Azure Serverless Computing

Build apps faster with serverless technologies

Randy Pagels

Sr. Cloud Solution Architect | Developer Advocate

Microsoft US Healthcare & Life Sciences

Mark your Calendars

Microsoft

Microsoft Ignite

October 12-14, 2022

Register Now!

https://ignite.microsoft.com/

Explore the latest tools, training sessions, technical expertise, networking opportunities, and more.

Focus Areas

- Empower everyone for a new world of hybrid work
- Innovate anywhere from multicloud to edge
- Reimagine a new era of business
- Protect everything with end-to-end security

Exciting announcements about Azure DevOps and GtiHub!

GitHub Universe 2022

FREE Registration

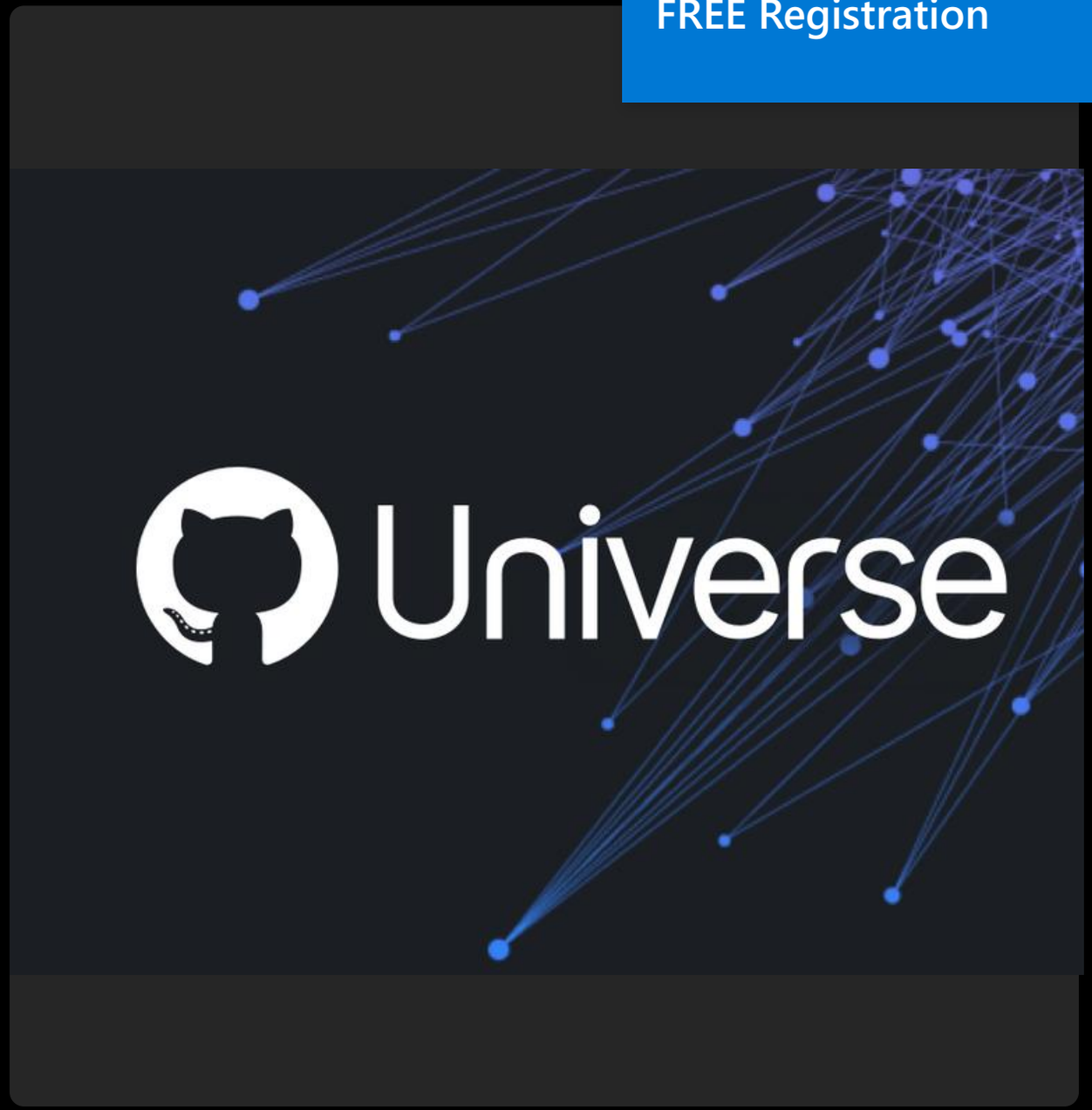
https://www.githubuniverse.com/

November 9-10, 2022 PDT — Streaming Everywhere

The global developer event!!!

On Demand
Wherever you are on your GitHub journey, our stacked catalog of on demand sessions will help you dive deeper. Register for free access to the full library.

Interactive
Get hands on with the people who write the code that helps you build what you want through demos, Q+As, and roundtables. Register for free to save your spot.



.NET Conf 2022

FREE Registration

https://www.dotnetconf.net/

November 8-10, 2022 — Streaming Everywhere

The global .NET 7 launch!!!

Day 1
Day one is all about the big news, .NET 7!

Day 2
Day two is where we dive deeper into all the things you can do with .NET.

Day 3
Day three continues our all day and night broadcast with speakers around the world.

Join the biggest .NET virtual event on the planet!!!

Agenda

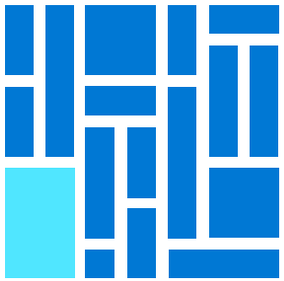
Developer Tool Landscape

Serverless Components

Demos

Microsoft offers
Best-in-class tools for every developer

What is Serverless?



