



The bridge to possible

Short & Sweet into ThousandEyes API Suite

Yazan Albikawi, Implementation Engineer

Cisco Webex App

Questions?

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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.



Kremer Prize

- Reward centered on Human-Powered aircraft, Created in 1959
- Idea is to fly a figure eight around two markers one half mile apart
- Dozens of teams, for 17 years no one won....



Define The problem

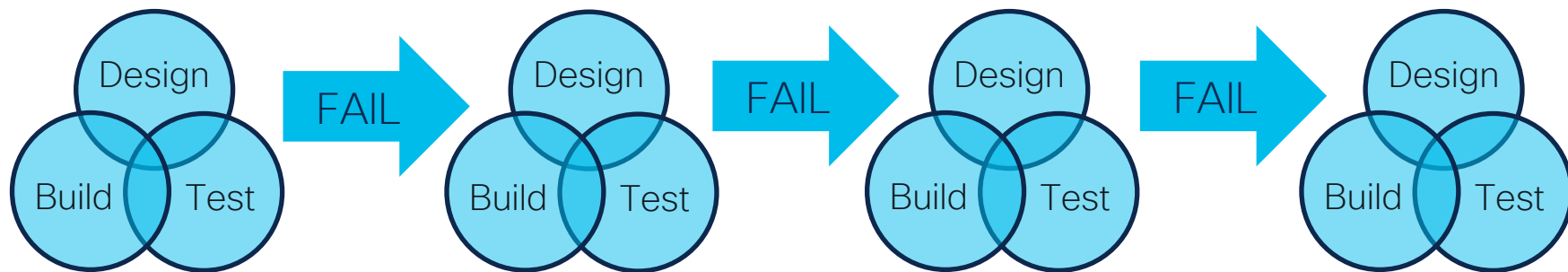
In 1977 Dr.Paul MacCready Team made the first sustainable and controlled Human powered aircraft called Gossamer Condor

- Goal is to make a human-powered aircraft ✗
- Goal is to speed up the Design-Build-Test cycle ✓
- Speed up iteration → speed up learning



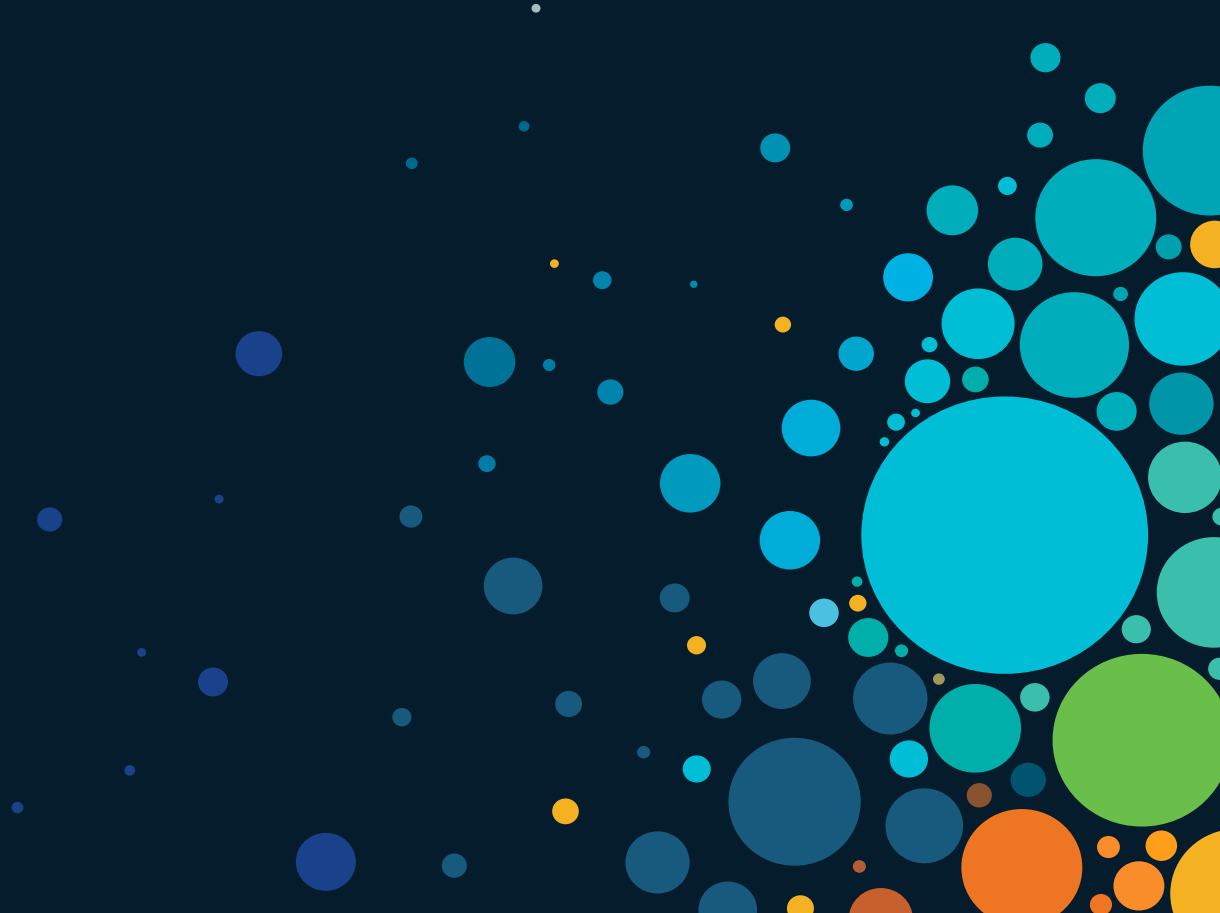
Iteration

FAIL FAST , FAIL OFTEN



Repeating a set of design, development and test operation cumulatively until the desired outcome is achieved.

