



The bridge to possible

Significance of CX Test Automation Framework for SP

Test, Validate and Deploy

Ravi Dhotarad & Ronak Gera

Cisco Webex App

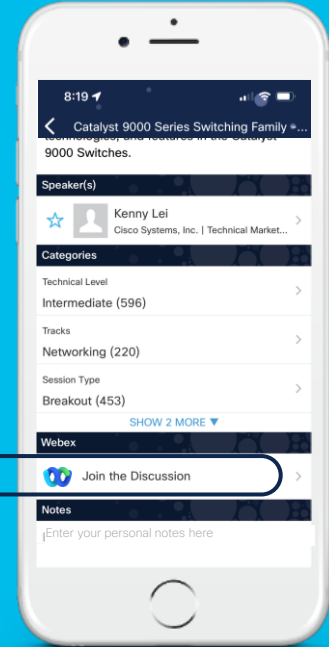
Questions?

Use Cisco Webex App to chat with the speaker after the session

How

- 1 Find this session in the Cisco Live Mobile App
- 2 Click “Join the Discussion”
- 3 Install the Webex App or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated until February 24, 2023.





Agenda

- Deployment Challenges
- What is CXTA?
- CXTA at a Glance
- CXTA Code Structure
 - CLI Parsing
 - Organizing Test Suites to Qualify SP Services
 - Script execution Report
- CXTA as a Service
- Potential Benefits of CXTA
- Demo and Q&A

Deployment Challenges

Repeated Efforts



Device Maintenance
Bandwidth Adjustments
Upgrades

Human-error



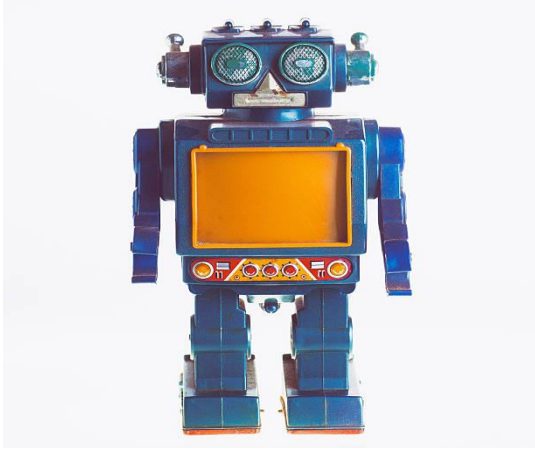
Configuration compare
Copy Paste Error

Scale



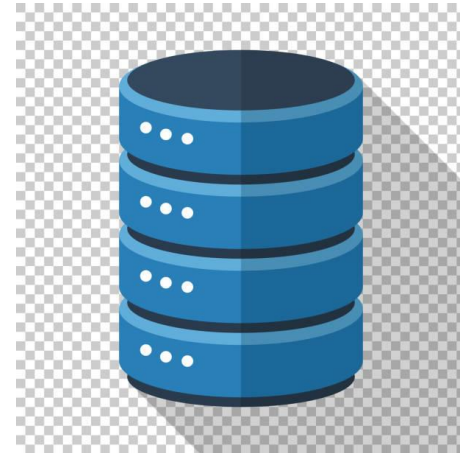
Verification and Validation
Time consuming
Implement New feature

What is CXTA?

