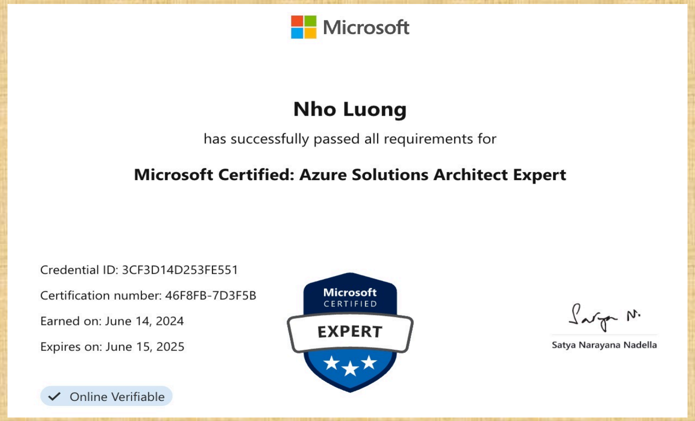
Kubernetes Ochestration

Author: Nho Luong

Skill: DevOps Engineer Lead



Microsoft

Nho Luong

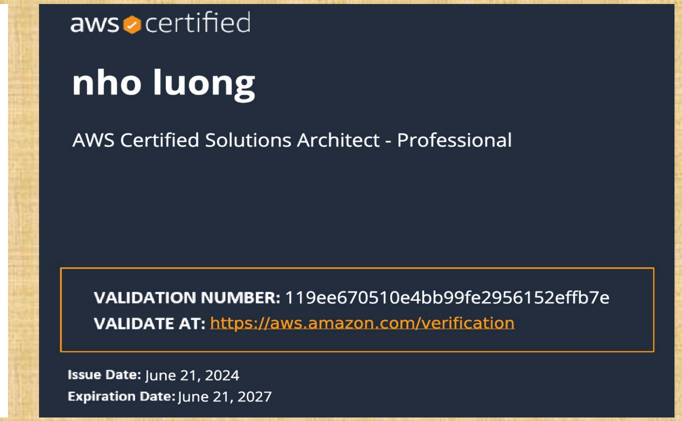
has successfully passed all requirements for

Microsoft Certified: Azure Solutions Architect Expert

Credential ID: 3CF3D14D253FE551
Certification number: 46F8FB-7D3F5B
Earned on: June 14, 2024
Expires on: June 15, 2025