Session Objective



Session Objective

Your main key takeaways

- Streamline network tests onboarding into ThousandEyes
- Grow the skillset needed for ThousandEyes Automation
- Discover the available options and “How to ” modules
- Facilitate sharing data and events from ThousandEyes

*“In protocol design, perfection has been reached not when there is nothing left to add, but when there is nothing left to take away”
Rule 12, RFC1925*





Agenda

- Introduction
- ThousandEyes API toolkit
- The Story: Clark & The Automation Harmony
 - The vision in a golden plate
 - Measure twice
- Customer success story
- Conclusion

About your speaker



Yazan Albikawi

- Focus areas: Network and Solution Design, Implementation, Consultation
- Technology Area: Security, Network observability and Design
- ThousandEyes EMEA Professional Services

Introduction

Expectation Check

The session will cover

- ThousanEyes API toolkit
- Examples and Use cases
- Getting started with Thousandeyes automation
- Use python and terraform in automation examples

The session will Not cover

- Details in multiple programming languages and code structure
- Deep dive into orchestration or automation tool



ThousandEyes API toolkit

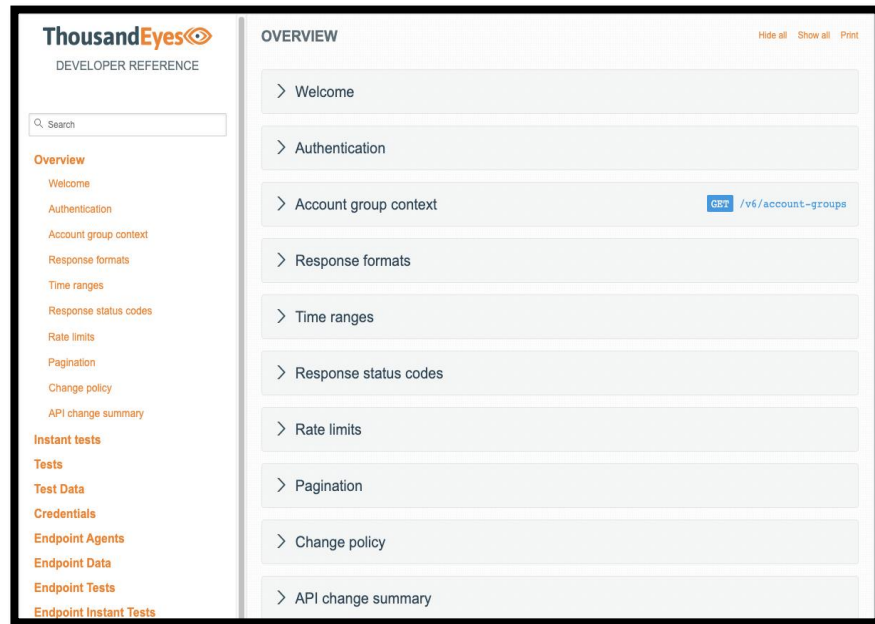
ThousandEyes API

Developer reference

<https://developer.thousandeyes.com>

- Authentication
 - Basic
 - Bearer token
- Response format: XML/JSON
- Rate Limits
 - 240 request per minute

x-organization-rate-limit-limit	①	240
x-organization-rate-limit-remaining	①	236
x-organization-rate-limit-reset	①	1667571120



ThousandEyes API

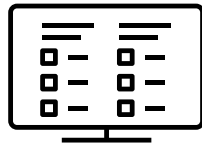
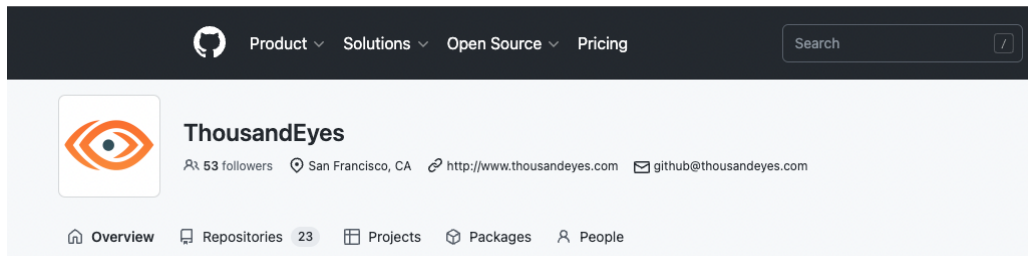
Developer reference

