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ISE Deployments in the Cloud

Automate ISE Deployments in AWS

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The bridge to possible

ISE Deployments in the Cloud

Automate ISE Deployments in AWS

Jesse Dubois, TAC Security Technical Leader
Patrick Lloyd, Senior Security Solutions Architect, CX Customer Delivery

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LTRSEC-2000

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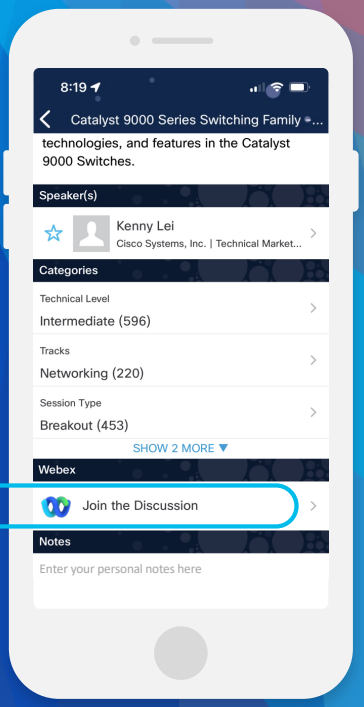

https://ciscolive.ciscoevents.com/ciscolivebot/#BRKXXX-xxxx

Agenda

- Introduction
- Overview: ISE in AWS
- Overview: Ansible
- Deployment Caveats and Topology
- Integrations
- Conclusion

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About Patrick Lloyd

Senior Solutions Architect, Security Services

14 years @ Cisco, 10 in Security

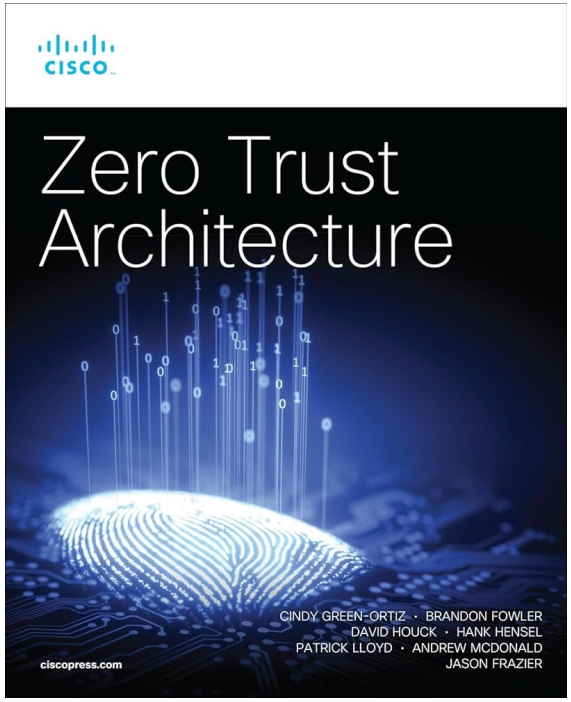
Previously DOD contractor, Higher Education

Private Pilot Working on Instrument

Ocala, FL

About Patrick Lloyd

Co-Author, Zero Trust Architectures



About Jesse Dubois

- name: Jesse Dubois

  Details.jessedubois:

  Location: Durham, North Carolina

  Interests: Brewing, Golf, Cooking

  Pets: Dunkel, Apollo, Comet, Calypso

  Travel: Lots

  Fun Fact: Squirrels in your attic are not fun.