No infrastructure management

Developers can just focus on their code—without needing to worry about provisioning and managing infrastructure

Instant, event-driven scalability

Application components react to events and triggers in near real-time with virtually unlimited scalability

Pay-per-use

Only pay for what you use: billing is typically calculated on the number of function calls, code execution time, and memory used*

Azure Functions

An event-based, serverless compute experience that accelerates app development

Integrated programming model

Use built-in triggers and bindings to define when a function is invoked and to what data it connects

End-to-end development experience

Take advantage of a complete, end-to-end development experience with Functions—from building and debugging locally on major platforms like Windows, macOS, and Linux
to deploying and monitoring in the cloud

Hosting options flexibility

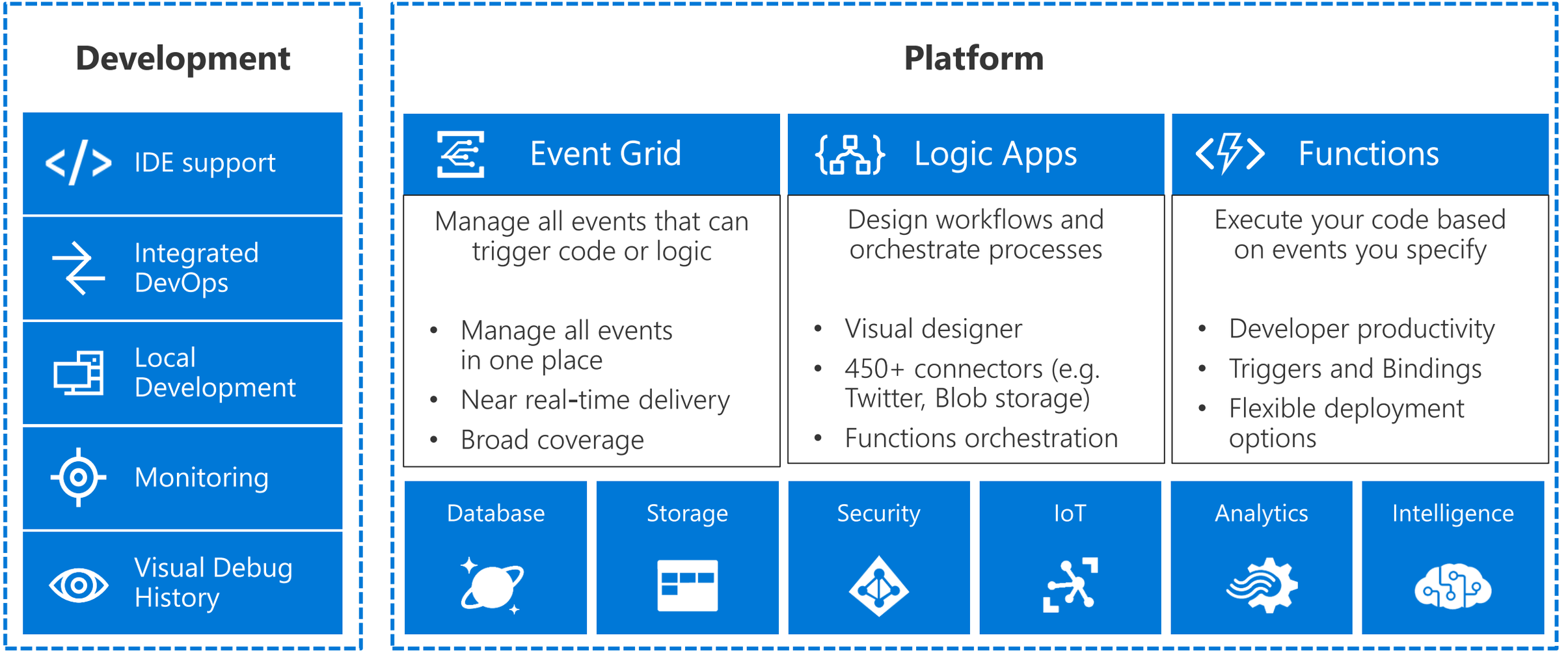
Choose the deployment model that better fits your business needs without compromising development experience

Fully managed and cost-effective

Automated and flexible scaling based on your workload
volume, keeping the focus on adding value instead of managing infrastructure

open-source project - https://github.com/Azure/Azure-Functions

Serverless application platform components



Azure Functions: event driven serverless compute

Events

React to timers, HTTP, or events from your favorite Azure services

Code

Author functions in C#, F#, JavaScript, TypeScript, Java, Python, PowerShell

Outputs

Send results to a growing collection of services

Ways to Run Functions – Hosting Options

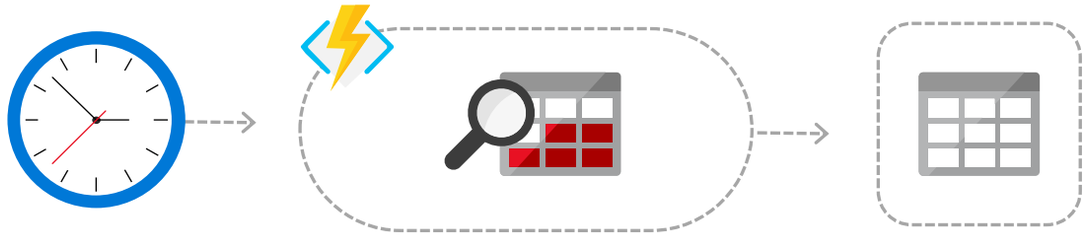
Consumption*	AS Plan	AS Environment	Azure Stack	Runtime	IoT Edge
Serverless	*Free, Basic, Standard, Premium*	*Network isolation*	*On-premises*	*Functions on your server*	*On devices*
					
Only pay for what you use; charges apply per execution and per GB second	Gain all the advantages of Functions along with Microsoft's financially-backed SLA and the always-on features of an App Service Plan	Use a dedicated App Service cloud environment (ASE) that comes with network isolation for apps, greater scale, and secure connectivity to local vNets	Bring the power of the entire Azure stack to your own data centers	Run Functions on your local server; does not include the entire Azure stack	Deploy custom Azure modules on IoT devices

* The first 400,000 GB/s of execution and 1,000,000 executions are free.

