Application Lifecycle Management at Auckland Transport
Microsoft Integration Overview

Nikolai Blackie
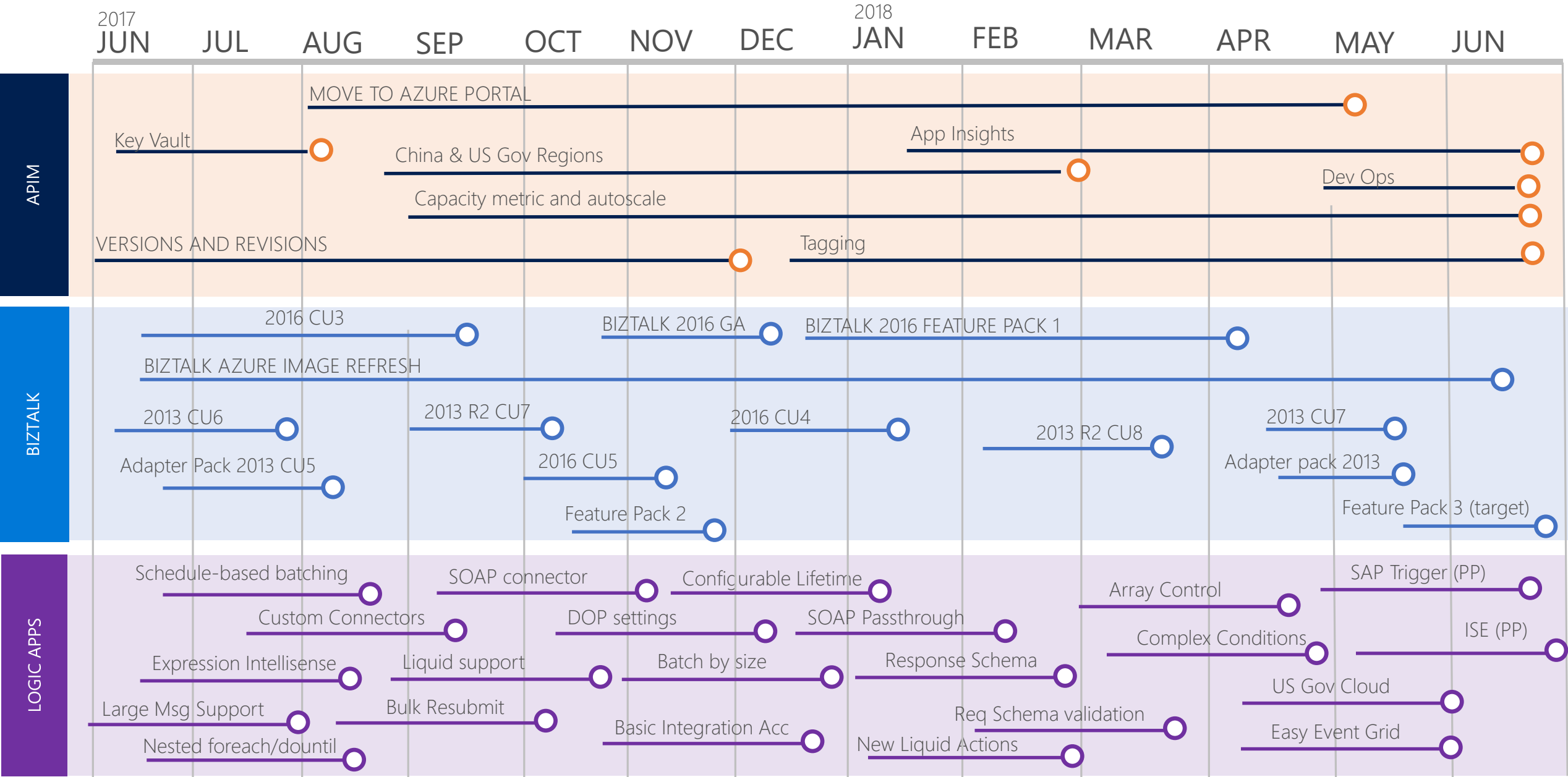Premier Field Engineer Sub-Contractor

Microsoft

AT VSTS Integration Guidance

- Microsoft Azure Integration Services Overview
- Azure API Management
- Extensibility leveraging Azure Functions
- Azure Logic Apps
- Messaging with Azure Service Bus and Event Grid
- PowerApps and Flow

Where Microsoft Integration teams have been &
         where they are going

PRO INTEGRATION – Year In Review

2017
JUN JUL AUG SEP OCT NOV DEC 2018 JAN FEB MAR APR MAY JUN

APIM
- MOVE TO AZURE PORTAL
- Key Vault
- China & US Gov Regions
- App Insights
- Dev Ops
- Capacity metric and autoscale
- VERSIONS AND REVISIONS
- Tagging

BIZTALK
- 2016 CU3
- BIZTALK 2016 GA
- BIZTALK 2016 FEATURE PACK 1
- BIZTALK AZURE IMAGE REFRESH
- 2013 CU6
- 2013 R2 CU7
- 2016 CU4
- 2013 R2 CU8
- 2013 CU7
- Adapter Pack 2013 CU5
- 2016 CU5
- Adapter pack 2013
- Feature Pack 2
- Feature Pack 3 (target)

LOGIC APPS
- Schedule-based batching
- SOAP connector
- Configurable Lifetime
- SAP Trigger (PP)
- Array Control
- Custom Connectors
- DOP settings
- SOAP Passthrough
- Complex Conditions
- ISE (PP)
- Expression Intellisense
- Liquid support
- Batch by size
- Response Schema
- Large Msg Support
- Bulk Resubmit
- Req Schema validation
- US Gov Cloud
- Nested foreach/dountil
- Basic Integration Acc
- New Liquid Actions
- Easy Event Grid

Recognized As 2018 Leaders by Gartner

Figure 1. Magic Quadrant for Enterprise Integration Platform as a Service

Source: Gartner (April 2018)

