Designing an API Management Strategy for Microsoft Azure

RECOMMENDING A HOSTING STRUCTURE FOR API MANAGEMENT

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Overview

Why APIs?

What is Microsoft Azure API Management (APIM)?

Why APIM?

APIM components
- API Gateway
- Azure Portal
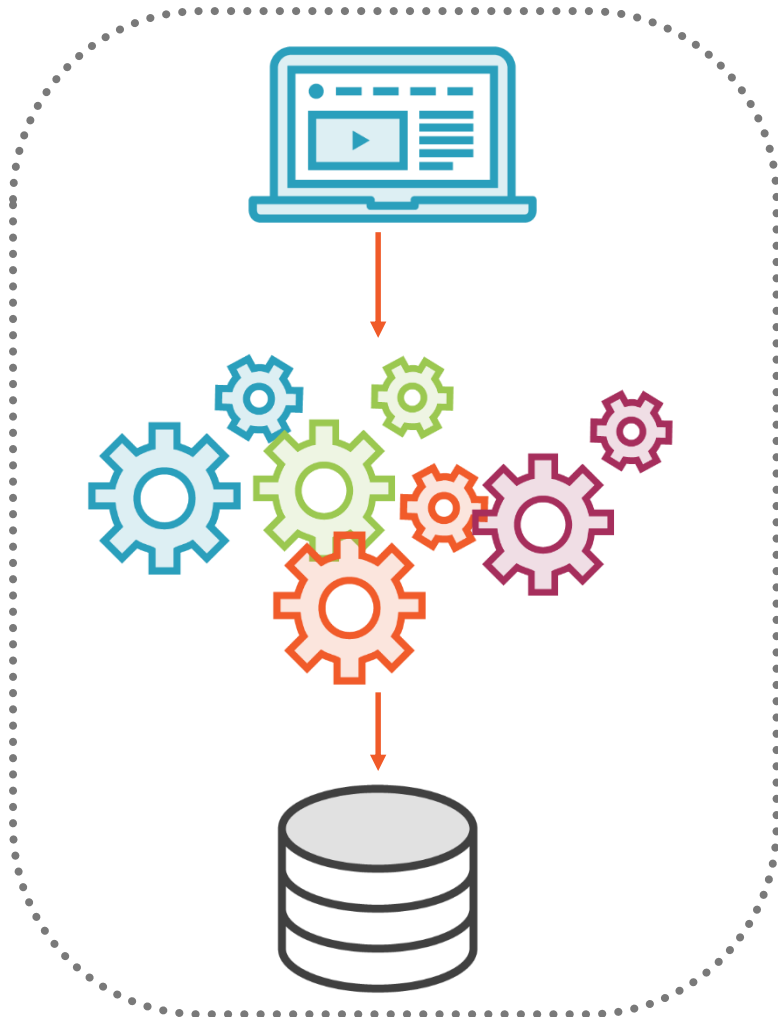- Developer Portal