Function App scenarios

Serverless scenarios: anything that responds to events

Timer-based processing

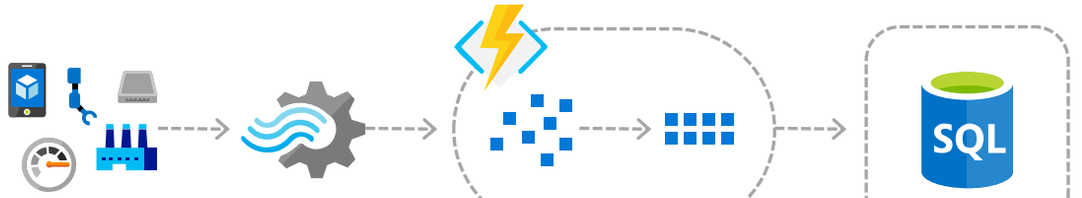


Every 15 minutes

Find and clean invalid data

Clean table

Real-time stream processing



Millions of devices feed into Stream Analytics

Transform to structured data

Store data in SQL DB

Mobile app backends

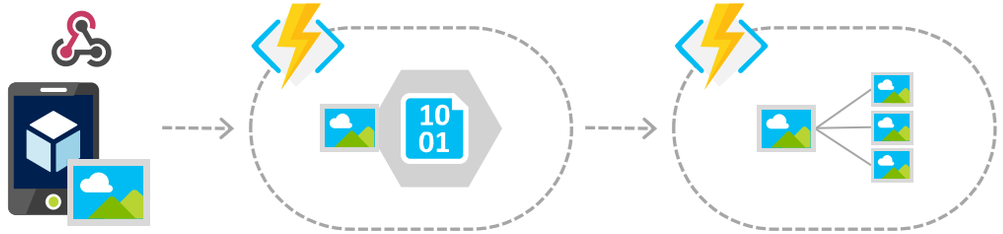
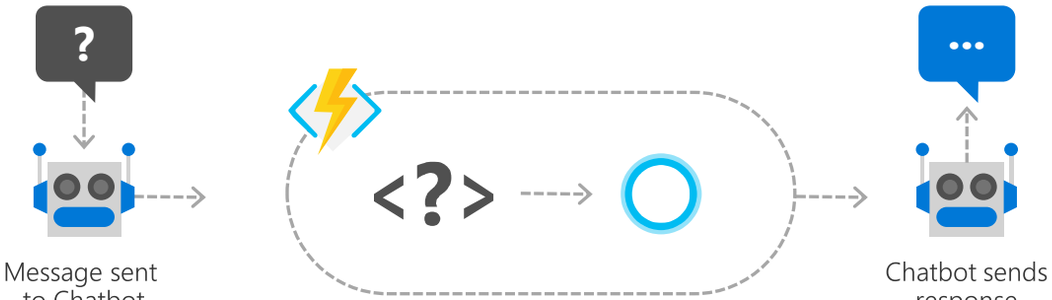


Photo taken and WebHook called

Stores in blob storage

Produces scaled images

Real-time bot messaging



Message sent to Chatbot

Cortana Analytics answers questions

Chatbot sends response

Azure Event Grid

Azure Messaging Services

Storage Queues

Simple task queues

Service Bus

Enterprise messaging

Event Hubs

Big data streaming

Relay

Secure sockets without changes to your network

Event Grid

Push based intelligent event routing with publish-subscribe semantics

Azure Event Grid

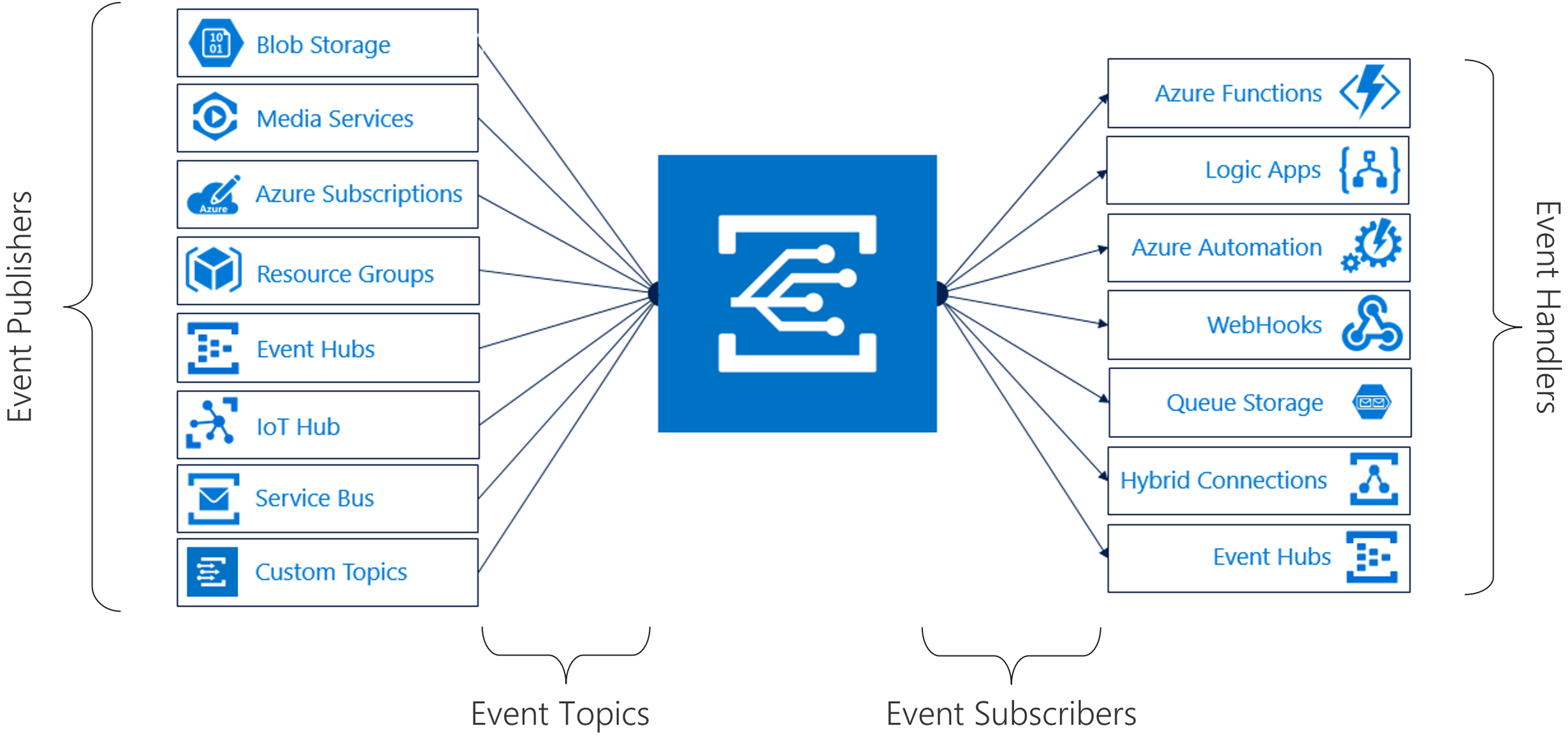
Fully-managed
event routing

Near real-time event
delivery at scale

Broad coverage within
Azure and beyond

Backbone of event-driven computing

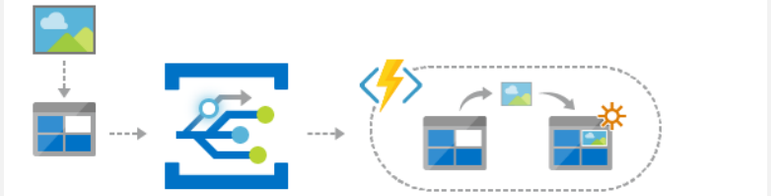
Manage all events in one place



Event Grid Scenarios

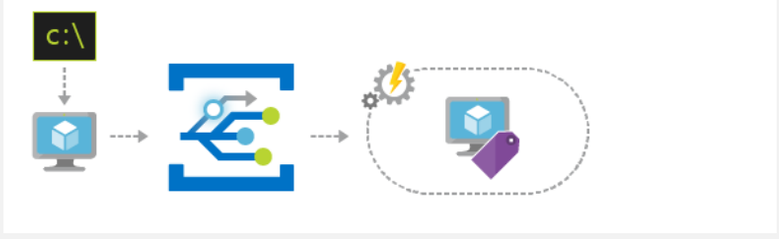
Serverless apps

Instantly trigger a serverless function to run analysis when a new file is added to a blob storage container.

