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The bridge to possible

Using ISE OpenAPI to automate certificate management

Steven McNutt, Cybersecurity Technical Solutions Architect, CCIE# 6495
@densem0de

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Agenda

- Introduction
- ISE API Primer
- ISE System certificates
- ISE certificate management API
- Demo
- Wrap-up

Introduction

Certificate management is a core operational task of Identity Services Engine.

It's also one of the biggest friction points in maintaining an ISE deployment.

- Certificate management related tasks traditionally performed manually.
- New APIs provide an opportunity to automate these tasks
- Reduces effort and risk

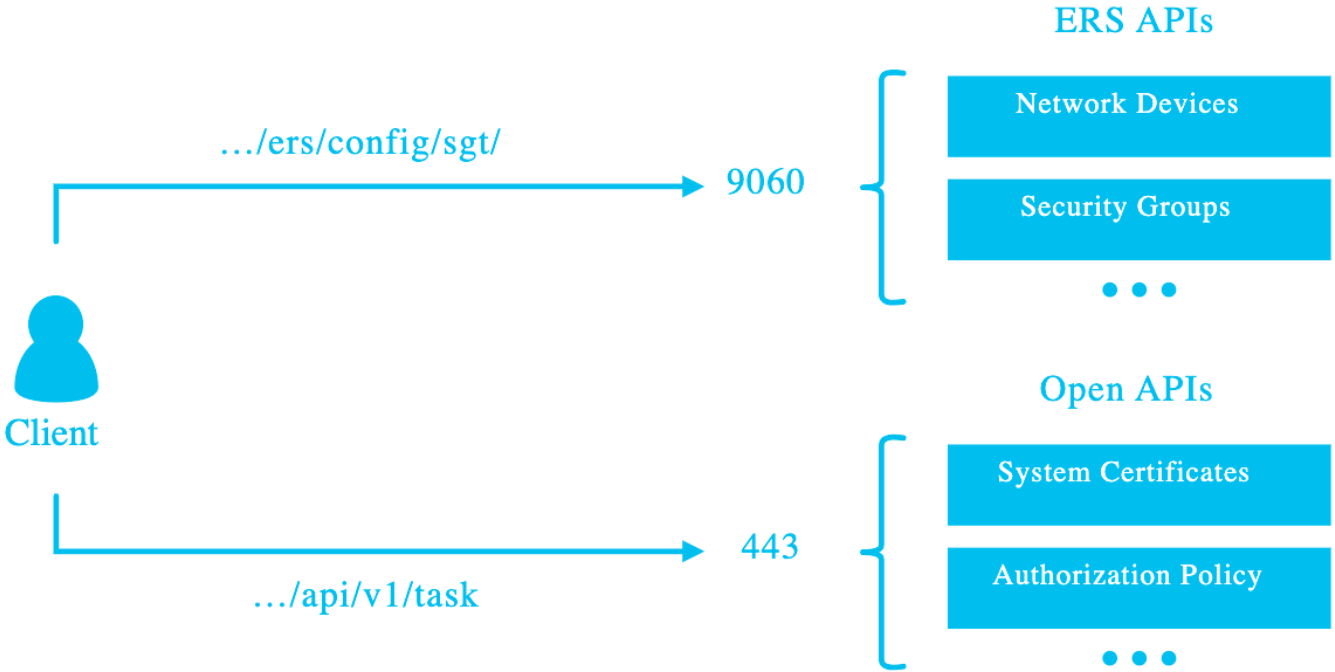
ISE API Primer

ISE API Services

- Pre-ISE 3.1:
  - MNT (Monitoring and Troubleshooting) - ISE 1.0
  - ERS (External Restful Services) - ISE 1.2
- ISE 3.1+
  - API Gateway for routing
  - OpenAPI

API Services

API Services Overview:

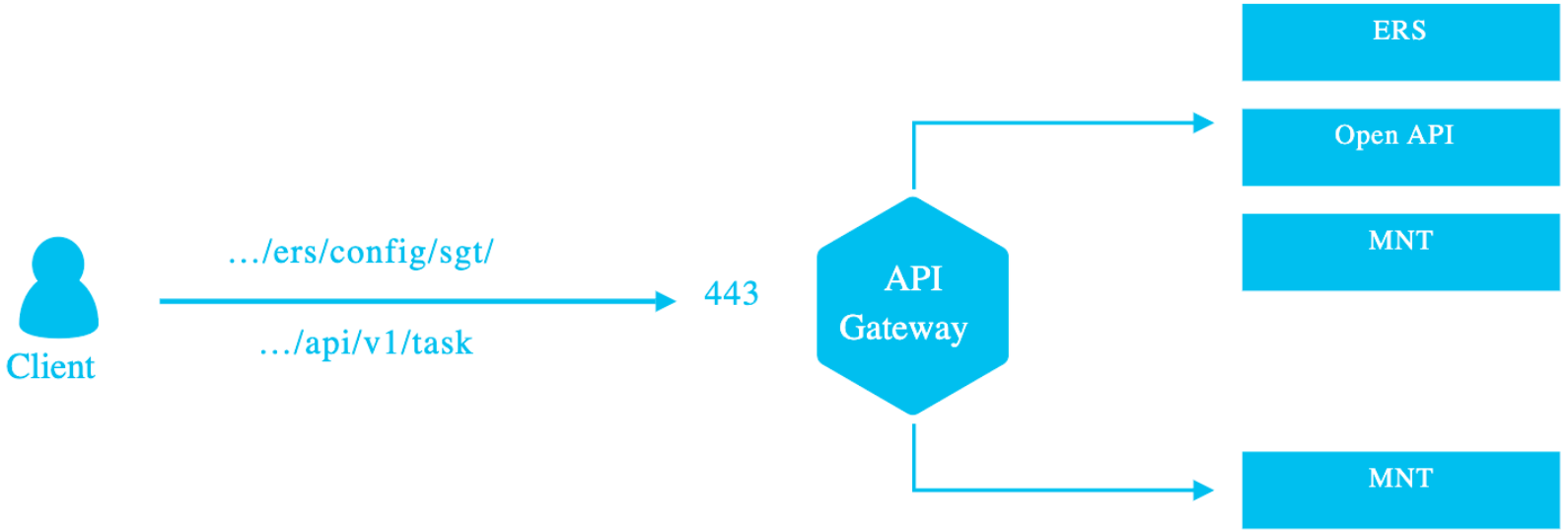


ISE API Gateway

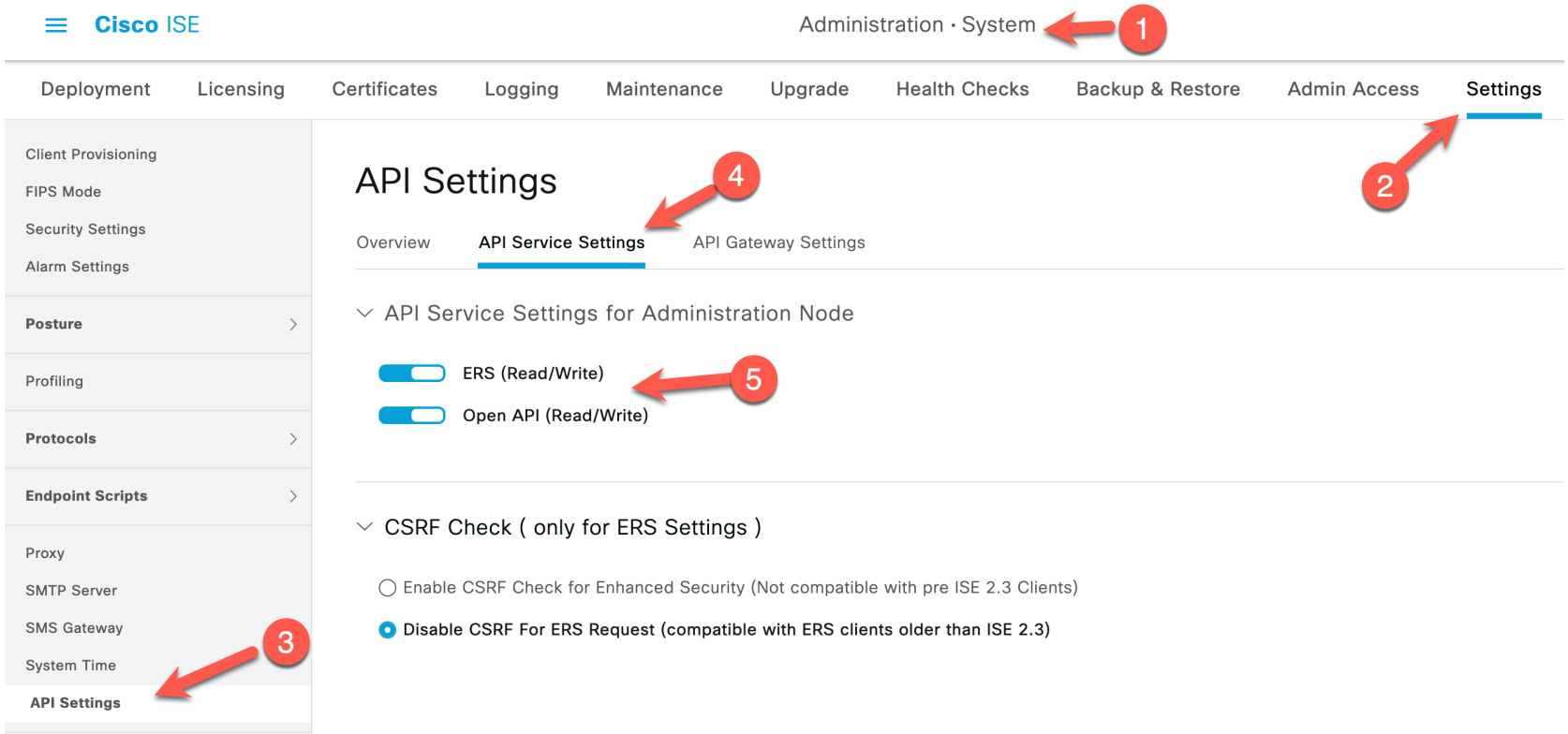
- Single access point for routing requests to different nodes
- Eliminates the need to use port 9060 to access the ERS API
- New in ISE 3.1

API Gateway

API Gateway Overview:

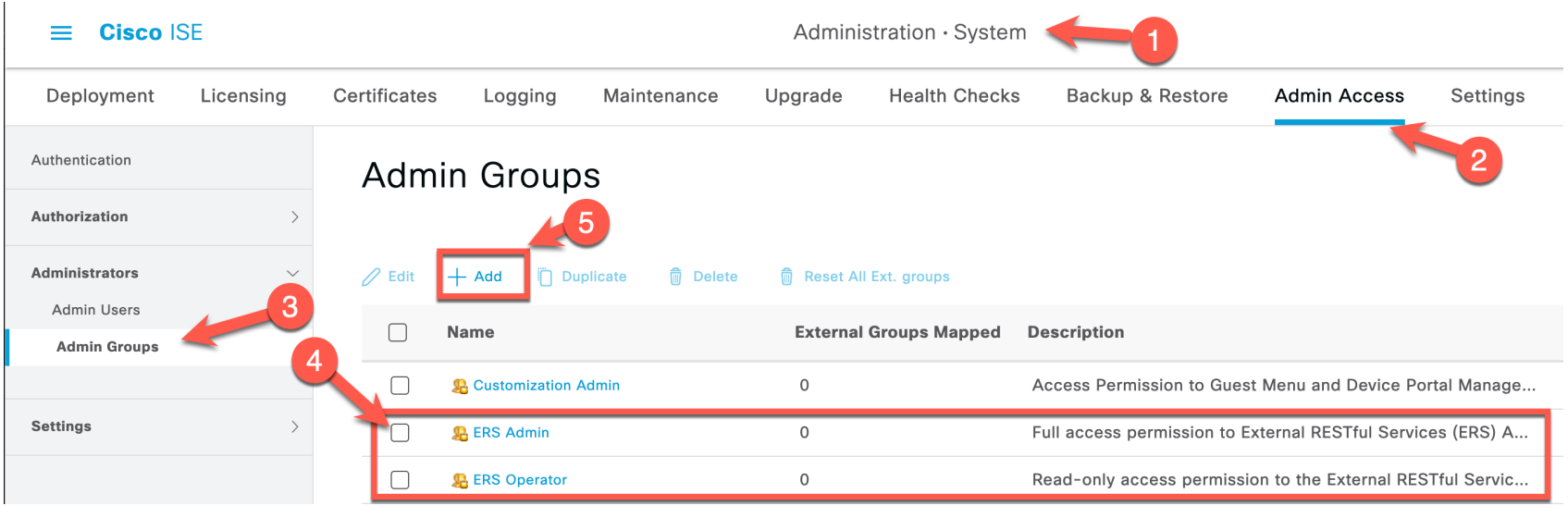


Enabling API Services



Authorizing Admin Users

Add an admin user to one of these ERS groups:



Example call

```
~ curl -ku "admin:[redacted]" https://198.18.133.27/api/v1/certs/system-certificate/ise
{
"response" : [ {
  "id" : "e5b499ae-78a3-48a3-8287-0cae2b48ebf0",
  "friendlyName" : "CN=ise.abl.ninja#ise.abl.ninja#00004",
  "serialNumberDecimalFormat" : "165045534310020026781750707223",
  "issuedTo" : "ise.abl.ninja",
  "issuedBy" : "ise.abl.ninja",
  "validFrom" : "Wed Apr 20 11:49:03 UTC 2022",
  "expirationDate" : "Fri Apr 19 11:49:03 UTC 2024",
  "usedBy" : "Admin, EAP Authentication, RADIUS DTLS, pxGrid, Portal",
  "keySize" : 4096,
  "groupTag" : "Default Portal Certificate Group",
  "selfSigned" : true,
```

System Certificates

System Certificate considerations

- **Public PKI**
  - Best used for non-corporate devices
  - Short lifetime
  - CA validation means SAN entries often get stripped from CSRs
  - Portal certificates good fit
- **Internal PKI** (ex: Active Directory Certificate Services)
  - Best used for corporate-managed devices
  - Longer lifetime
  - Unlimited flexibility with certificate design
- **Self-signed** (no PKI)
  - Limited usefulness, only type that supports renewal

System Certificates (partial list)

- **Admin**
  - Internal PKI
  - Good idea to include SAN entries for IP addresses, short names, etc
- **Portal**
  - Public PKI (short lifetime, SAN entries problematic)
- **EAP** (used for 802.1x)
  - Internal PKI (longer lifetime, trusted by enrolled devices)
- **SAML**
  - Use public PKI, must be dedicated certificate
- **PxGrid**
  - Internal PKI – easier to integrate other services (i.e. firepower)

Certificate APIs

There’s an extensive set of APIs

Focus on what’s relevant for the task at hand

Common tasks:

- Get the System Certificate list
- Check for expiring certificates
- Export Certificates*

*easy, high-impact use case

Demo

Wrap up

Key Takeaways

- Understand what you're automating
  - PKI requirements depend on use case
  - Some operations can be service affecting
- Resources to develop and test your code
  - Sample code used in this talk:
    - https://github.com/srmcnutt/devlit-1220
    - https://github.com/srmcnutt/ise-t
  - DEVNET sandboxes (search for ISE in the sandbox catalog)

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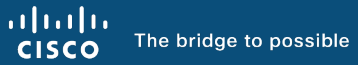

Thank you