API version

APIv6 the current release

APIv7 preview, some API calls like create Dashboard

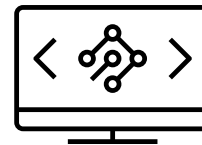
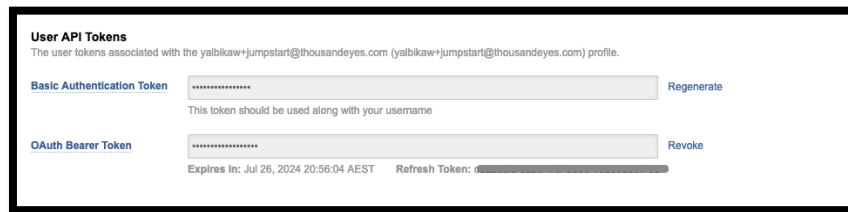
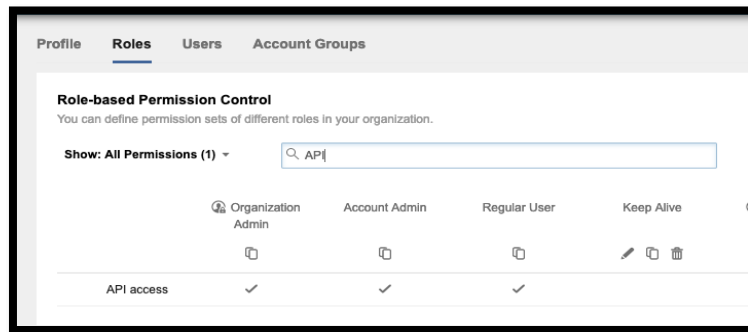
ThousandEyes- GitHub



ThousandEyes API

Getting started

- ThousandEyes side
 1. Account with API permission
 2. Account RBAC privilege
 3. API Token
- Client Side
 - Any IDE with API library
 - Any API Platform



ThousandEyes API

Resource ID

Organization/ACME



Account Groups

Network/AID

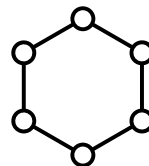
Finance/AID

Tests

SIG_Test/TestId

PCI_Test/TestId

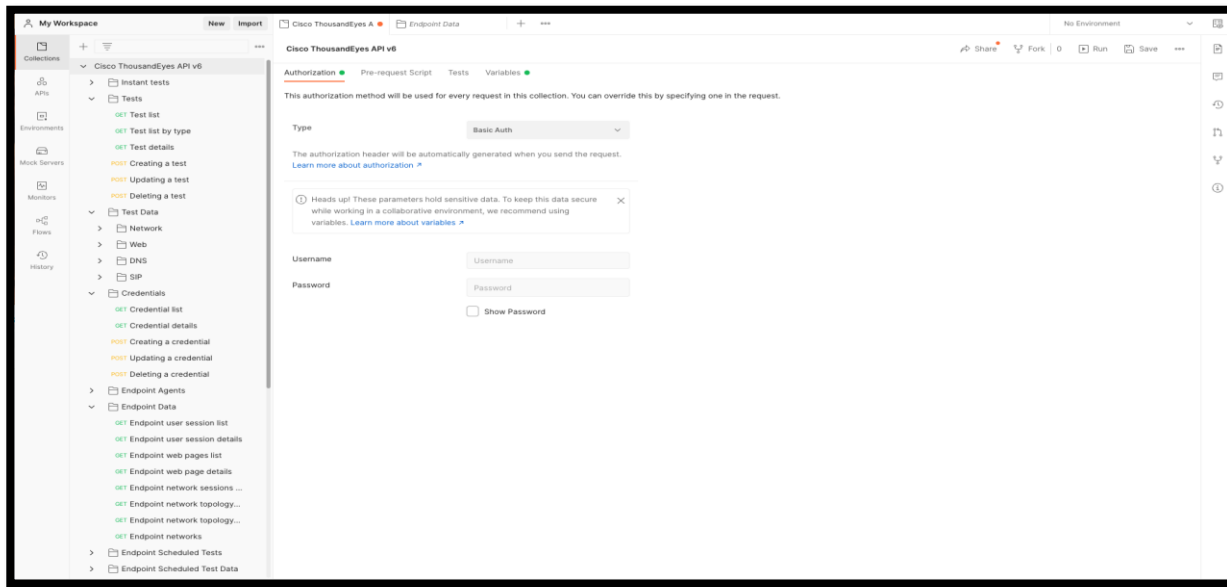
Alerts, labels, Dashboards...



ThousandEyes API

Postman API Platform

- Install Postman
- Download Cisco ThousandEyes API v6 collection



Demo Postman- Thousandeyes API

Summary To Run First API Call in Postman

- Update Base_URL Variable with thousandeyes endpoint

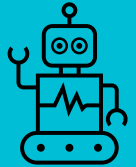
Variable in postman → {{Variable_name}}

ThousandEyes API Target url: <https://api.thousandeyes.com>

- Get Account Group ID
- Get Test list
- Get Test Details

Name	URL
Account group ID	https://{{base_url}}/v6/account-groups.json
Test List	https://{{base_url}}/v6/tests.json
Test Details	https://{{base_url}}/v6/tests/Testid.json

The Story: Clark and The Automation Harmony



Introduction to Central Science

Central Science is a fictitious company focused on research and development sector for water and climate

- In the past year they have onboarded Thousandeyes
- The testing portfolio skyrocket after seeing the benefits of Network Observability
- More teams adopted the FSO idea and currently a lot of application owners are using ThousandEyes

ThousandEyes maintenance becoming a burden, The technical board are having a meeting to discuss this.