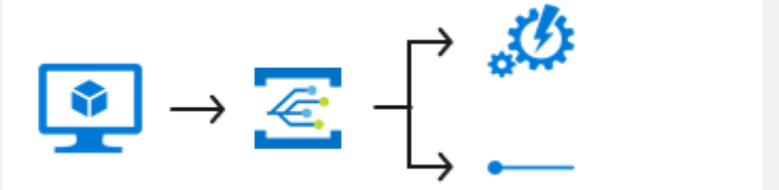


Ops automation

Speed up automation and simplify policy enforcement by notifying Azure Automation when underlying infrastructure is provisioned



Tag newly provisioned VMs with Azure Automation and add to metadata store



Application integration

Connects your app with other services. Create an application topic to route your app's event data to any desired destination

Azure Logic Apps

Logic Apps

Automate workflows and orchestrate business processes easily

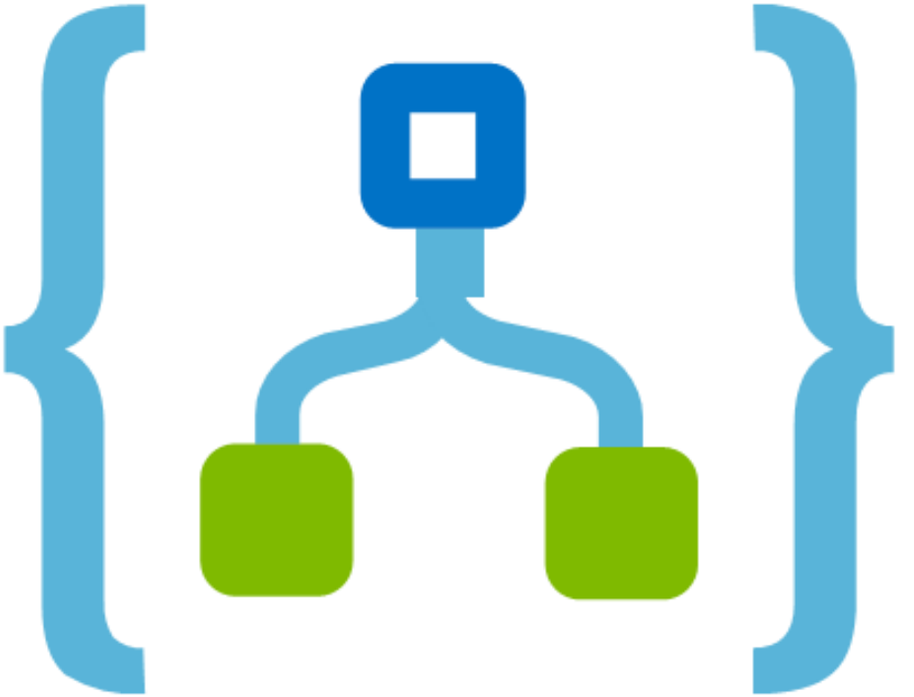
Out-of-the-box connectors reduce integration challenges

Visually design workflows in the cloud

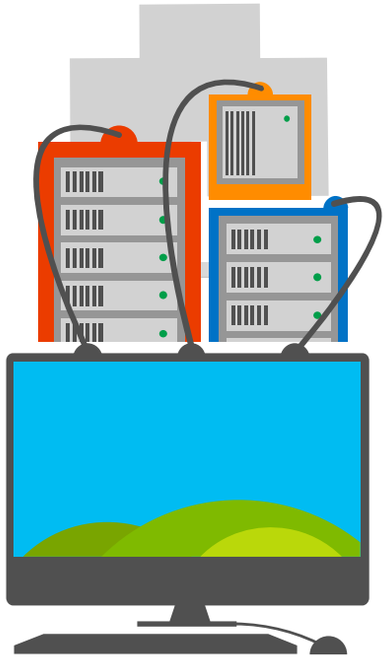
Express logic through powerful control flow

Connect disparate functions and APIs

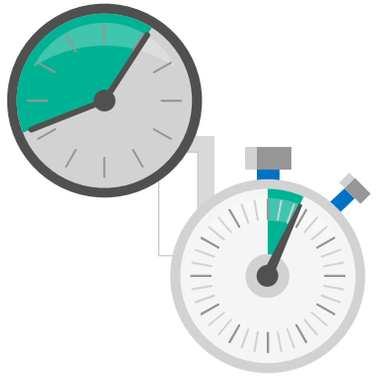
Utilize declarative definition to work with CI/CD