© Gartner, Inc

Core Integration Capabilities

Development

- IDE support
- Integrated DevOps
- Monitoring
- Visual Debug History

Microsoft Flow
Enable the Citizen Developer to Do More

Logic Apps

Connect SaaS applications

Serverless compute, auto scaling, fully managed

Leverage Azure Services

API Management

Document and catalog LOB APIs

Discover, manage and secure connectivity

Gain insights, measure and monetize

Service Bus

Cloud-based messaging service

Connect to the cloud

Secure and predictable message delivery

Event Grid

Fully-managed event routing

Near real-time event delivery at scale

Broad coverage within Azure and beyond

BizTalk Server
Integrate on-premises LOB to SaaS apps

Azure Stack
Run Integration on-premises

Azure
Management Portal, Azure Resource Manager

Modern Integration Architecture

iPaaS

Serverless

Integration Services

Multiple Personas

Citizen
ad-hoc
Professional

High Productivity

Low/no Code

Templates

API Centric

Reduced DevOps

SPEED 30x

Event-driven scale

Abstraction of servers

Faster Time To Market

Rapid development

Focus on business logic

Micro-billing

Per action billing

Reduce costs
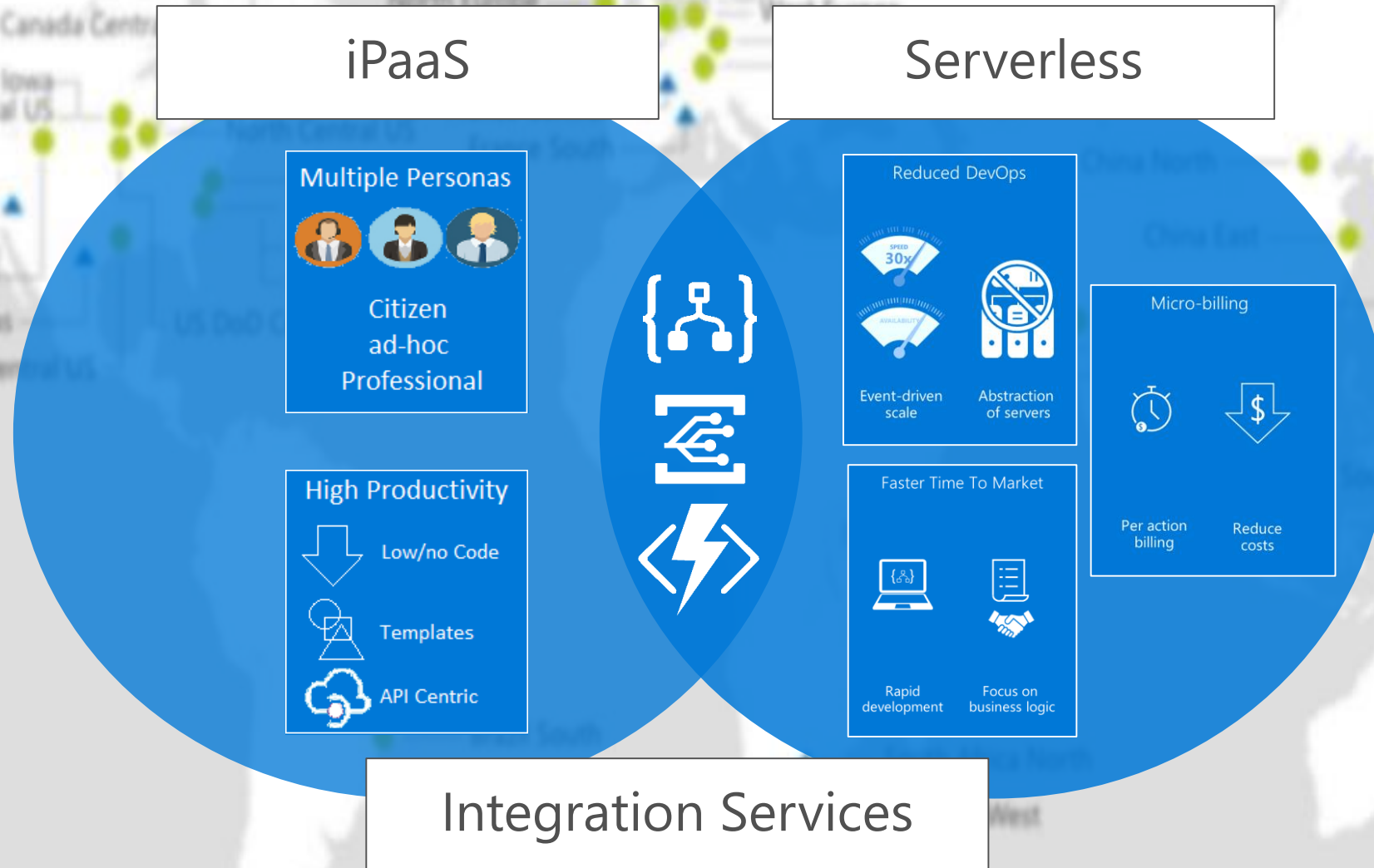
Microsoft's Integration Vision

A platform for integration...

Better together...

Tried and trusted...

Integration everywhere...

Complete
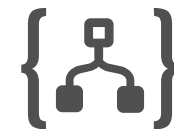
A platform for integration

Azure Integration Services are the key components you need to build enterprise integration applications.

Better together

Azure Integration Services connect together easily and seamlessly to help you build solutions

Deployment, management and analytics are easy to use across services
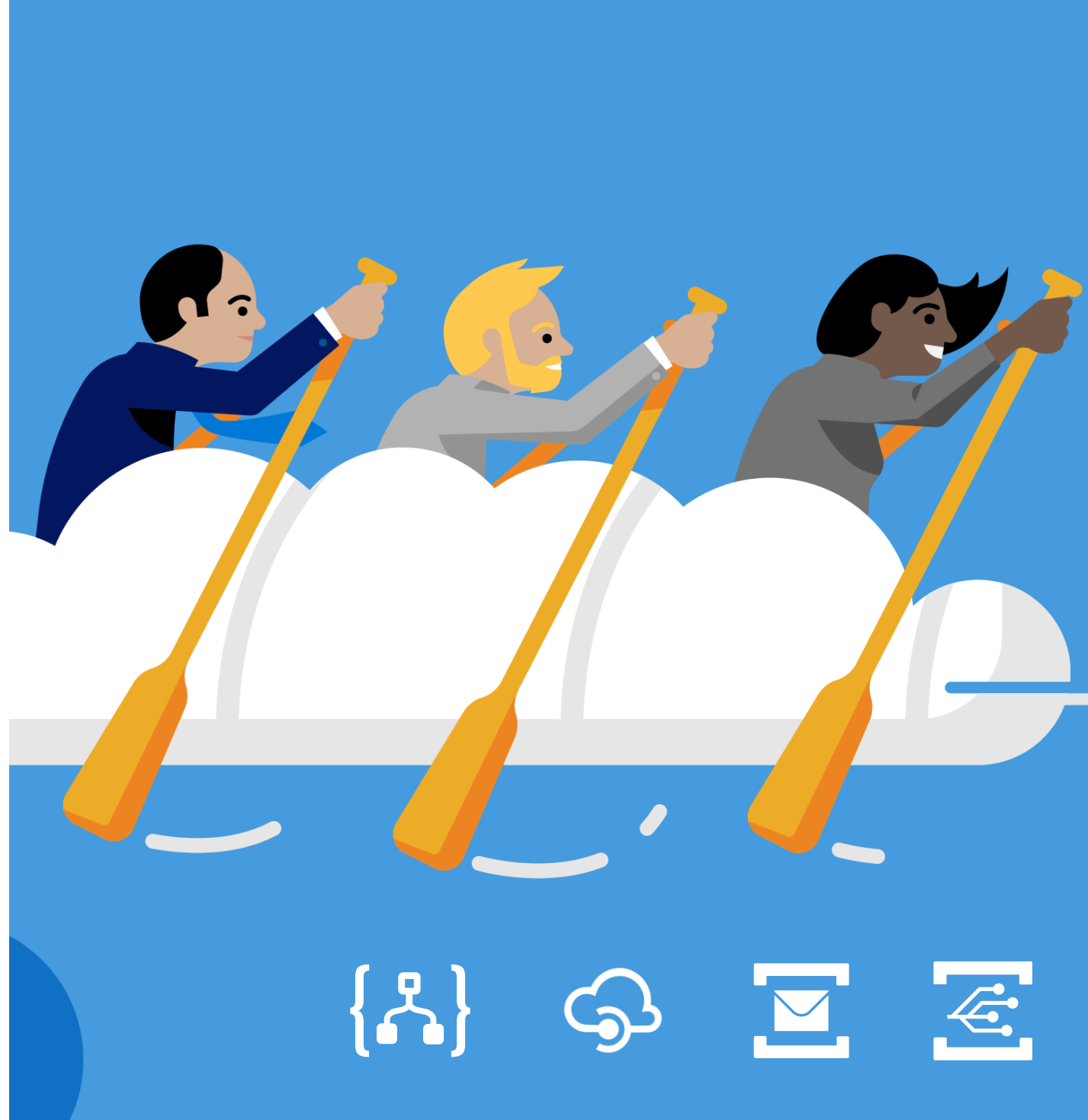
Tried and trusted

Reference architectures to help you design the right solution

Templates for common solution patterns

Guidance on implementation of CI/CD, disaster recovery, scaling etc.
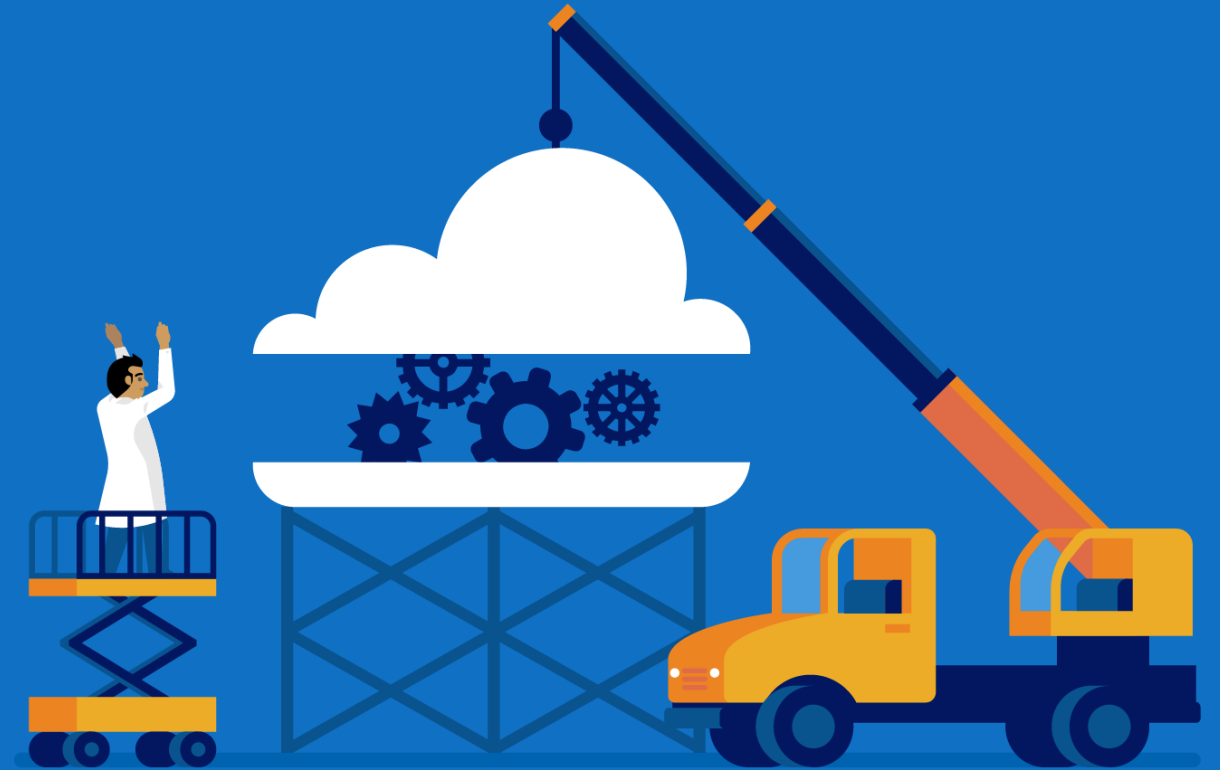
Integration everywhere