Introduction to central science IT staff

Main Characters of the day

- Clark the network admin
 - One of the top talents, he always try to work proactively, owner of many initiatives and he loves ThousandEyes
- Lobo from the dev team
 - He is a dedicated developer, hard working and always willing to provide help in coding and development



The vision in a golden plate

Leaders Meeting Minutes

Hello Team,

Please find below the agreed goals from the board:

- Cleanup the inactive tests in the platform
- Utilize Splunk for Alerts and base it for further tasks
- Kick off ThousandEyes with Netops team, and make sure they maintain the state of their configuration

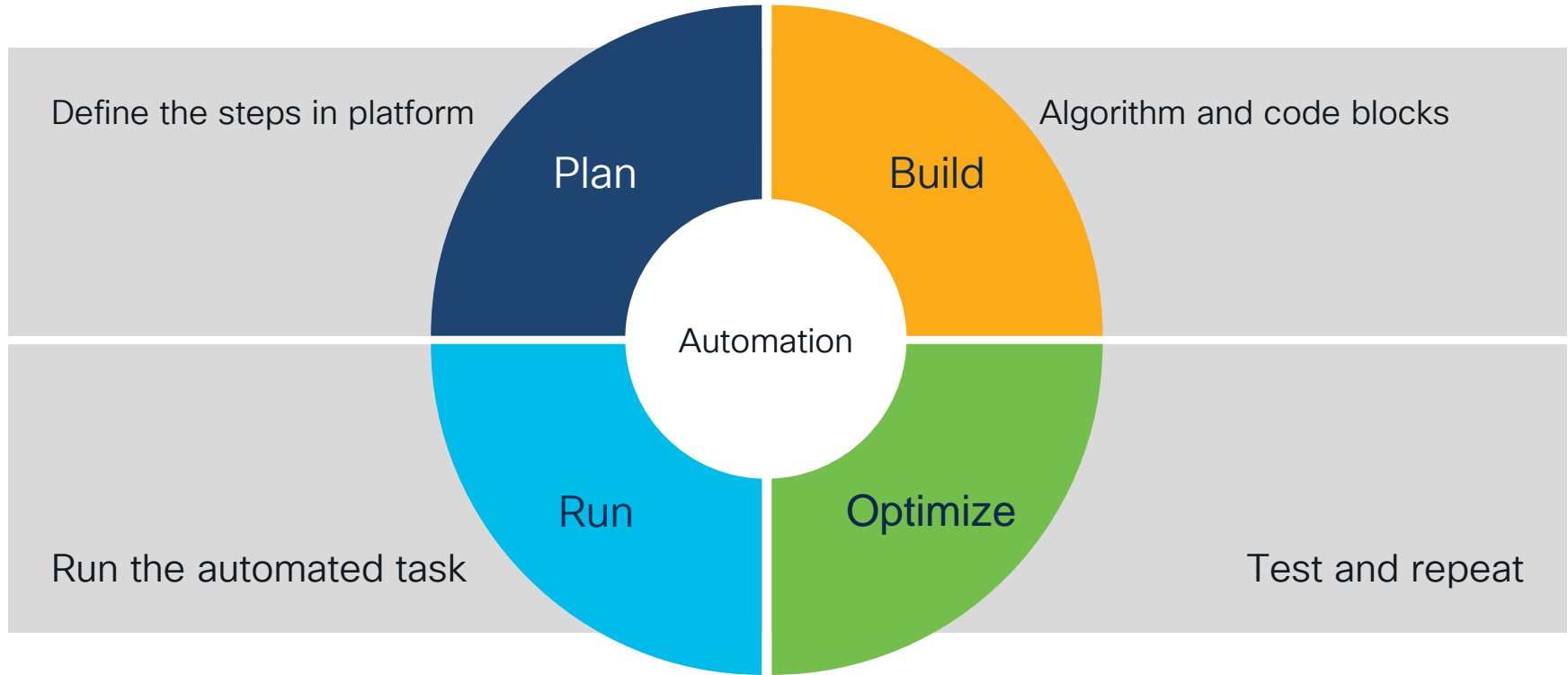
Complete these Goals assigning them priority over other tasks, we want best use of Thousandeyes.

Diana
VP of network and services strategy



Measure twice

Measure Twice Strategy



Measure Twice Key Overview



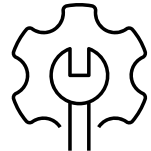
Measure Twice

First Goal

Cleanup inactive tests



Cloud & Enterprise Agents > Test Settings					
Cloud & Enterprise Agents Views New Views ... Test Settings Agent Settings BGP Monitors Endpoint Agents Devices Internet Insights Dashboards Alerts 13 Sharing Account Settings	centralscience domain	DNS Server	centralscience.local A · UDP	✓	<input checked="" type="checkbox"/> ...
	centralscience Internal applicaiton	Web - Page Load	https://facebook.com		<input checked="" type="checkbox"/> ...
	centralscience.local availability	Web - HTTP Server	http://centralscience.local	✓	<input checked="" type="checkbox"/> ...
	Cloud-test Africa 1 netflix Cairo + cape town	Web - HTTP Server	https://www.netflix.com		<input type="checkbox"/> ...
	DNS server	DNS Server	cisco.com A · UDP		<input type="checkbox"/> ...
	DNS Trace to Microsoft Teams	DNS Trace	teams.microsoft.com A · UDP	✓	<input checked="" type="checkbox"/> ...
	DNS_MS	DNS Server	microsoft.com A · UDP		<input checked="" type="checkbox"/> ...
	DNS_O365	DNS Server	office365.com A · UDP		<input checked="" type="checkbox"/> ...
	DNS_O365-OneDrive	DNS Server	bikawi-my.sharepoint.com CNAM...		<input checked="" type="checkbox"/> ...
	DNS_O365-Outlook	DNS Server	outlook.office365.com CNAME · U...		<input checked="" type="checkbox"/> ...
	DNSSEC	DNSSEC	www.dnssec-tools.org A		<input type="checkbox"/> ...
	DNSTrace	DNS Trace	cisco.com A · UDP		<input type="checkbox"/> ...