✓ Online Verifiable

Satya Narayana Nadella



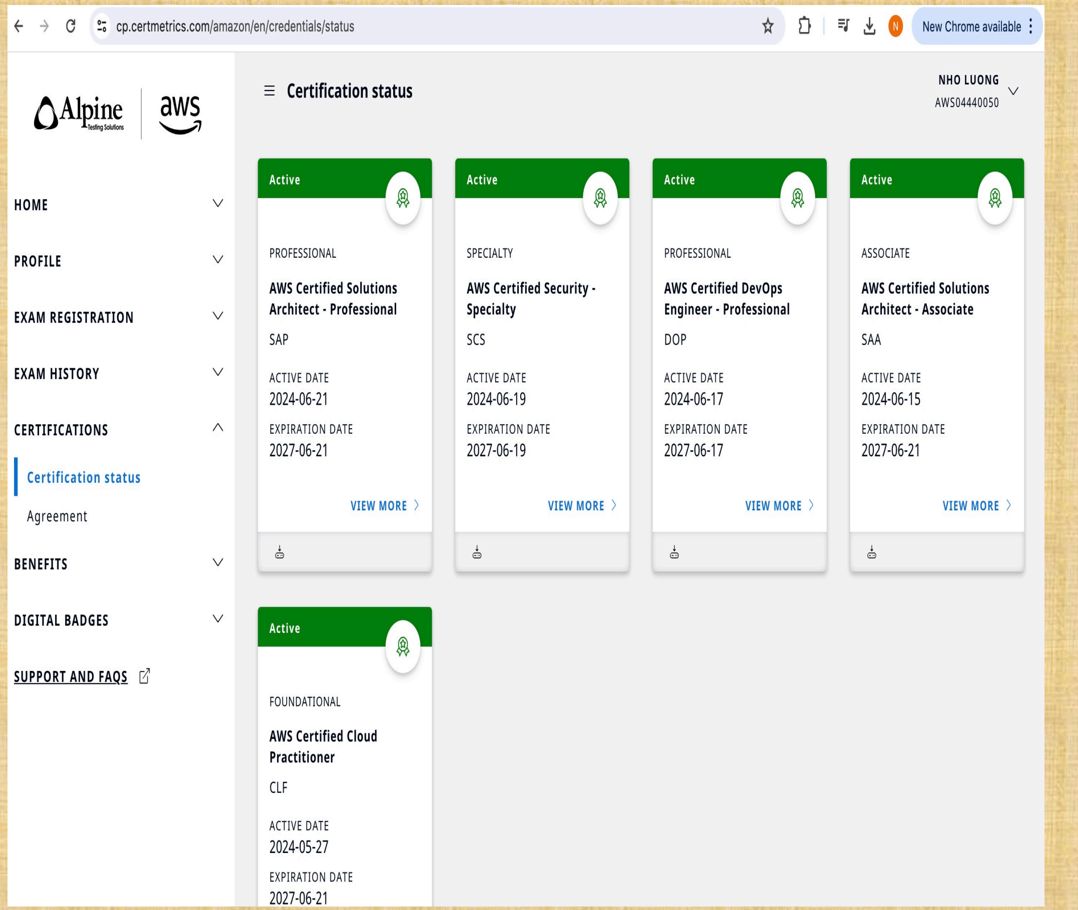
aws certified

nho luong

AWS Certified Solutions Architect - Professional

VALIDATION NUMBER: 119ee670510e4bb99fe2956152effb7e
VALIDATE AT: https://aws.amazon.com/verification

Issue Date: June 21, 2024
Expiration Date: June 21, 2027



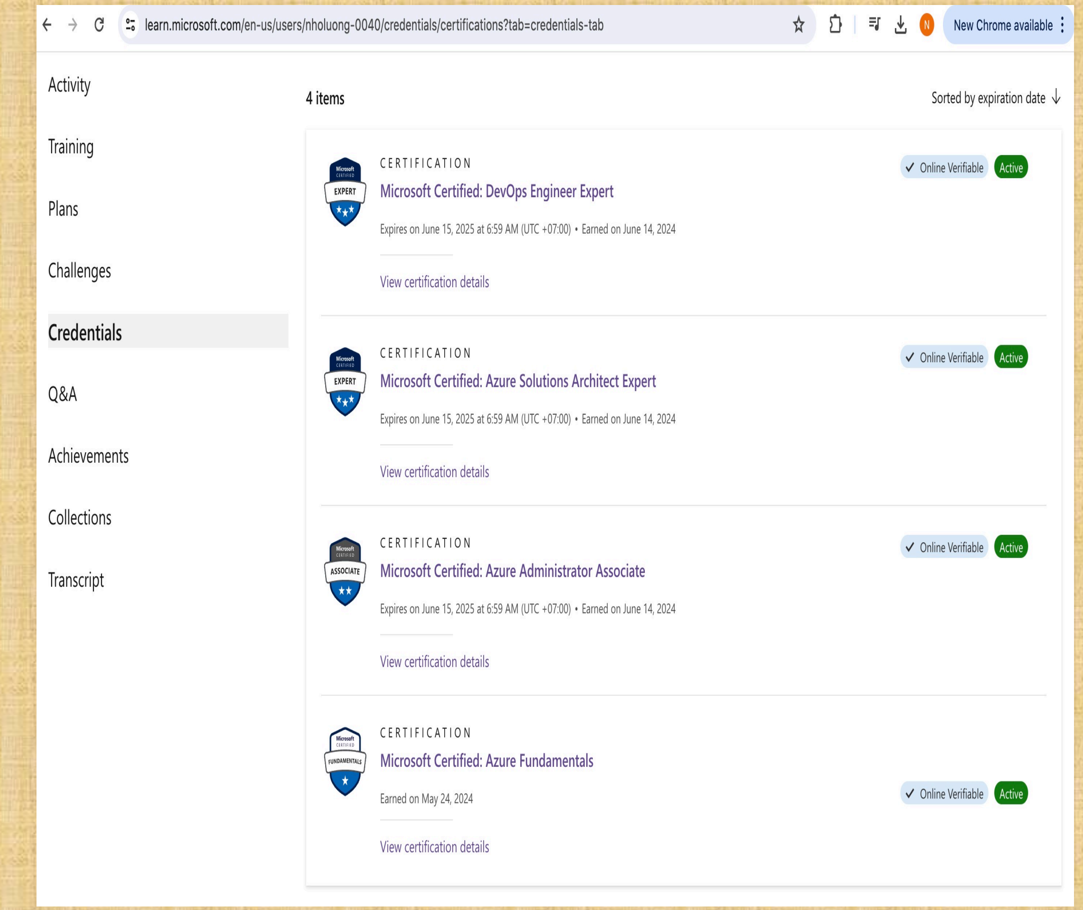
cp.certmetrics.com/amazon/en/credentials/status