Scaling APIM

Automating APIM

Summary

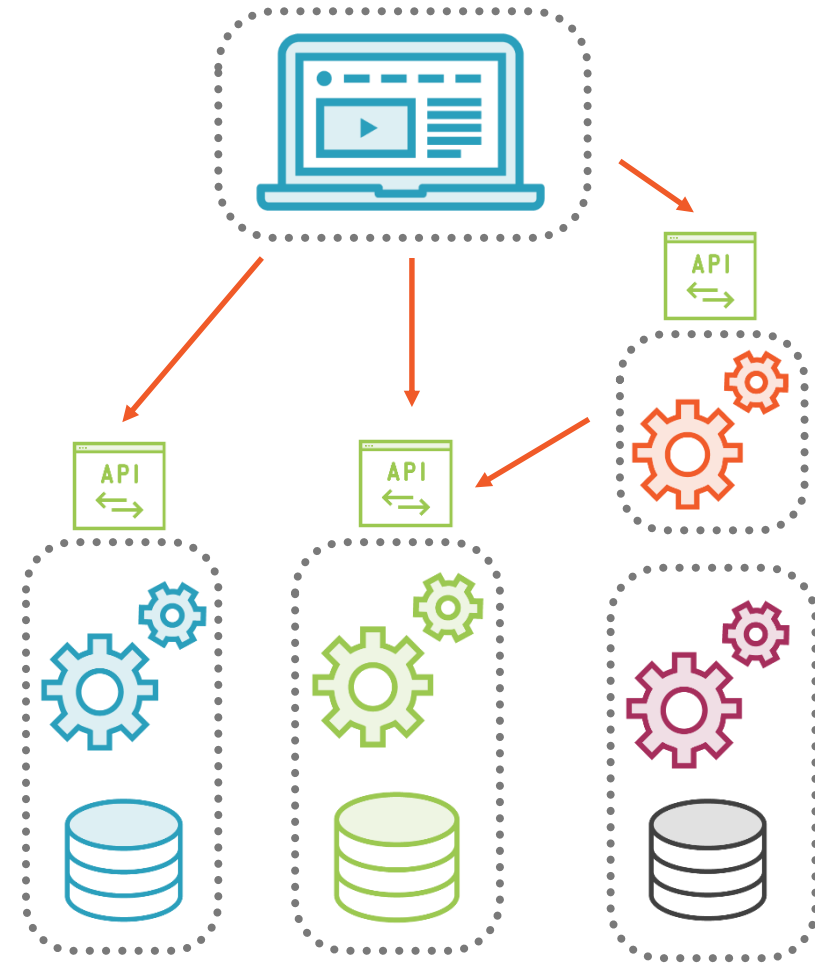# Introducing Azure API Management (APIM)

Why APIs?

Monolithic

Service Oriented / Microservices

Decompose

Why APIs?

APIs allow service-oriented design

Breaking down applications to smaller independent services

Easy integration

Each service exposes APIs which are consumed by other services/clients

Easy maintenance

Deployments and bug fixes can target each individual service, not the whole application

Any application can expose APIs, regardless of whether they are monolithic or service-oriented.
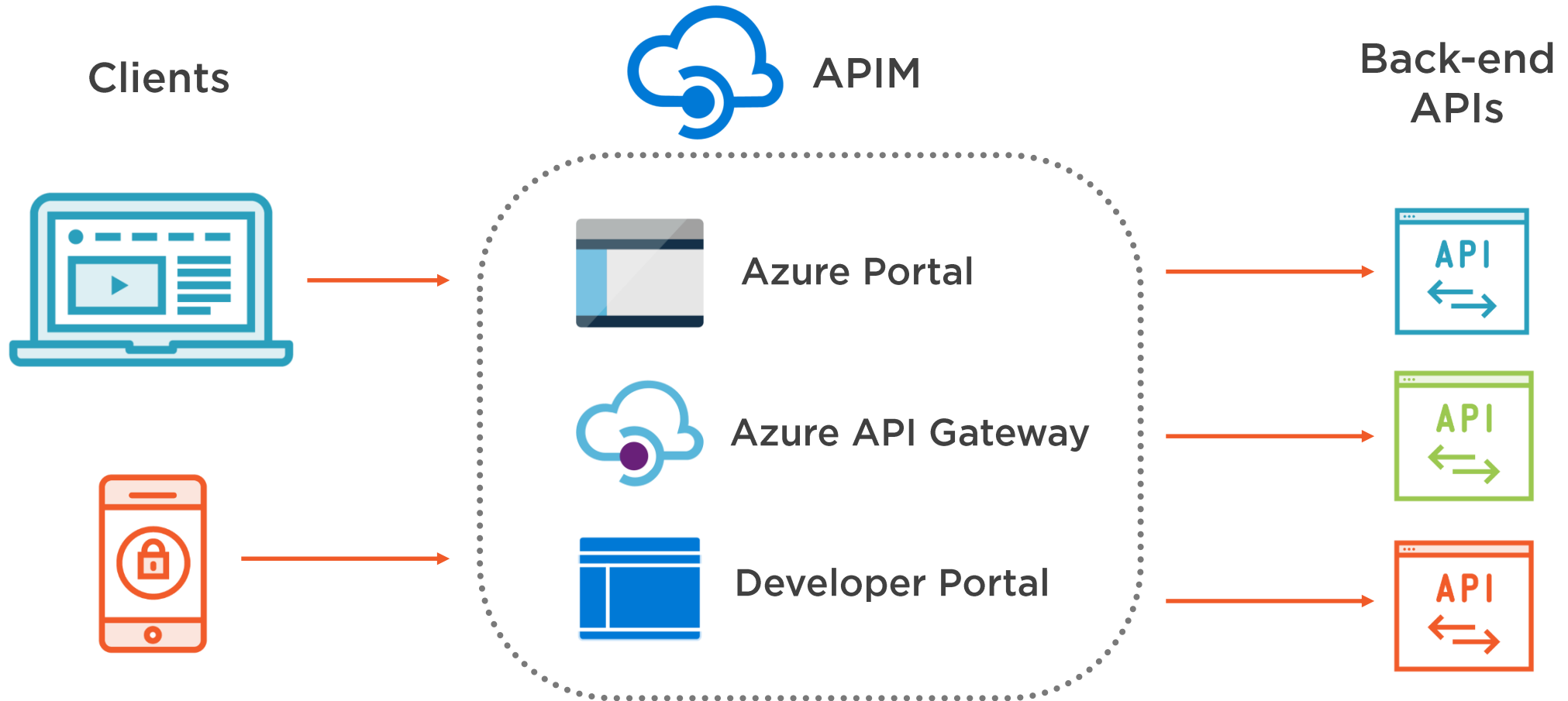
Azure API Management (APIM)