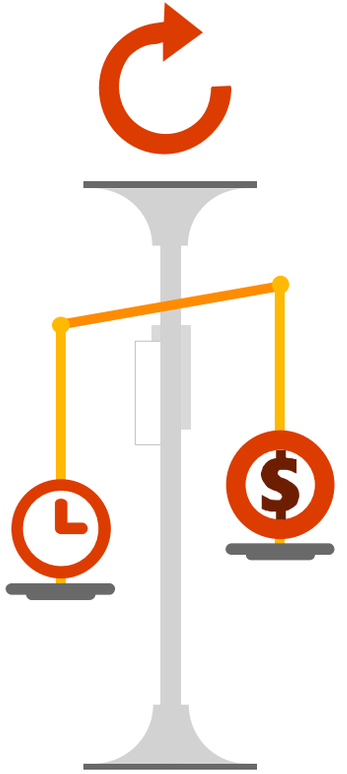
Logic Apps are Serverless



Reduced devops



Reduced time to market



Per action billing

The first 4,000 actions are free

Logic Apps Workflow Designer

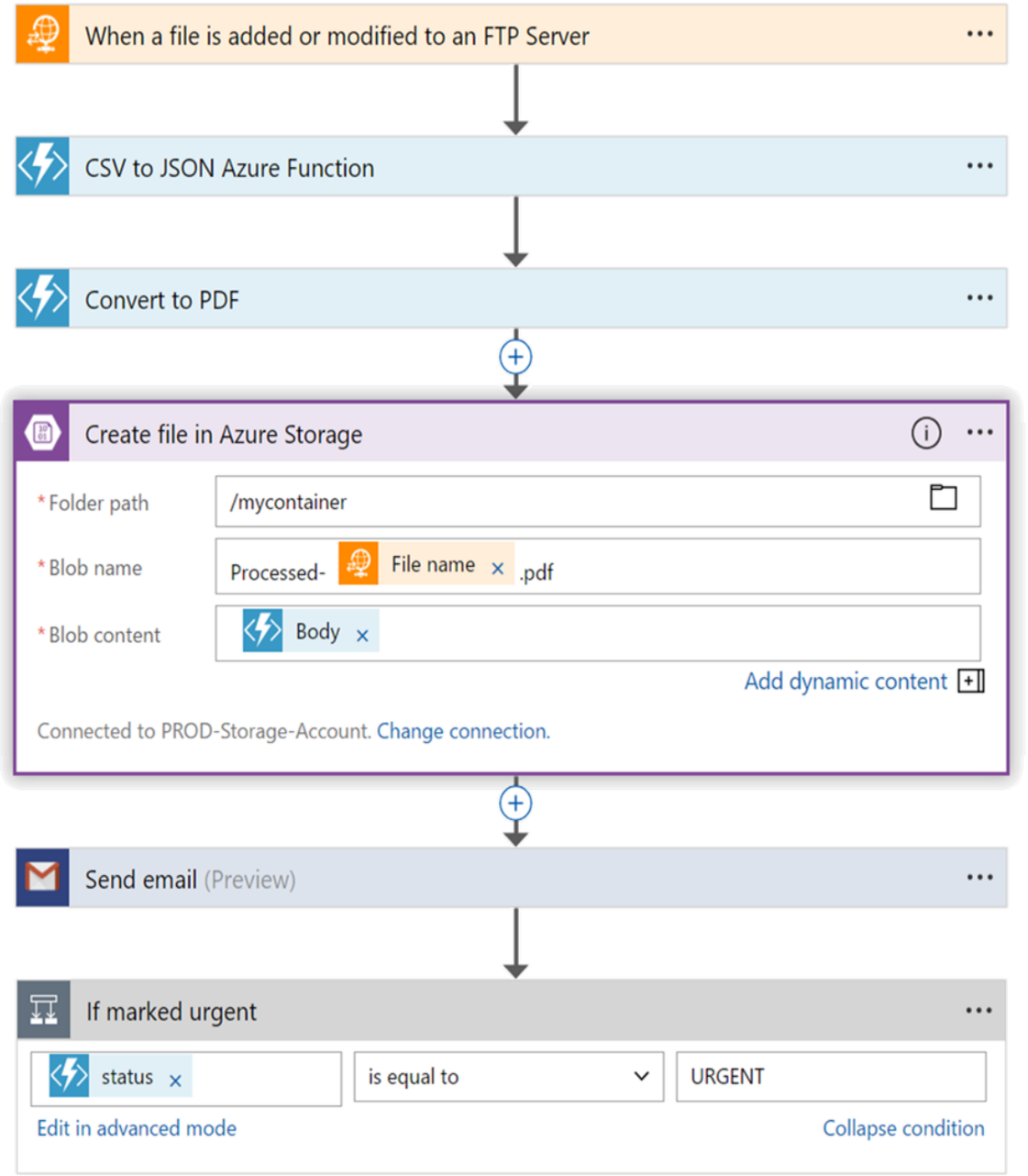
Workflow in the cloud

Powerful control flow

Connect disparate applications

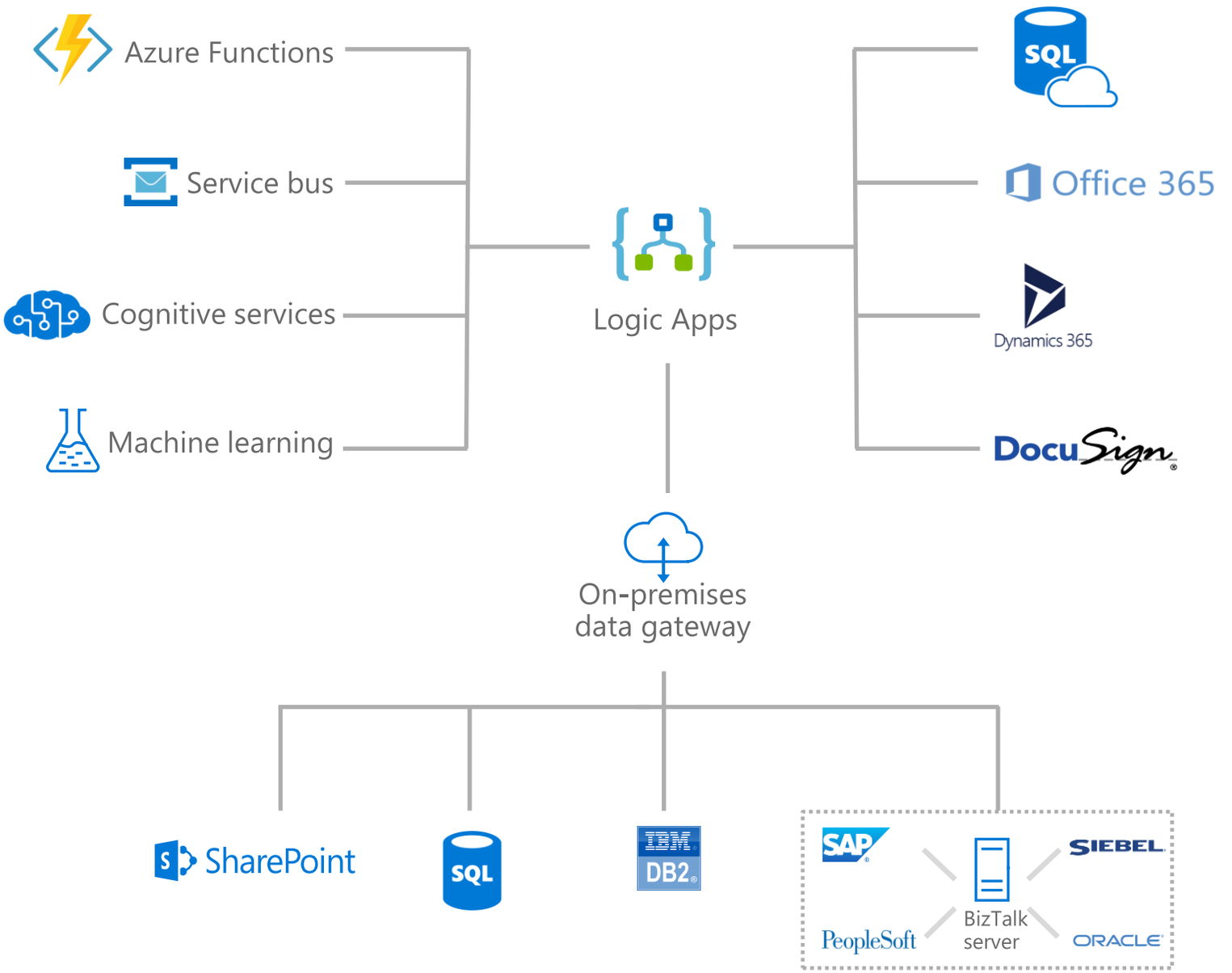
No code designer for rapid creation

Also works within Visual Studio (2019) for added CI/CD



Logic Apps connects everything

- Connect on-premises, hybrid and cloud applications
- Run mission-critical, complex integration scenarios with ease
- Enhance business productivity by automating business processes where it makes sense, on-premises or in Azure
- Build “Smart” Integrations leveraging Machine Learning/Cognitive Services