Certification status

NHO LUONG
AWS04440050

HOME / PROFILE / EXAM REGISTRATION / EXAM HISTORY / CERTIFICATIONS / Certification status / Agreement / BENEFITS / DIGITAL BADGES / SUPPORT AND FAQS

Status	Level	Certification	Code	Active date	Expiration date
Active	PROFESSIONAL	AWS Certified Solutions Architect - Professional	SAP	2024-06-21	2027-06-21
Active	SPECIALTY	AWS Certified Security - Specialty	SCS	2024-06-19	2027-06-19
Active	PROFESSIONAL	AWS Certified DevOps Engineer - Professional	DOP	2024-06-17	2027-06-17
Active	ASSOCIATE	AWS Certified Solutions Architect - Associate	SAA	2024-06-15	2027-06-21
Active	FOUNDATIONAL	AWS Certified Cloud Practitioner	CLF	2024-05-27	2027-06-21



learn.microsoft.com/en-us/users/nholuong-0040/credentials/certifications?tab=credentials-tab

Activity / Training / Plans / Challenges / Credentials / Q&A / Achievements / Collections / Transcript

4 items — Sorted by expiration date

CERTIFICATION
Microsoft Certified: DevOps Engineer Expert — ✓ Online Verifiable, Active
Expires on June 15, 2025 at 6:59 AM (UTC +07:00) • Earned on June 14, 2024
View certification details

CERTIFICATION
Microsoft Certified: Azure Solutions Architect Expert — ✓ Online Verifiable, Active
Expires on June 15, 2025 at 6:59 AM (UTC +07:00) • Earned on June 14, 2024
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CERTIFICATION
Microsoft Certified: Azure Administrator Associate — ✓ Online Verifiable, Active
Expires on June 15, 2025 at 6:59 AM (UTC +07:00) • Earned on June 14, 2024
View certification details

CERTIFICATION
Microsoft Certified: Azure Fundamentals — ✓ Online Verifiable, Active
Earned on May 24, 2024
View certification details

Security is hard.

Containers are faster, but less secure?

How do you sign off on a release before it goes to production?

Not who, but what

How do you make sure that only trusted code runs in your production environments?

What about the bad guys?

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Digitally sign it!

But how do you sign a Docker image?

Enter Notary

Implements The Update Framework (TUF) Stores

trusted data ... such as Docker image digests

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Skill: DevOps Engineer Lead

Daemon

Digest for ubuntu:latest, please!

Content for ubuntu@12345, please!

Registry

12345

<stuff>

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Skill: DevOps Engineer Lead

Daemon

Digest for ubuntu:latest, please!
I trust Bob...

◂

And his signature checks out!

Content for ubuntu@12345, please!

◂

Notary

▸ 12345, and it's signed by Alice, Bob, and Charlie

Registry

▸ <stuff>

Why not use Docker Content Trust in your cluster?
Who else do you trust?
What about the kubelet images?