From serverless, to isolated, to on premises to edge
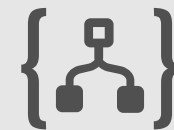
Complete

All the capabilities you have in Biztalk today, reimagined for the cloud
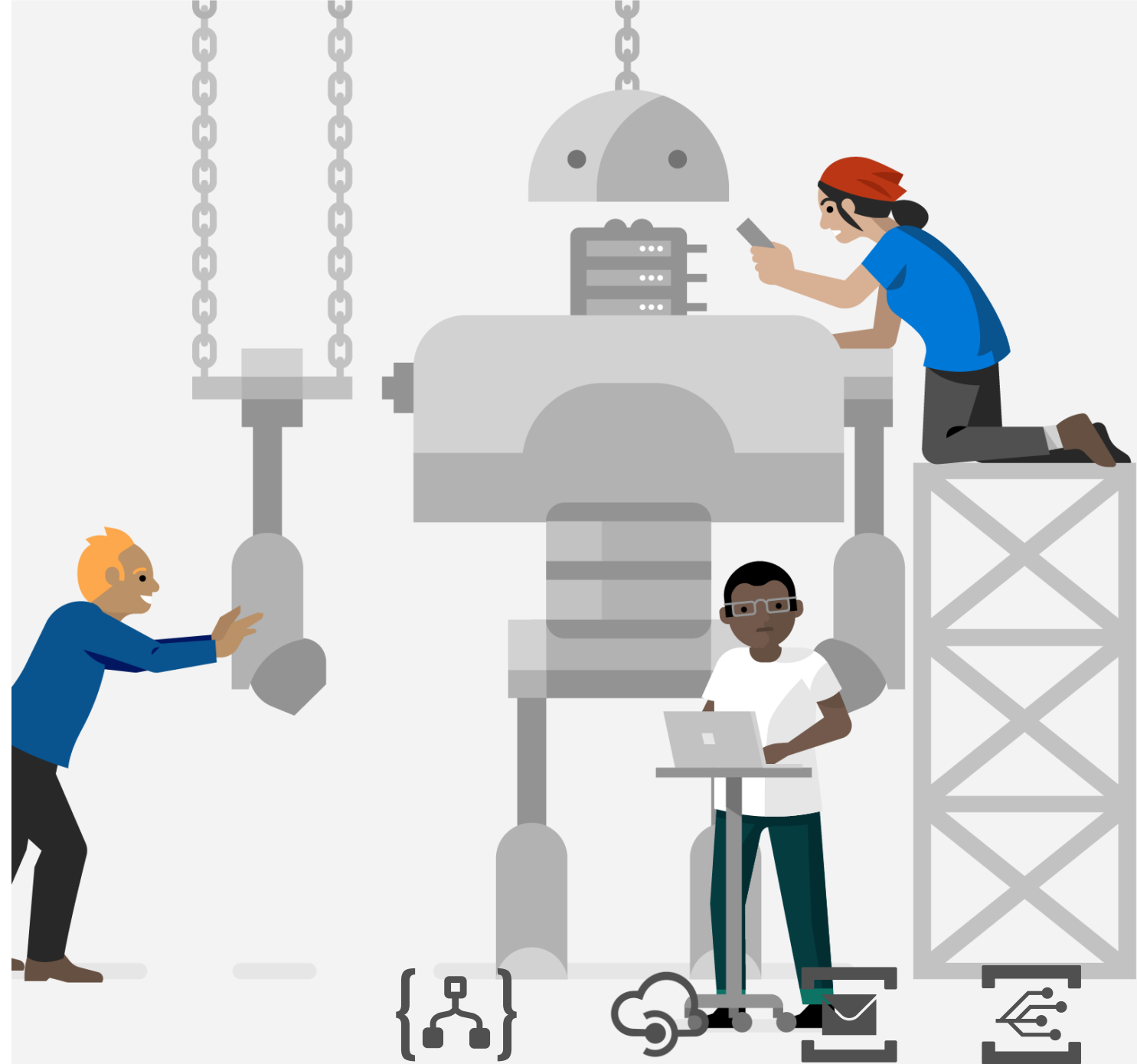
Azure Integration Services