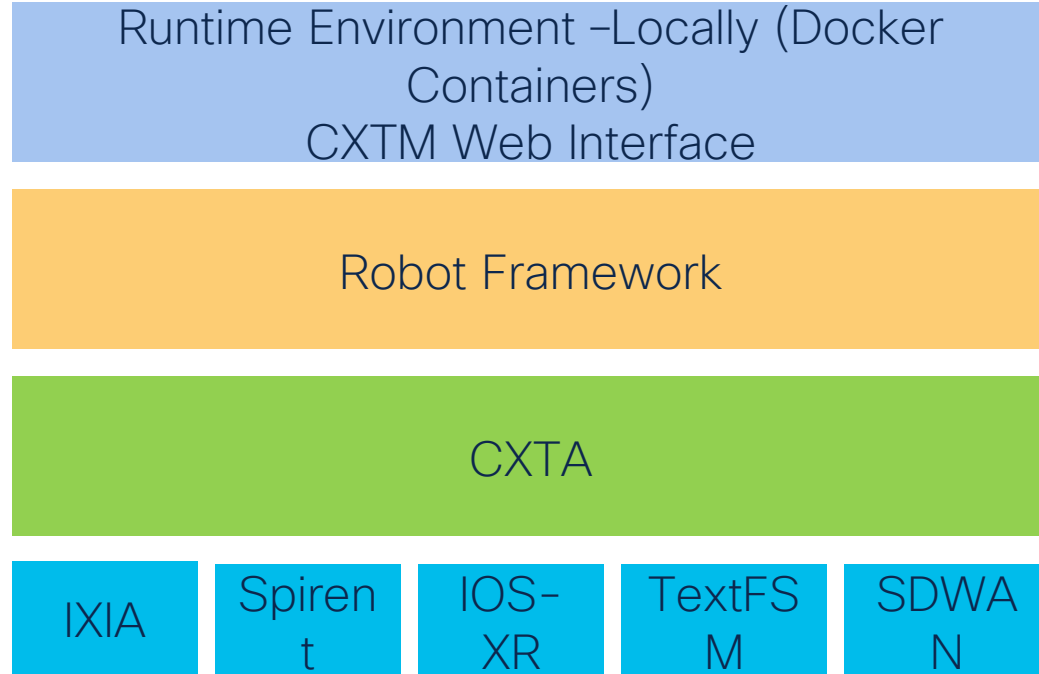


- Pronounced as Siesta
- Leverages Robot Framework
- Cisco's Built-in Library CXTA
- Customized Keywords
- Easy to write Test cases

- Run-time environment
- SSH CLI interaction with any system
- Work with all Cisco Platforms
IOS-XE, IOS-XR, NX-OS...



CXTA At a Glance



CXTA Code Structure

- Headers
- Router initialization
- User Defined Keywords
- Variable to Define router name
- Definition of Test Cases

```
*** Settings ***
Library          CXTA
Resource         cxta.robot
Library         CXTA.robot.platforms.iosxr.config
Documentation    Demonstration for EMEA Cisco Live 2023
Metadata        Version      1.0

Suite Setup      load testbed "testbed.yaml"
# Resource       community/iosxr.robot

*** Keywords ***
Check interface
    [Arguments]  ${INTERFACE}
    run "show interface ${INTERFACE}"

*** Variables ***
${hostname}     ios

*** Test Cases ***
#show commands sections
Connection to device
    [Documentation]  Sets the hostname on an IOS device
    [Tags]          Device Access
    connect to device "${hostname}"
    execute command "show platform" on device "${hostname}"
    execute command "show env" on device "${hostname}"
```

Contd.

*** Test Cases ***

Connect to device

```
use testbed "microsoft_nce_tb_virl.yaml"
connect to device "IBRBOT3-NCS5508"
```

```
@keyword(r'use testbed "${path:[^}]+}"')
def use_testbed_path(self, path):
    logger.info(f'Loading testbed {path}')

    return self._load_testbed(path)

@keyword(r'connect to device "${device:[^}]+}"')
def connect_to_device(self, device):
    return self._connect_to_device(device)
```

Connection to device

*** Test Cases ***

Verify route in table

```
verify route "5.5.5.1/32" in table
```

To check prefix existence in a table

```
@keyword(r'verify route "${route:[^}]+}" in table')
def verify_route_in_table(self, route):
    parser = TextFSMParser()
    try:
        logger.info(f'Checking ipv4 table for route')
        route = parser.run(
            self.shared.connected_devices[self.shared.current_device], "show_route_ip", **{"type": 'ipv4', "ip": route})
    except:
        logger.info(f'Checking ipv6 table for route')
        route = parser.run(
            self.shared.connected_devices[self.shared.current_device], "show_route_ip", **{"type": 'ipv6', "ip": route})
    return bool(route)
```


Contd..

