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Athenz:

The Open-Source Solution to Provide Access Control in Dynamic Infrastructures

Tatsuya Yano / Yahoo Japan Corporation

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Athenz: Open Source System

Created by Yahoo Inc.

- Service Authentication
  - Provide secure identity in the form x.509 certificate to every workload / service in modern environments
- Authorization
  - Provides fine-grained Role Based Access Control (RBAC)

Service Authentication

Authentication

- User Authentication
  - AD / LDAP / Okta / etc
- Service Authentication
  - Instances within a service with a unique identity to enable secure communication
    - IP / Networks ACLs / iptable
    - Mutual TLS with x.509 certificates

Why does this matter?

- Many persistent large scale infrastructure problems are rooted in identity and policy
  - Network ACL complexity
  - Federated “Single” Sign On (SSO) systems
  - Headless/Automation users
  - Shared secrets

Certificate Based Authentication

- Every instance / service in your cloud has its own identity
- Stronger security by Mutual TLS Authentication
- Short Lived Certificates

Copper Argos

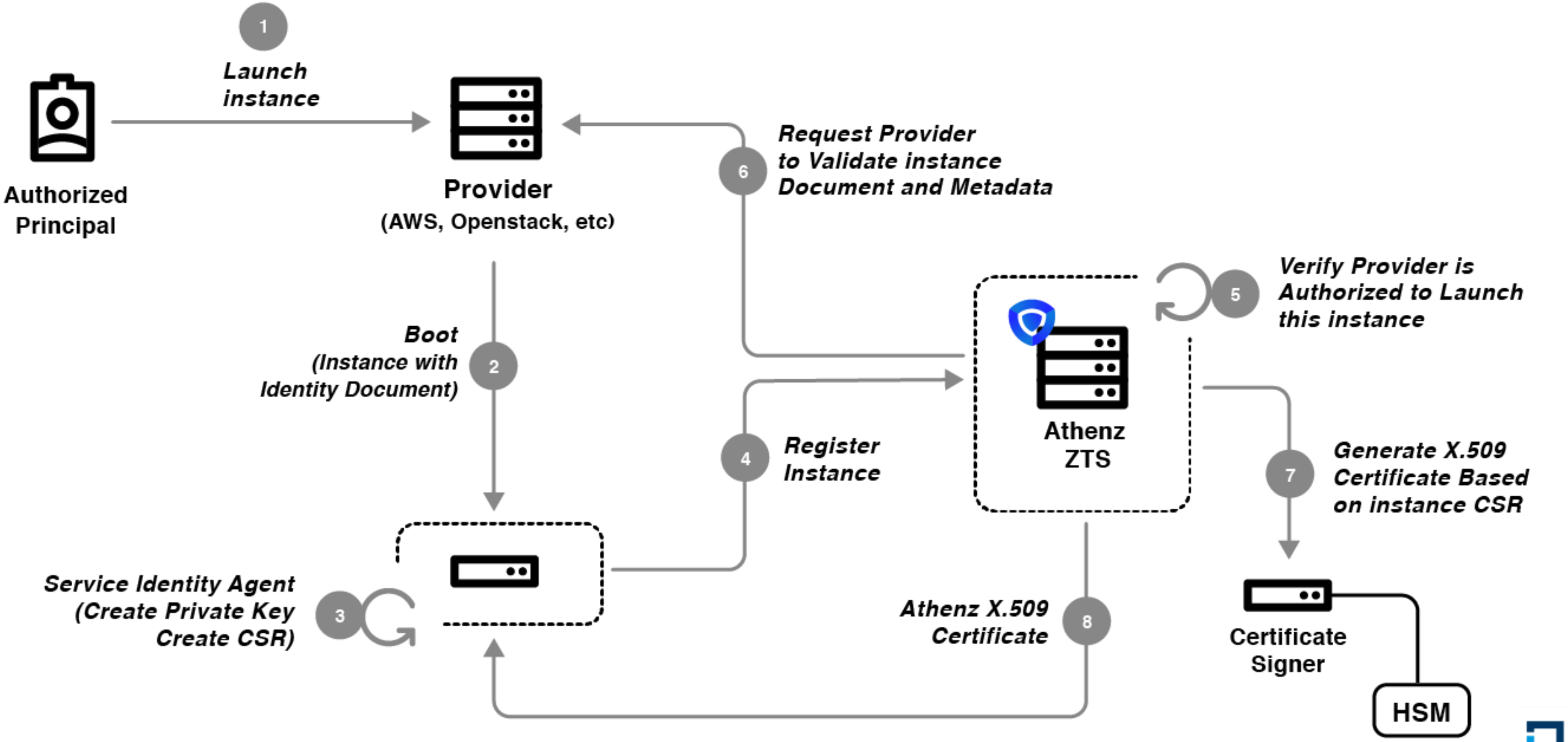
- Generalized model for authorized service providers to launch other service identities in an authorized way through a callback-based verification model.