Customers

Partners
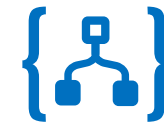
Employees

Power BI

PowerApps

Microsoft Flow

Visual Studio

Messaging

APIs

Orchestration
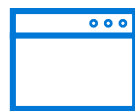
Service Bus   Event Grid

API Management

Logic Apps

SaaS

Packaged Applications

Custom Applications

Data

The value of APIs
Azure API Management

Strategic value of APIs

User engagement

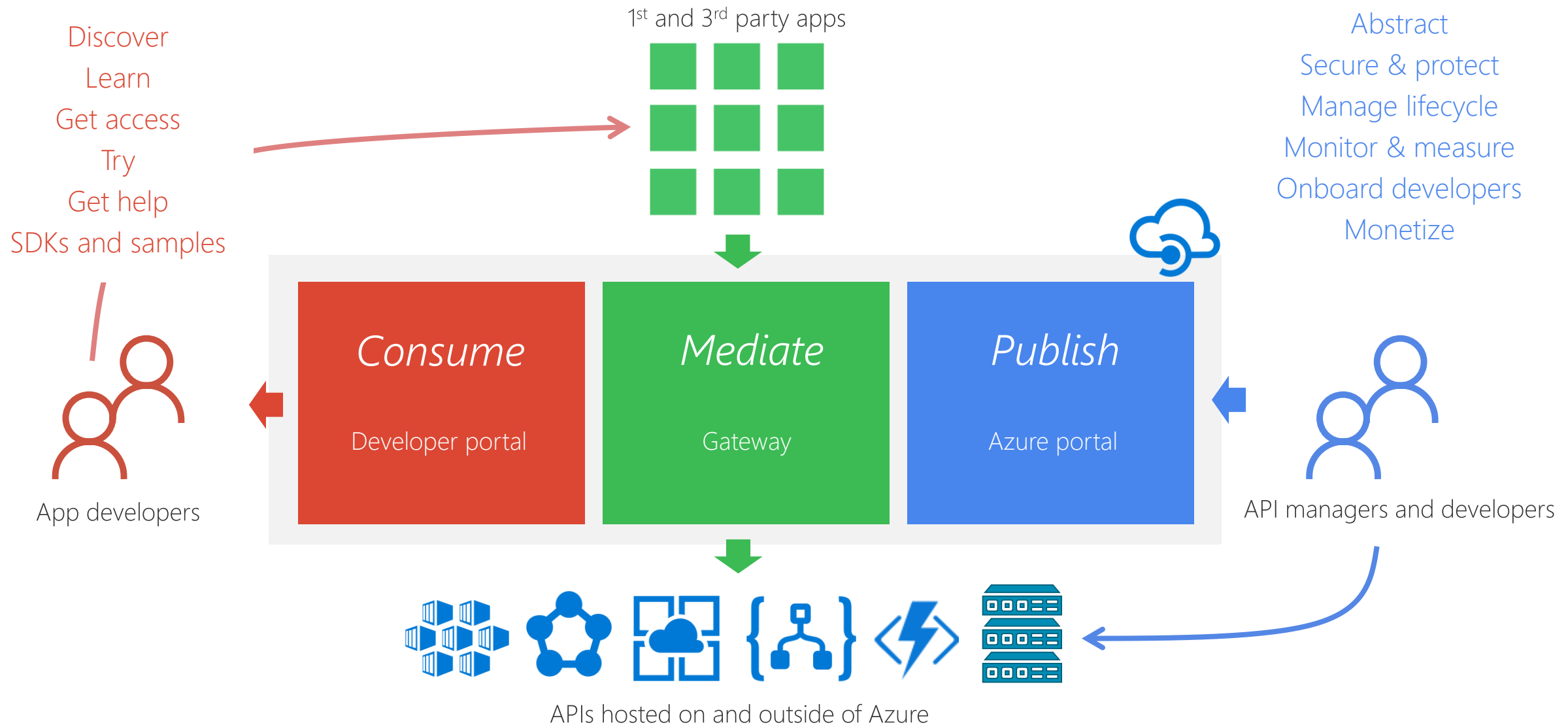Satisfaction
Loyalty
Crowdsourcing

Ecosystems

Business models
Channels
Ecosystems

Multi-speed IT

Agility
Empowerment
Productivity

API Management

Discover
Learn
Get access
Try
Get help
SDKs and samples

1st and 3rd party apps

Abstract
Secure & protect
Manage lifecycle
Monitor & measure
Onboard developers
Monetize

App developers

Consume
Developer portal

Mediate
Gateway

Publish
Azure portal

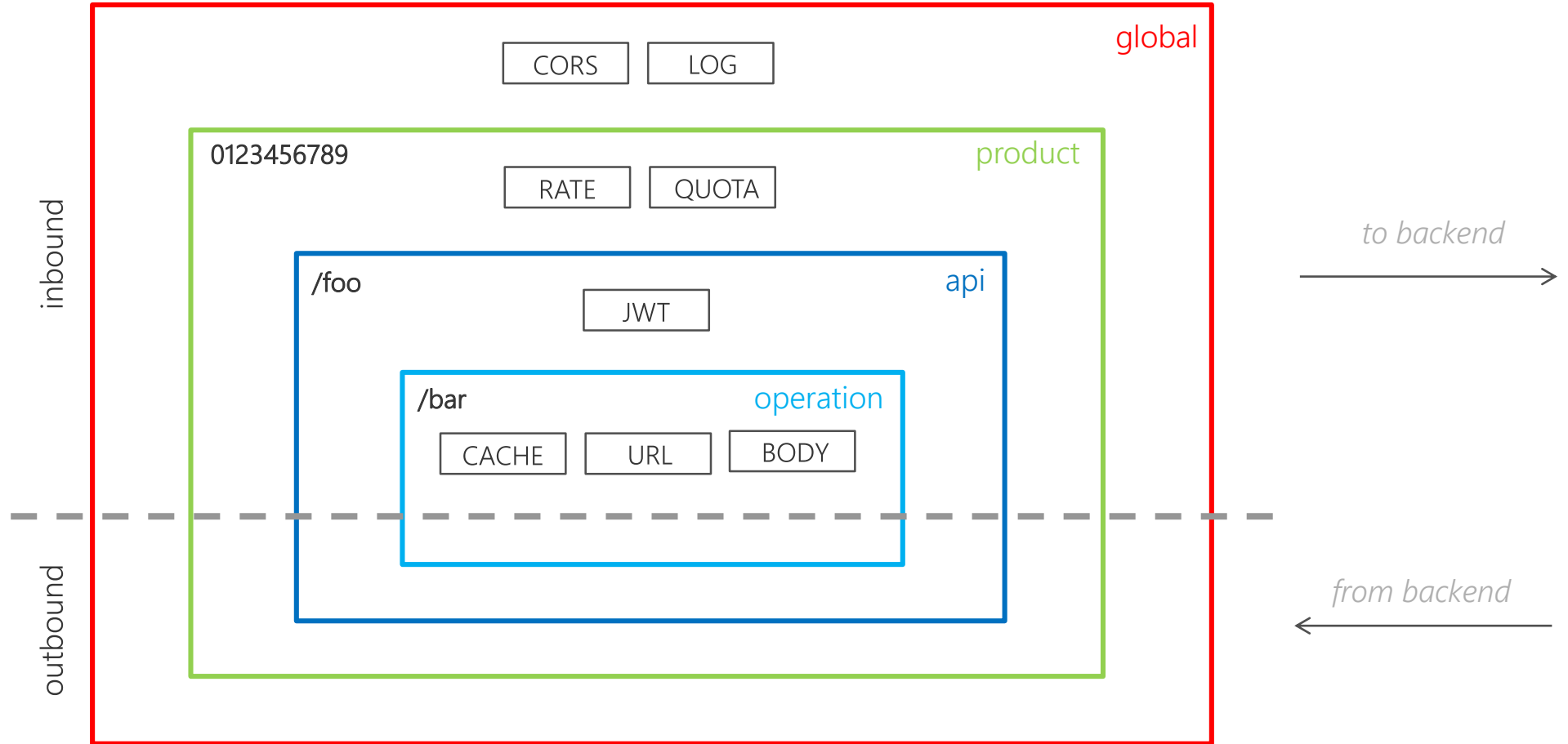API managers and developers

APIs hosted on and outside of Azure

Policy scopes

GET /foo/bar HTTP/1.1
Host: api.constoso.com
Key: 0123456789

from caller

inbound

outbound

to caller

global

CORS   LOG

product

0123456789

RATE   QUOTA

api

/foo

JWT

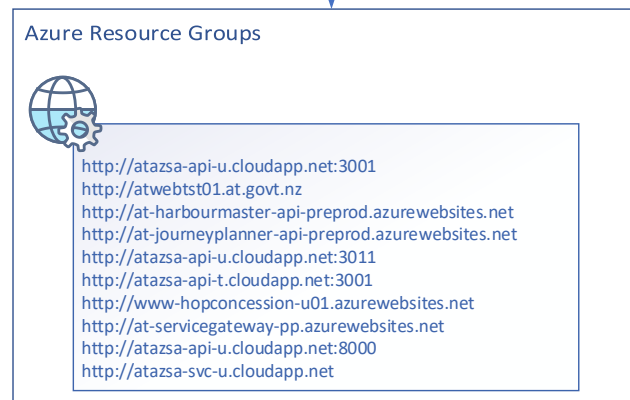**operation**

/bar

CACHE   URL   BODY

to backend

from backend

External APIM @ Auckland Transport

PREPROD

External APIM

PreProd – External APIM
atpreprod

Developer Portal

APIs
- General Transit Feed (GTFS)
- General Transit Feed (GTFS)
- GIS Disruptions API
- Harbourmaster
- Journey Planner
- Journey Planner (Restricted)
- locations
- Maxx Legacy
- notifications
- Public
- Realtime Transit Feed (GTFS)
- Realtime Transit Feed (GTFS) Stage
- Restricted
- Restricted (geocode)
- Restricted Customer
- Restricted Realtime
- Service Gateway
- Trip Times
- WebService

Azure Resource Groups

http://atazsa-api-u.cloudapp.net:3001
http://atwebtst01.at.govt.nz
http://at-harbourmaster-api-preprod.azurewebsites.net
http://at-journeyplanner-api-preprod.azurewebsites.net
http://atazsa-api-u.cloudapp.net:3011
http://atazsa-api-t.cloudapp.net:3001
http://www-hopconcession-u01.azurewebsites.net
http://at-servicegateway-pp.azurewebsites.net
http://atazsa-api-u.cloudapp.net:8000
http://atazsa-svc-u.cloudapp.net

PROD

External APIM

Prod – External APIM
atprod

Developer Portal

APIs
- General Transit Feed (GTFS)
- General Transit Feed (GTFS)
- GIS Disruptions API
- Harbourmaster
- Journey Planner
- Journey Planner (Restricted)
- locations
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Azure Resource Groups

http://atazsa-api-u.cloudapp.net:3001
http://atwebtst01.at.govt.nz
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http://atazsa-api-u.cloudapp.net:3011
http://atazsa-api-t.cloudapp.net:3001
http://www-hopconcession-u01.azurewebsites.net
http://at-servicegateway-pp.azurewebsites.net
http://atazsa-api-u.cloudapp.net:8000
http://atazsa-svc-u.cloudapp.net

