Azure IoT Suite

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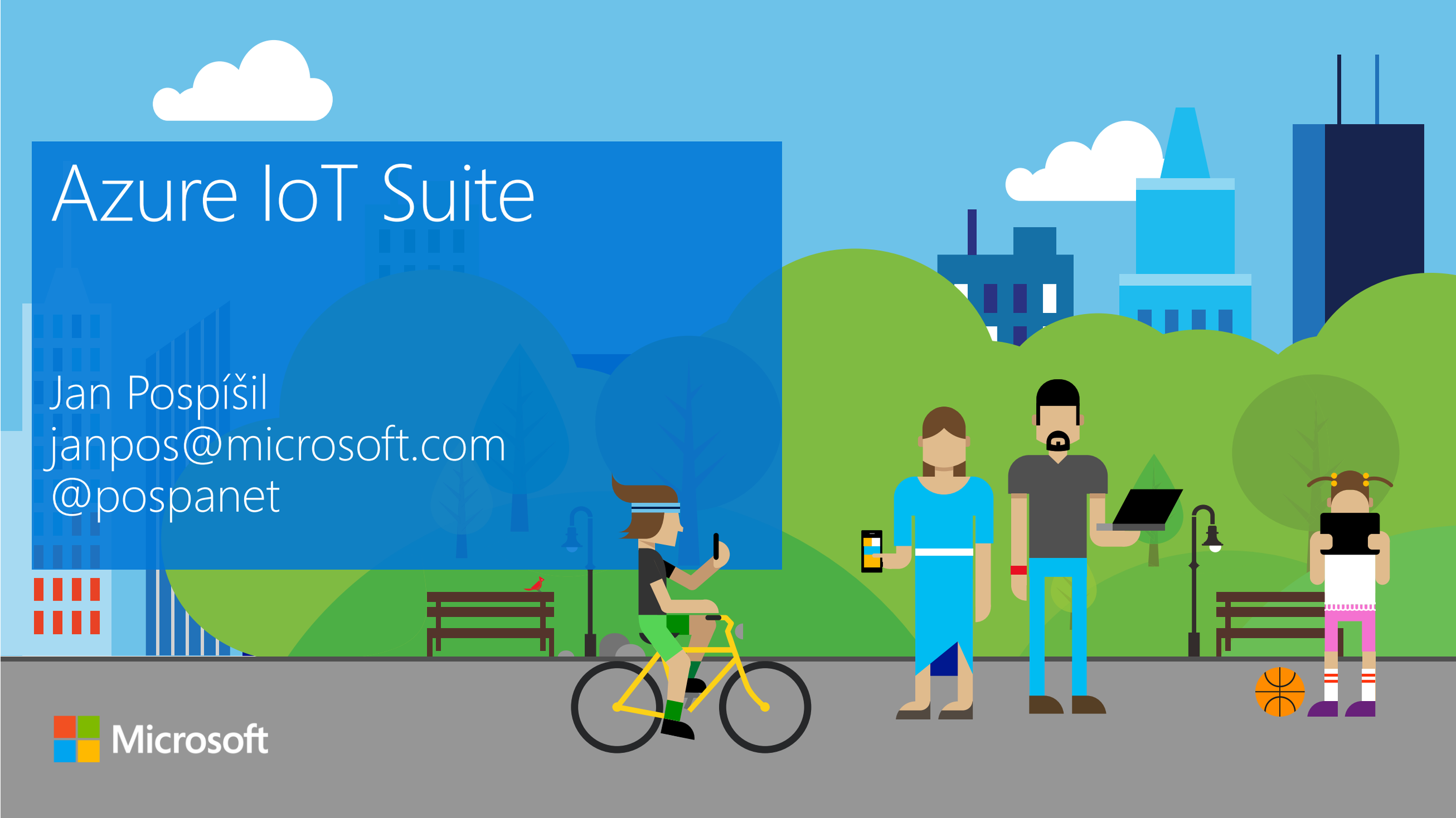


Microsoft

What is IoT?

