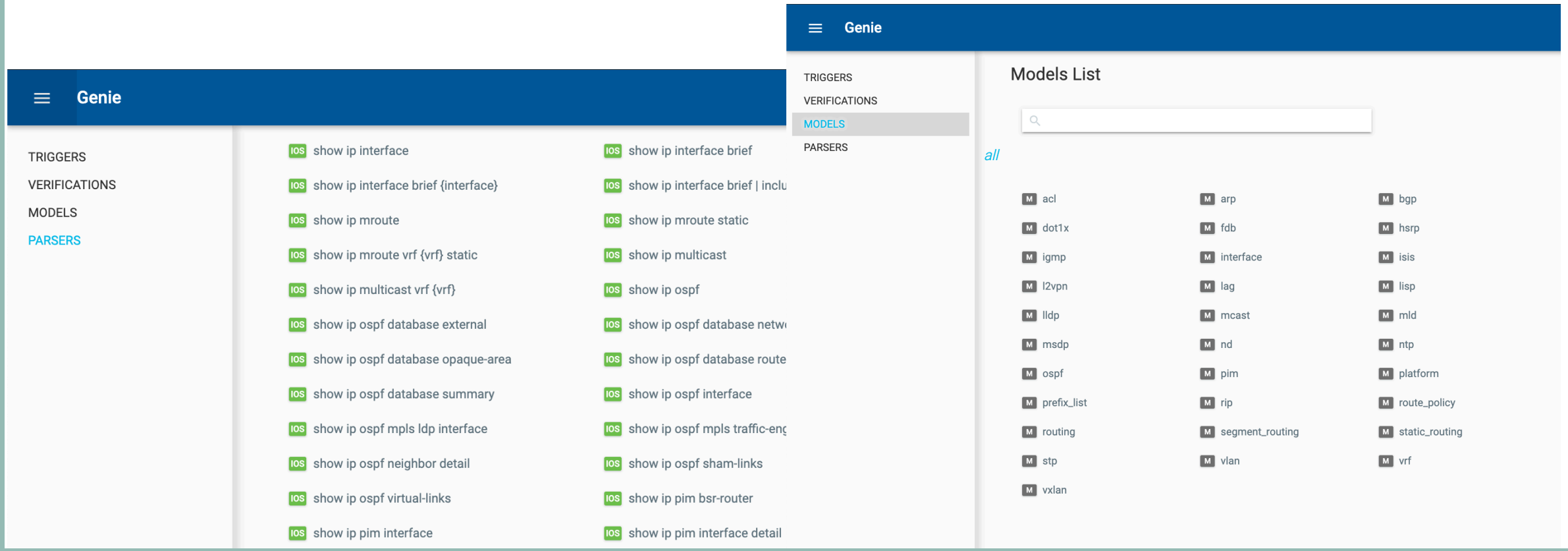
Environment

- Linux/macOS/WSL
- Python 3.4-3.7 (3.8 soon)
- Generates HTML+Text and Email Reports

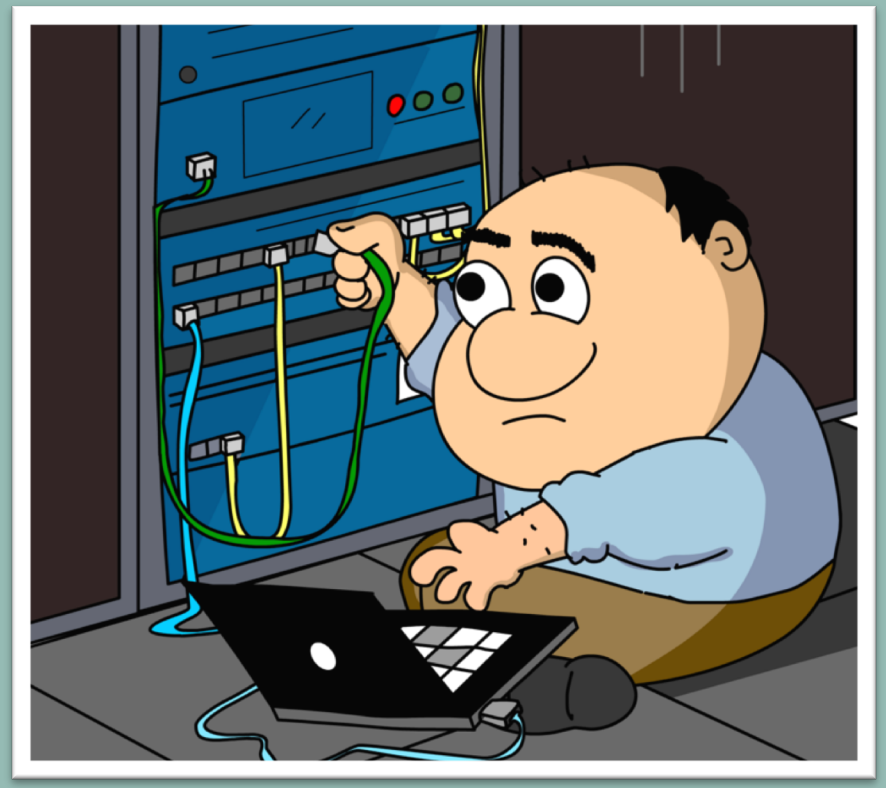

```
bash$ python3 -m venv ~/pyats
bash$ source ~/pyats/bin/activate
(pyats) bash$ pip install pyats genie
(pyats) bash$ pyats --help
(pyats) bash$ genie --help
```