Internal APIM @ Auckland Transport

Azure Functions

What are Azure Functions

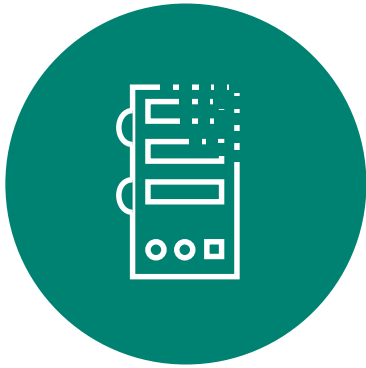- Execute your code in response to any event

```
public static IActionResult Run([HttpTrigger(…)]HttpRequest req, TraceWriter log)
        {
            log.Info("Azure Function triggered -- FunctionAPI");

            // Perform work

            return new OkResult();
        }
```
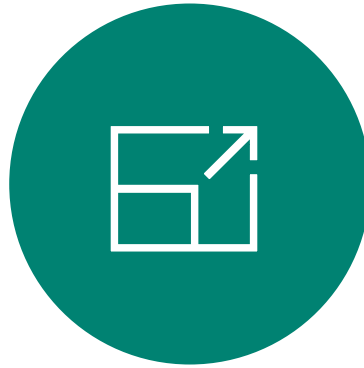
What is serverless?

Abstraction
of servers

Event-driven/
instant scale

Micro-billing

Serverless application platform components

Development

`</>`	IDE support
⇄	Integrated DevOps
🖥	Local development
◎	Monitoring
👁	Visual Debug History

Platform

`<⚡>` Functions	`{🔗}` Logic apps	`⬚` Event Grid
✓ Developer productivity	✓ Visual designer	✓ Manage all events in one place
✓ Triggers and Bindings	✓ 100+ connectors	✓ Near real-time delivery
✓ Flexible deployment options	✓ Functions orchestration	✓ Broad coverage

Database	Storage	Security & Access Control	IoT	Analytics	Intelligence

Key Concepts

a. **Function App** – Unit of development and deployment. Can have many functions

b. **Triggers** – Event source that starts the function. One per function

c. **Bindings**

- **Input** – Data that is pulled **in** at the start of an execution. Can have multiple
- **Output** – Data that is pushed **out** after an execution. Can have multiple

Popular Triggers and Bindings
HTTP
Storage Queues
Cosmos DB
Event Hubs
Blob Storage
Service Bus Queues/Topics
Event Grid
IoT Hub
And more…

Instance and Resource Management

- Azure Functions automatically adds **instances** as needed

- A single **instance** can process multiple requests (over time and at once)

- Leverage this by sharing certain code resources across executions (HttpClient, SqlClient, etc.)

Azure Function Instance

Function App

→ Execution

→ Execution

→ Execution

→ Execution
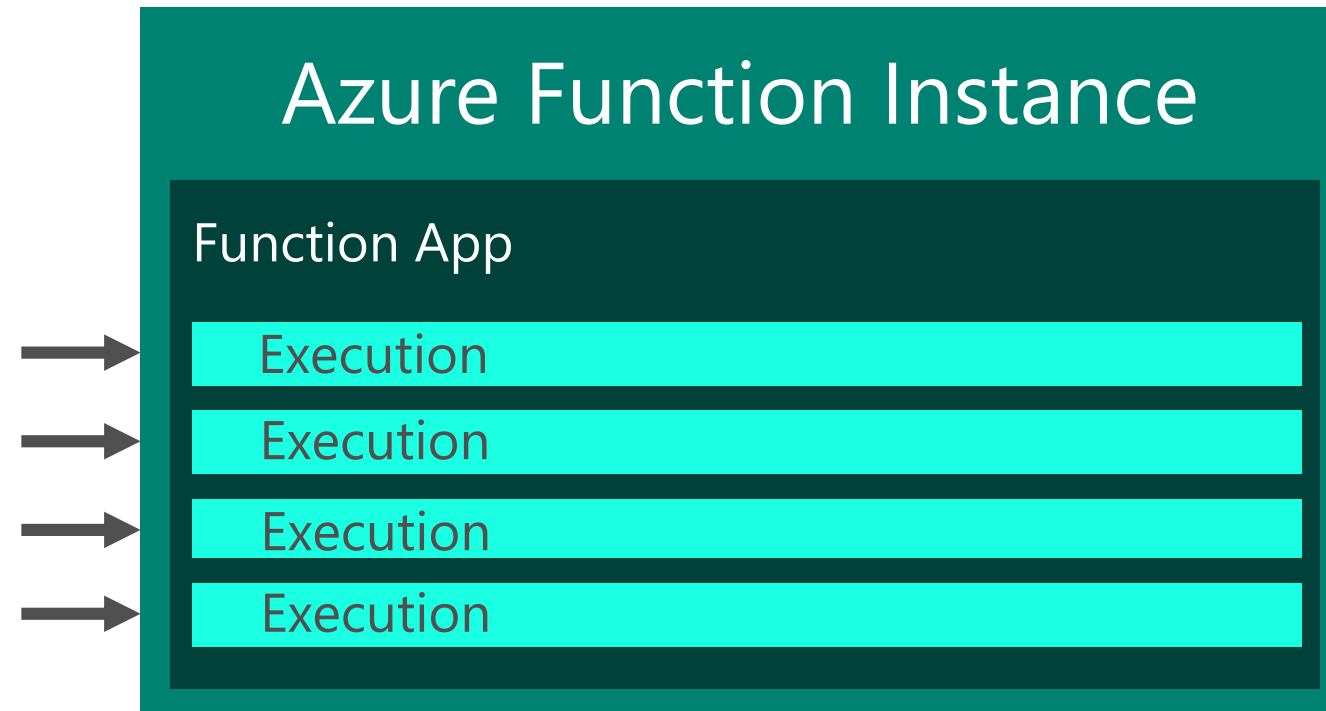
Where Functions Fit

Running custom code in a workflow (Logic Apps / BizTalk)

Processing on top of event streams (IoT, Event Hubs, Kafka, etc.)

Web APIs and mobile backends

Participating in an Enterprise Service Bus

Automating scripts and jobs

Azure Function Plan

- ## Consumption Plan
  - Good option if your functions run at elastic scale with potentially intermittent executions.

- ## App Service Plan
  - Good option if you have existing, under-utilized VMs that are already running other code

