

Serverless on  Azure

*Scalable and reliable event based compute  
experience for code and workflows that  
accelerate the development of applications  
while hiding the  
infrastructure and providing auto-scale and  
micro-billing*

*"We're seeing the first steps toward this nirvana world where developers just write their application and give it to the platform and everything other than the application is taken care of by the platform itself... We're going to push as much as we can towards the serverless paradigm"*

- Mark Russinovich, Azure CTO

<https://www.geekwire.com/2017/serverless-nirvana-microsoft-azure-cto-mark-russinovich-future-cloud/>

*"At least superficially, adoption of serverless technologies now matches that of containers"*

<https://thenewstack.io/week-numbers-serverless-adoption-par-containers/>  
<https://newrelic.com/serverless-dynamic-cloud-survey?content=eBook>

*"For serverless architectures, billing is proportional to usage, not reserved capacity. This removes the economic benefit of creating a single service package so different tasks can share the same reserved capacity... Applications based on serverless designs have to apply distributed, request-level authorization."*

- Serverless computing: economic and architectural impact Adzic et al., ESEC/FSE'17

<http://www.doc.ic.ac.uk/~rbc/papers/fse-serverless-17.pdf>

How do I **architect** my app?



Serverless, the platform for next gen apps

On-Premises

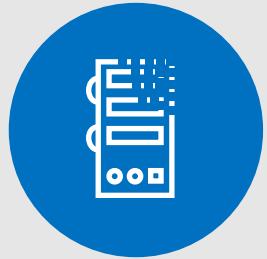
IaaS

PaaS

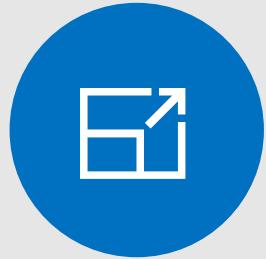
**Serverless**

[azure.com/serverless](http://azure.com/serverless)

# What is Serverless?



Abstraction  
of servers



Event-driven  
instant scale



Micro-billing



Manage apps  
not servers

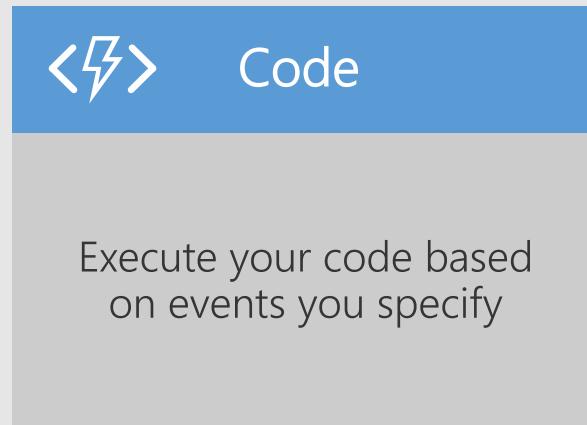


Reduced  
DevOps



Faster time  
to market

# Serverless application platform components



# Functions

Develop locally using best of class developer tools

Boost productivity through triggers and bindings

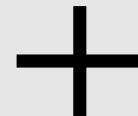
Choose from a variety of programming languages