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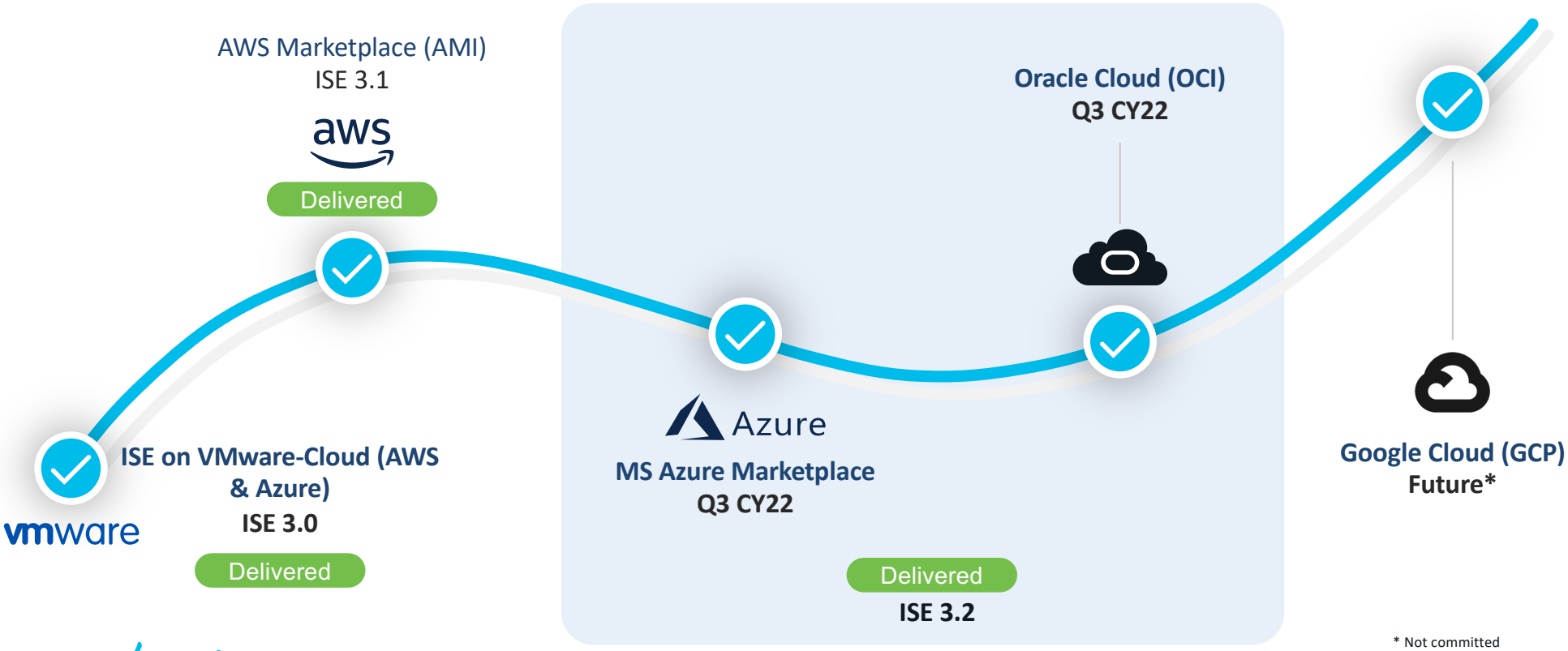
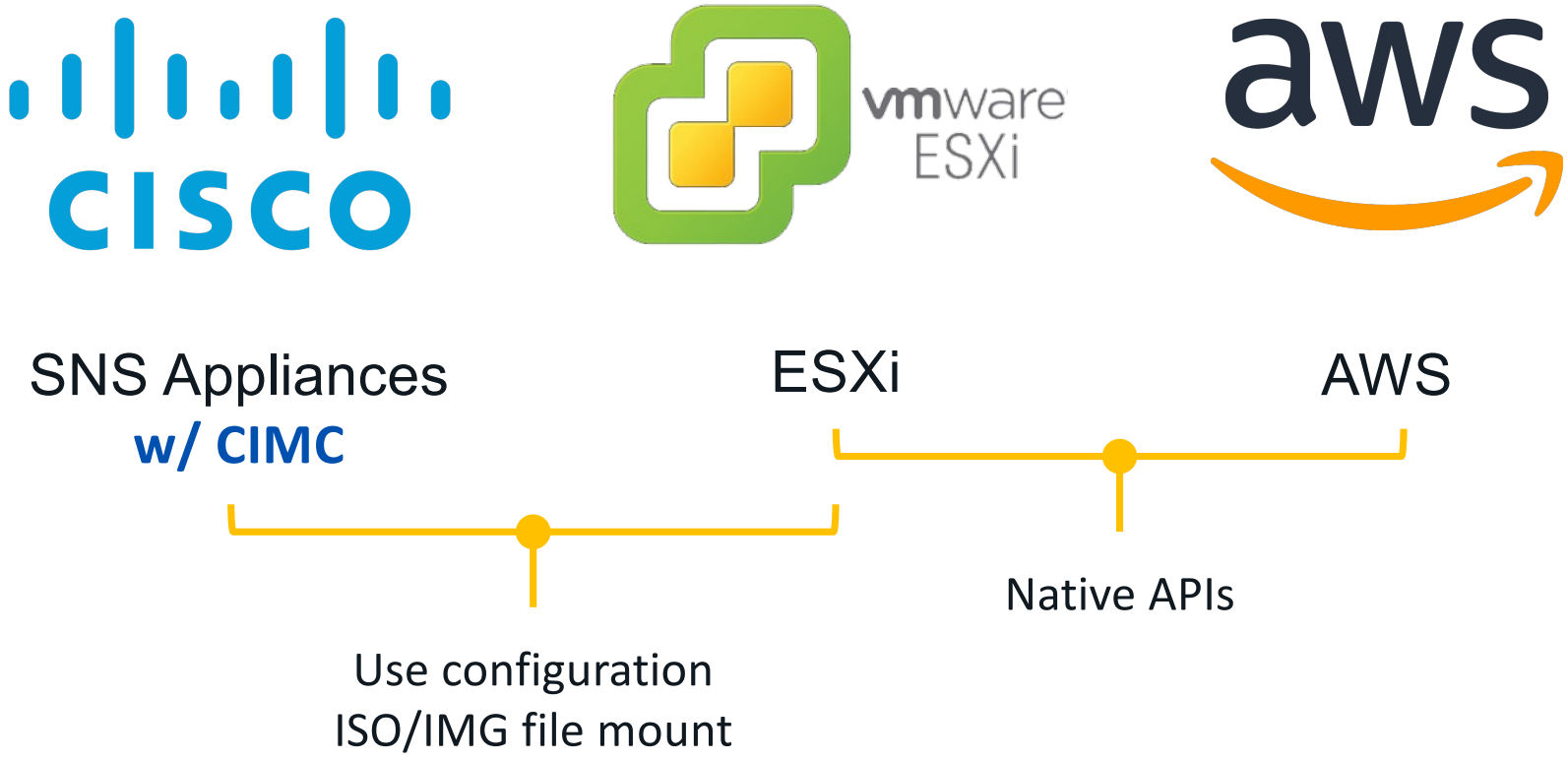
ISE journey on public cloud



* Not committed

Zero Touch Provisioning



CIMC – Cisco Integrated Management Controller

ISE Architecture

Standalone ISE

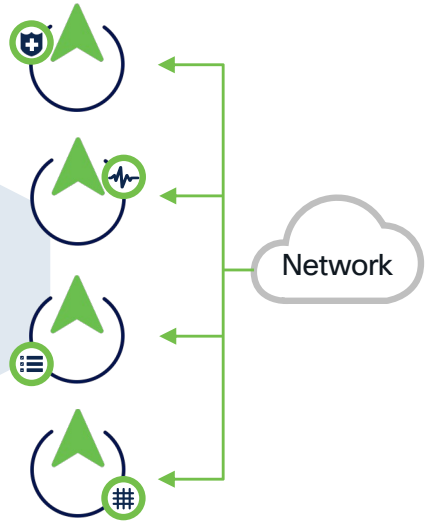
Policy Administration Node (PAN)
- Single plane of glass for ISE admin
- Replication hub for all config changes

Monitoring & Troubleshooting Node (MnT)
- Reporting and logging node
- Syslog collector from ISE Nodes