Providers

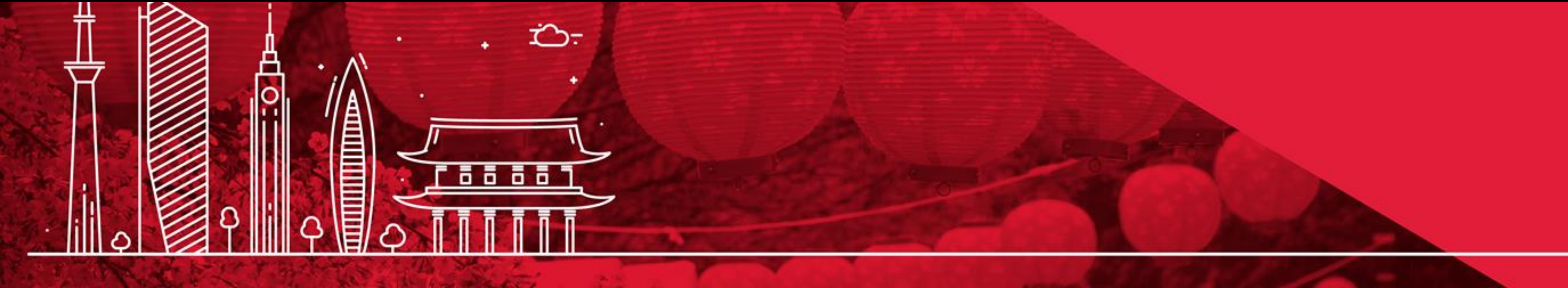
OpenStack **Kubernetes** **Screwdriver**