Integrate with existing DevOps processes

Code



Azure Functions



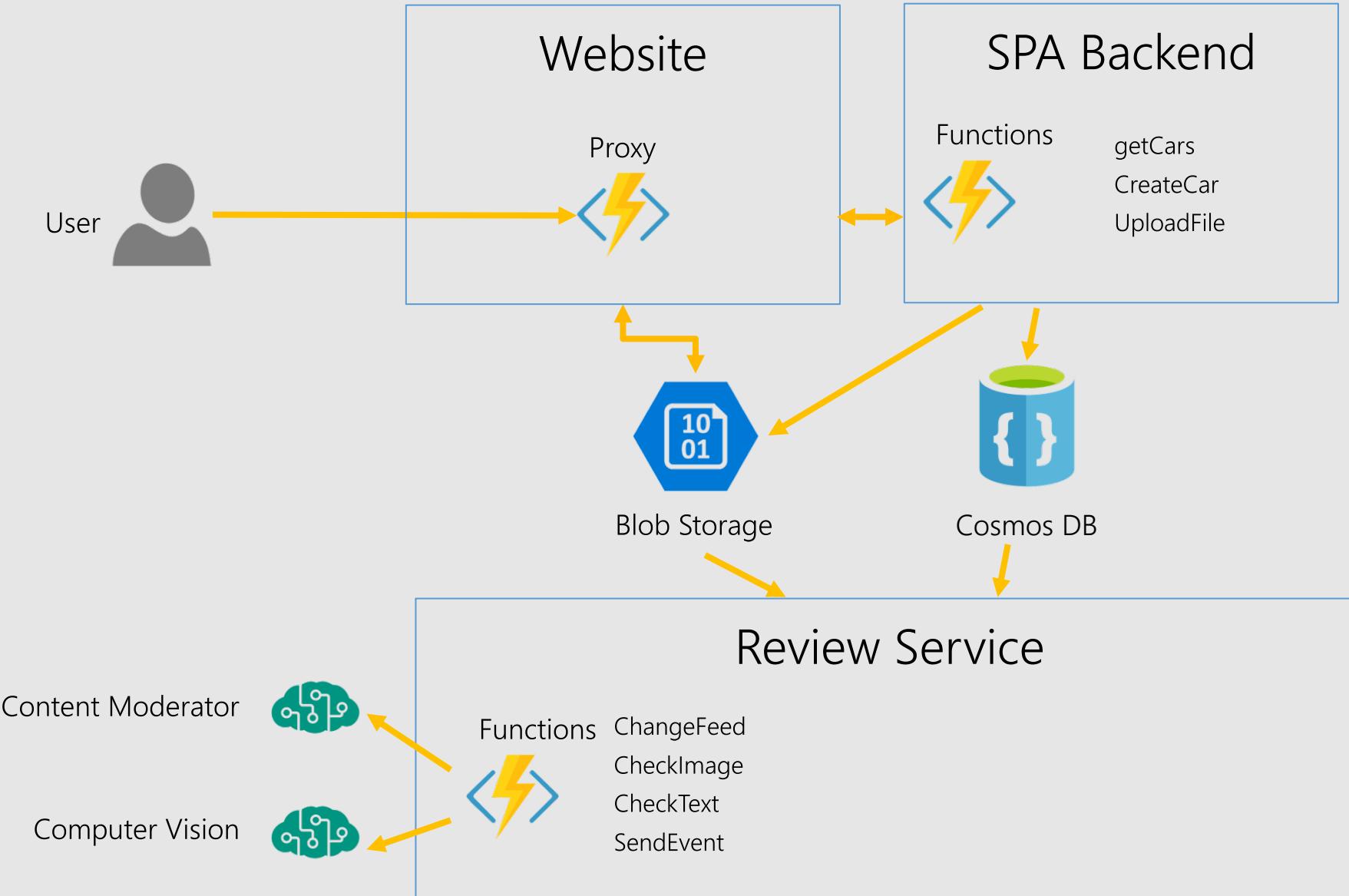
Events & Data



# Functions triggers and bindings

Type	Service	Trigger*	Input	Output
Schedule	Azure Functions	✓		
HTTP (REST or webhook)	Azure Functions	✓		✓**
Blob Storage	Azure Storage	✓	✓	✓
Events	Azure Event Hubs	✓		✓
Queues	Azure Storage	✓		✓
Queues and topics	Azure Service Bus	✓		✓
Storage tables	Azure Storage		✓	✓
SQL tables	Azure Mobile Apps		✓	✓
NoSQL DB	Azure Cosmos DB	✓	✓	✓
Push Notifications	Azure Notification Hubs			✓
Twilio SMS Text	Twilio			✓
SendGrid email	SendGrid			✓
Excel tables	Microsoft Graph	✓		✓
OneDrive files	Microsoft Graph	✓		✓
Outlook email	Microsoft Graph			✓
Microsoft Graph events	Microsoft Graph	✓	✓	✓
Auth tokens	Microsoft Graph			✓

# Demo – Part 1



# Serverless application platform components



## Workflows

Design workflows and orchestrate processes



## Code

Execute your code based on events you specify

# Logic Apps

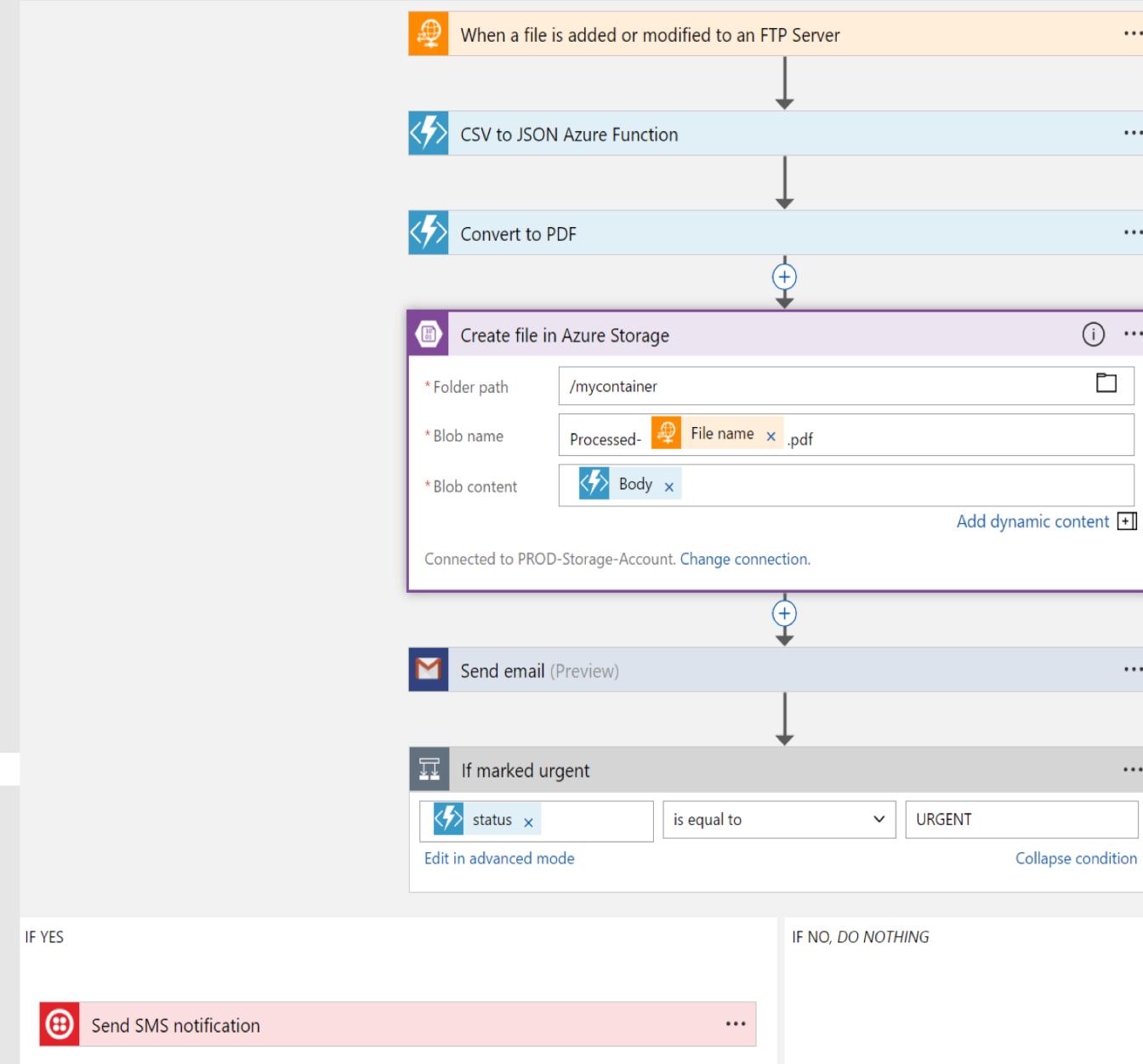
Visually design workflows  
in the cloud