Policy Services Node (PSN)
- Makes policy decisions
- RADIUS / TACACS+ Servers

pxGrid Controller
- Facilitates sharing of context

Distributed ISE



Single Node (Virtual/Appliance)		Multiple Nodes (Virtual/Appliance)
Up to **25,000** concurrent endpoints	3600	Up to **2,000,000** concurrent endpoints
Up to **50,000** concurrent endpoints	3700	Up to **2,000,000** concurrent endpoints

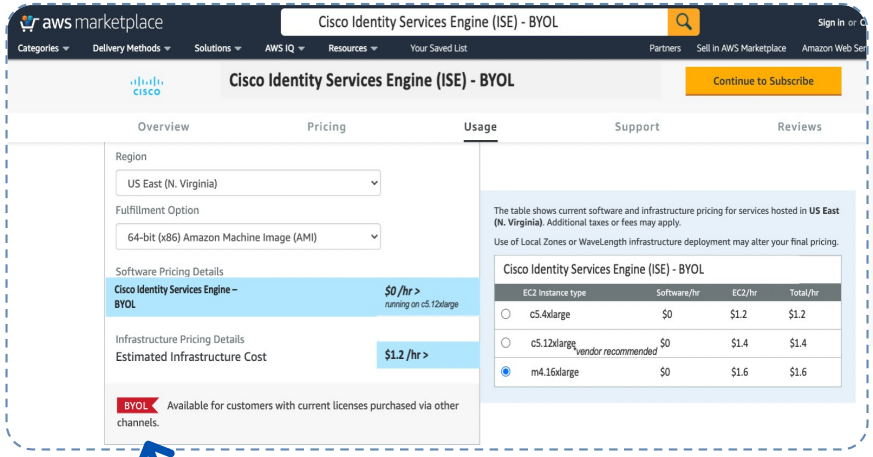
ISE 3.3 Supported AWS Platforms

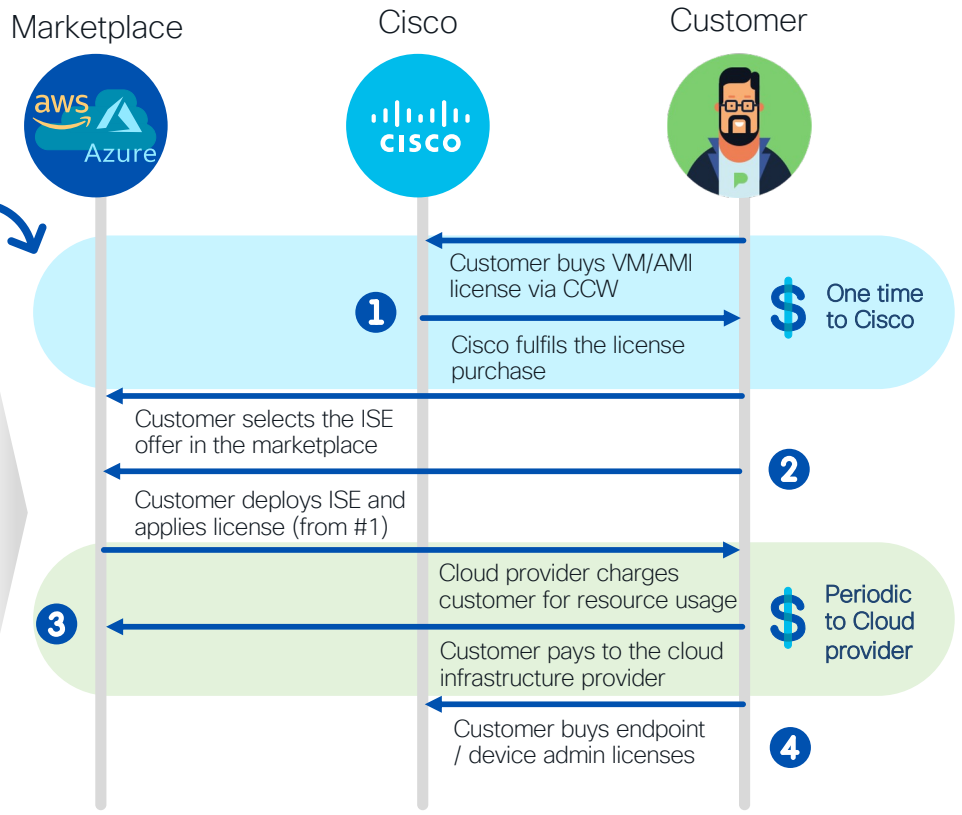
AWS Instance Type	Shared PSN Sessions	Dedicated PSN Sessions	Global Sessions	Cores	Memory	Disk
T3.xlarge	100	100	100	4	16 GB	300 – 600 GB
M5.2xlarge	N/A	12000	N/A	8	32 GB	300 – 600 GB
c5.4xlarge*	12,500	25,000	N/A	16	32 GB	300 GB – 600 GB
m5.4xlarge	20,000	40,000	500,000	16	64 GB	300 GB – 600 GB
c5.9xlarge* m5.8xlarge	25,000	50,000	500,000	36 32	72 GB 128 GB	300 GB – 2.4 TB
m5.16xlarge	50,000	100,000	2,000,000	64	256 GB	300 GB – 2.4 TB

*This instance is compute-optimized and provides better performance compared to the general purpose instances.

ISE Cloud Instance Buying Experience

Flexibility to move from virtual appliances to AWS/Azure without license transaction.





BYOL – Bring Your Own License
Customer will purchase VM license from Cisco and use it in either in VM or Cloud IaaS.