    or

  - Good option if you expect to run functions continuously or almost continuously

Logic Apps

Logic Apps

Connect to on-premises, hybrid, and cloud applications

Run mission critical, complex integration scenarios with ease

Build smart integrations leveraging machine learning, cognitive services

Azure Functions

Service Bus

Cognitive Services

Machine Learning

Azure API Management

Logic Apps

On-premises data gateway

SQL

Office 365

Microsoft Dynamics 365

salesforce

box

Eventbrite
twilio
Dropbox
DocuSign
slack
SharePoint
Trello

SharePoint

SAP

SQL

IBM DB2

ORACLE
JD EDWARDS ENTERPRISEONE

SIEBEL

BizTalk Server

PeopleSoft

TIBCO
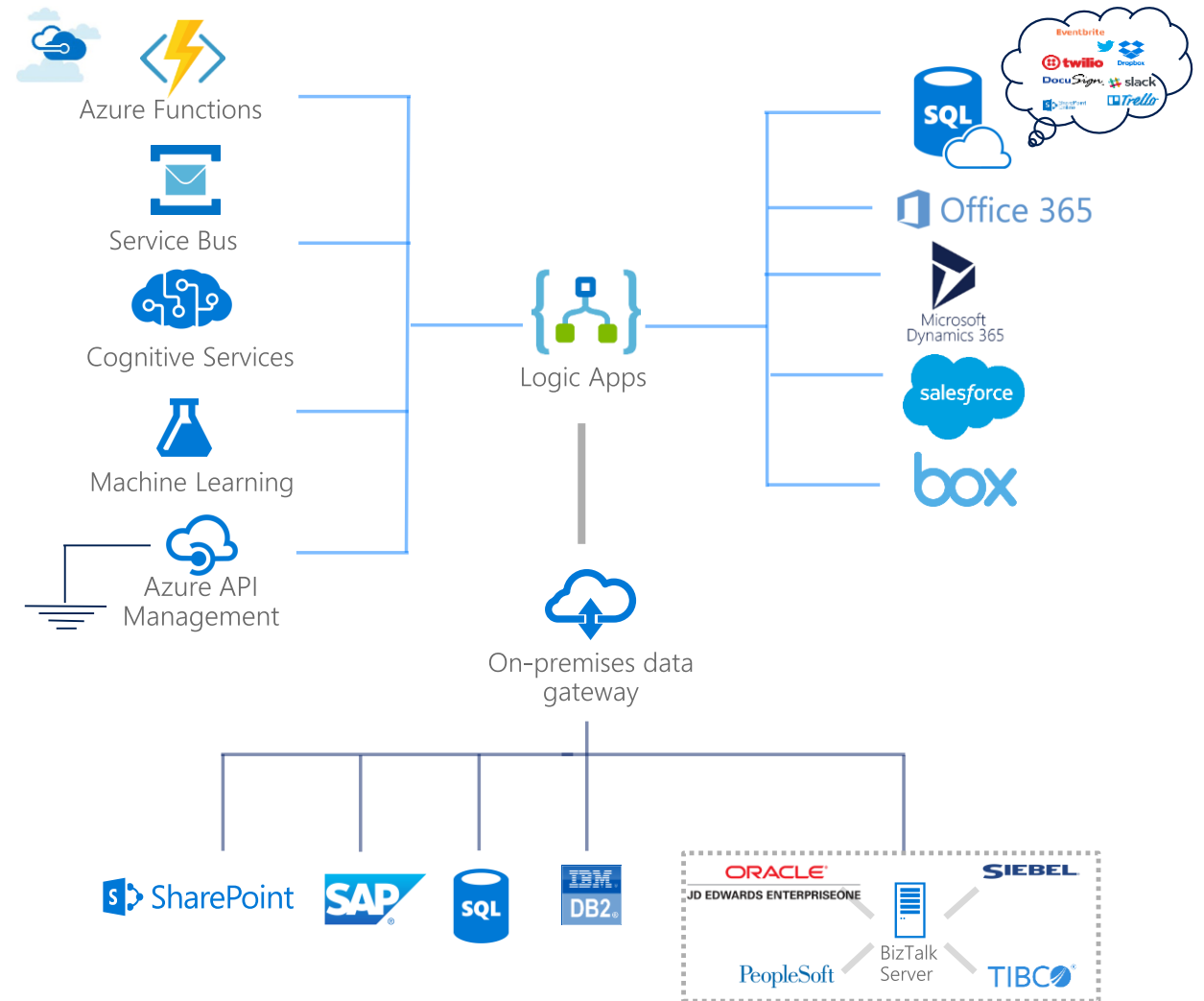
Powerful Integration

Faster integration using a smart visual designer

Easy workflow creation with triggers and actions

Mashup applications, data and services

Built for mission critical Enterprise Integration

Create, deploy, manage and monitor
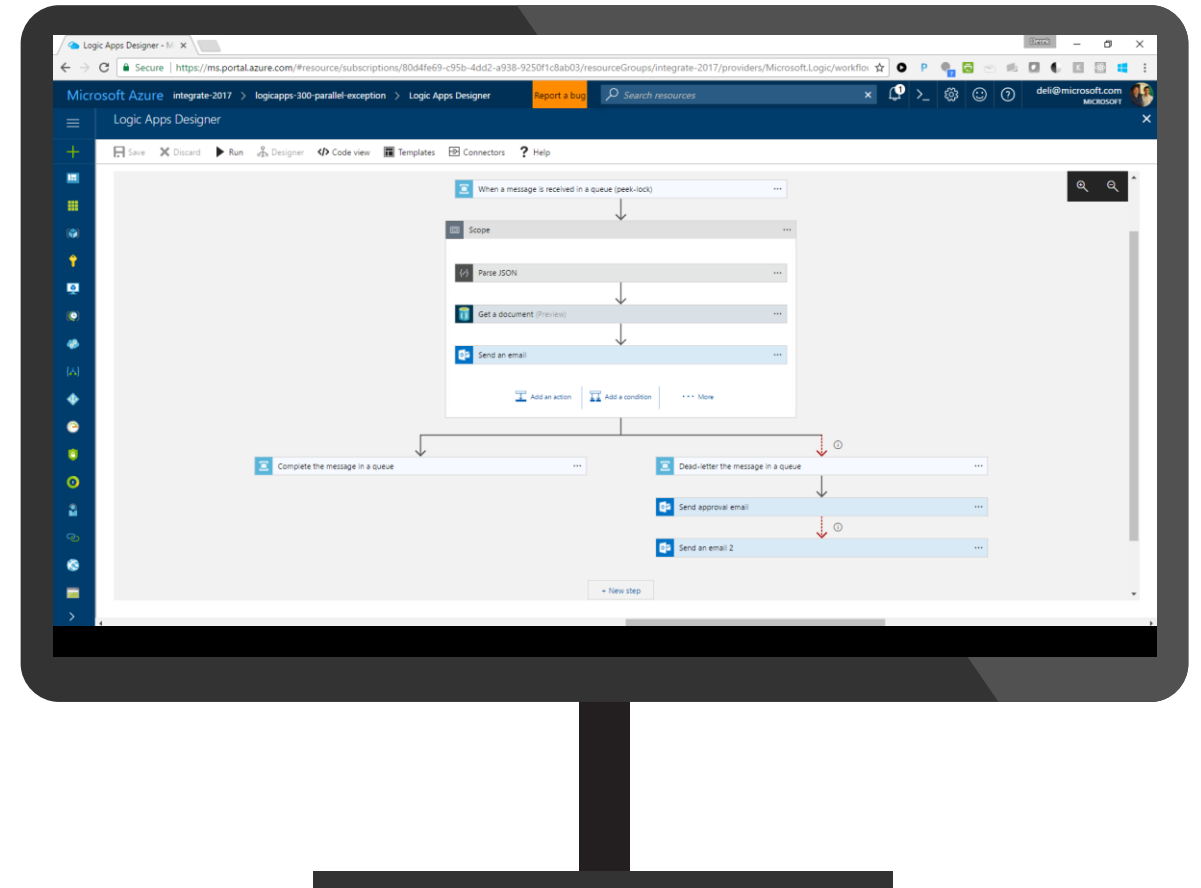
Connected with over 200 connectors
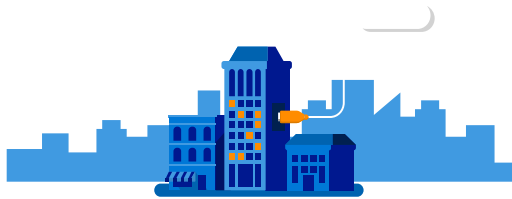
Cloud APIs and platform functionality

Over 200 out of box connectors

> SaaS, on-prem, protocols, B2B and message manipulation

Hybrid connectivity

Hosted and managed within the platform

Scales to meet your needs

First class designer experience

API connections

Authenticate once and reuse

Differentiate connection configuration

Simple to deploy

Portal experience for managing API Connections

Custom Connectors

Access any REST/SOAP API

Cloud or on-premises

Simple creation wizard

Connections and managed secrets

First class designer experience
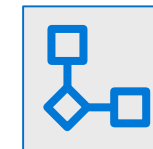
Incredible Platform Versatility

Messaging	Data Wrangling	B2B & EDI	(hybrid) EAI	Process Automation	Smart SaaS
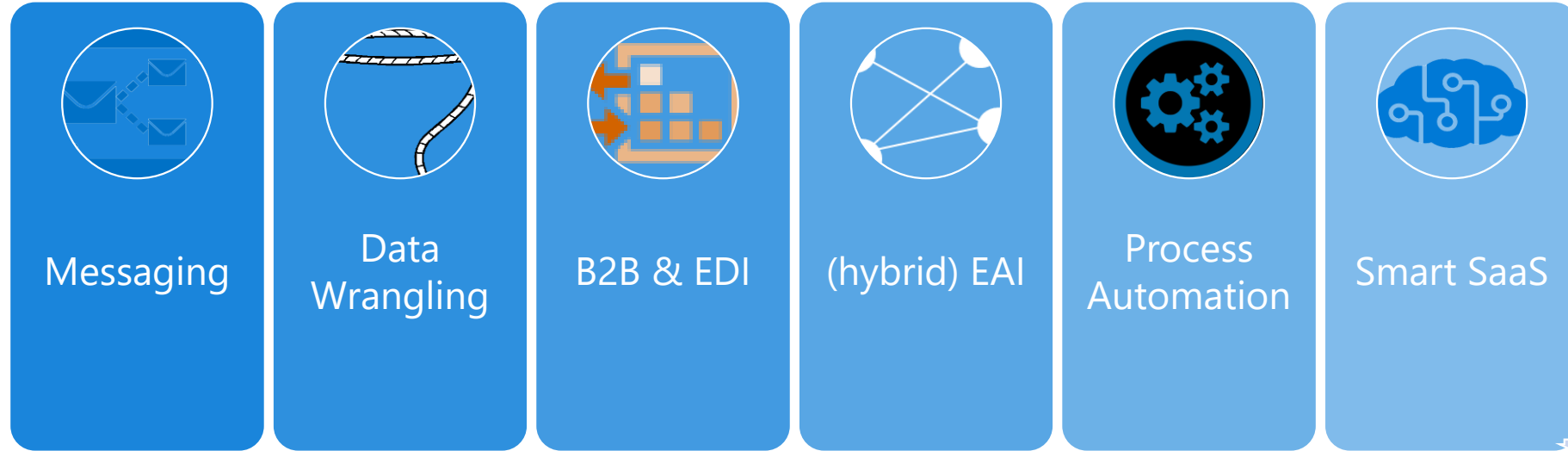
Serverless