Express logic through  
powerful control flow

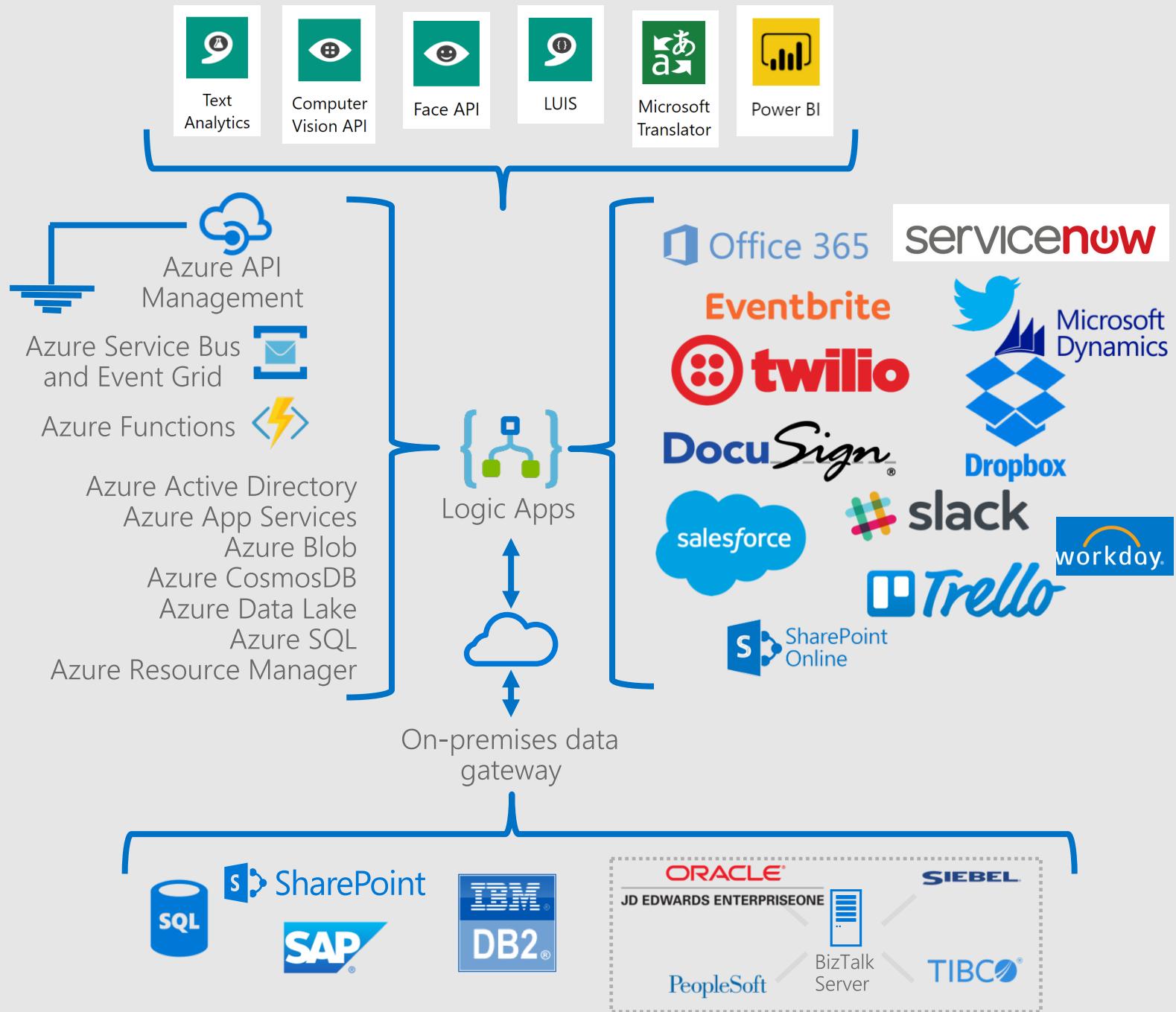
Connect disparate  
functions and APIs

Utilize declarative definition  
to work with CI/CD

On premises gateway



# Logic Apps connectors - ~200 and growing



# Serverless application platform components

 Events	 Workflows	 Code
Manage all events that can trigger code or logic	Design workflows and orchestrate processes	Execute your code based on events you specify

# Event Grid

Manage all events in one place

Focus on innovation and pay per event

Unlock new scenarios for your apps

Ensure reliability and performance for your apps

## Event publishers

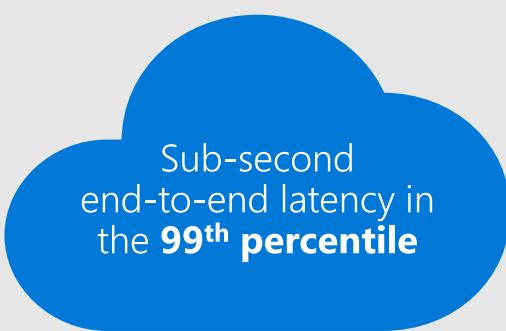
-  Blob Storage
-  Resource Groups
-  Azure Subscriptions
-  Event Hubs
-  Custom Events



## Event handlers

-  Azure Functions
-  Logic Apps
-  Azure Automation
-  WebHooks

# Event Grid delivers at massive scale



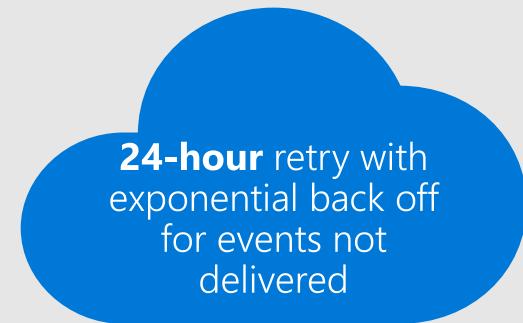
Sub-second  
end-to-end latency in  
the **99<sup>th</sup> percentile**