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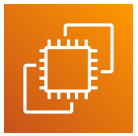
ISE Setup Options

AWS Marketplace

AWS CloudFormation Template



Amazon Elastic Compute Cloud AMI (Amazon Machine Image)

Infrastructure as Code (IoC) tools

Cisco MSX (Managed Services Accelerator)

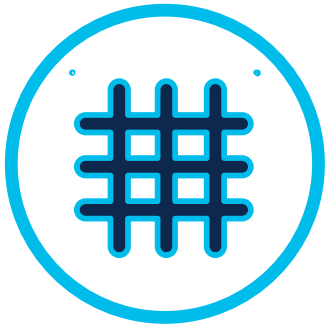
Bring up ISE node one at a time

Bring up multiple ISE nodes at the same time*

* Initial release of ISE + MSX will be single node only

ISE APIs



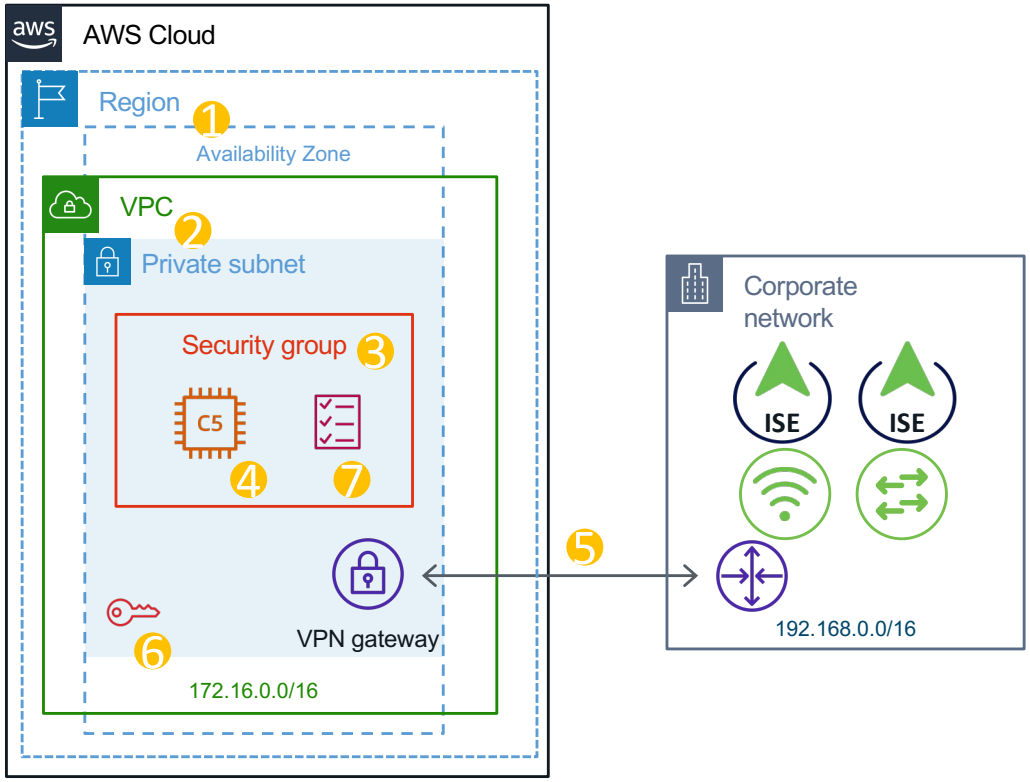



OpenAPIs	ERS	MNT	pxGrid
configuration	configuration	sessions	asynchronous endpoint context

cs.co/ise-api

github.com/cisco-pxgrid/pxgrid-rest-ws

ISE Installation Prerequisites



1. Decide on Region and Availability zones
2. Create VPC & Subnet
3. Create Security Group
4. Decide on Instance Type
5. Setup VPN between AWS and on-prem network
6. Create Key pair for SSH
7. Collect ISE setup information: hostname, domain, DNS, NTP, Timezone, Admin credentials

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{JSON}

```
{
  "object": {
    "hostname": "ise.securitydemo.net",
    "port": 443,
    "auth": {
      "username": "admin",
      "password": "C1sco12345"
    },
    ”verify": true
  }
}
```