Things

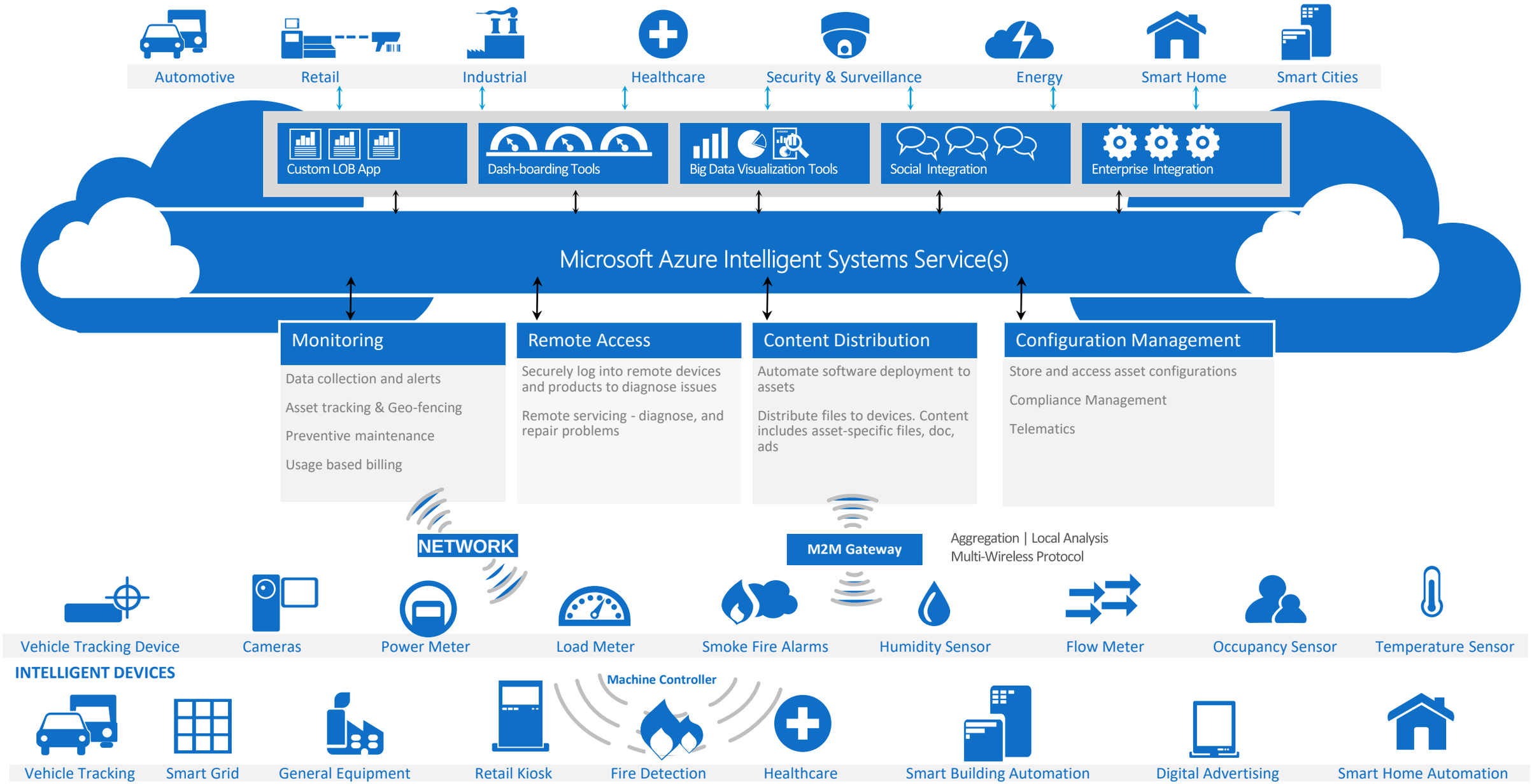
Internet

Data

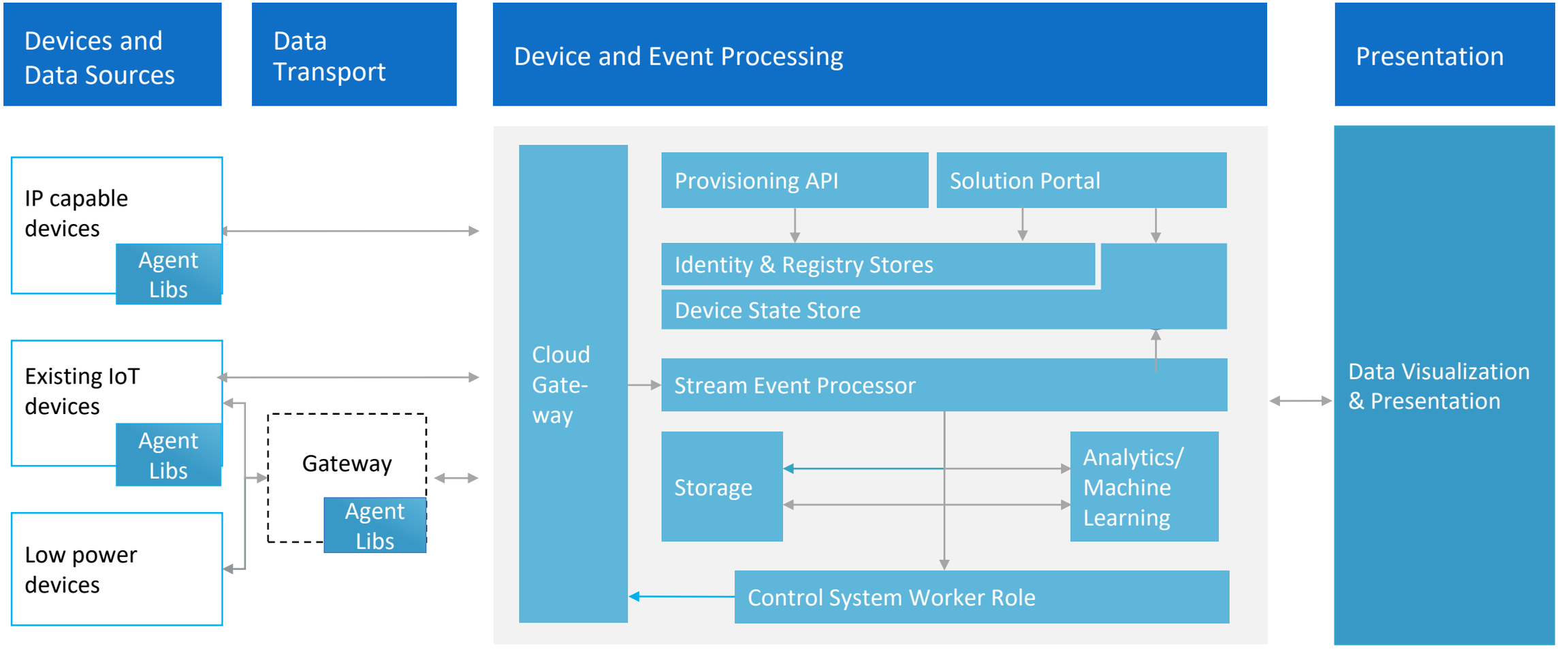
10101
01010
00100

Analytics

Microsoft Internet of Your Things



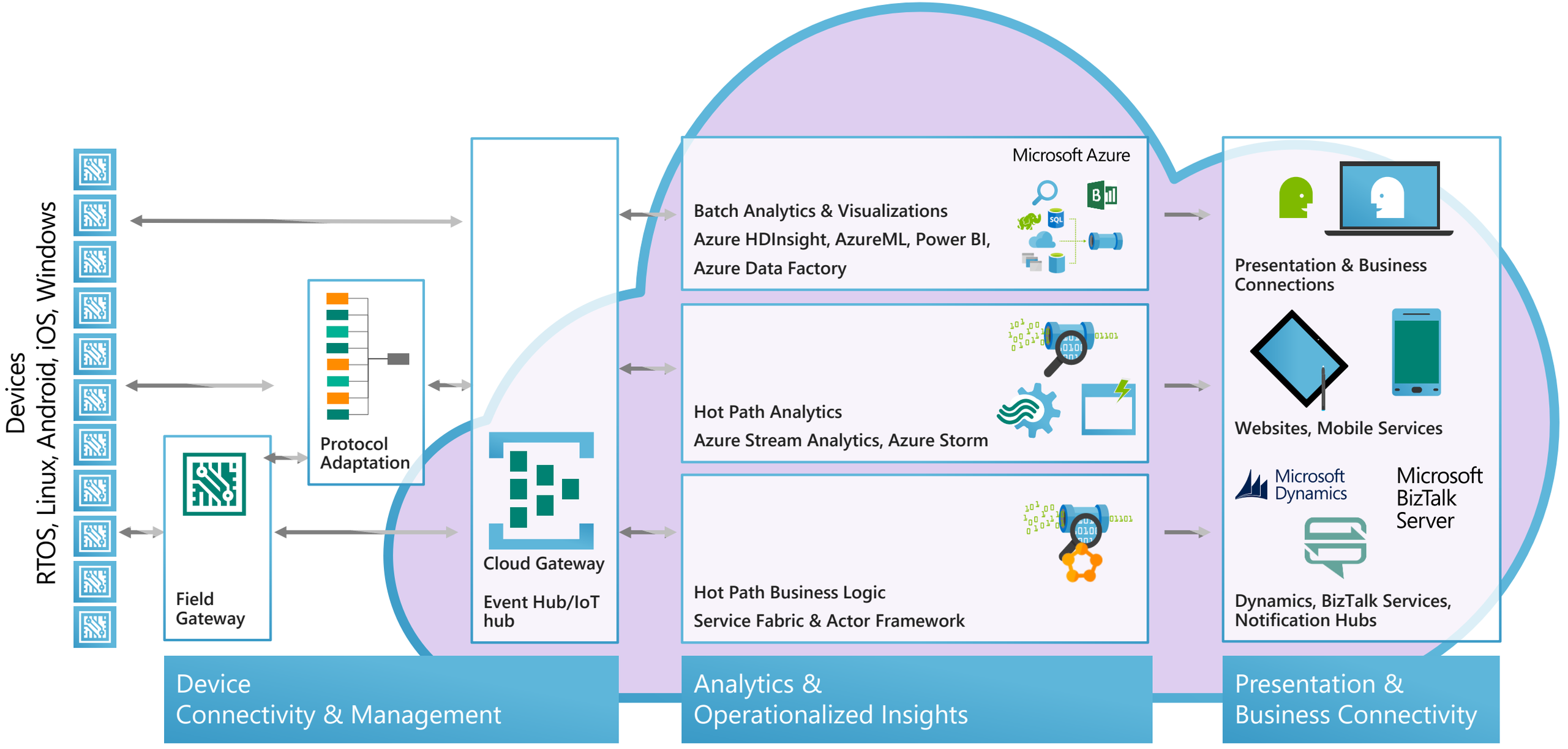