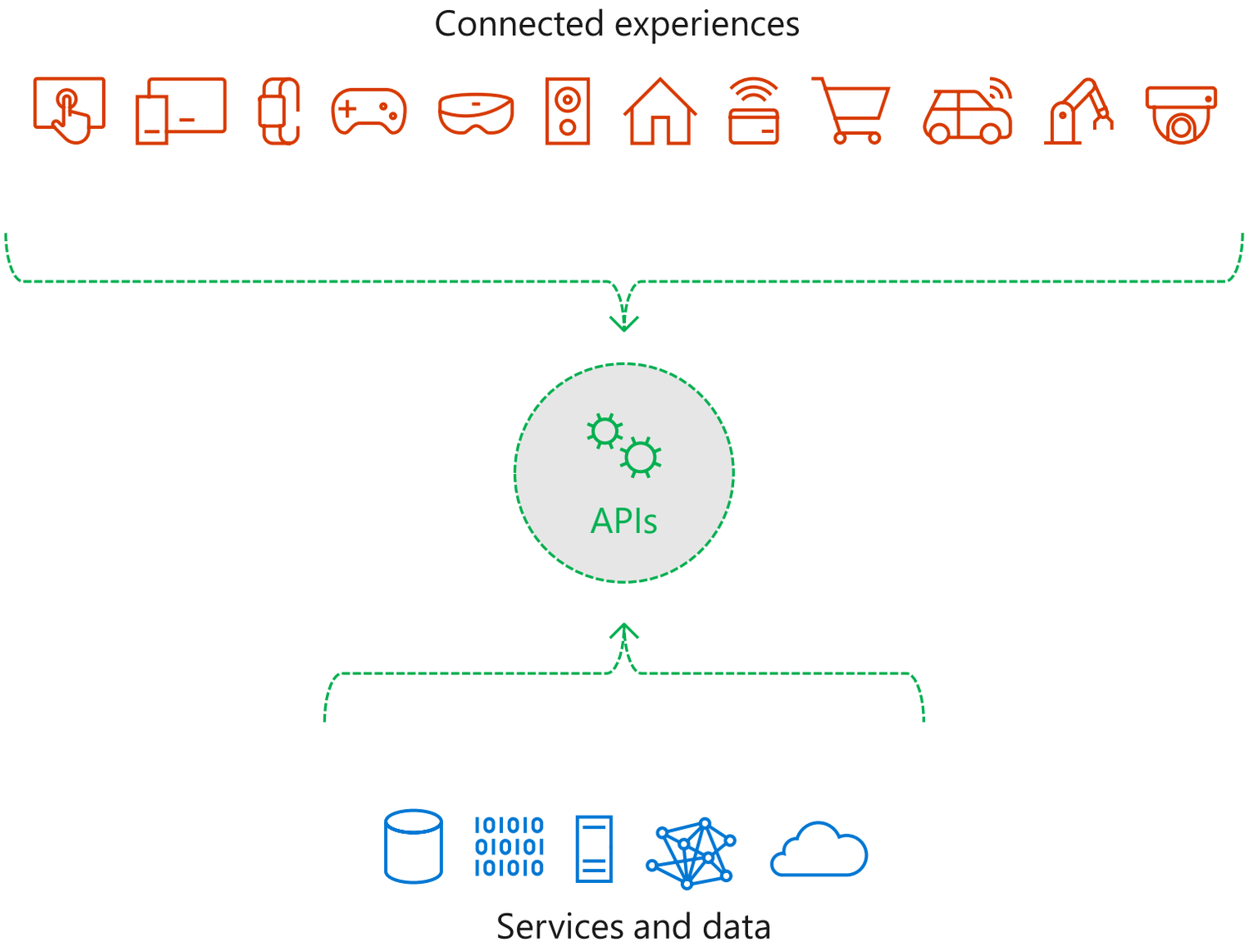


Consumption vs Standard

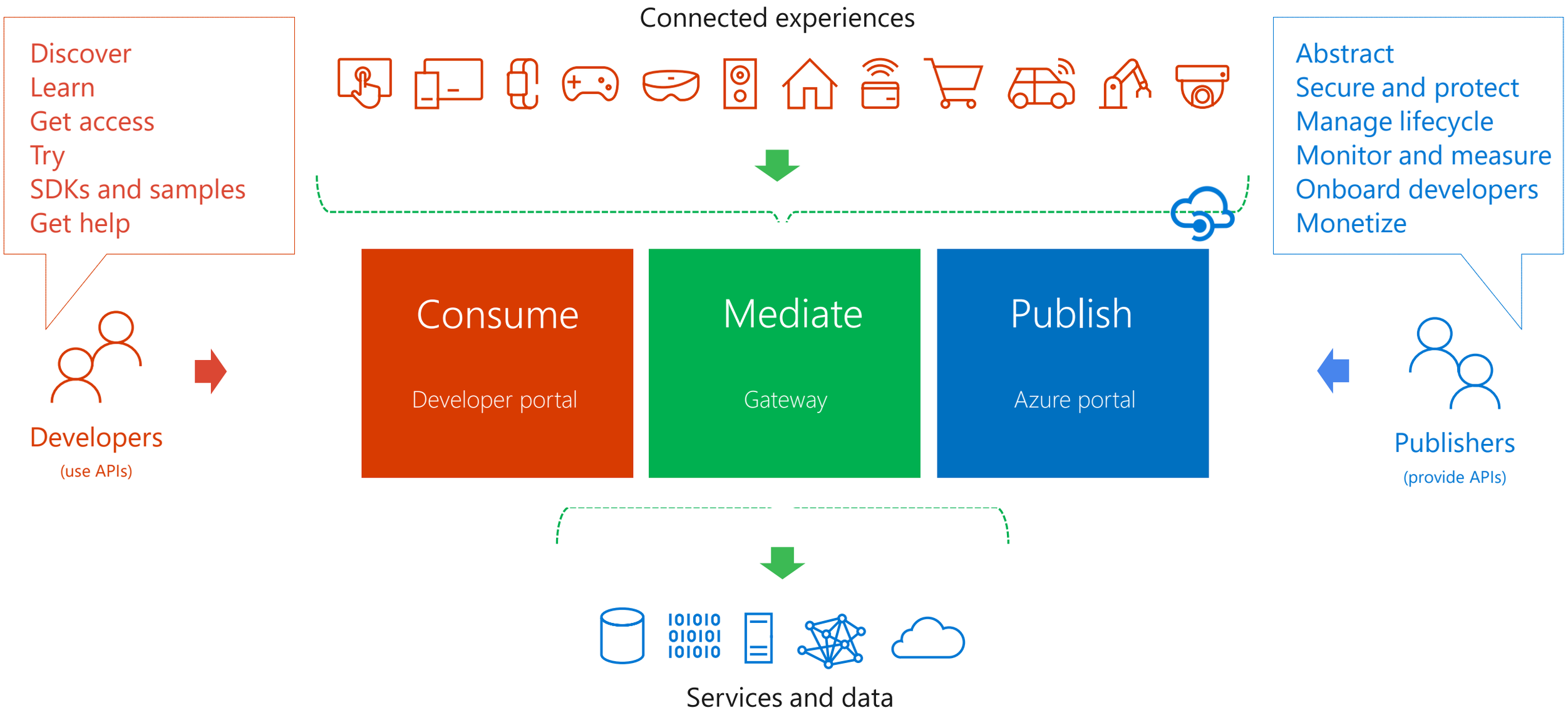
	Logic App (Consumption)	Logic App (Standard)
Pricing	Consumption (pay-per-execution) ISE (fixed)	App Service plan with a selected pricing tier Static monthly charge
Business process type	A single logic app can have only one business process (aka workflow).	A single logic app can have multiple stateful and stateless workflows.
Development tools	Azure Portal, Visual Studio (2019), and Visual Studio Code (limited)	Azure Portal and Visual Studio Code.
Scalability	Logic App (Consumption) is Serverless. Nevertheless, if you use ISE you can either scale your process manually or set up auto-scaling in the portal.	Can enable autoscaling or manually scale with more virtual machine instances or a different App Service plan.