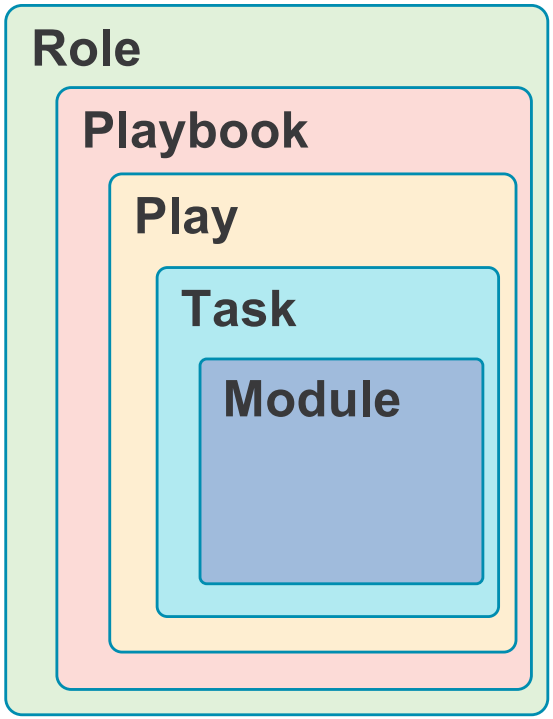
YAML

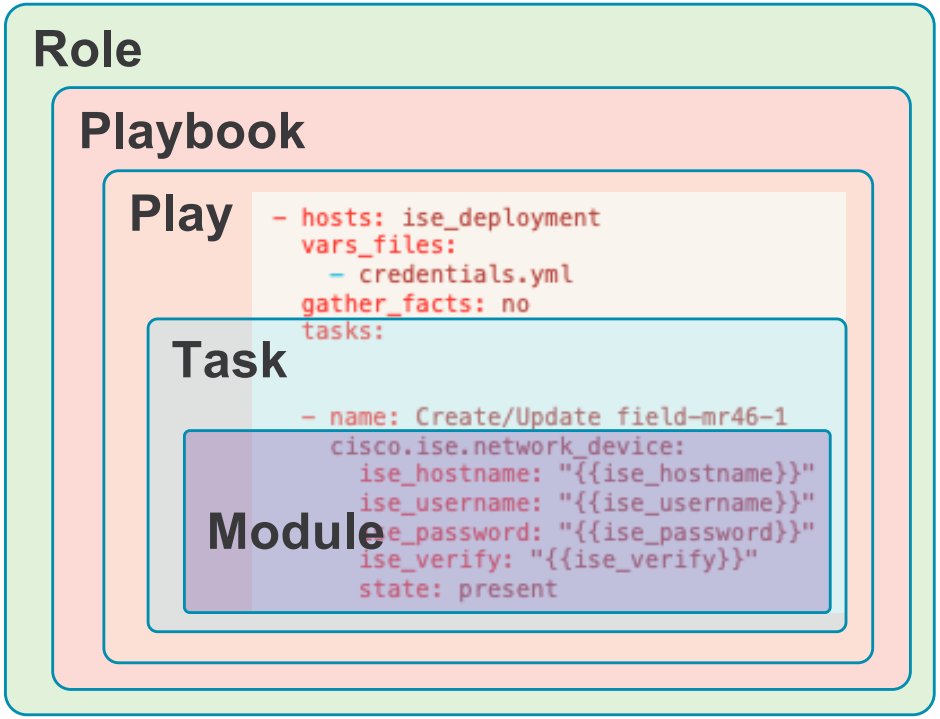
```
---
object:
  hostname: ise.securitydemo.net
  port: 443
  auth:
    username: admin
    password: C1sco12345
  verify: true

# YAML supports Comments!!!
```

ANSIBLE

Simple	Flexible	Agentless
• human-readable • declarative configs • ordered tasks • no coding required • start small and scale	• config management • workstations • servers / containers • applications • networks • security services • workflows	• SSH (Linux, macOS) • REST (ISE) • WinRM (Windows) • others as needed • efficient • secure

Ansible Taxonomy





Ansible Collections

amazon.aws	**cisco.ise**	community.hashi_vault	community.windows	hetzner.hcloud	ngine_io.cloudstack
ansible.builtin	cisco.meraki	community.hrobot	community.zabbix	hpe.nimble	ngine_io.exoscale
ansible.netcommon	cisco.mso	community.kubernetes	containers.podman	ibm.qradar	ngine_io.vultr
ansible.posix	cisco.nso	community.kubevirt	cyberark.conjur	infinidat.infinibox	openstack.cloud
ansible.utils	cisco.nxos	community.libvirt	cyberark.pas	inspur.sm	openvswitch.openvswitch
ansible.windows	cisco.ucs	community.mongodb	dellemc.enterprise_sonic	junipernetworks.junos	ovirt.ovirt
arista.eos	cloudscale_ch.cloud	community.mysql	dellemc.openmanage	kubernetes.core	purestorage.flasharray
awx.awx	**community.aws**	community.network	dellemc.os10	mellanox.onyx	purestorage.flashblade
azure.azcollection	community.azure	community.okd	dellemc.os6	netapp.aws	sensu.sensu_go
check_point.mgmt	community.crypto	community.postgresql	dellemc.os9	netapp.azure	servicenow.servicenow
chocolatey.chocolatey	community.digitalocean	community.proxysql	f5networks.f5_modules	netapp.cloudmanager	splunk.es
cisco.aci	community.docker	community.rabbitmq	fortinet.fortimanager	netapp.elementsw	t_systems_mms.icinga_director
cisco.asa	community.fortios	community.routeros	fortinet.fortios	netapp.ontap	theforeman.foreman
cisco.intersight	community.general	community.skydive	frr.frr	netapp.um_info	vyos.vyos
cisco.ios	community.google	community.sops	gluster.gluster	netapp_eseries.santricity	wti.remote
cisco.iosxr	community.grafana	community.vmware	google.cloud	netbox.netbox	

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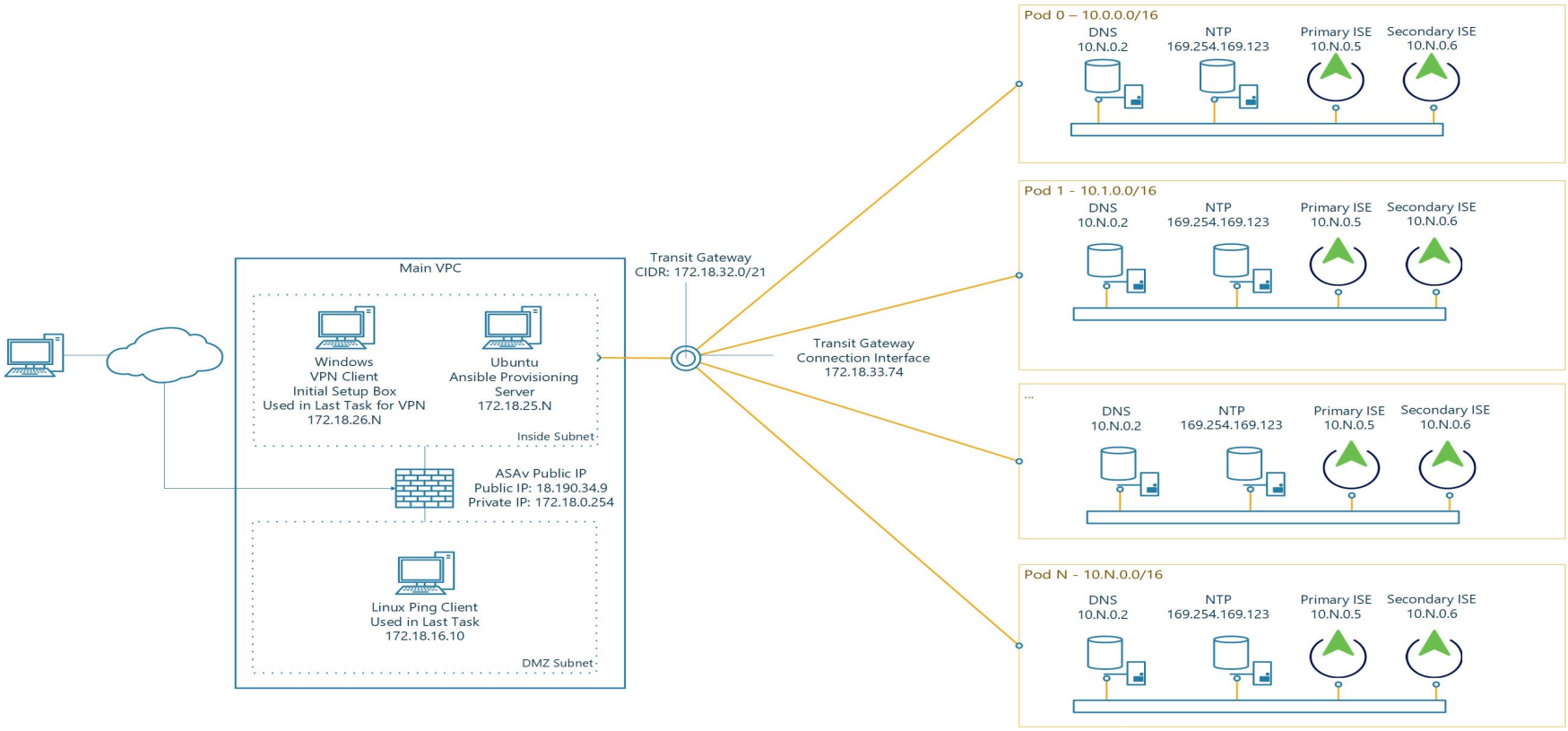
What Are We Doing?