Azure IoT Reference Architecture



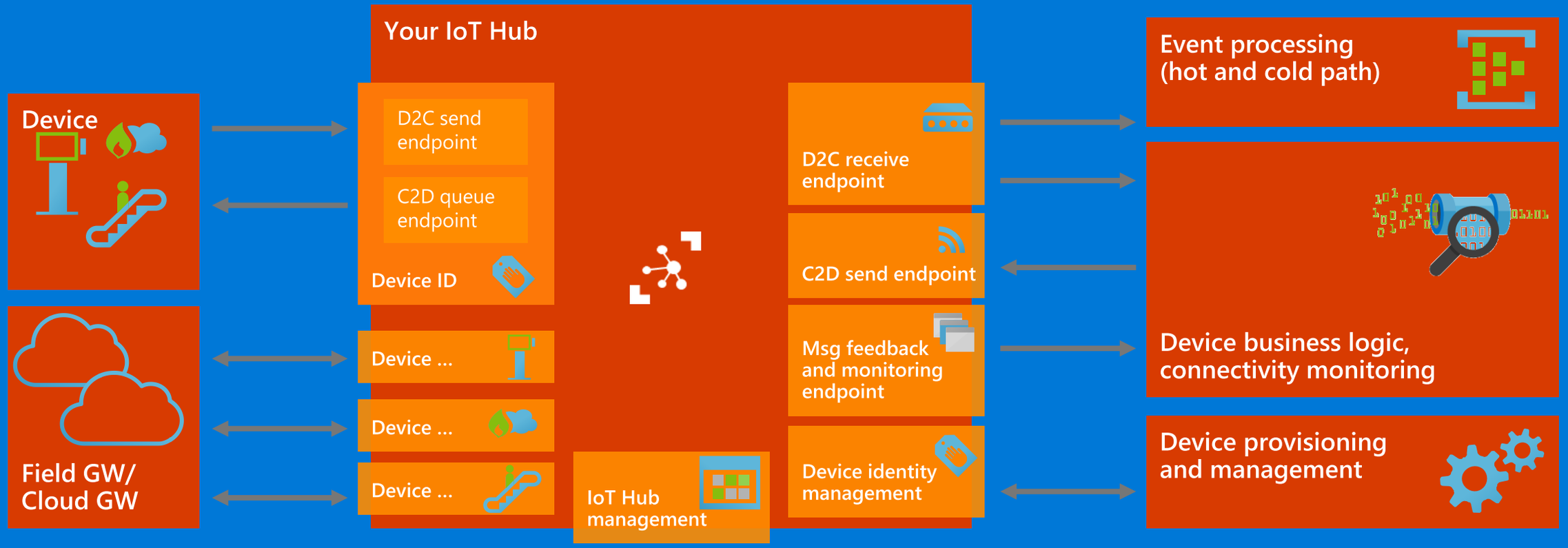
Microsoft Azure IoT Services

Zařízení	Konektivita	Úložiště	Analýza dat	Přezentace a řízení
	 Event Hub	 SQL Database	 Machine Learning	 App Service
	 IoT Hub	 Table/Blob Storage	 Stream Analytics	 Power BI
	 Service Bus	 DocumentDB	 HDInsight	 Notification Hubs
	 External Data Sources	 3rd party Databases	 Data Factory	 Mobile Services
			 Data Lake	 BizTalk Services