Kubernetes deserves powerful trust management

Admission Controllers

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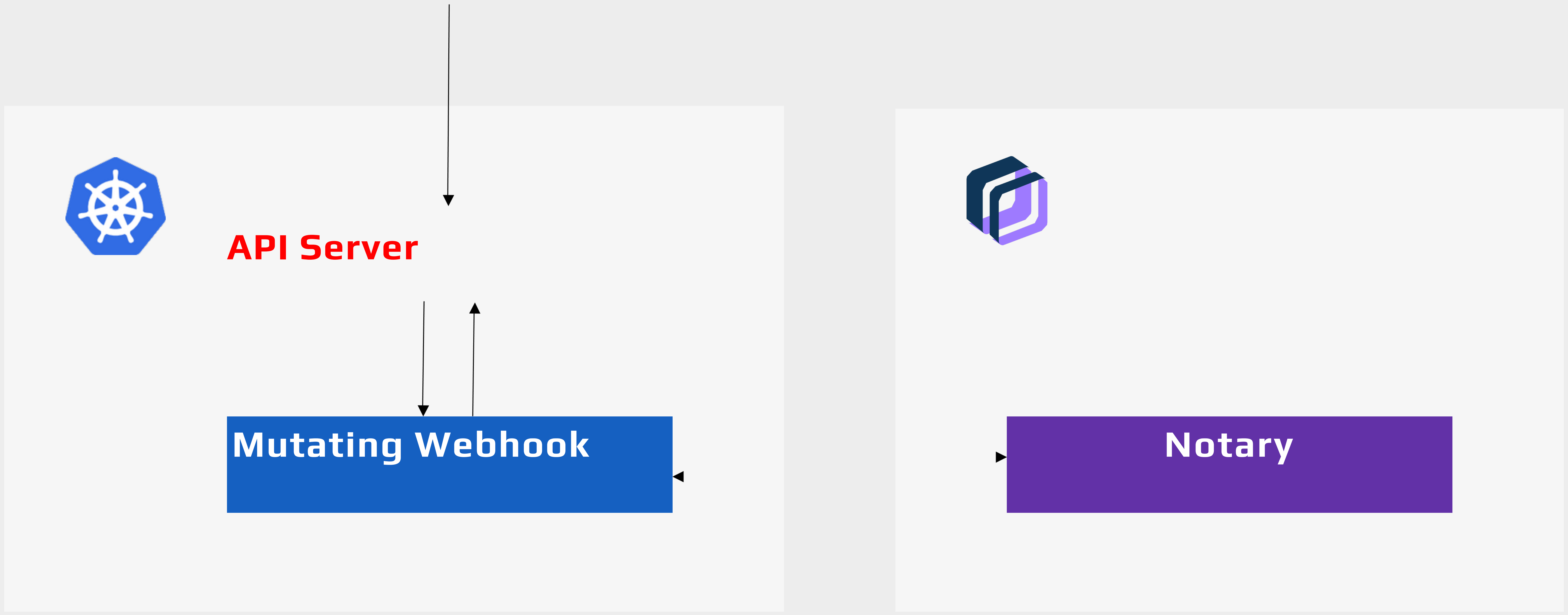
Validating Admission Webhook
Mutating Admission Webhook

Author: Nho Luong
Skill: DevOps Engineer Lead

liamwhite/**kubecon**@**sha256**:4bd87a5758f80eedb01335676a9e47347801fc...

Author: Nho Luong
Skill: DevOps Engineer Lead



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API Server -> Webhook (AdmissionRequest)

```
{
uid: "a2e5846b-059a-4d56-a564-3b7c4fc4ccfb",

kind: {
group: "",
version: "v1",
kind: "Pod",
},

resource: {
group: "",
version: "v1",  resource: "pods",
},

namespace: "default",  operation: "CREATE",  object: <lots-of-bytes>
}
```

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API Server <- Webhook (AdmissionResponse)

```
{

uid: "a2e5846b-059a-4d56-a564-3b7c4fc4ccfb",

allowed: true,

// If !allowed give a reason to inform the user  result: {
status: "Failure",
message: "Untrusted Image",  code: "401",
}

patchType: "JSONPatch",  patch: <some-bytes>

}
```

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API Server <- Webhook (Patch)

```
{


operation: "replace",

path: "/spec/containers/0/image",

value: "liamwhite/kubecon@sha256:4bd87a5758f80eedb01335676a9e47347801fc",


}
```

PORTIERIS

github.com/ibm/portieris

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Whitelist Images
Fail Closed

Namespace or Cluster Wide Policies

Extensible

Author: Nho Luong
Skill: DevOps Engineer Lead

```
apiVersion: securityenforcement.admission.cloud.ibm.com/v1beta1  kind:
ClusterImagePolicy

metadata:
name: kubecon-cluster-image-policy

spec:
repositories:
- name: "docker.io/liamwhite/kubecon"  policy:
trust:
enabled: true
```

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```yaml
apiVersion: securityenforcement.admission.cloud.ibm.com/v1beta1  kind:
ClusterImagePolicy

metadata:
name: kubecon-cluster-image-policy-pinned

spec:
repositories:
- name: "docker.io/liamwhite/*"  policy:
trust:
enabled: true
signerSecrets:
- name: <secret_name>
```

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```
apiVersion: v1  kind: Secret  type: Opaque  metadata:
name: <secret_name>  data:
name: c2lnbmVyMQ==
publicKey: LS0tLS1CRUdJTiBQVUJMSUMgS0VZLS0tLS0...
```

```
apiVersion: securityenforcement.admission.cloud.ibm.com/v1beta1  kind:
ImagePolicy

metadata:
name: kubecon-image-policy  namespace: default

spec:
repositories:
- name: "docker.io/liamwhite/*"  policy:
trust:
enabled: true
signerSecrets:
- name: <secret_name>
```

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Skill: DevOps Engineer Lead

Thank You

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