Near real-time



**10,000,000** events  
per second per  
region

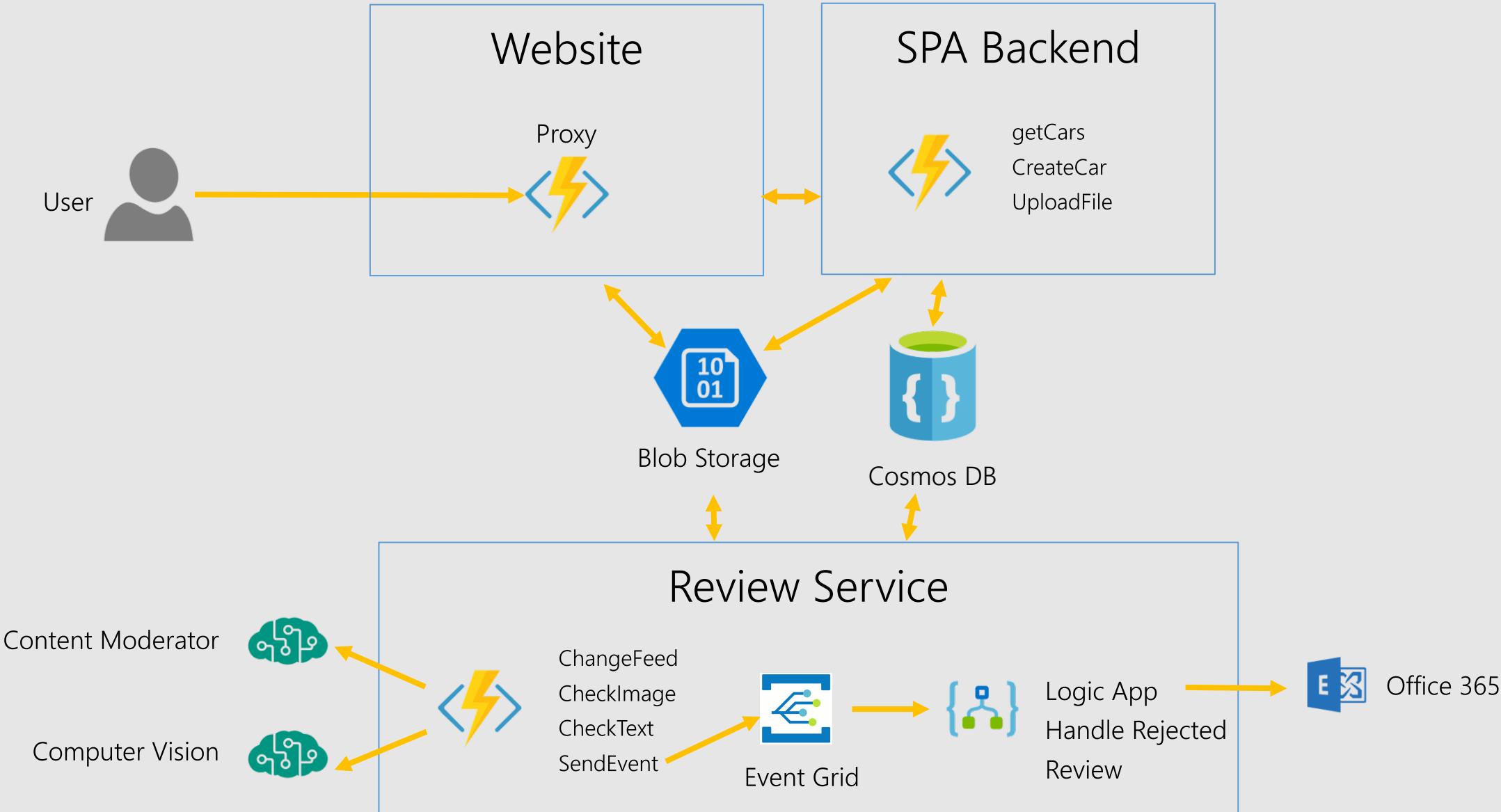
Massive scale-out



**24-hour** retry with  
exponential back off  
for events not  
delivered

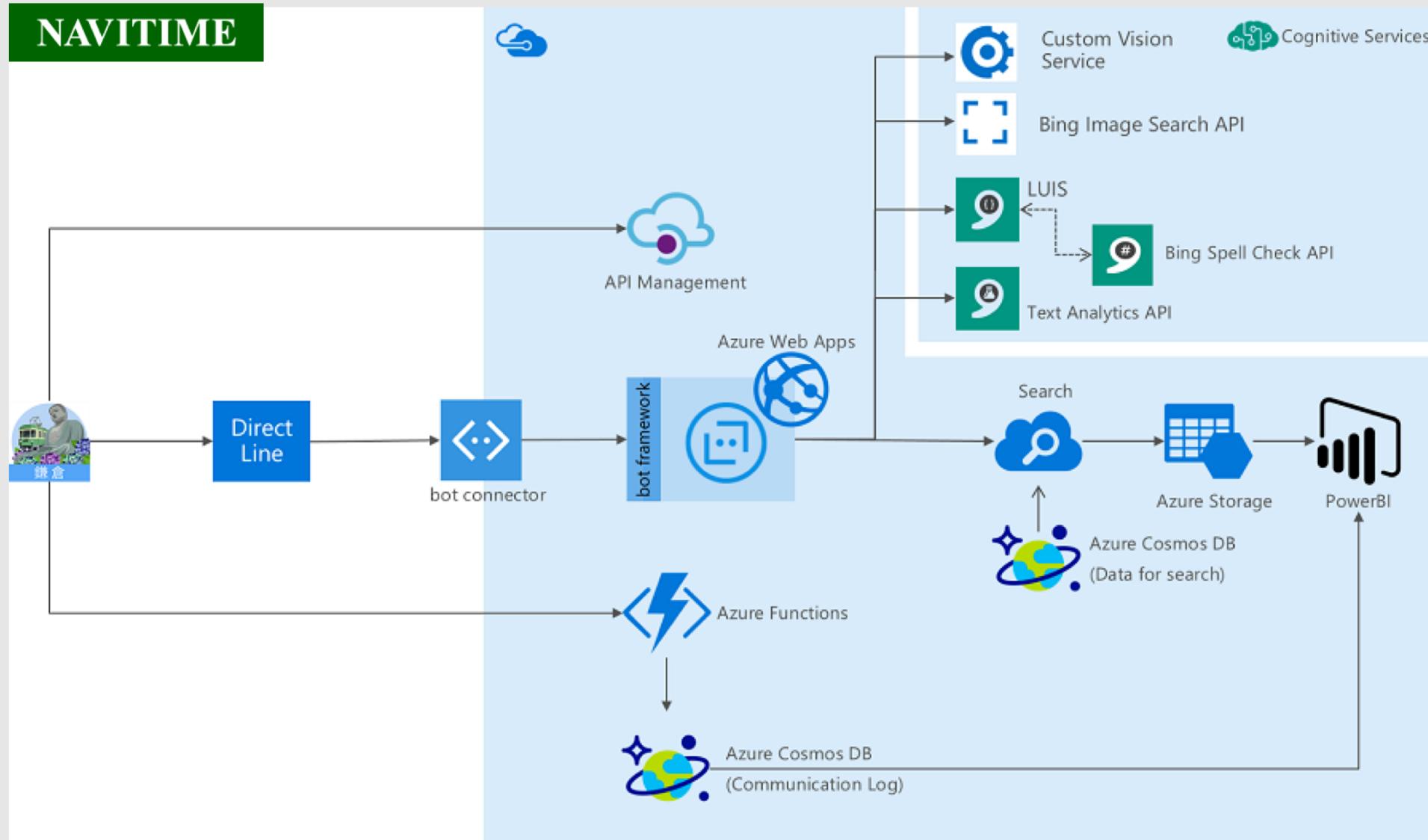
High reliability

# Demo – Part 1

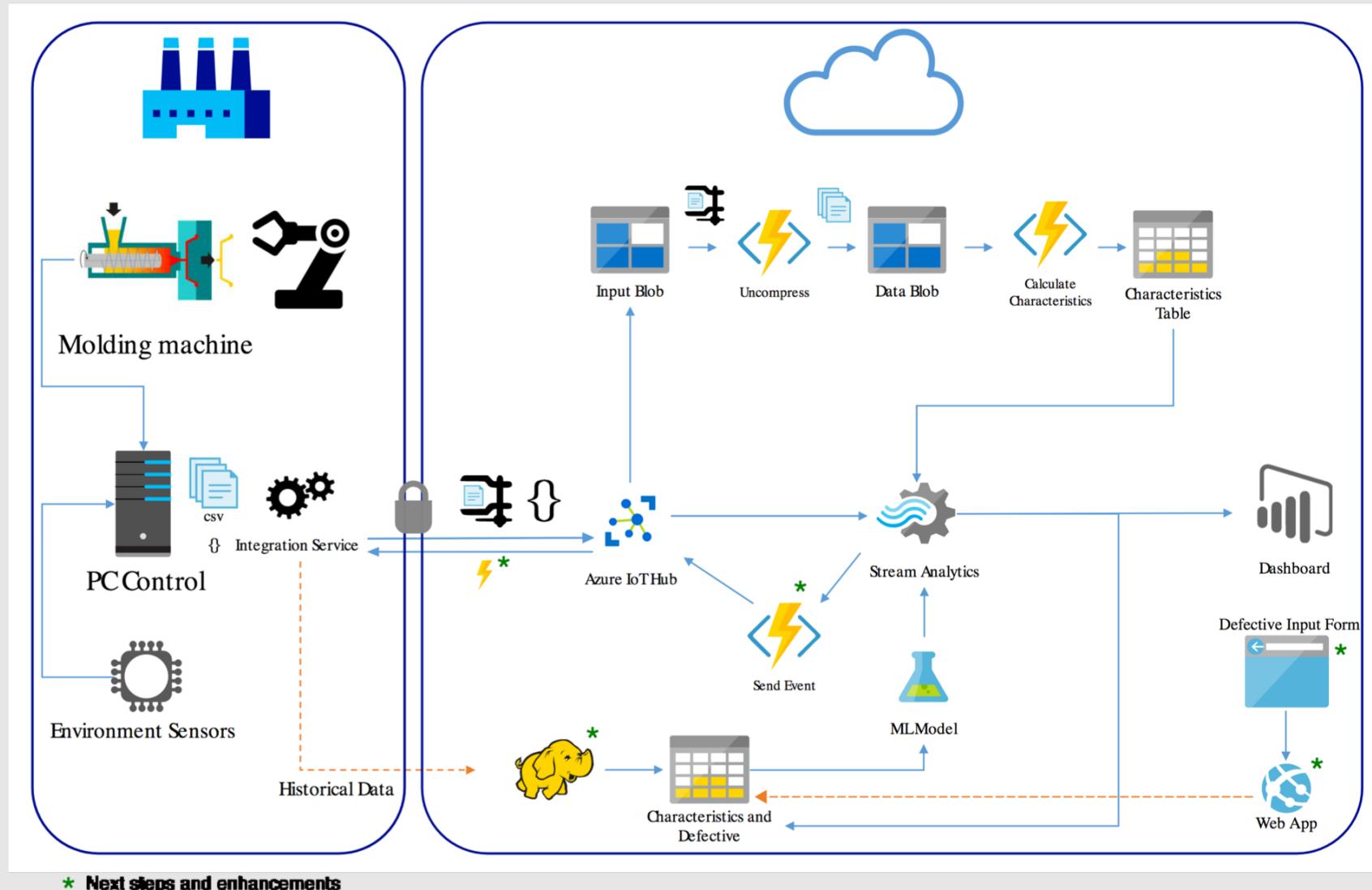


# Scenarios

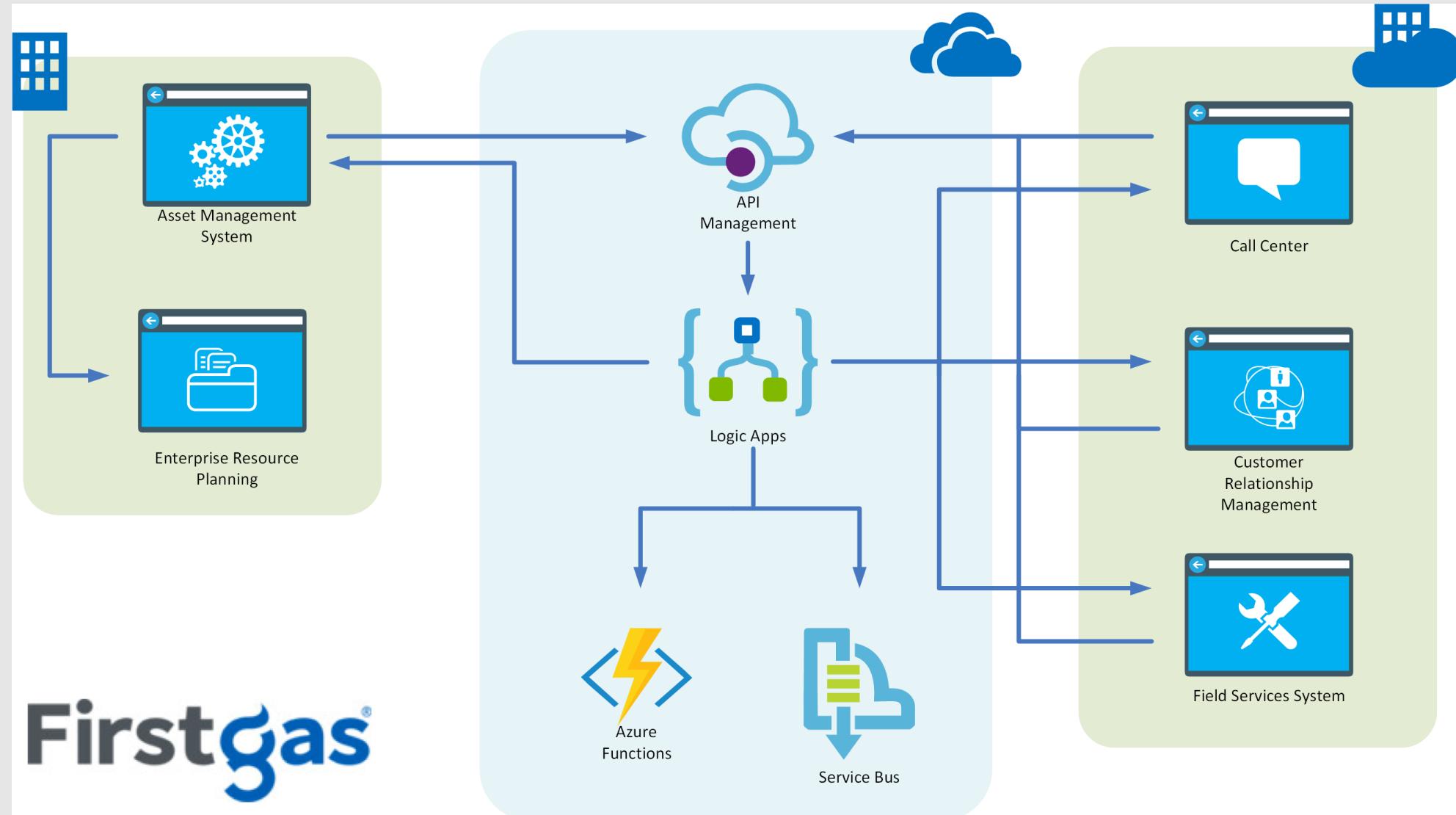