IoT Device & Cloud Patterns



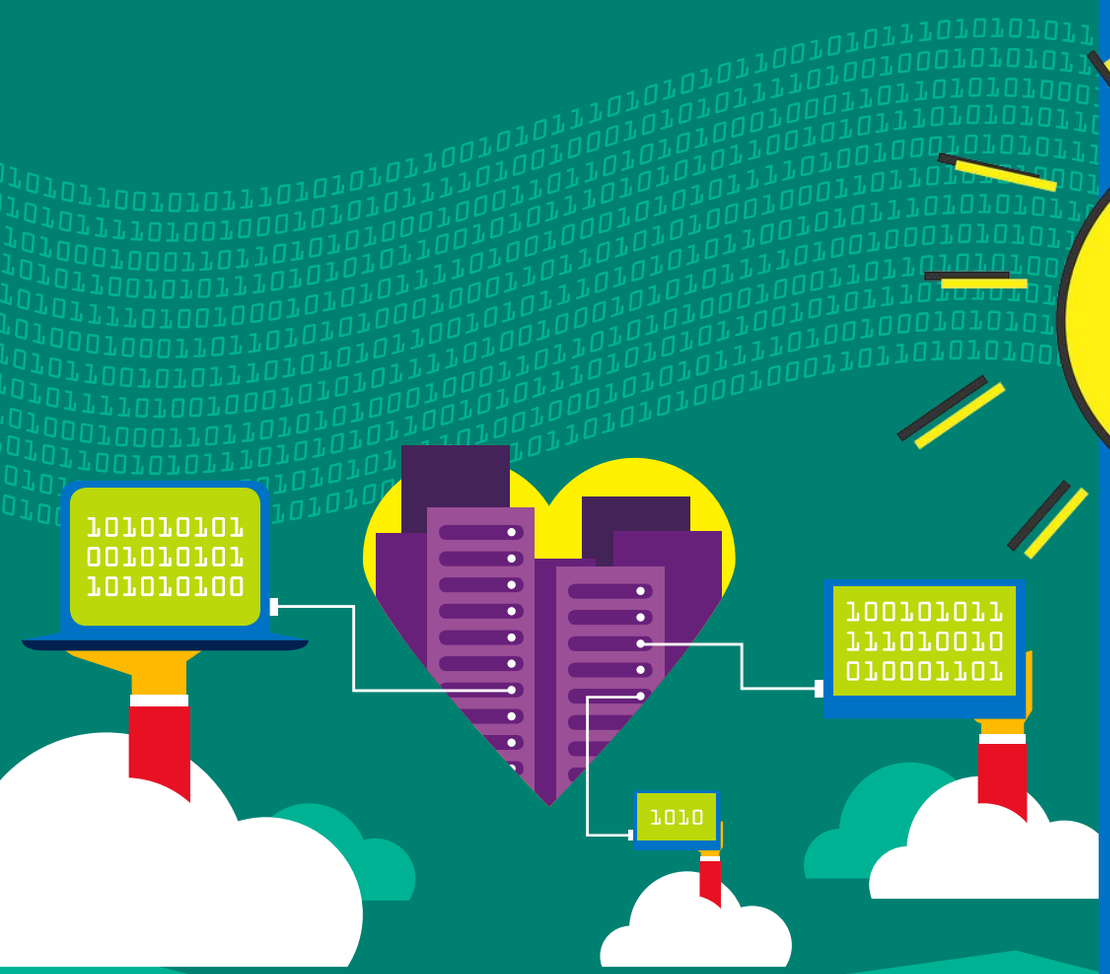
IoT hub


Your IoT Hub
Device
Field GW/
Cloud GW
D2C send endpoint
C2D queue endpoint
Device ID
Device ...
Device ...
Device ...
IoT Hub management
D2C receive endpoint
C2D send endpoint
Msg feedback and monitoring endpoint
Device identity management
Event processing (hot and cold path)
Device business logic, connectivity monitoring
Device provisioning and management