Event-driven scale

Abstraction of servers

Micro-billing

Triggers

Create new instances of Logic Apps

Recurrence/advanced scheduling

Polling

Webhook

Request

Actions

Flow control

Scope

Condition

Switch-case

For each

Do-until

Actions

Workflow steps

Call APIs

Invoke code

Control behavior

Message handling

Expressions & operators

What's coming?
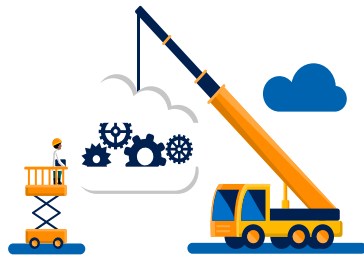
- China Cloud
- Smart designer
- Dedicated and connected
- Testability
- On-prem
- Managed Service Identity
- OAuth request trigger
- Output property obfuscation
- Key Vault

Azure Service Bus and Event Grid

Where does Service Bus fit in?

Decoupling and providing durability are primary drivers for using Service Bus

Queue

Frontend / UX

Backend / Processing
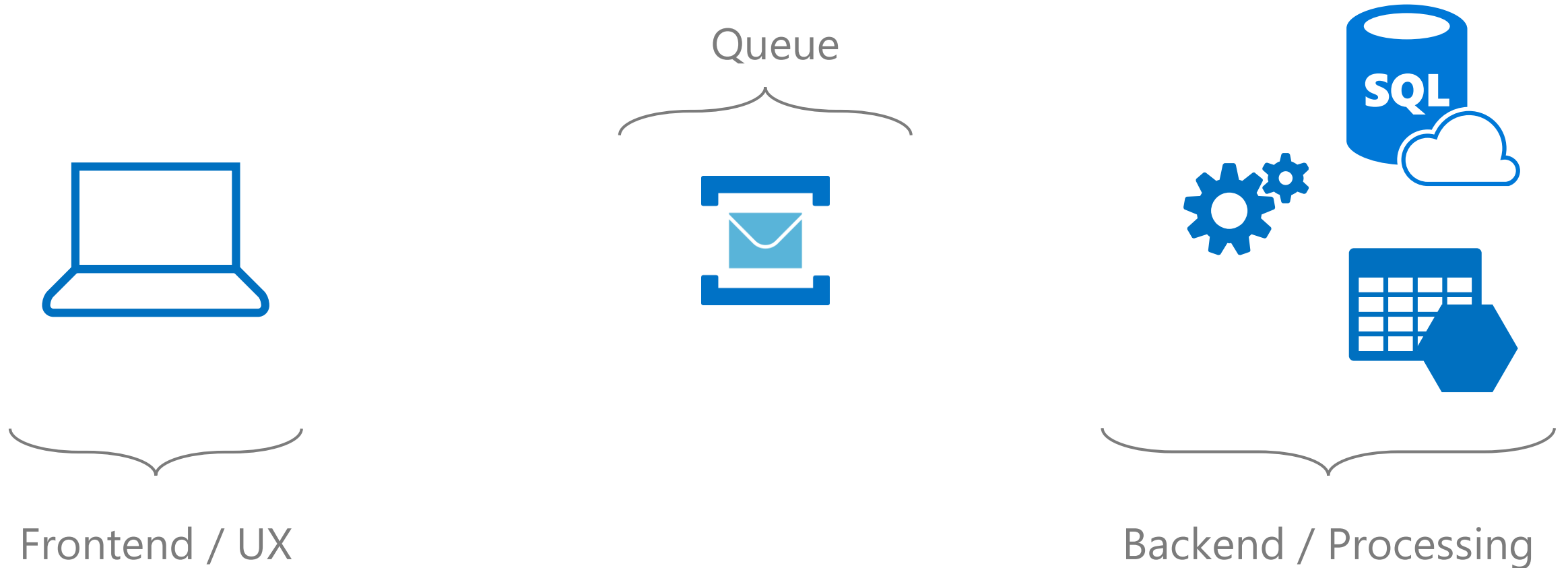
Event Grid: Manage all events in one place

IoT Hub

Blob Storage

Azure Subscriptions

Resource Groups

Event Hubs

Custom Topics

Azure Media Services

Service Bus

Azure Functions

Logic Apps

Azure Automation

WebHooks

Event Hubs

Storage Queues

Hybrid Connections
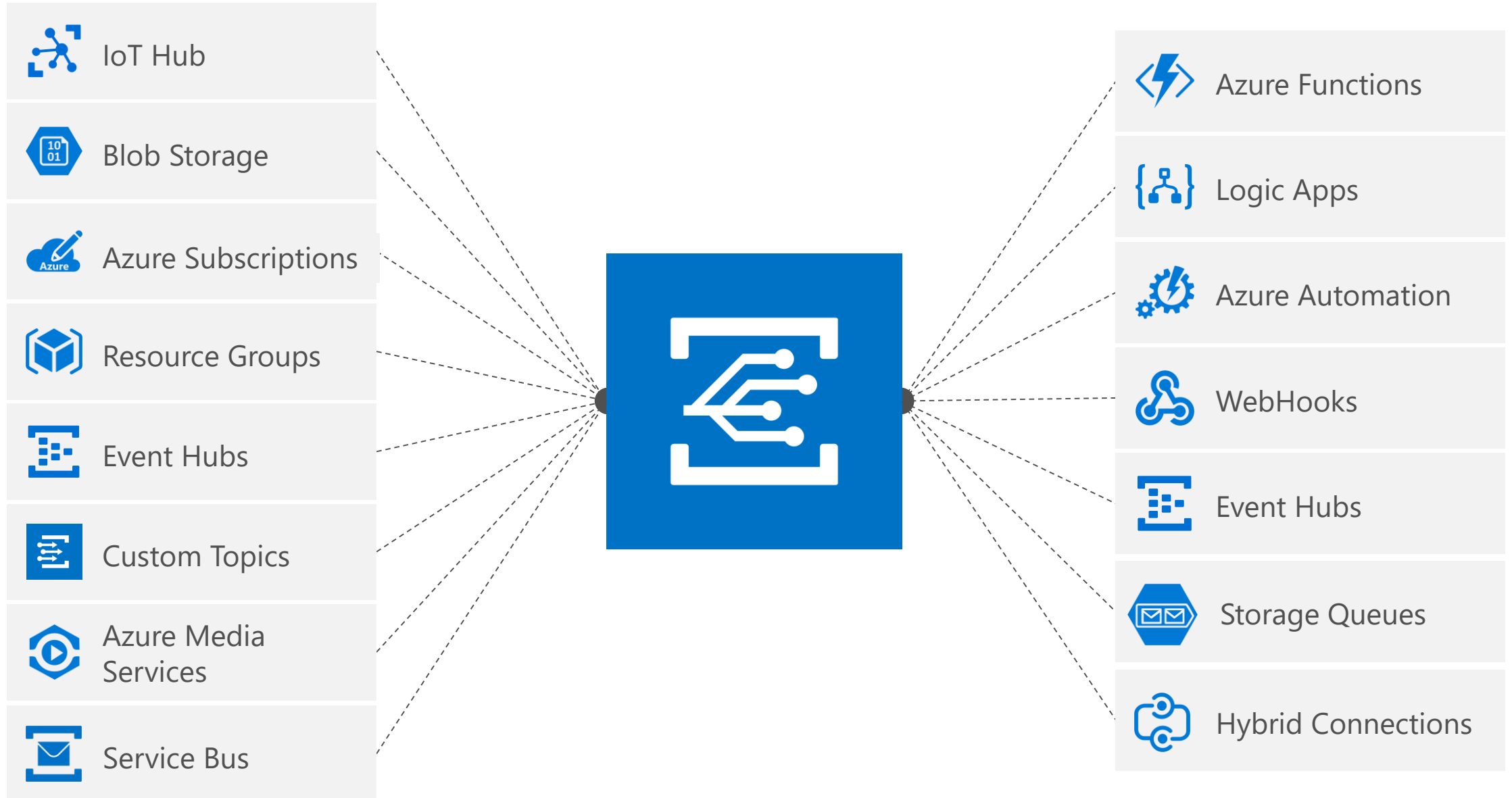
PubSub for two different models