Amazon EC2 **AWS ECS** **AWS Lambda**

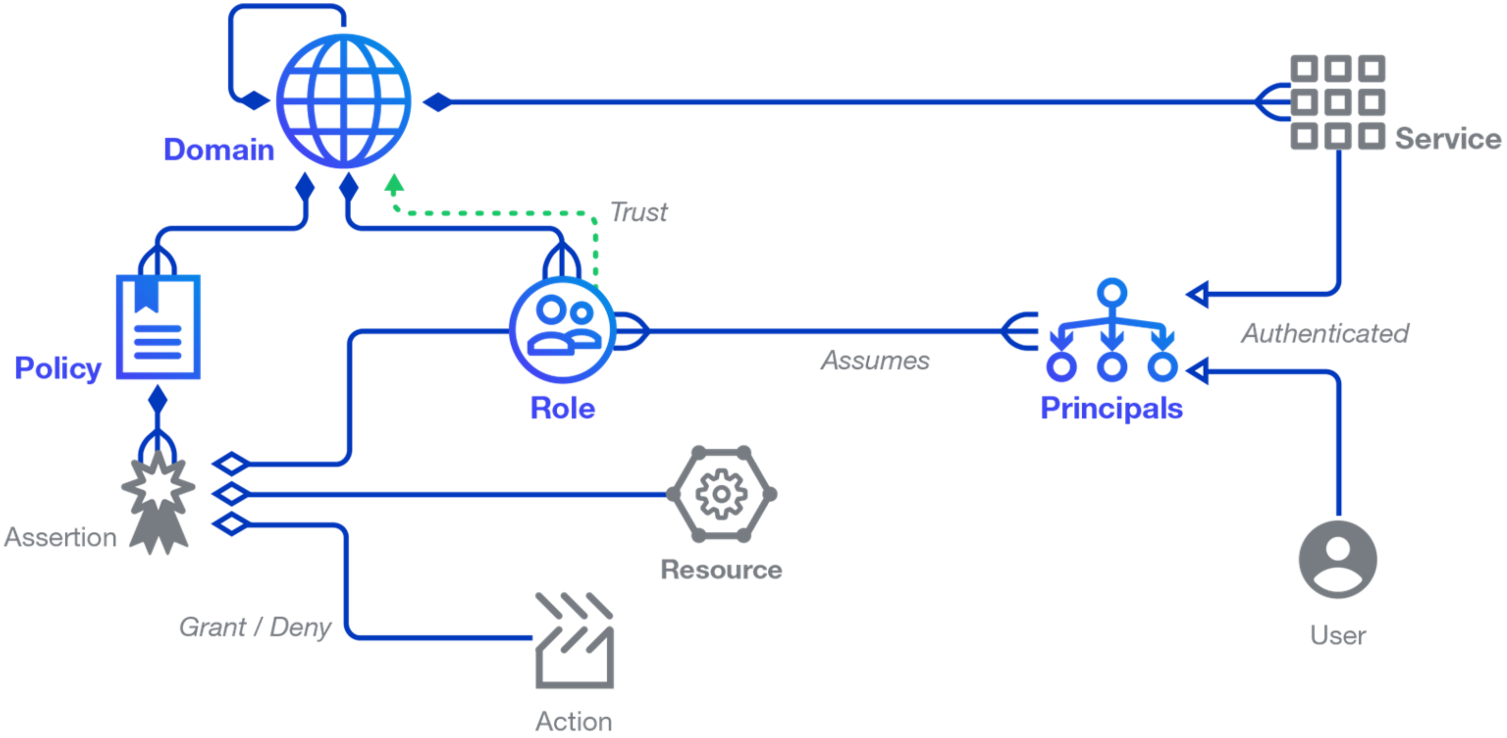
Bootstrapping Athenz Identity


1
Launch instance
Authorized Principal
Provider
(AWS, Openstack, etc)
6
Request Provider to Validate instance Document and Metadata
5
Verify Provider is Authorized to Launch this instance
Boot (Instance with Identity Document)
2
Athenz ZTS
4
Register Instance
7
Generate X.509 Certificate Based on instance CSR
Service Identity Agent (Create Private Key Create CSR)
3
Athenz X.509 Certificate
8
Certificate Signer
HSM