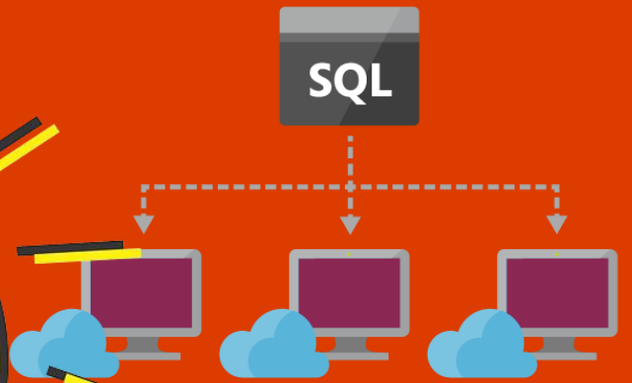
Azure Stream Analytics

Microsoft

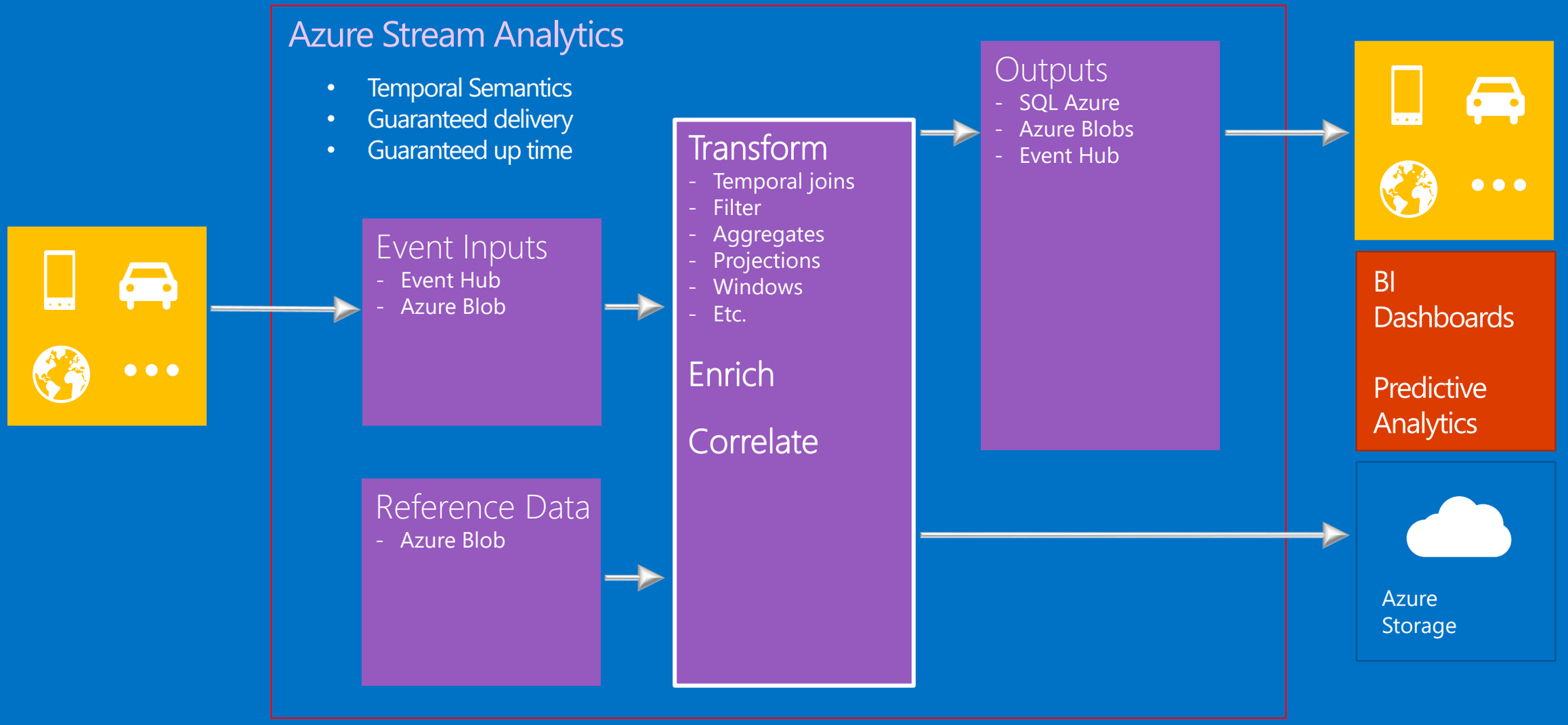
Real-time analytics



Query language

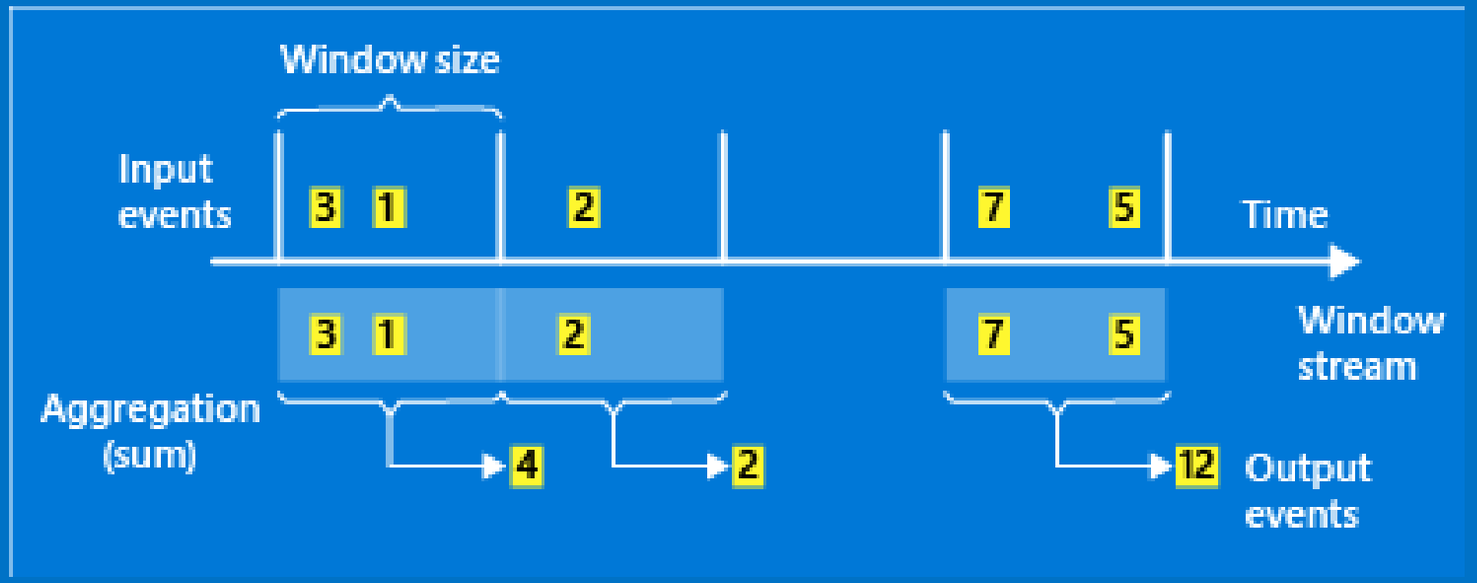


End-to-End Architecture Overview



Microsoft

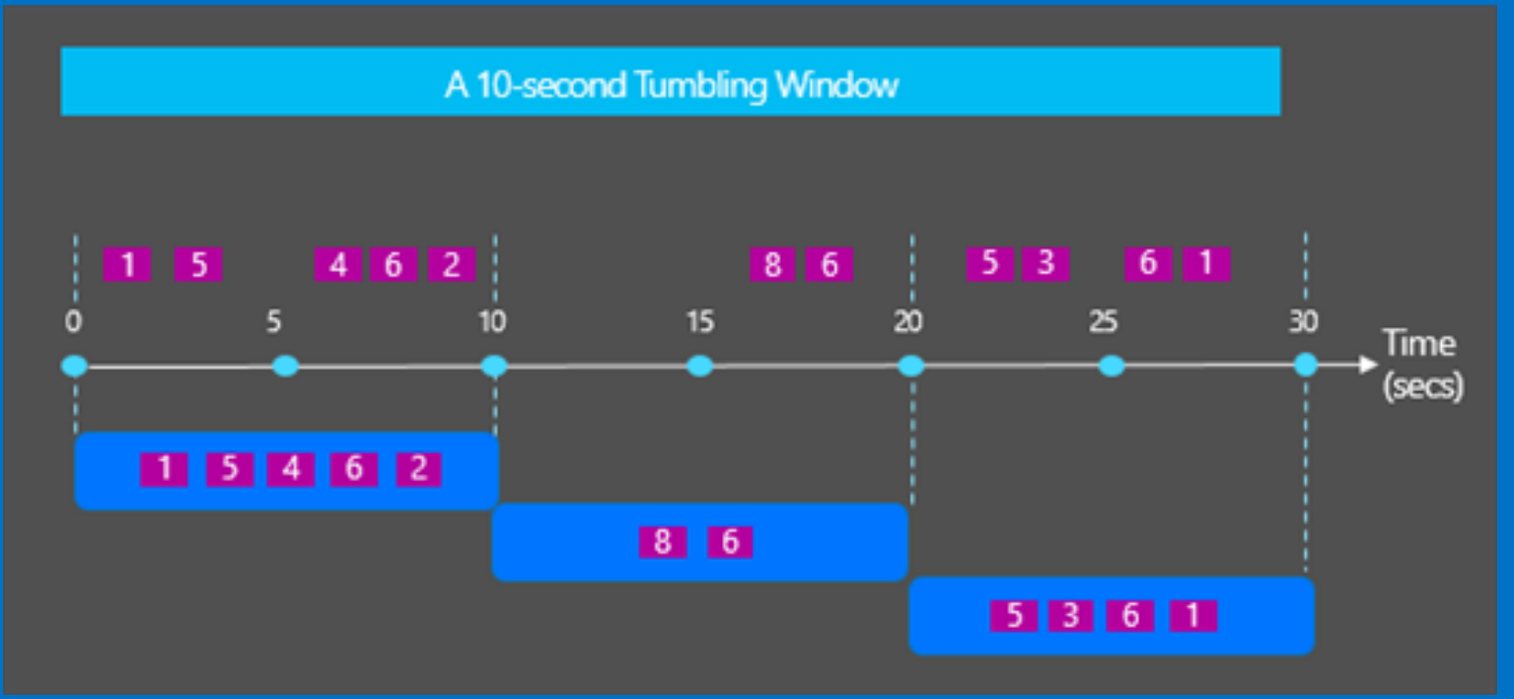