Azure API Management (APIM) helps organizations to publish existing back-end APIs for external consumers, partners, and internal developers.

What Is APIM?

Clients

APIM

Back-end APIs

Azure Portal

Azure API Gateway

Developer Portal

Why APIM?

Easy API consumption for clients and internal developers	Easy integration with AAD for b2b and b2c federated authentication	Define quotas for callers, throttling
Enable API versioning and revisioning	Usage report, monitoring	Provides API documentation, mocking, IP filtering, and response caching

APIM Components

API Gateway
The endpoint that accepts the API calls from clients

Azure Portal
The administrative interface where the API management is set up

Developer Portal
The web panel for the developers who intend to consume the APIs

API Gateway

Accepts calls from clients and directs to the back-end APIs

Verifies API keys, security tokens, certificates, and other credentials

Enforces usage quotas and call rate limits

Transforms API on the fly without code modifications using policies

Caches backend responses if set up

Logs API call details for analytics and monitoring purposes

Azure Portal

Define or import back-end API schema

Logical API packaging into products

Set up policies such as quotas or transformations on the APIs

Get insights from analytics

Manage API access for users

Developer Portal

Developers can read API documentation

Try-out/test an API via the interactive console

Create an account and subscribe to the APIs by getting an API key

Access API call analytics on their own usage

APIM and Other Azure Resources

Managed Identities

External Cache

Managed Identities for Azure Services

A service of
Azure Active Directory
(Azure AD)

Works with services that
support Azure AD
authentication

The new name for the service
formerly known as Managed
Service Identity (MSI)

Helps APIM to access
other Azure resources

Managed Identities and APIM

API Management

Managed Identity (MSI)