- YAML data structure for router definition
- Easier to use if larger set of data to be managed
- Optionally one place for variable

Router Definition

Build similar block of code to define routers

```
devices:
  ios1:
    type: router
    os: iosxr
    credentials:
      default:
        username: user_name
        password: pass_word
    connections:
      term:
        protocol: telnet
        ip: 10.10.10.10
        port: '2012'
      vty:
        protocol: ssh
        ip: 127.0.0.1
        port: 30778
    defaults:
      via: term
```

CLI Parsing

Basic Check using Keywords

Parsing using Keywords

Parsing using keywords

Verify Correct Software Version

execute command "show version" on device "\${hostname}"

Verify version

values "7.4.1" and "Version" exist on same line

Regex – Parsing

Match and Extract the pattern using
Regular Expression

RegEX Parsing Example

Check for inventory

execute command "show inventory" on device "\${hostname}"

\${SN}= extract pattern "PID:.*"

Log \${SN}

Organizing Test Suites to Qualify SP Services

- Descriptive naming for test suites
- Structure the script for respective services
- One Time effort, and reusable in existing scenario

*** Test Cases ***

Software upgrade

Tag [IOS-XR upgrade]
Upgrade Router

Verify Hardware & Software Health Check

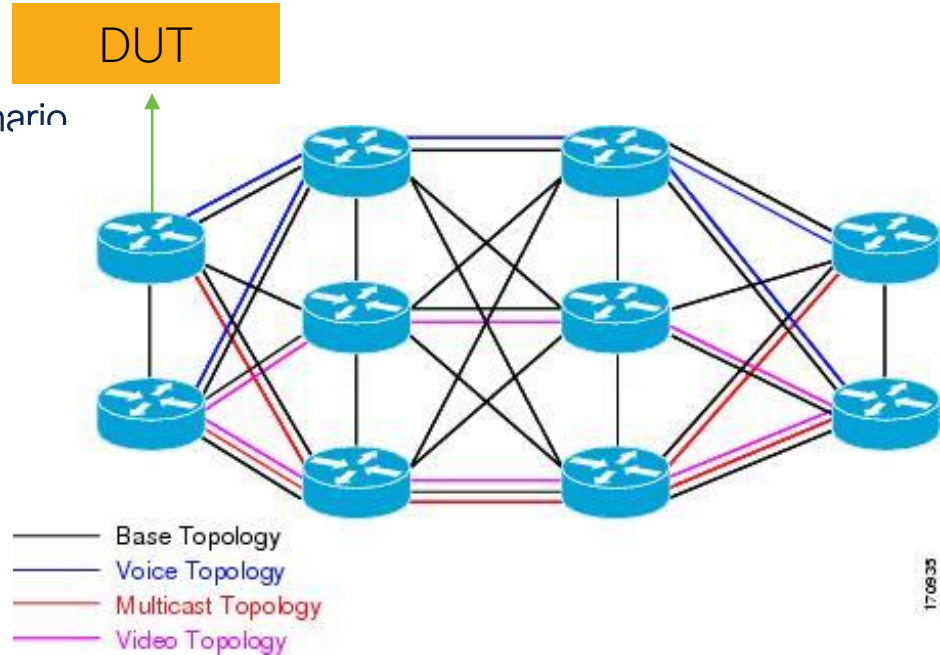
Tag [infra-tests]
Validate HW-SW On device