Cleanup Inactive Tests



Define the steps that needs to be automated.

- To delete tests, we need to filter the flag enabled = no
- Then click on each test and delete it.

The image shows a screenshot of the Cisco Test Runner interface. On the left, a dropdown menu for 'Enabled' is open, showing 'No' selected and 'Yes' unselected. A blue arrow points from this menu to the main interface. The main interface shows a table of tests with columns: Test Name, Type, Target, Alerts, and Enabled. The 'Enabled' column has a filter set to 'No'. A context menu is open over the 'Delete' button in the 'Enabled' column of the first row.

Test Name	Type	Target	Alerts	Enabled
ACI HDS(EA2)-To-HDS(EA3)	Network - Agent to Agent	HDS-3:49153		<input type="checkbox"/> ...
ACI HDS(EA2,EA3)-To-Core(Nexus)	Network - Agent to Agent	nexus9k:49153		<input type="checkbox"/> ...
ACI IPS test Copy	Network - Agent to Server	192.168.5.5:80		<input type="checkbox"/> ...
API agent-to-server test addition for www.thousande...	Network - Agent to Server	www.thousandeyes.com:80		<input type="checkbox"/> ...
B.W Tests	Network - Agent to Server	10.10.10.10 ICMP		<input type="checkbox"/> ...
b.w_eth0	Network - Agent to Server	rule11.tech:80		<input type="checkbox"/> ...
b.w_eth1	Network - Agent to Server	rule11.tech:80		<input type="checkbox"/> ...

Cleanup Inactive Tests

Using postman get list of disabled tests



Get <https://api.thousandeyes.com/v6/tests.json>



Delete

Post <https://api.thousandeyes.com/v6/tests/{{testType}}/{{testId}}/delete.json>

Cleanup Inactive Tests

Plan

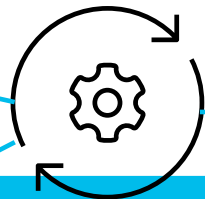
Build

Run

- Get list of inactive tests
- Delete all



- Easy, I will do the code



```
parse_config()  
(credentials and account  
group)  
get_aid()  
(getting the account id)  
get_testlist  
(get all the tests that are  
inactive )  
delete_inactive_tests  
(delete all the tests inside the  
inactive_testlist )
```


Delete Inactive Tests, Demo

Summary Steps For The First Goal

Cleanup Inactive Tests using Python Script

Plan

- Define the steps in Thousandeyes
- Verify if it can be automated

Build

- Test sample outcome with API using postman
- Build the logic to automate the task
- Create the script

Run

- Run the code
- Verify the outcome in platform

Integration: Event-driven & Polling API

ThousandEyes Integration

Event-Driven

Webhooks

Webhooks are simple lightweight method of sending Alerts between applications.

- Classic webhooks
- Custom Webhooks



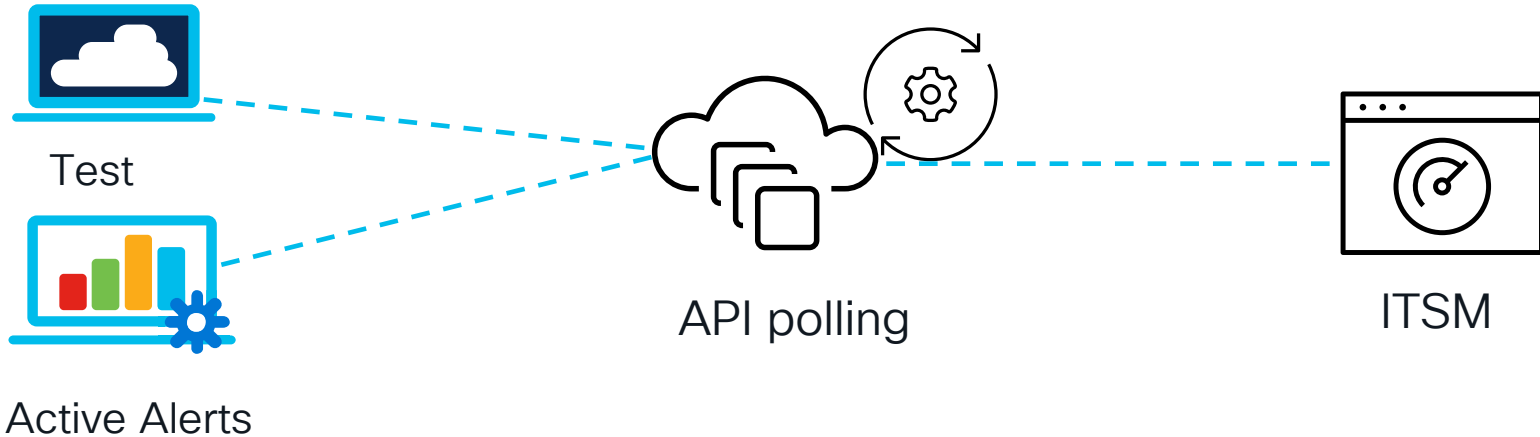
ThousandEyes Integration

API Poll

Polling mode

Periodically sending API request to check data

- Test metrics, active alerts
- Dashboards and other services

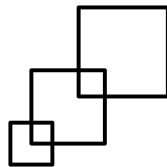


Integration Demo Webhooks

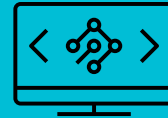
Summary on Integration using custom webhooks