Azure Key Vault

Ask for the SSL Certificate

Get the SSL Certificate from KV

Custom domain HTTPS
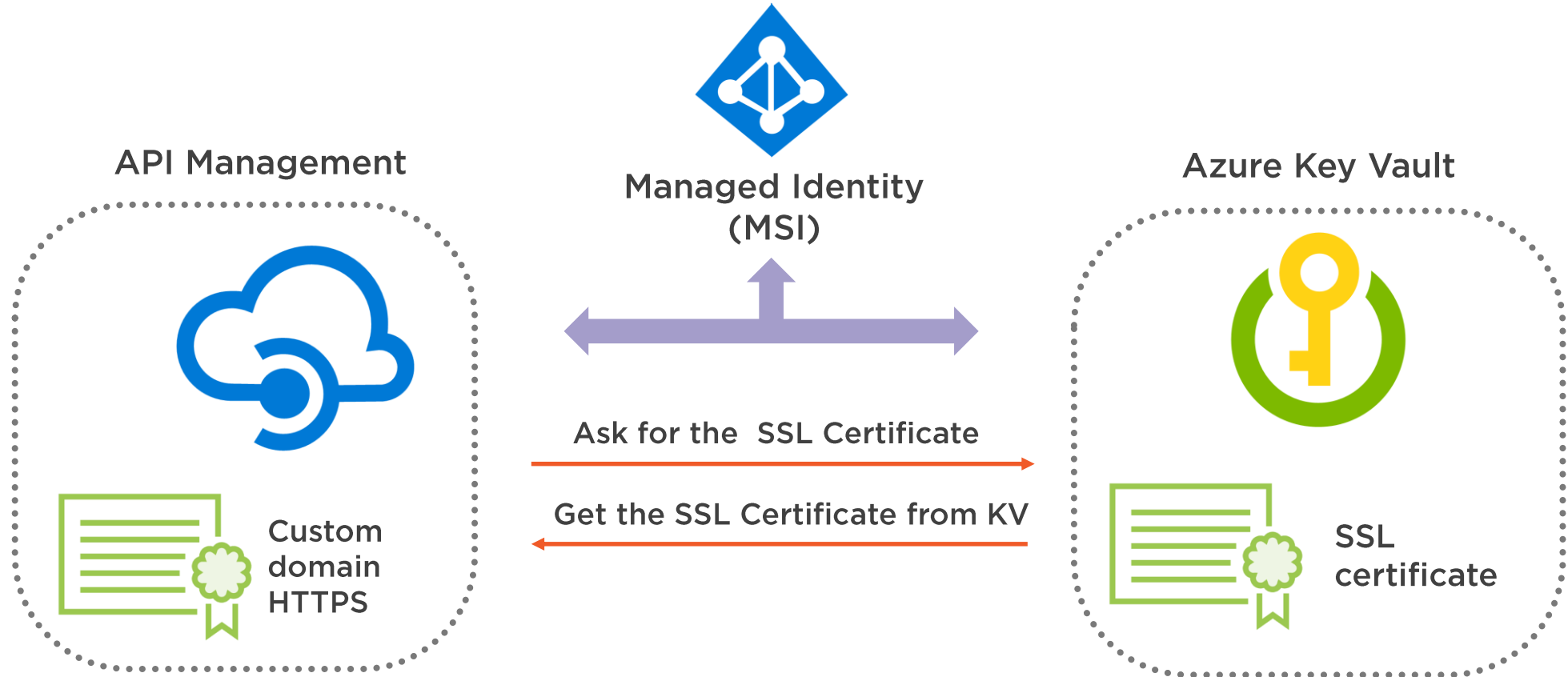
SSL certificate

Managed Identities and APIM

A Managed Identity allows API Management to easily and securely access Azure AD-protected resources, such as Azure Key Vault
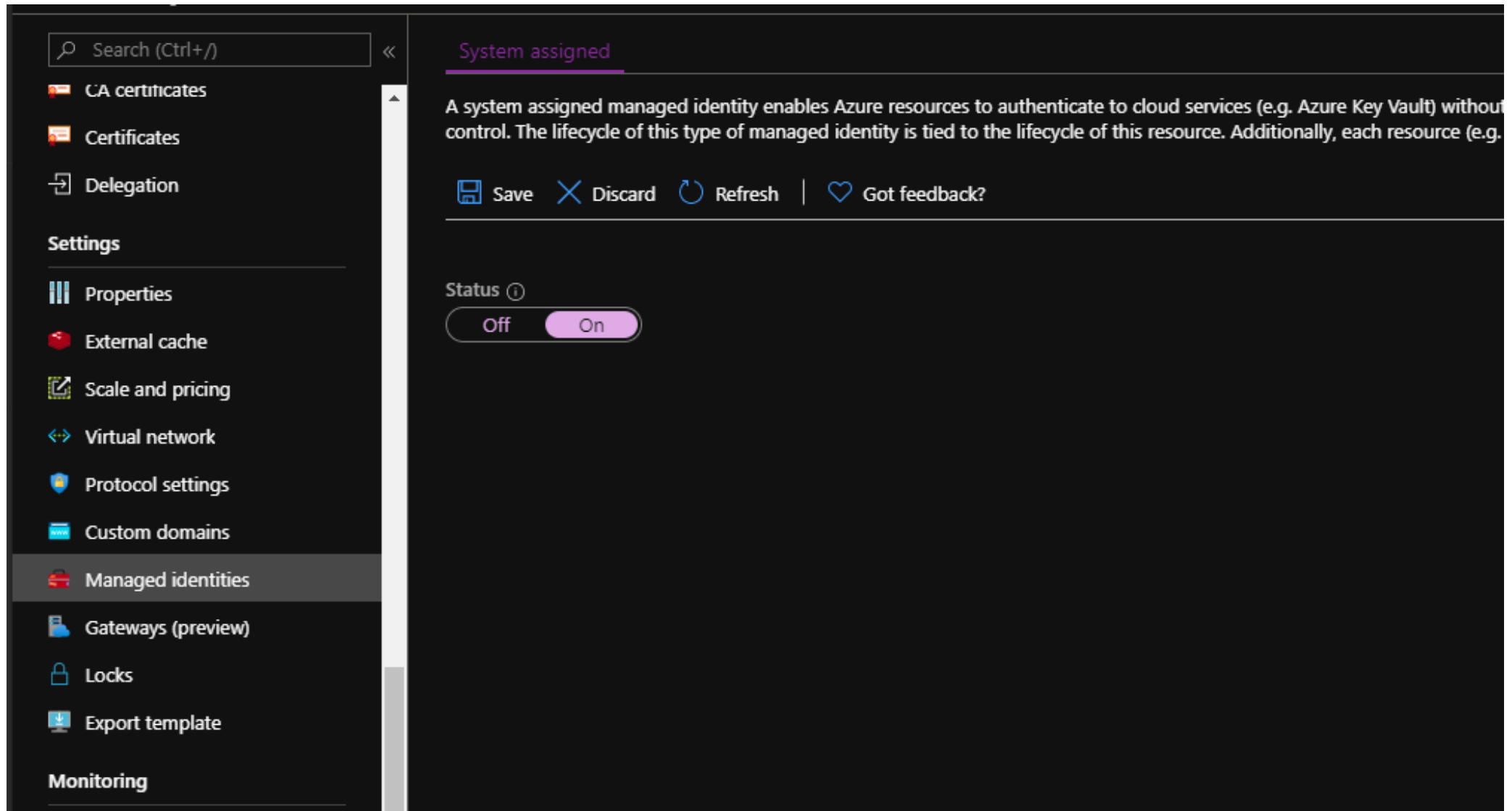
Currently, managed identities can be used to obtain certificates from Azure Key Vault for API Management custom domain names

According to Microsoft, more scenarios will be supported soon

Managed Identities and APIM

Securing Applications in Microsoft Azure

by Reza Salehi

This hands-on course covers powerful Azure security services including MSI, WAF, NSGs, ASGs, and App Service Environments. These services enable you to easily protect your IaaS and PaaS applications from today's sophisticated attacks.

WAF Monitoring

▶ **Resume Course**   🔖 Bookmark   ((φ)) Add to Channel   ⬇ Download Course

This course is part of: ⊞ Securing Data and Applications in Microsoft Azure Path   Expand All

▶ Course Overview		✓ 🔖	1m 22s	⌄
▶ Configuring TLS/SSL Certificates		🔖	27m 13s	⌄
▶ Configuring Managed Service Identities (MSI) for Microsoft Azure Resources		🔖	32m 30s	⌄
▶ Configuring Network Security Groups & Application Security Groups to Secure Virtual Machines		🔖	42m 53s	⌄

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
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Response Caching and APIM