- If you were to deploy this manually, the following tasks would be accomplished:
  - **Create an SSH Key Pair**
  - **Create AWS VPC**
  - **Create Subnets**
  - **Create Route Tables**
  - **Edit Route Tables**
  - **Create a Linux Test Instance for Pinging**

Topology

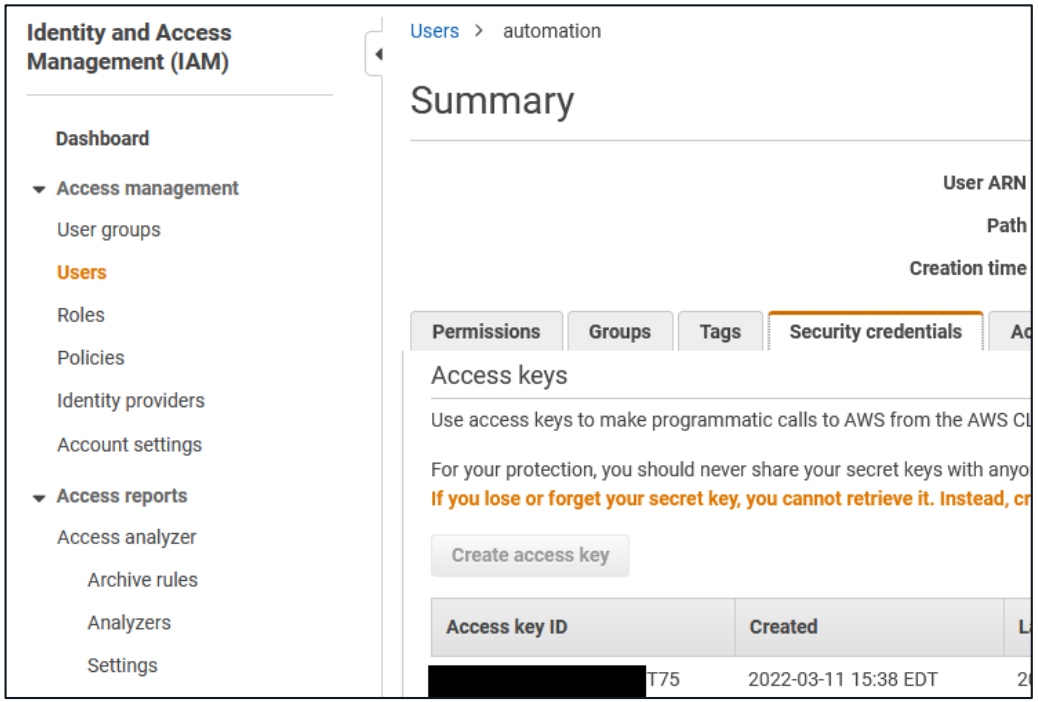


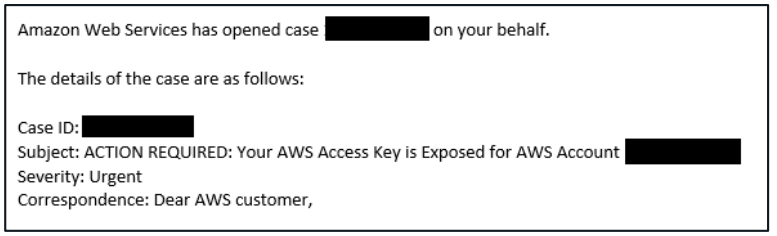
What You'll Need

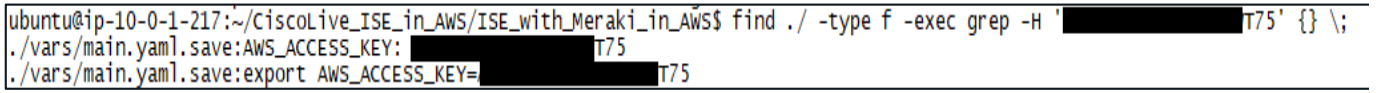
- An AWS Account (and preferably budget to run that AWS instance!)
- An Ubuntu Deployment Machine
  - Access to Git
  - Ansible Installed
- Knowledge of your Deployment
  - AWS Region
  - AWS Access Key
  - AWS Secret Key
  - Expected ISE Credentials