Authorization



Athenz Data Model



Single source of truth

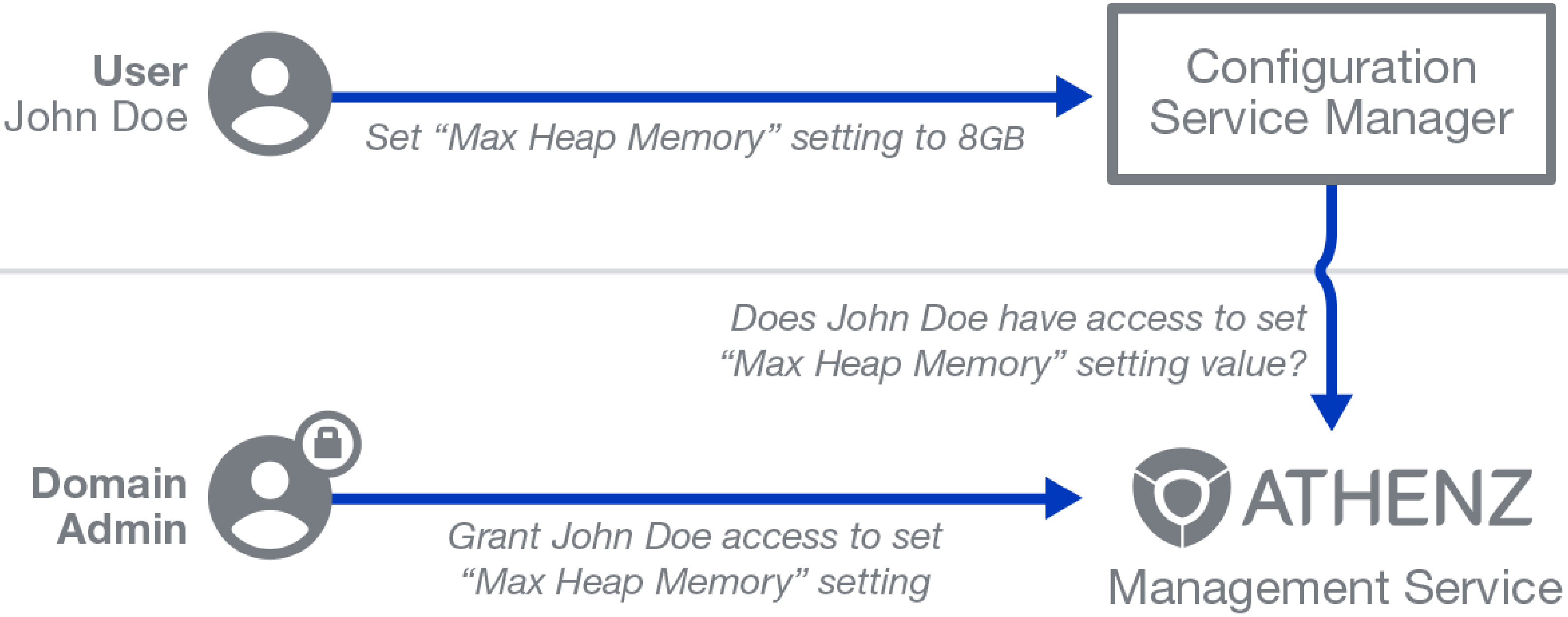
- Most infrastructures in Cloud computing environments (e.g. Kubernetes, OpenStack, AWS, etc) have their own system of access control.
- Athenz provides interface to integrate with each infrastructure to run multi environments with a single access control model.

Cloud computing environments

OpenStack **Kubernetes** **Screwdriver**

Amazon EC2 **AWS ECS** **AWS Lambda**

Authorization - Centralized Access Control



User
John Doe

Set "Max Heap Memory" setting to 8GB

Configuration Service Manager

Does John Doe have access to set "Max Heap Memory" setting value?