Out-of-Box Features

https://pubhub.devnetcloud.com/media/pyats-packages/docs/genie/genie_libs/#/



Demo



1. CLI:
   No programming experience required
2. RobotFramework:
   English-like testcases
3. Raw, unadulterated Python

Content available at:

https://github.com/RunSi/pyATS_GENIE_NetDevOpsLive

Summary

pyATS & Genie …

1) provides an ecosystem for Network Engineers to perform test automation, DevOps and validation
2) is platform agnostic, free to use, and comes out of the box with ready-to-use libraries and network models, parsers and testcases
3) is suitable for Network Engineers with a variety of programming abilities and skillsets

Webinar Resource List

- pyATS & Genie landing page: https://cs.co/pyats
- Documentation: https://developer.cisco.com/docs/pyats/
  - Features: https://pubhub.devnetcloud.com/media/pyats-packages/docs/genie/genie_libs/index.html
  - Cookbook: https://pubhub.devnetcloud.com/media/pyats-packages/docs/genie/cookbooks/index.html

- Demo Content: https://github.com/RunSi/pyATS_GENIE_NetDevOpsLive

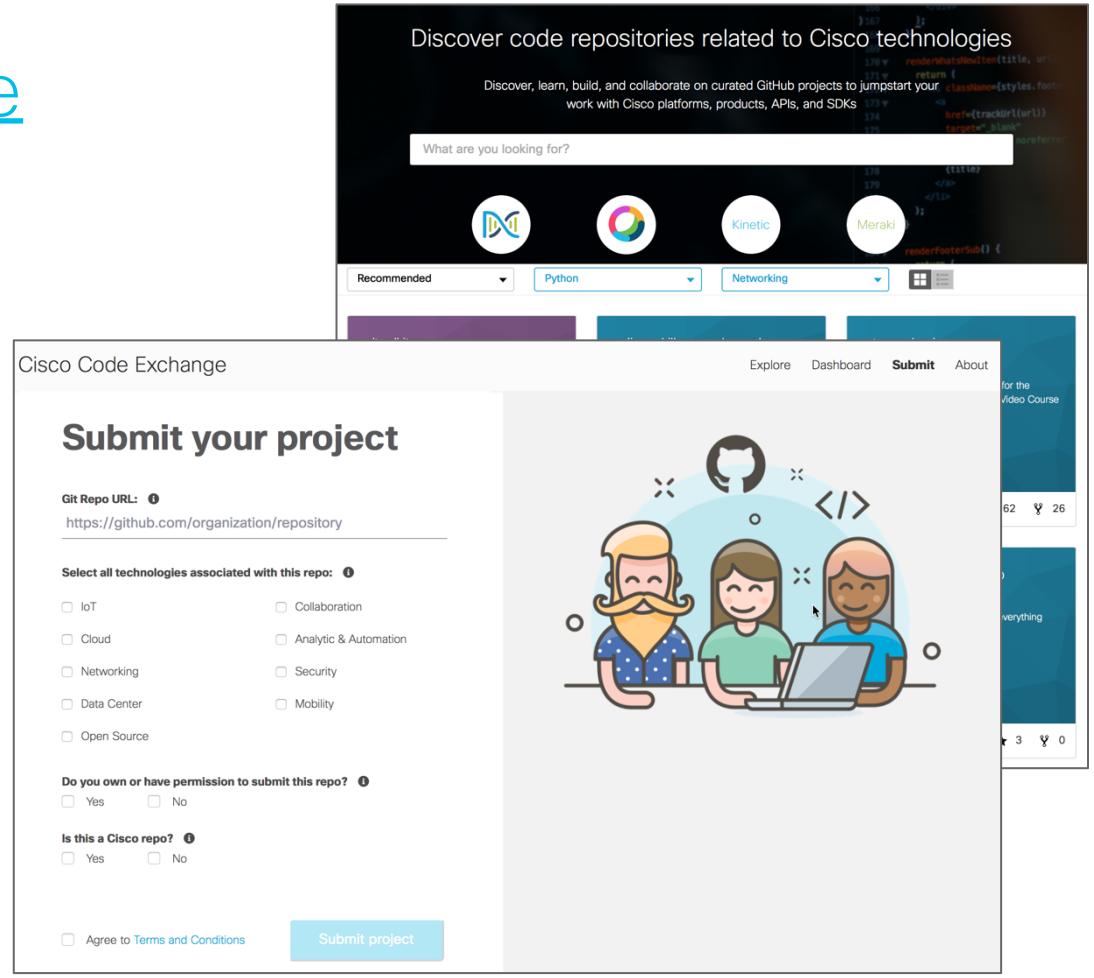
NetDevOps Live! Code Exchange Challenge

developer.cisco.com/codeexchange

Write your own Network Verifications

Examples:

- *Reachability Tests*
- *HSRP Status*
- *BGP/OSPF States*
- *Interface Counts/Counters*
- *Checks for critical routes*



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  developer.cisco.com/video/net-prog-basics/

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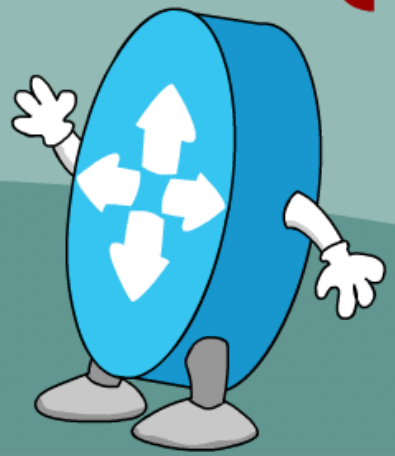

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