What You'll Need

- An AWS Account with Programmatic Access
- Don't be like Patrick!
  - Save files and hidden files
  - Search for secrets with Linux Utilities
  - find ./ -type f -exec grep -H 'YOUR_SECRET_KEY' {} \;







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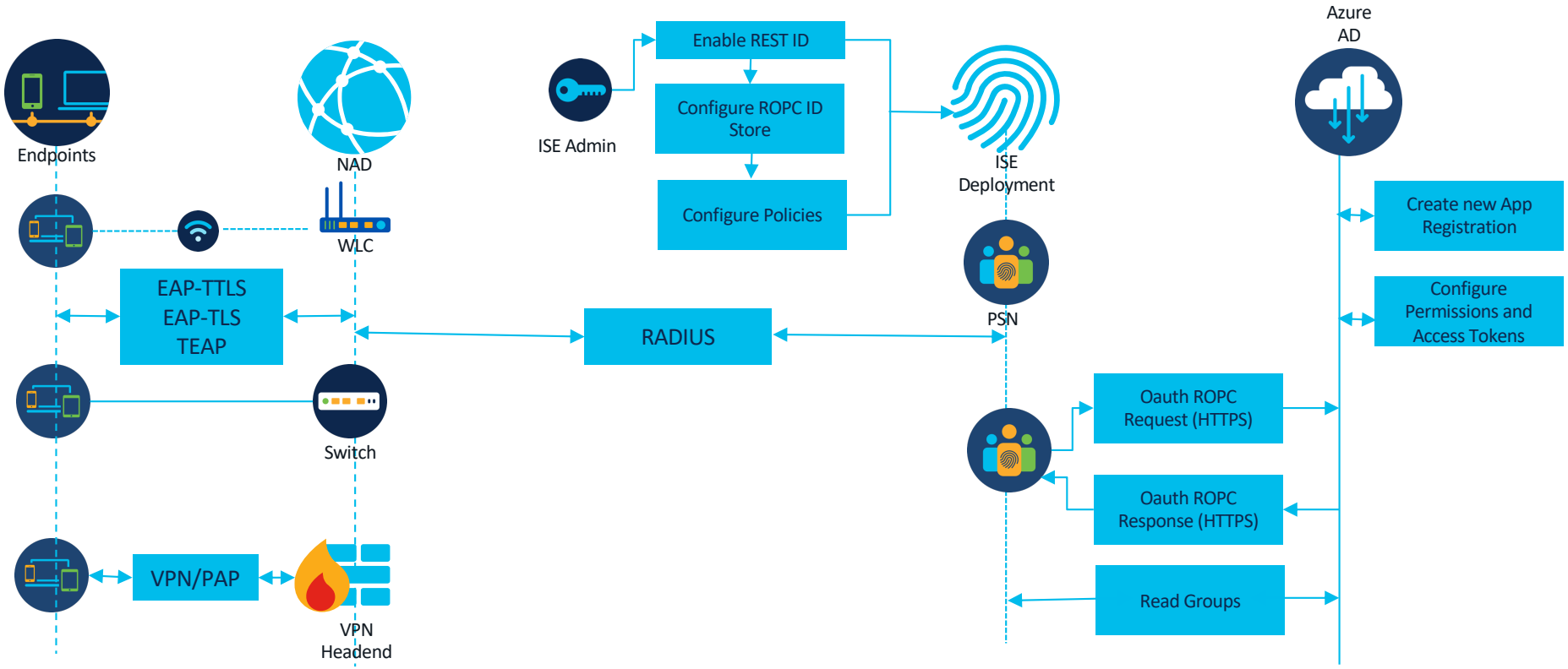
Azure AD / ROPC

- Resource Owner Password Credentials (ROPC) is an OAuth 2.0 grant type that allows Cisco ISE to carry out authorization and authentication in a network with cloud-based identity providers.
- Controlled Access Introduction Feature
- Supports EAP-TTLS and PAP authentications with ISE 3.0+
- Supports EAP-TLS and TEAP with ISE 3.2+
- Introduced with new REST Auth Service

```
ISE PROCESS NAME                       STATE            PROCESS ID
--------------------------------------------------------------------
Database Listener                      running          8864
Database Server                        running          115 PROCESSES
Application Server                     running          26777
Profiler Database                      running          17001
ISE Indexing Engine                    running          28790
AD Connector                           running          30324
M&T Session Database                   running          23085
M&T Log Processor                      running          27013
Certificate Authority Service          running          30113
EST Service                            running          74954
SXP Engine Service                     running          3497002
TC-NAC MongoDB Container               running          3508280
TC-NAC Core Engine Container           running          3509361
VA Database                            running          3511016
VA Service                             running          3511272
PassiveID WMI Service                  running          3486473
PassiveID Syslog Service               running          3487203
PassiveID API Service                  running          3488149
PassiveID Agent Service                running          3489868
PassiveID Endpoint Service             running          3493221
PassiveID SPAN Service                 running          3495802
DHCP Server (dhcpd)                    disabled
DNS Server (named)                     disabled
ISE Messaging Service                  running          12100
ISE API Gateway Database Service       running          15723
ISE API Gateway Service                running          21553
ISE EDDA Service                       running          51664
REST Auth Service                      running          1486625
Hermes (pxGrid Cloud Agent)            disabled
ISE Node Exporter                      running          40606
ISE Prometheus Service                 running          43036
ISE Grafana Service                    running          49934
ISE MNT LogAnalytics Elasticsearch     disabled
ISE Logstash Service                   disabled
ISE Kibana Service                     disabled
```