Webex Notification

- ThousandEyes
 - Configure custom webhook
 - Use Preset Configuration template for Webex
 - Customize the body to include roomId
 - Add/remove variables, <https://docs.thousandeyes.com/product-documentation/alerts/integrations/webhooks/webhook-vars>
- Webex
 - Token
 - RoomID



Integration with Splunk



Integration with Splunk

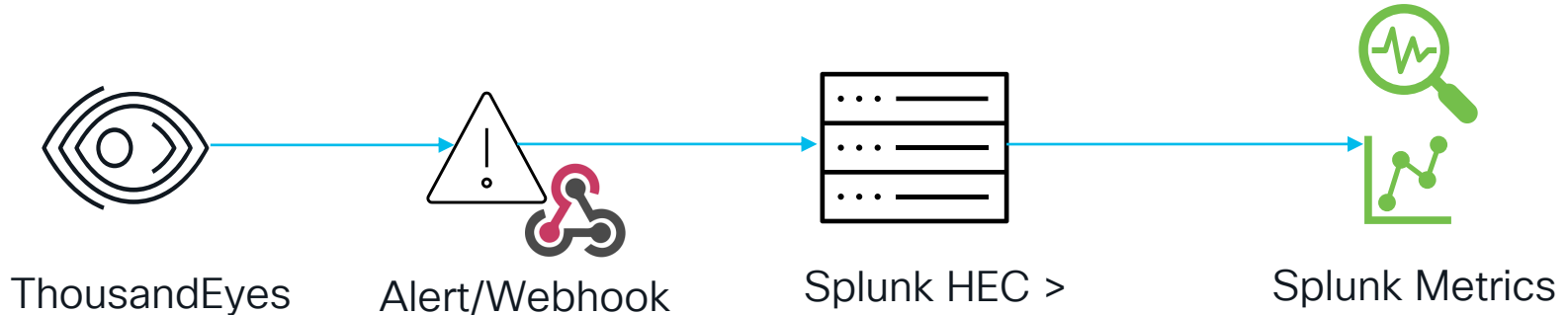
Second Goal



Utilize Splunk for Alerts and base it for further tasks

This task will be based on webhooks

- Splunk Http event collector HEC
- ThousandEyes custom Webhooks



Integration with Splunk



Splunk HEC configuration

- Select data input
- Turn on HTTP event collector
- Generate an HEC token
- Make sure HEC is enabled in Global settings

Notes

Send data to HTTP Event Collector on Splunk Cloud Platform

```
<protocol>://http-inputs-<host>.splunkcloud.com:<port>/<endpoint>
```

Send data to HTTP Event Collector on Splunk Enterprise

```
<protocol>://<host>:<port>/<endpoint>
```

Endpoint -> /services/collector/event

Splunk >

Integration with Splunk



ThousandEyes configuration

- Custom Webhook
- Use Splunk pre-defined template
- Test the integration
- Add Alerts to the webhook

This integration is attached to alert rule(s). Modifying it may affect the existing alert notifications.

Name: Splunk_HEC

URL: http://83.22.133.44:8080/services/collector/event

Present Configurations

Override with an example: Selecting a preset will override any configurations below.

Auth Type: **None** Basic Token OAuth Code OAuth Client Credentials

Headers

Content-Type: application/json

Authorization: Splunk f7ee8338-de79-4771-b368-16d5ac277d82

+ Key-Value Pair

URL Query Parameters:

Body:

```
1 {
2   "event": {
3     "eventId": "{{id}}-{{alert.id}}",
4     "eventType": "THOUSANDEYES_ALERT_NOTIFICATION",
5     "ip": "{{id}}",
6     "type": "{{type.id}}",
7     "alert": {
8       "id": "{{alert.id}}",
9       "name": "{{alert.name.alertTime.id}}"
```



ThousandEyes

Plan

Build

Run

Splunk Integration Demo

Summary Steps For The Second Goal

Integration With Splunk

Plan

- Define the integration type which is webhooks
- Understand the Splunk HEC requirement

Build

- Configure HEC on Splunk
- Configure Custom webhook on Thousandeyes
- Verify the connectivity

Run

- Configure the alert rules with integration
- Verify Splunk once the alert is triggered

Notes: Always use HTTPS in production and never share tokens

Onboard ThousandEyes with Netops team



Measure Twice

Last Goal



To introduce thousandeyes configuration for netops we need the following

- Account group for the team
- Use some tool to maintain the state of configuration
- Use MS Teams as monitoring pilot for their test configurations and alerts

Create account group

Account Settings ▾

- Users and Roles
- Usage and Billing
- Activity Log
- Organization Settings

Profile Roles Users **Account Groups**

Add New Account Group ✕

Account Group Name

Enterprise Agents

Cancel Add New Account Group

Terraform

Last Goal



What is Terraform

Terraform is well-adopted open-source IaC tool, developed by HashiCorp

- Declarative
- Agentless
- Cloud-agnostic can be used with different cloud providers
- Easy to be added with Netops team pipeline process
- Maintain state configuration file