Verify L3VPN with Traffic

Tag [l3vpn Tests]
Verify Basic L3vpn with Traffic

Verify L2VPN with QoS

Tag [l2vpn QoS]
Verify Basic L2VPN with QoS



Script Execution Report

Passed Test case Report

First Test Report

Generated 20230203 12:13:20 UTC+01:00 51 seconds ago

Summary Information

Status: All tests passed
Documentation: Demonstration for EMEA Cisco Live 2023
CXTA Version: 22.20
Version: 1.0
Start Time: 20230203 12:12:22.480
End Time: 20230203 12:13:20.223
Elapsed Time: 00:00:57.743
Log File: [log.html](#)

Test Statistics

Total Statistics	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
All Tests	6	6	0	0	00:00:55	<div></div>
Statistics by Tag	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
Device Health Check	1	1	0	0	00:00:16	<div></div>
Statistics by Suite	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
First Test	6	6	0	0	00:00:58	<div></div>

Test Details

All Tags Suites Search

Suite:

Test:

Include:

Exclude:

[Help](#)

Failed Test case Report

First Test Report

Generated 20230203 12:15:45 UTC+01:00 4 seconds ago

Summary Information

Status: 1 test failed
Documentation: Demonstration for EMEA Cisco Live 2023
CXTA Version: 22.20
Version: 1.0
Start Time: 20230203 12:14:47.865
End Time: 20230203 12:15:44.766
Elapsed Time: 00:00:56.901
Log File: [log.html](#)

Test Statistics

Total Statistics	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
All Tests	6	5	1	0	00:00:54	<div></div>
Statistics by Tag	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
Device Health Check	1	1	0	0	00:00:15	<div></div>
Statistics by Suite	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
First Test	6	5	1	0	00:00:57	<div></div>

Test Details

All Tags Suites Search

Suite:

Test:

Include:

Exclude:

[Help](#)

Script Execution Report Contd.

First Test Log

Generated
20230203 12:45:09 UTC+01:00
40 seconds ago

Test Statistics

- Test Case Statistics
- Advantage of using Tags in Test cases
- Easy to Navigate the Test Results

Total Statistics	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
All Tests	8	8	0	0	00:01:13	<div></div>
Statistics by Tag	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
Check for the Linecard Status	1	1	0	0	00:00:15	<div></div>
Device Access	1	1	0	0	00:00:06	<div></div>
Device Health Check	1	1	0	0	00:00:16	<div></div>
Download Router Running Configuration	1	1	0	0	00:00:03	<div></div>
Inventory Details	1	1	0	0	00:00:14	<div></div>
RSP Status Check	1	1	0	0	00:00:14	<div></div>
Show interface output	1	1	0	0	00:00:04	<div></div>
Software Version Check	1	1	0	0	00:00:01	<div></div>
Statistics by Suite	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
First Test	8	8	0	0	00:01:16	<div></div>

Additional warning message

Test Execution Errors

20230203 12:48:52.602 **WARN** Please help our CX tools usage tracking efforts by setting the project ID (PID) via environment variable CUSTOMER_PID or via keyword 'callhome set customer pid to "xx"'.

CXTA as a Service

- CX Professional service team can assist in creating test scenarios/plans and automation.
- CX Professional Services can provide recommendations to integrate with 3rd party API, build testing tool using CXTA.
- SVS team can be leveraged to create an, end to end validation of unique deployment scenario.
- Subscription Service

Potential Benefits



Code with ease



Prevent wheel reinvention



Multi-vendor Support



Automated Documentation



MW – Pre & Post check



One Click and Verify

Demo, Q & A



Useful Resources

- [Robot Framework Documentation](#)
- [CXTA Further reference](#)
- [Spirent API reference](#)
- [IXIA API References support](#)

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DevNet Hoodie!



cs.co/DNZCLEUR2023

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- Please complete your session survey after each session. Your feedback is important.
- All surveys can be taken in the Cisco Events Mobile App or by logging in to the Session Catalog and clicking the "Attendee Dashboard" at <https://www.ciscolive.com/emea/learn/sessions/session-catalog.html>



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The bridge to possible

Thank you

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CISCO *Live!*

ALL IN