Azure API Management

Digital Transformation runs on APIs



API management solves API-related challenges



What APIs can I import into API Management?

Blank API

Create an empty API

OpenAPI

Standard, language-agnostic interface to REST APIs

WADL

Standard XML representation of your RESTful API

WSDL

Standard XML representation of your SOAP API

Logic App

Scalable hybrid integrations and workflows.

API App

API hosted on App Service.

Function App

Serverless, event driven experience on App Service.

App Service

API hosted on App Service.

Container App

Serverless containers for microservices.

Azure Serverless Databases

SQL Database serverless

On-demand flexible scale
Operate at the true rhythm of your business

Adapts compute resources to the workload without sacrificing performance

Automatically pauses and resumes

Cost-effective
Pay for performance. Period.

Pay only for compute resources you consume, on a per-second basis

Further optimize costs with configurable compute thresholds

Fully managed & intelligent
Focus on your applications, not your infrastructure

Fully-managed and intelligent database service

Built-in 99.99% availability

Best for unpredictable and intermittent workloads on single databases, such as:

Dev/test

Line of Business

E-commerce

Cosmos DB serverless

Azure Cosmos DB is a fully managed NoSQL database for modern app development with SLA-backed speed and availability, automatic and instant scalability, and open source APIs for MongoDB, Cassandra, and other NoSQL engines.

Guaranteed speed at any scale

Gain unparalleled SLA-backed speed and throughput, **fast global access**, and instant elasticity.

Simplified application development

Build fast with open source APIs, multiple SDKs, schemaless data, and no-ETL analytics over operational data.

Mission-critical ready

Guarantee business continuity, 99.999% availability, and enterprise-level security for every application.

Fully managed and cost-effective

End-to-end database management with serverless and automatic scaling matching your application and TCO needs.

Azure Cognitive Services

Most comprehensive set of AI capabilities

Vision

Image understanding

Text extraction

Image captioning

Form recognition

Video indexing

Facial recognition

Spatial analysis

Speech

Speaker recognition

Speech to text

Text to speech

Custom neural voices

Speech translation

Language

Entity extraction

Sentiment analysis

Intent understanding

Text and document translation

Q & A creation

Decision

Anomaly detection

Root-cause analysis

Metric monitoring

Personalization

Demos

Visual Studio / VS Code

Function Apps
Event Grid
Cognitive Services
Logic Apps
APIM

Appendix

Event Grid in Comparison




	Storage Queues	Service Bus	Event Hubs	Event Grid
Transactions/Atomicity	✗	✓	✗	✗
Ordering guarantee	✗	✓	✓	✗
Delivery Guarantee	At least Once	At least Once, At Most Once	At least Once	At least Once
Read	Pull/Destructive	Pull/Destructive	Pull/Repeatable	Push
Peek	✓	✓	✓ Repeatable reads	✗
Batch Send	✓	✓	✓	✓
Batch Receive	✗	✓	✗	✗
Filtering/Routing	✗	✓ Advanced	✗	✓ - Simple
In flight transformation	✗	✓	✗	✗
Message Size	64 KB	256KB – 1 MB	256 KB	64 KB
De-duplication	✗	✓	✗	✗

Map of Sentiments for Trump - Power BI Desktop

Randy Pagels (MSIT)

File Home Insert Modeling View Help Format Data / Drill

Paste Cut Copy Format painter — Clipboard

Get data Excel Power BI datasets SQL Server Enter data Recent sources — Data

Transform data Refresh — Queries

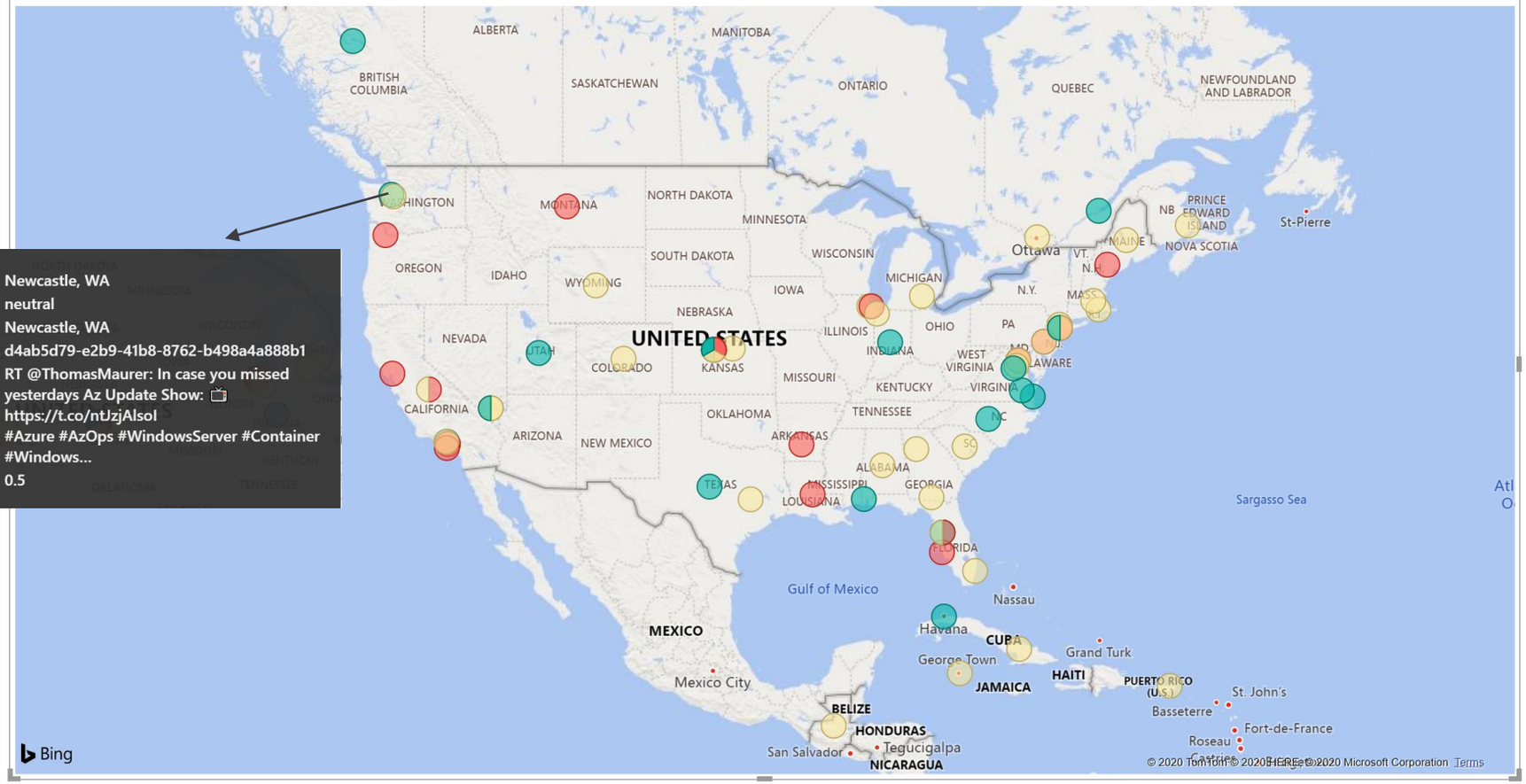
New visual Text box More visuals — Insert