Service Bus
Enterprise Messaging

Queue semantics

Rich filters

Instantaneous consistency

Strict ordering

JMS

Geo-Replication & Availability

Rich broker features

Event Grid
Reactive Programming

Events are raised by other services

Independent individual messages

Push semantics

Filtering and routing

Pay as you go

Fan out

PowerApps and Flow
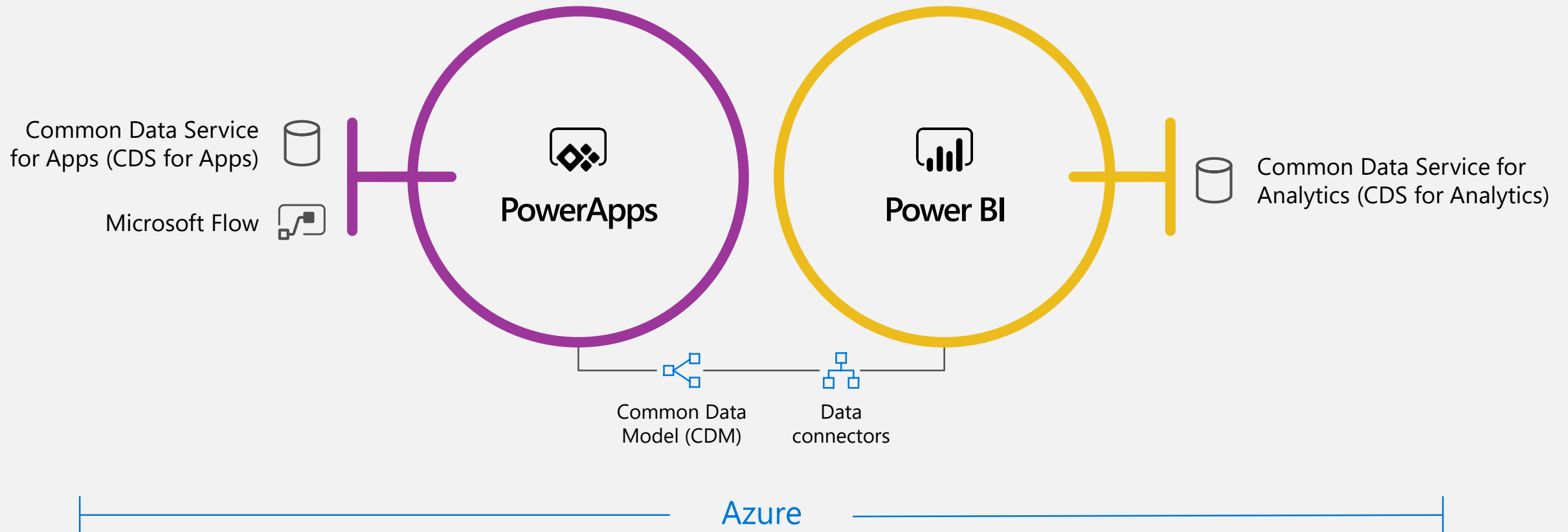
Unifying to one high-productivity application platform

Dynamics 365 applications	Customized Office 365 (e.g., SharePoint form)	Standalone model-driven apps	Standalone canvas apps	ISV apps

PowerApps

Solution Explorer (advanced)

App Module Designer	Form Designer	View Designer	Dashboard Designer	Canvas Studio

Flow (workflow and business processes)

Common Data Service

Sharing and Security

Dynamics 365 data natively on the platform – no integration required

Enterprise-grade Application Lifecycle Management

Server-side business logic for validation, defaulting, calculated fields and more

1.2 M+

monthly active users

213K+

organizations are using PowerApps, Flow & CDS

Transformation does not occur while waiting in a line!

Isn't this like 'running with scissors'?

Enterprise-grade Centralized Management

Azure Active Directory – all identity is managed through Azure Active Directory, enabling rich policies and 2FA

Unified Admin Center - comprehensive view of the platform usage within a company and full application lifecycle management

Data Loss Prevention Policies – manage access and data flow of the 200+ different connectors

Compliance & Security - audit logs for admins provide visibility on the activities of users and admins within their organization

Mobile Device Management– conditional access is supported and Mobile Application Management (MAM) coming soon
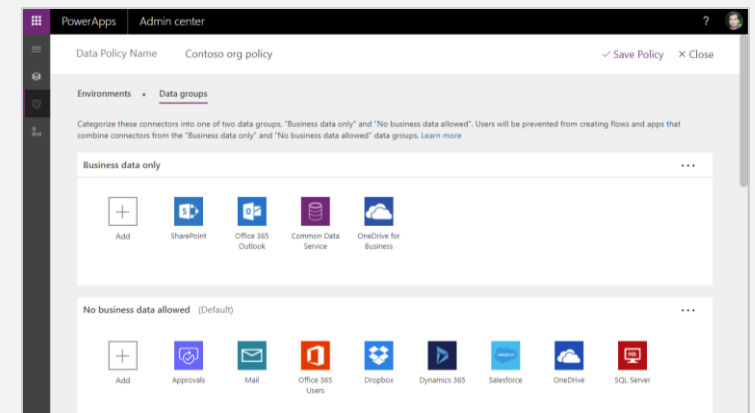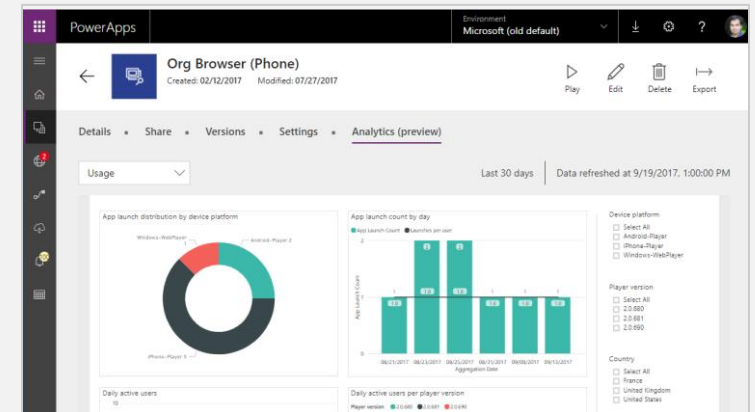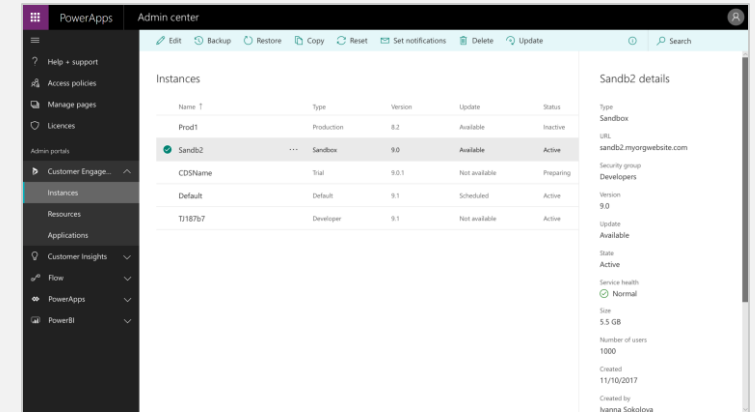
2 Labs:
Customer Loyalty Business Scenario Lab & Flow in a day

Lab Notes

- Flow Lab Stretch Goals

  - Complete Hackathon labs (Azure Vision, Sentiment Analysis, Team Bots)

- Integration Lab Stretch Goals

  - Add AppInsights logging to API Manager https://docs.microsoft.com/en-us/azure/api-management/api-management-howto-app-insights

- Integration Lab Clean Up

  - Make sure that you delete the resource group you create before you leave
  - It deploys very expensive resources

Wrap Up & Questions