# Bots



# IoT & Data Solution

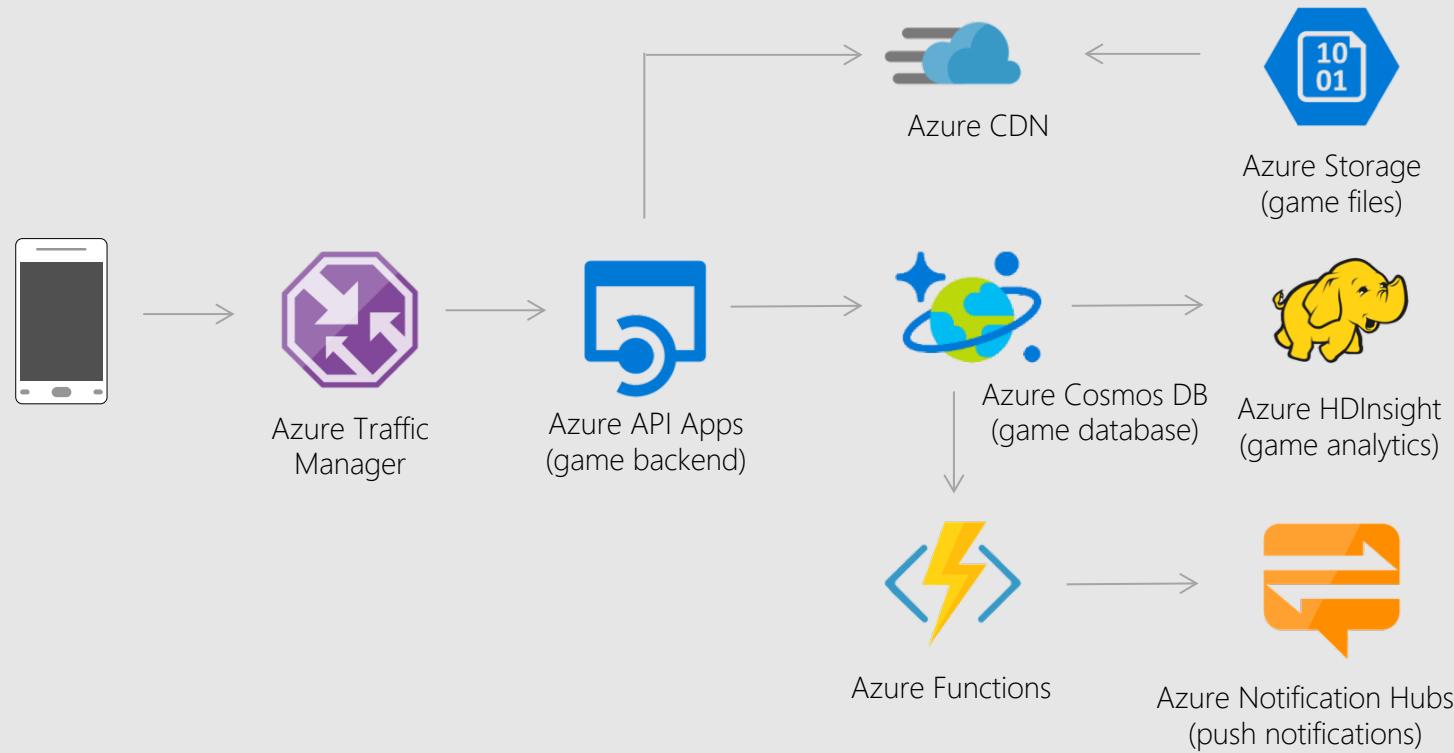


# Enterprise Workflow



**Firstgas®**

# Multiplayer Gaming





Transformed its popular IMAGE WORKS service through Azure serverless technologies.

#### Benefits:

- Latency reduced by 95%
- Development time reduced by 75%
- Higher reliability
- Ability to add new features and releases faster and more frequently

“We were able to move development along smoothly and cost-effectively, even when unexpected issues arose, by taking advantage of Azure capabilities”

Yuki Chiba  
Design Leader,  
Advanced Solutions Group

# Hiromasa Oka

## CEO/Architect of ZEN ARCHITECTS



DOWNLOAD

SHARE

OTHERS ▾

SORT

# IMAGE WORKS

IMAGE WORKS is a cloud storage service for transferring B2B digital image assets.