New measure Quick measure — Calculations

Publish — Share

First Content.Location, First RowKey, First Content.Tweet and First Content.Score by Content.Location and PartitionKey

Sentiment negative neutral positive



Content.Location	Newcastle, WA
PartitionKey	neutral
First Content.Location	Newcastle, WA
First RowKey	d4ab5d79-e2b9-41b8-8762-b498a4a888b1
First Content.Tweet	RT @ThomasMaurer: In case you missed yesterdays Az Update Show: https://t.co/ntJzjAlsoI #Azure #AzOps #WindowsServer #Container #Windows...
First Content.Score	0.5

Filters

Visualizations

Fields

Search

twitterdata

- Content.Lo...
- Content.Sc...
- Content.Sc...
- Content.Tw...
- PartitionKey
- RowKey
- Timestamp

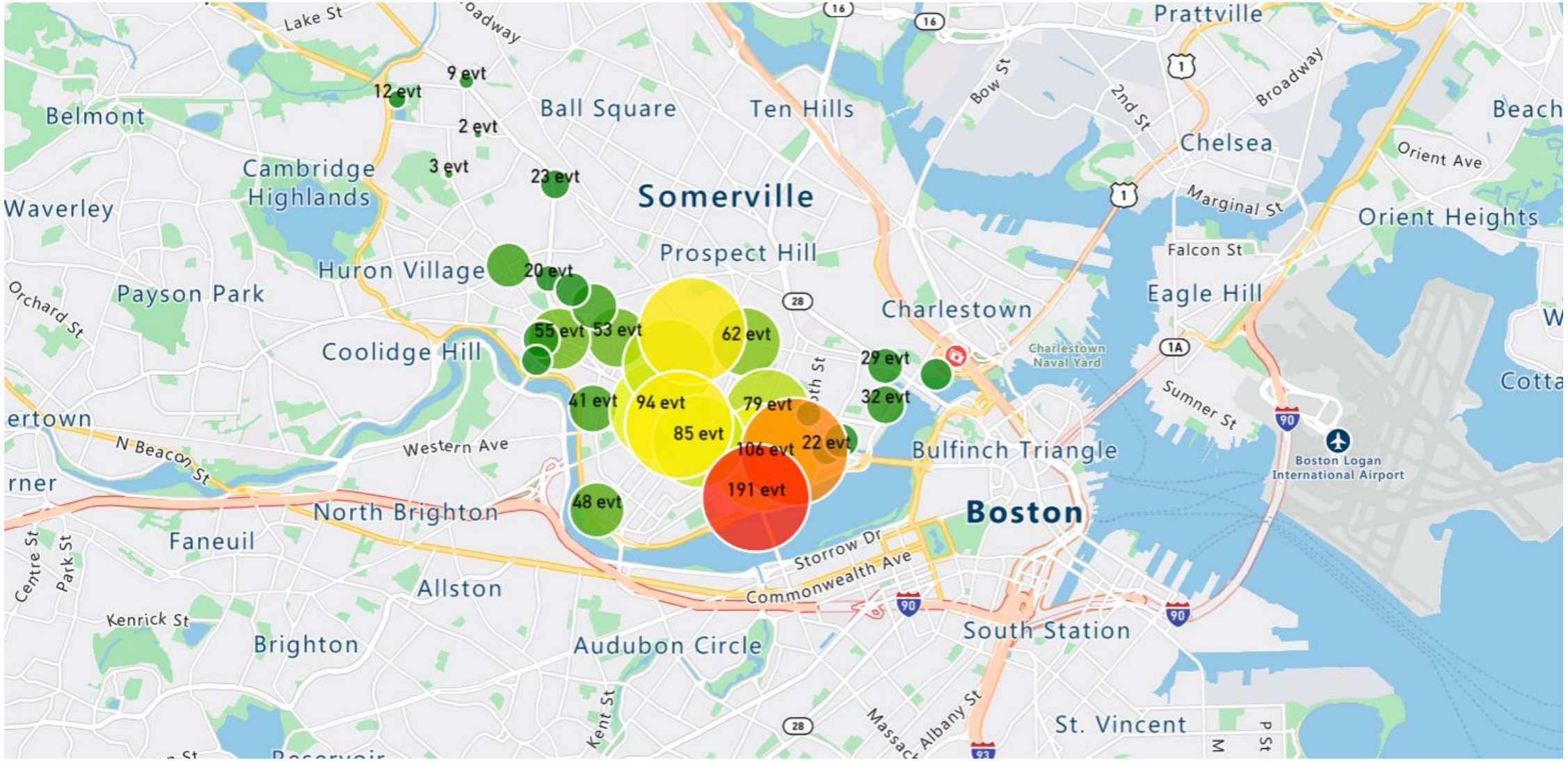
Page 1

PAGE 1 OF 1

Type here to search

11:52 AM 6/14/2020

Azure Service – Hubwayplot.html



Azure Maps Bubble Layer Styling is used to represent the number of start station events.