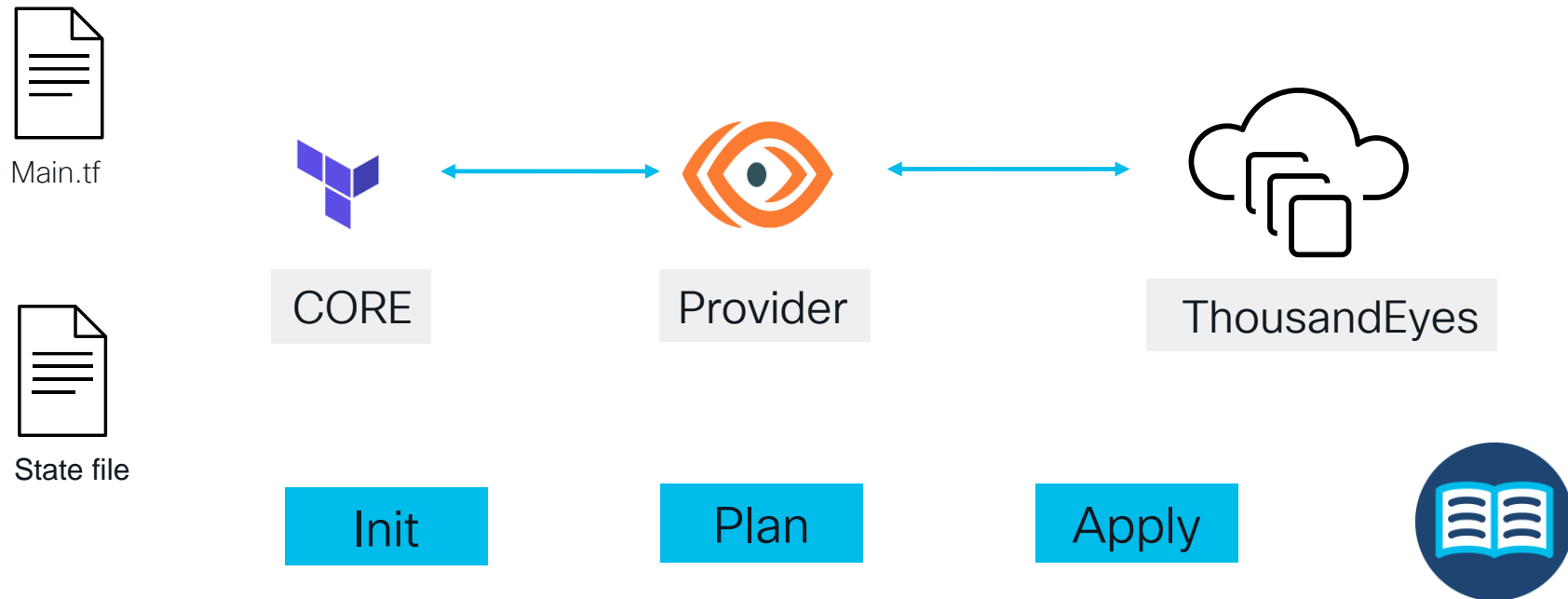
The features available match the requirements

Terraform

Last Goal



Architecture components & workflow



Terraform

Getting started with ThousandEyes Provider



The plugin can be found in Terraform registry

<https://registry.terraform.io/providers/thousandeyes/thousandeyes/1.3.1>

Requirements

- Terraform
- Go

Main code blocks

- Provider
- Data
- Resource



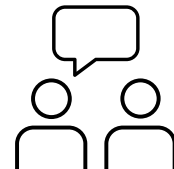
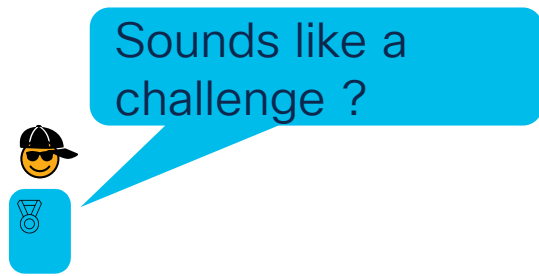
MS Teams Monitoring

Prepare the configuration blocks



Requirements

- Use the assigned enterprise agent under Netops account group
- Configure tests to monitor MS Teams url
- Create alert rule and assign to the tests



Plan

Build

Run

Terraform Demo

Summary Steps For The Third Goal

Configure ThousandEyes Resources using Terraform

Plan

- Verify the requirements
- Install the Thousandeyes provider

Build

- Build the configuration file
- Add all the resources (tests and alerts)
- Plan the deployment and verify the outcome

Run

- Apply the configuration
- Check the state file and verify the configuration on Thousandeyes platform

Goals are Achieved !

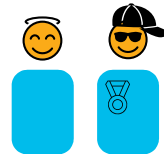
Hello Team,

Below the board agreed Goals for you,

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Complete these Goals assigning them priority over other tasks, we want best utilization and use of Thousandeyes.