Data grouping



Microsoft

Tumbling Window

- fixed-sized
- Contiguous
- non-overlapping

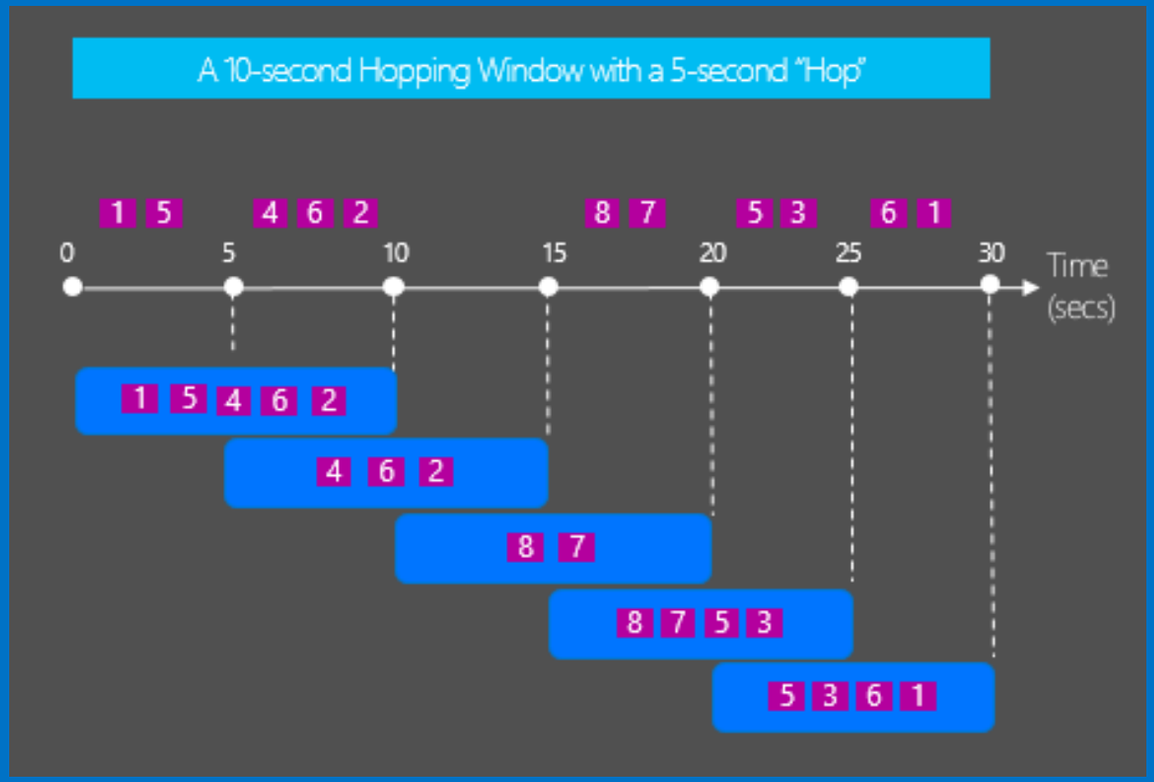


TUMBLINGWINDOW (timeunit , windowsize, [offsetsize])
TUMBLINGWINDOW (Duration(timeunit , windowsize), [Offset(timeunit , offsetsize)])