✓ 40,000 Active Users

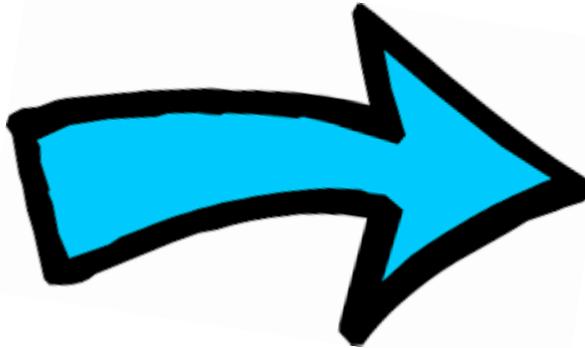
✓ 5,000,000 Req/Day

✓ 800Mbps Transferring

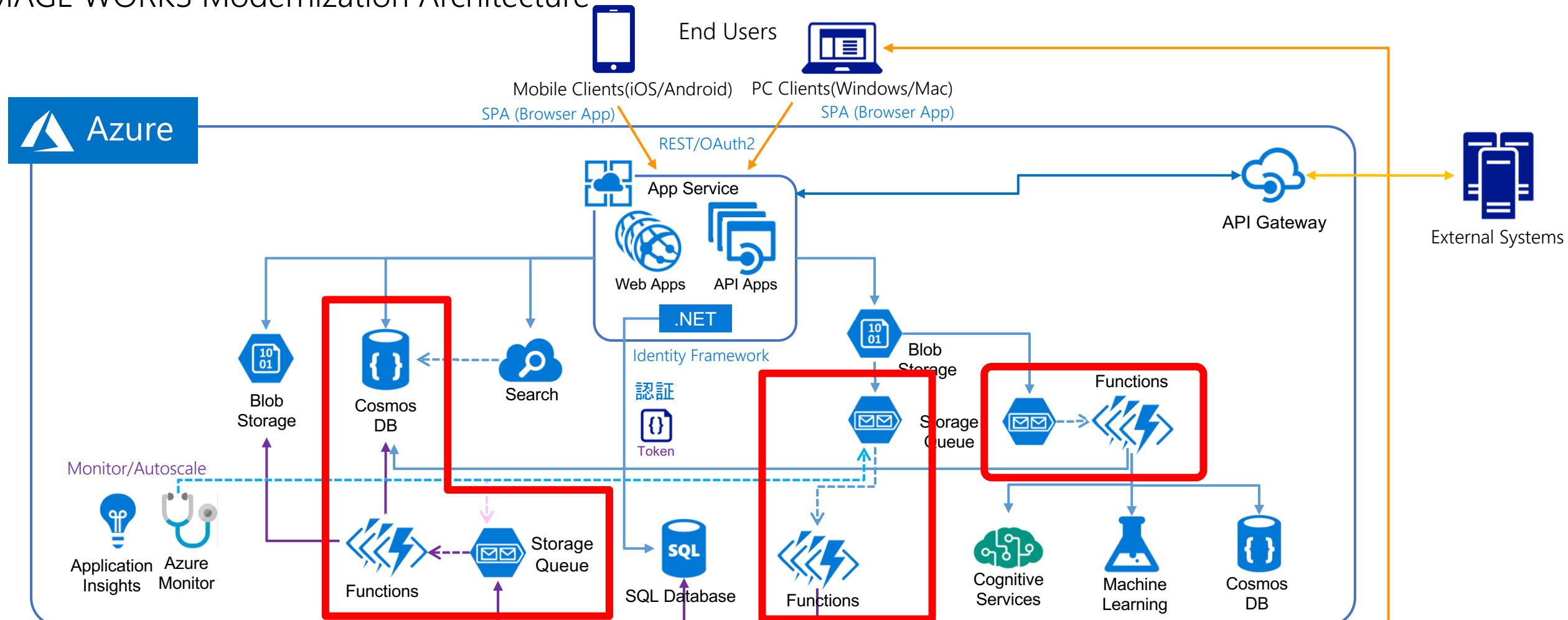
✓ Mission Critical



# Modernization for Serverless



# IMAGE WORKS Modernization Architecture



## SBA (Serverless based Architecture)

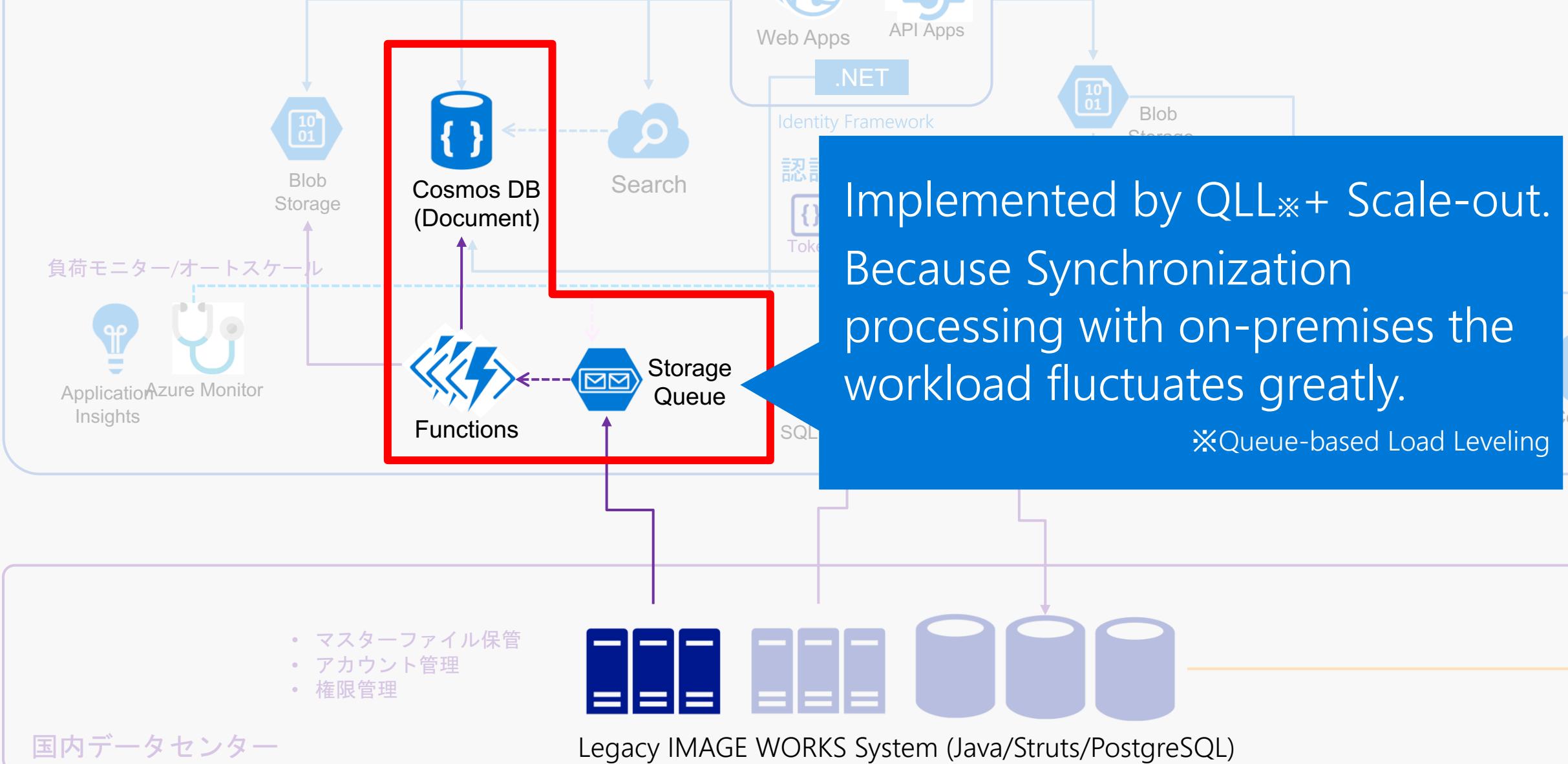
- Store original assets
- Manage User Account
- Authorization/Identification