Azure AD Integration with ISE - High Level Flow Overview



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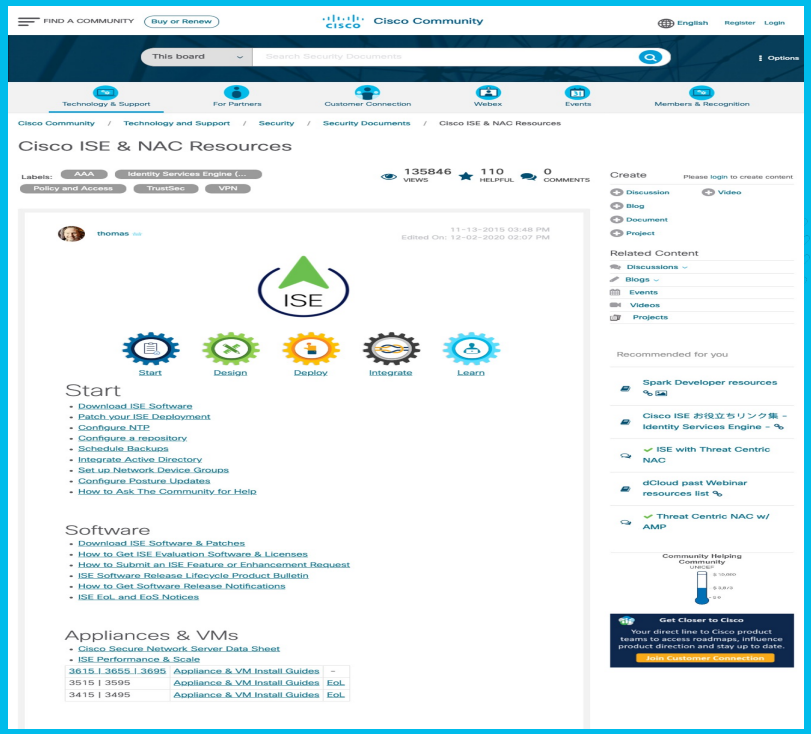
ISE Customer Resources



- Resources cs.co/ise-resources
- Community cs.co/ise-community
- YouTube Channel cs.co/ise-videos
- Licensing Guide cs.co/ise-licensing
- API SDK cs.co/ise-api
- Future webinars! cs.co/ise-webinars
- Devnet https://cs.co/ise-devnet
- ISE Github https://github.com/CiscoISE
- Patrick Lloyd's GitHub https://github.com/plloyd44

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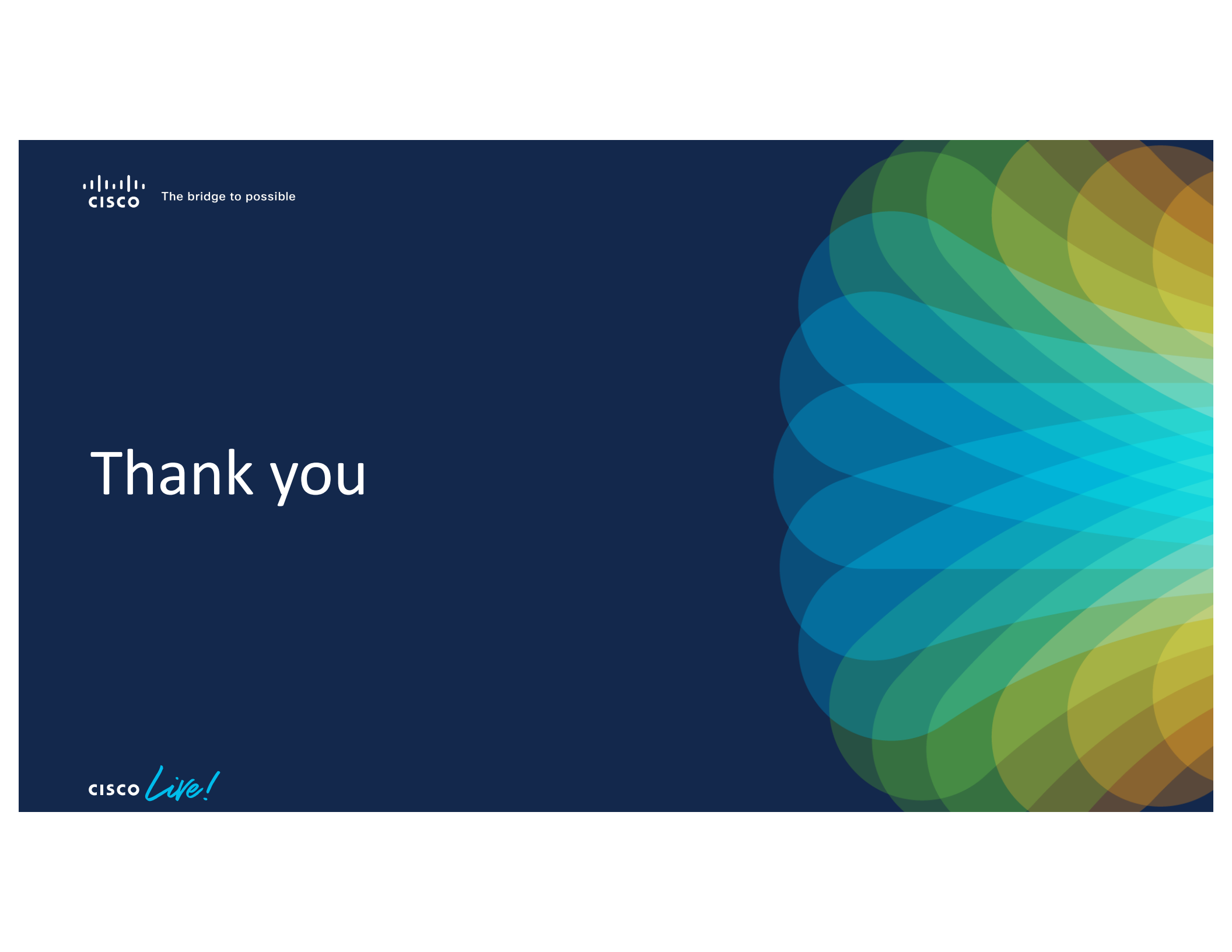
  - Eugene Korneychuk
  - 10:30am Wednesday Feb 7th
- Book your one-on-one Meet the Engineer meeting
- Visit the On-Demand Library for more sessions at www.CiscoLive.com/on-demand


The bridge to possible
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