Diana
VP of network and services strategy



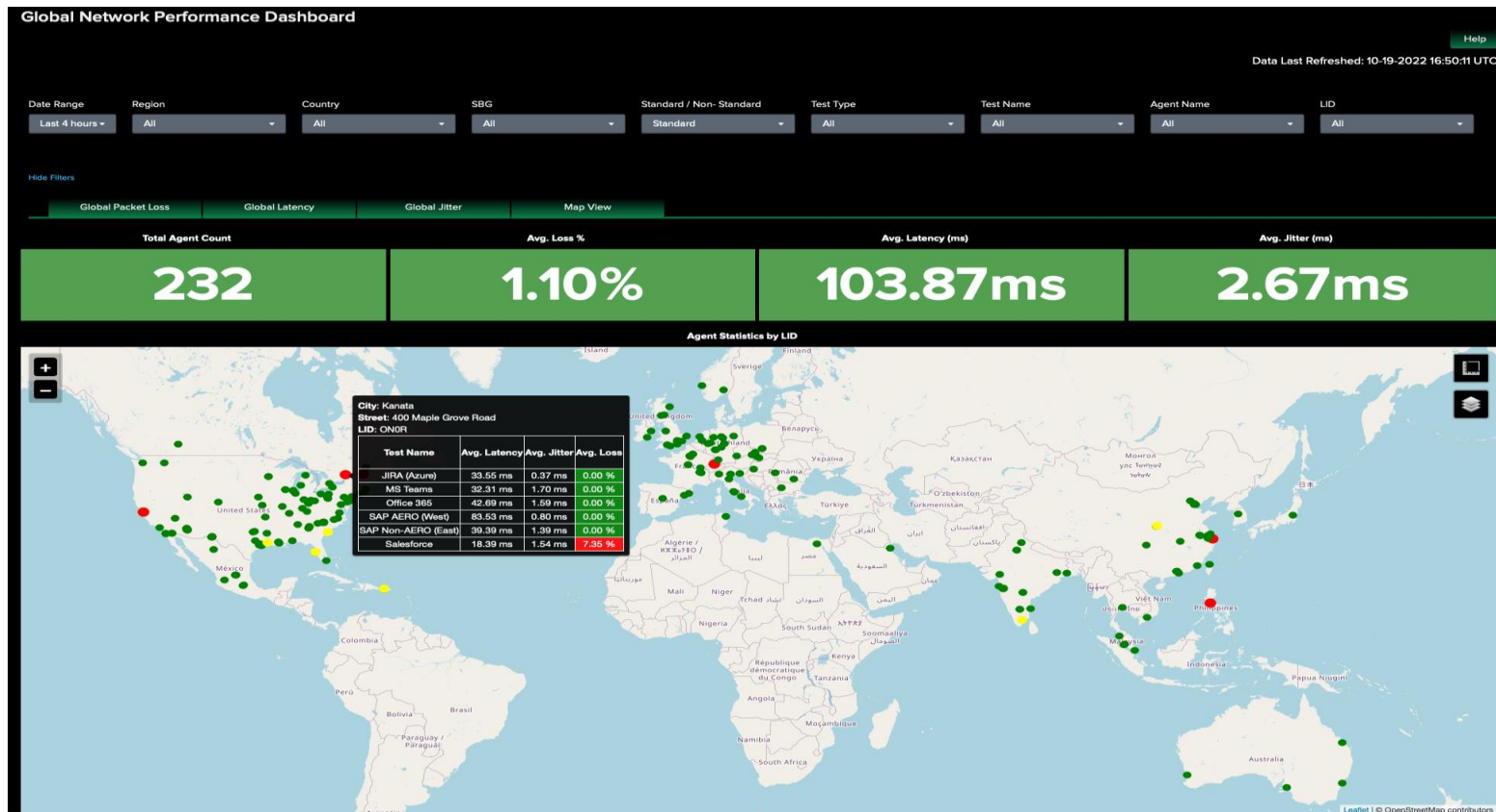


Success story Honeywell



Honeywell

Mean Time Of Innocence



Get ThousandEyes Test Metrics

- Test Data API covers
Network, Web, DNS, Voice

Example for Data Metrics API

https://developer.thousandeyes.com/v6/test_data/

Metric	URL
HTTP Metrics	https://{base_url}/v6/web/http-server/testid.json
Network Metrics	https://{base_url}/v6/net/metrics/testid.json

```
"httpServer": {  
  "connectTime": 1276,  
  "dnsTime": 52,  
  "errorType": "None",  
  "numRedirects": 0,  
  "receiveTime": 1,  
  "responseCode": 200,  
  "serverIp": "194.1.147.11",  
  "sslTime": 415,  
  "responseTime": 2565,  
  "totalTime": 2566,  
  "waitTime": 821,  
  "wireSize": 14978,  
  "sslVersion": "TLSv1.3",  
  "sslCipher": "TLS_AES_256_GCM_SHA384",  
  "agentName": "thousand-eyes-MDC"}
```

```
{  
  "avgLatency": 97.0,  
  "loss": 0.0,  
  "maxLatency": 203.0,  
  "jitter": 26.859993,  
  "minLatency": 30.0,  
  "serverIp": "194.1.147.98",  
}
```



Integration and automation made possible

Thousandeyes API toolkit allows you to automate and integrate solutions, facilitate the deployment and collaboration between teams and products .



Automate tests



Integration



Stay updated



Simplify

What is next ?



Complete your Session Survey

- Please complete your session survey after each session. Your feedback is important.
- Complete a minimum of 4 session surveys and the Overall Conference survey (open from Thursday) to receive your Cisco Live t-shirt.
- 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>



Continue Your Education



Visit the Cisco Showcase for related demos.



Book your one-on-one Meet the Engineer meeting.



Attend any of the related sessions at the DevNet, Capture the Flag, and Walk-in Labs zones.



Visit the On-Demand Library for more sessions at ciscolive.com/on-demand.



The bridge to possible

Thank you

CISCO *Live!*

CISCO *Live!*

ALL IN