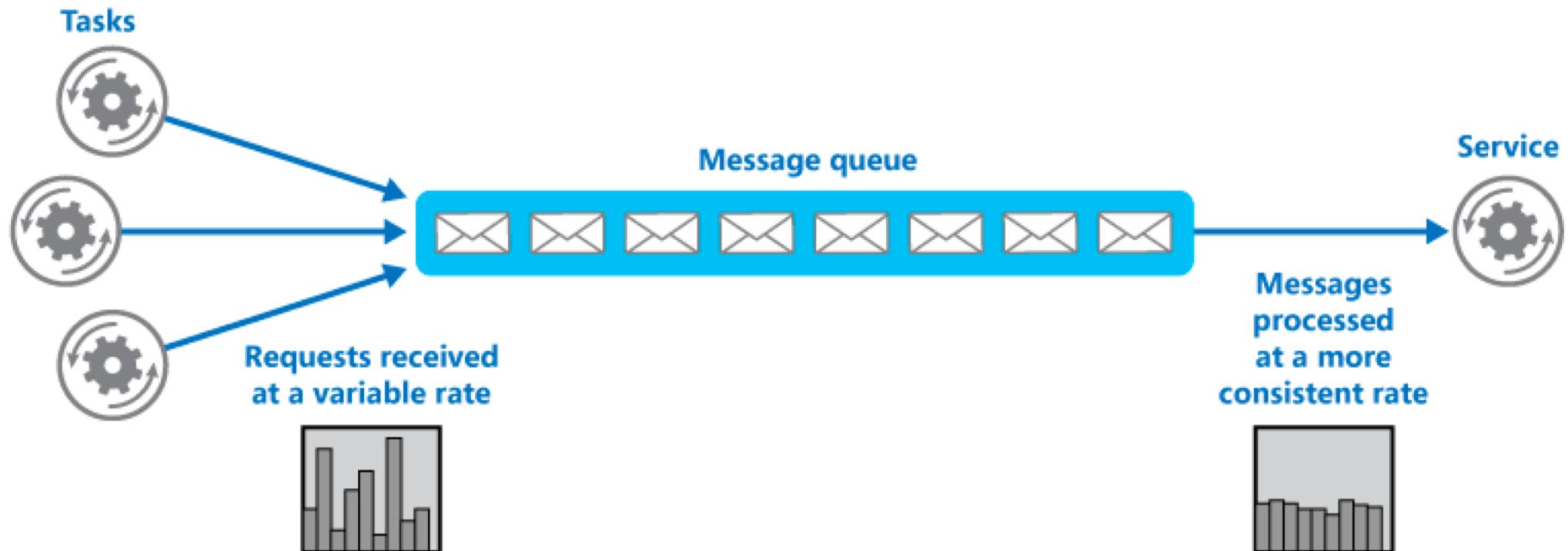
Data Center (Japan)

Legacy IMAGE WORKS System (Java/Struts/PostgreSQL)

# Serverless Batch Processing

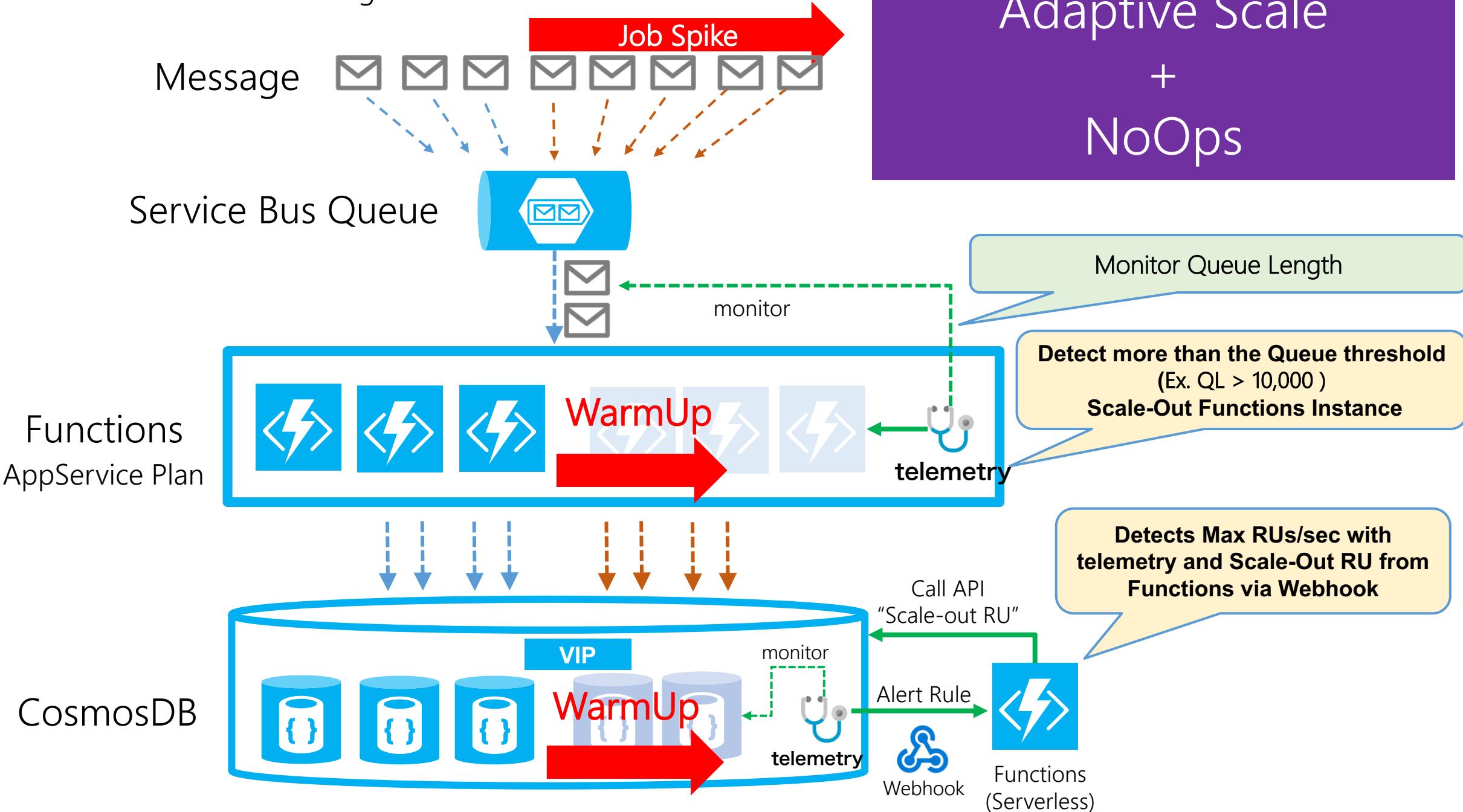


# Queue-based Load Leveling (QLL)



<https://docs.microsoft.com/en-us/azure/architecture/patterns/queue-based-load-leveling>

## Serverless Elastic Batch Processing Architecture



# Serverless on Azure

<http://aka.ms/serverlesscardemo>  
<http://azure.com/serverless>

Thiago Almeida  
Senior Engineer, CSE  
@nzthiago

Chris Risner  
Principal Engineer, CSE  
@chrisrisner

Tsuyoshi Ushio  
Senior Engineer, CSE Japan  
@sandayuu