API Management operations can use response caching

Response caching reduces latency, bandwidth and resource consumption

Should only be used to load data which does not change frequently

Response Caching and APIM

Built-in Cache
Comes with your APIM tier
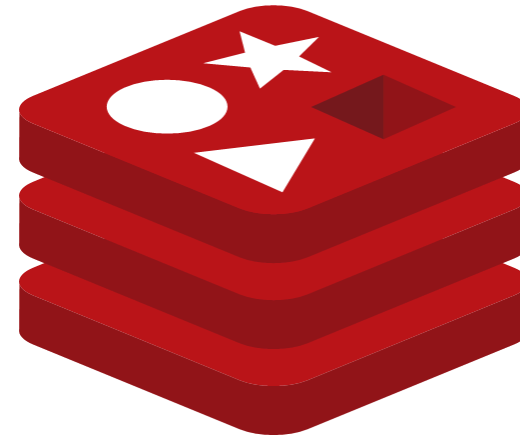
External Redis Cache
Both Azure-hosted and external Redis instances

APIM Built-in Cache

DEVELOPER	BASIC	STANDARD	PREMIUM
No SLA	**99.9** SLA, %	**99.9** SLA, %	**99.95*** SLA, %
AAD integration	No AAD integration	AAD integration	AAD integration
Virtual network	No virtual network	No virtual network	Virtual network
Single region only	Single region only	Single region only	Multi-region support
No scaling	Up to 2 scale units	Up to 4 scale units	Unlimited scale units*
10 MB cache	50 MB cache / unit	1 GB cache / unit	5 GB cache / unit
500 max rps (estimat...	1K max rps / unit (esti...	2.5K max rps / unit (e...	4K max rps / unit (e...
58.56 CAD/MONTH (ESTIMATED)	**179.43** CAD/MONTH (ESTIMATED)	**837.26** CAD/MONTH (ESTIMATED)	**3,407.96** CAD/MONTH (ESTIMATED)

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Internal cache is not available in the APIM Consumption tier.

APIM and Redis Cache

Avoid loosing cached responses due to API Management updates

Have fine-tuned control over Redis cache configuration

Cache much more data comparing to API Management built-in caching

Use caching with the Consumption tier of API Management

APIM and Redis Cache

apim-update01 - External cache
API Management service

External cache
API Management service

Search (Ctrl+/)

+ Add   ◯ Refresh

💾 Save

Repository

🖋 Management API

Security

🛡 Identities

🛡 OAuth 2.0

🛡 OpenID Connect

🔲 CA certificates

🔲 Certificates

➡ Delegation

Settings

📊 Properties

🟥 External cache

📝 Scale and pricing

‹› Virtual network

🛡 Protocol settings

Used from

No results

Cache instance

Cache instance location

Use from *

Description

Connection string (StackExchange.Redis) *

Demo

Explore a sample JSON API

Create a new APIM instance

Examine the Azure Portal for the APIM:

- Import a sample API
- Configure call limits
- Create a product
- Configure mocking

Examine the developer portal for the APIM

- Read the API documentation
- Subscribe to the API

Call the APIs in the APIM

Azure API Management (APIM) in Scale

Upgrade and Scale an Azure APIM Instance

Change the service tier

Upgrade service tier for better performance (Developer, Basic, Standard, Premium)