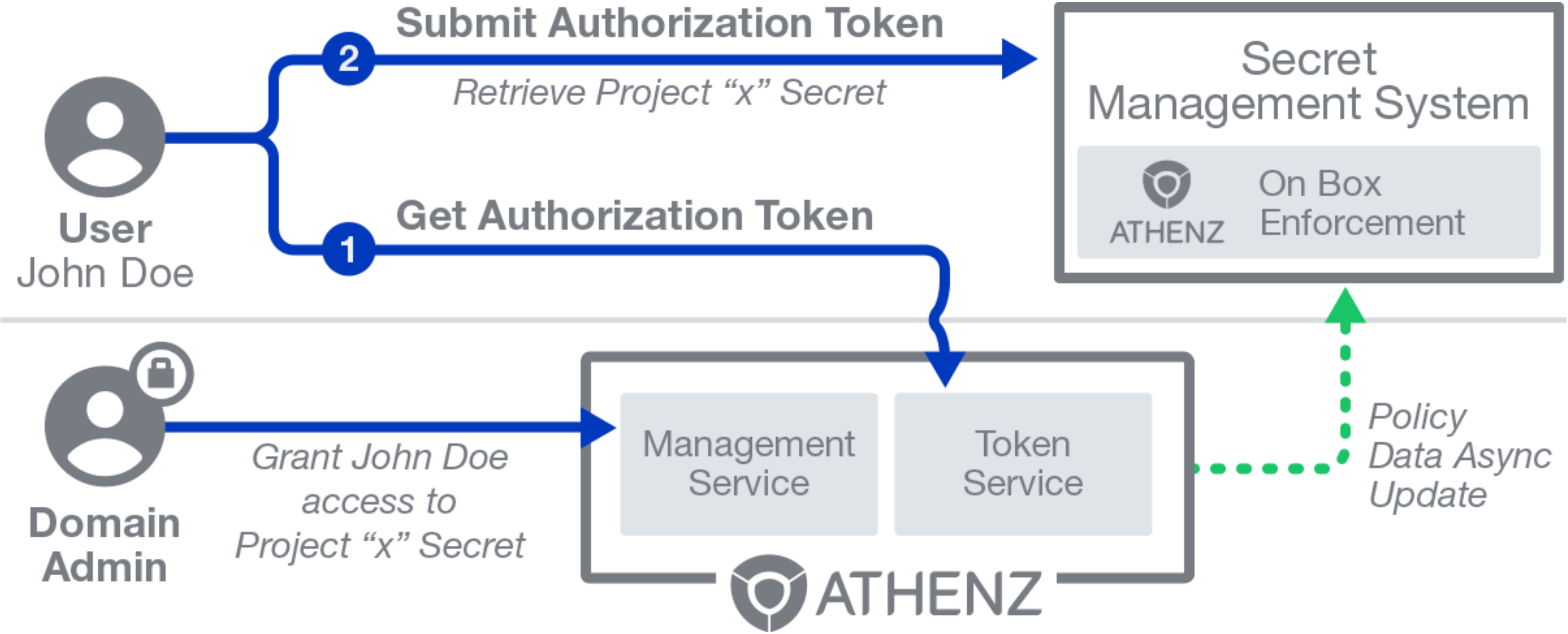
Domain Admin

Grant John Doe access to set "Max Heap Memory" setting

ATHENZ

Management Service

Authorization - Decentralized Access Control



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Demo

Advantages of Athenz

- To provide service identity X.509 certificates for services running in common providers like Kubernetes, OpenStack or AWS that can be used for mutual TLS authentication.

- To have precise and frequently configurable access controls with single source of truth.

Future plans

- To support SPIFFE ID in SAN field of x509 certificate
- To integrate with Istio envoy for authorization

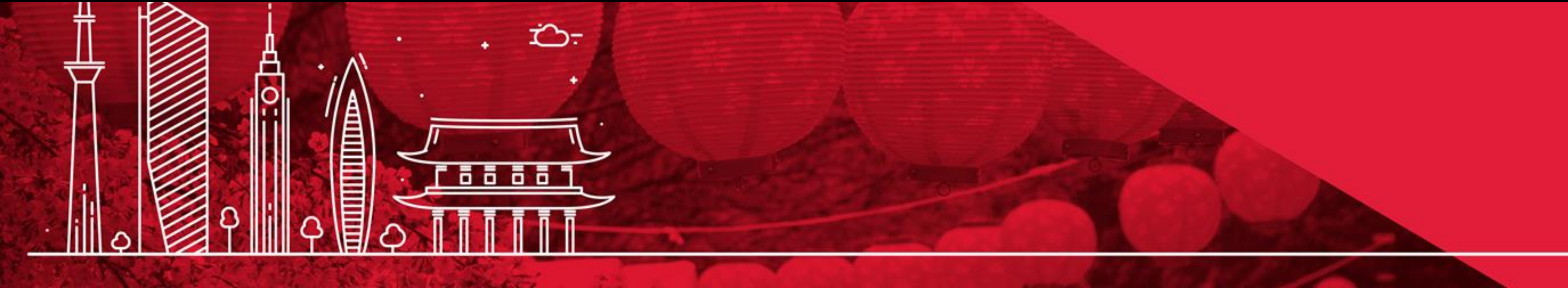
Resources

- Athenz Website : http://www.athenz.io
- Athenz Github: https://github.com/yahoo/athenz
- Athenz Slack Channel: https://athenz.slack.com/
- Athenz Discussion Groups:
  - Google Group: Athenz-Users
- Questions or Comments:
  - Tatsuya Yano: tatyano@yahoo-corp.jp

Join US

http://www.athenz.io

Q & A



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