Add or remove performance units in one tier

Developer tier does NOT support changing units

Change APIM Service Tier

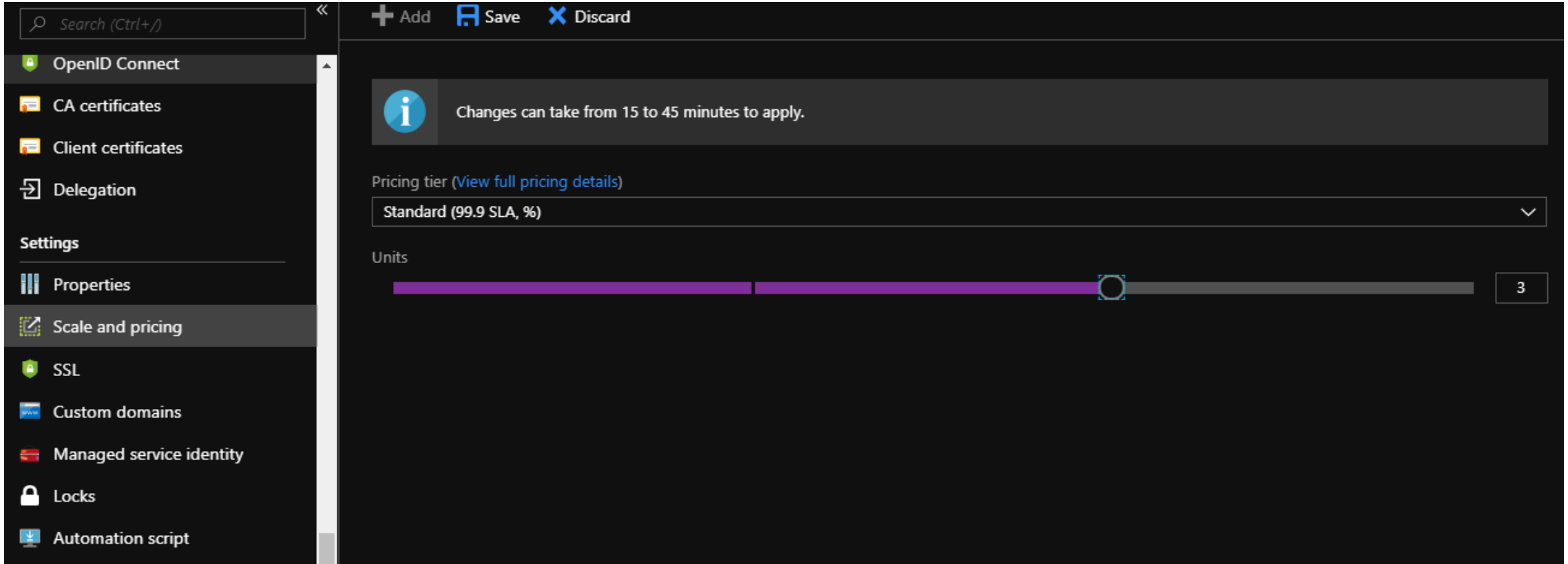| DEVELOPER	BASIC	STANDARD	PREMIUM
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A unit is composed of dedicated Azure resources and has a certain load-bearing capacity expressed as a number of API calls per month.

Add or Remove Performance Units in One Tier

The upgrade or scale process can take from 15 to 45 minutes to apply. You will get a notification when it is done.

When to Scale an APIM Instance?

Auto-scale

Auto-scale can be enabled for Standard and Premium tiers

Use "capacity"

Capacity is the most important metric for making informed decisions whether to scale an API Management instance

Auto Scaling an APIM Instance

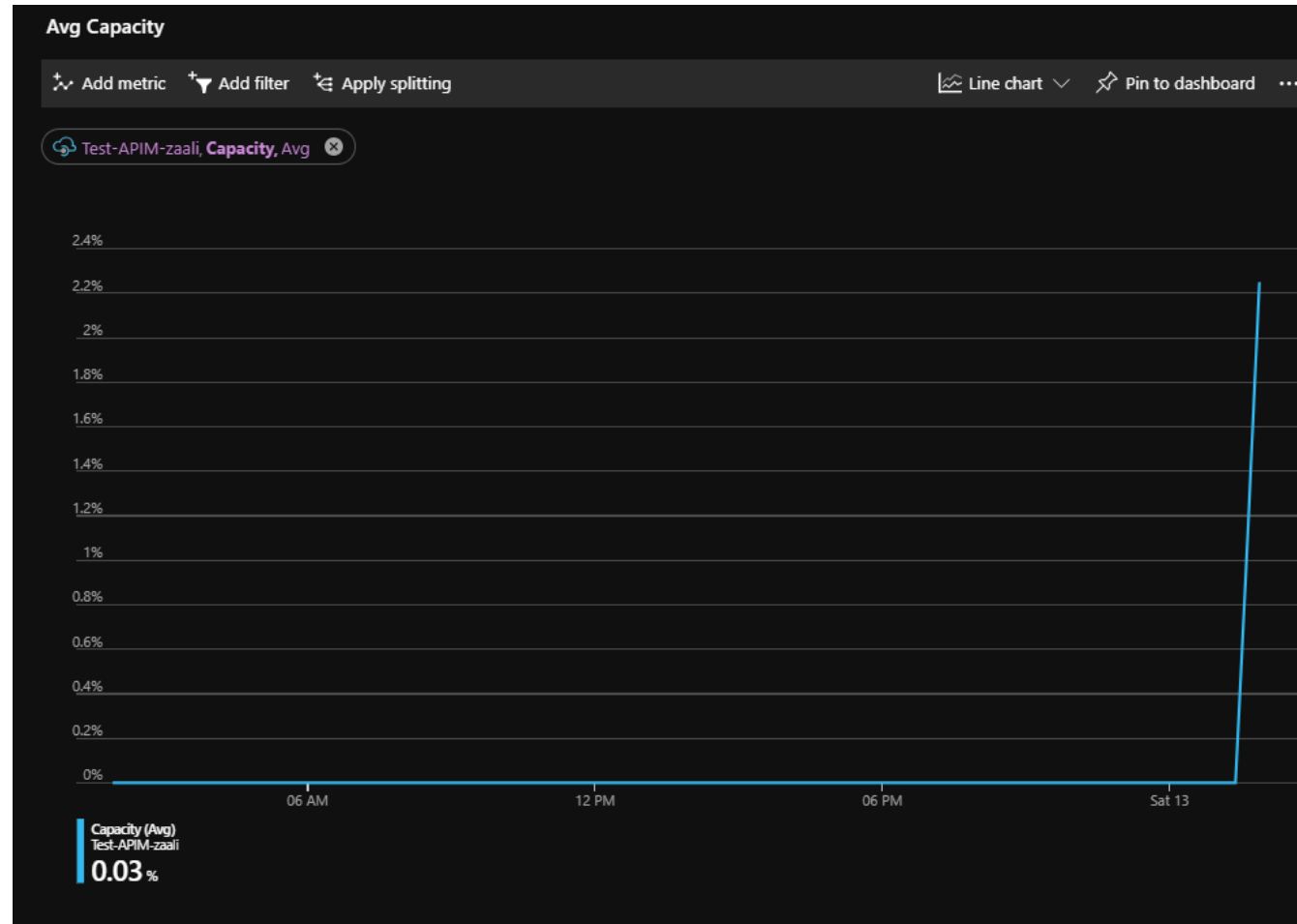Auto-scale can be enabled only for Standard and Premium tiers

Pricing tiers specify the maximum number of units

Scaling process will take at least 20 minutes

A service with multi-regional deployments, only units in the Primary location can be scaled

Use Capacity to Determine When to Scale

Use Capacity to Determine When to Scale

Look at a long-term trend and average

Ignore sudden spikes that are most likely not related to increase in load

Upgrade your instance when average capacity exceeds 60%-70% for a longer period (e.g. 30 minutes)

APIM and Multiple Region Deployment

A single APIM deployment can be distributed among multiple regions

API consumers around the globe will experience less latency, also provides failover in case of primary region outage

Only the API gateway component is deployed to all regions

Only available in the Premium tier of APIM

APIM and Multiple Region Deployment

Demo

Upgrade the APIM tier to Standard

Change the units

Configure auto-scale
- Scale up
- Scale down

Examine the capacity report

Downgrade the instance to Developer

Demo

APIM and Multiple Region Deployment

Notes About Azure Automation and APIM

Automating APIM Tasks

You can write PowerShell scripts to perform many of your API Management tasks

The scripts can be run manually or by Azure Automation workflows

You can pair these cmdlets in Azure Automation with the cmdlets for other Azure services, to automate complex tasks across Azure services

Demo

Backup the API Management service using Azure PowerShell

Restore the API Management Service from the backup

Summary

APIs and modern software architecture

Introduced Microsoft Azure API Management (APIM)

How can APIM help?

APIM components
- API Gateway
- Azure Portal
- Developer Portal

Scaling APIM

Automating APIM