Microsoft

Hopping Window

- fixed-sized
- overlapping

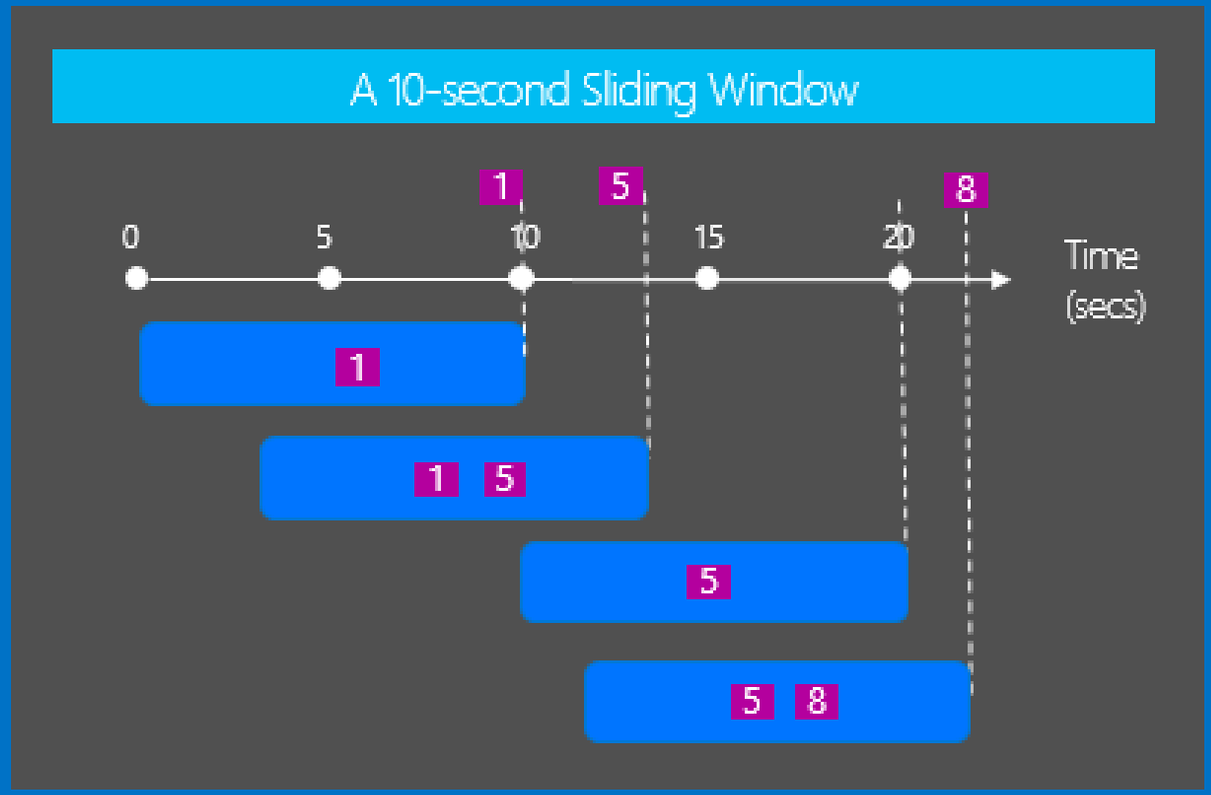


HOPPINGWINDOW (timeunit , windowsize , hopsize, [offsetsize])
HOPPINGWINDOW (Duration(timeunit , windowsize) , Hop (timeunit , windowsize), [Offset(timeunit , offsetsize)])

Microsoft

Sliding Window

- fixed-sized
- overlapping
- sliding based on data



SLIDINGWINDOW (timeunit , windowsize)
SLIDINGWINDOW (Duration(timeunit , windowsize))

Microsoft

Analytics functions

- **ISFIRST**

  Returns 1 if the event is the first event within a given duration.

  ISFIRST (timeunit , duration) [OVER ([PARTITION BY partition_by_expression] [WHEN when_expression])]

- **LAG**

  Allows to look up the “previous” event in an event stream

  LAG(<scalar_expression >, [<offset >], [<default>]) OVER (LIMIT DURATION(<unit>, <length>) [PARTITION BY <partition key>] [WHEN boolean_expression])

- **LAST**

  Allows one to look up the most recent event in an event stream

  LAST(<scalar_expression >, [<default>]) OVER (LIMIT DURATION(<unit>, <length>) [PARTITION BY <partition key>] [WHEN boolean_expression])

Microsoft

Build-in types and functions

Aggregate functions

`Count, Min, Max, Avg, Sum, Var, Varp, TopOne, Stdev, Stdevp, CollectTop`

Scalar/Conversion functions

`Cast`

Date and time: `Datename, Datepart, Day, Month, Year, Datediff, Dateadd`

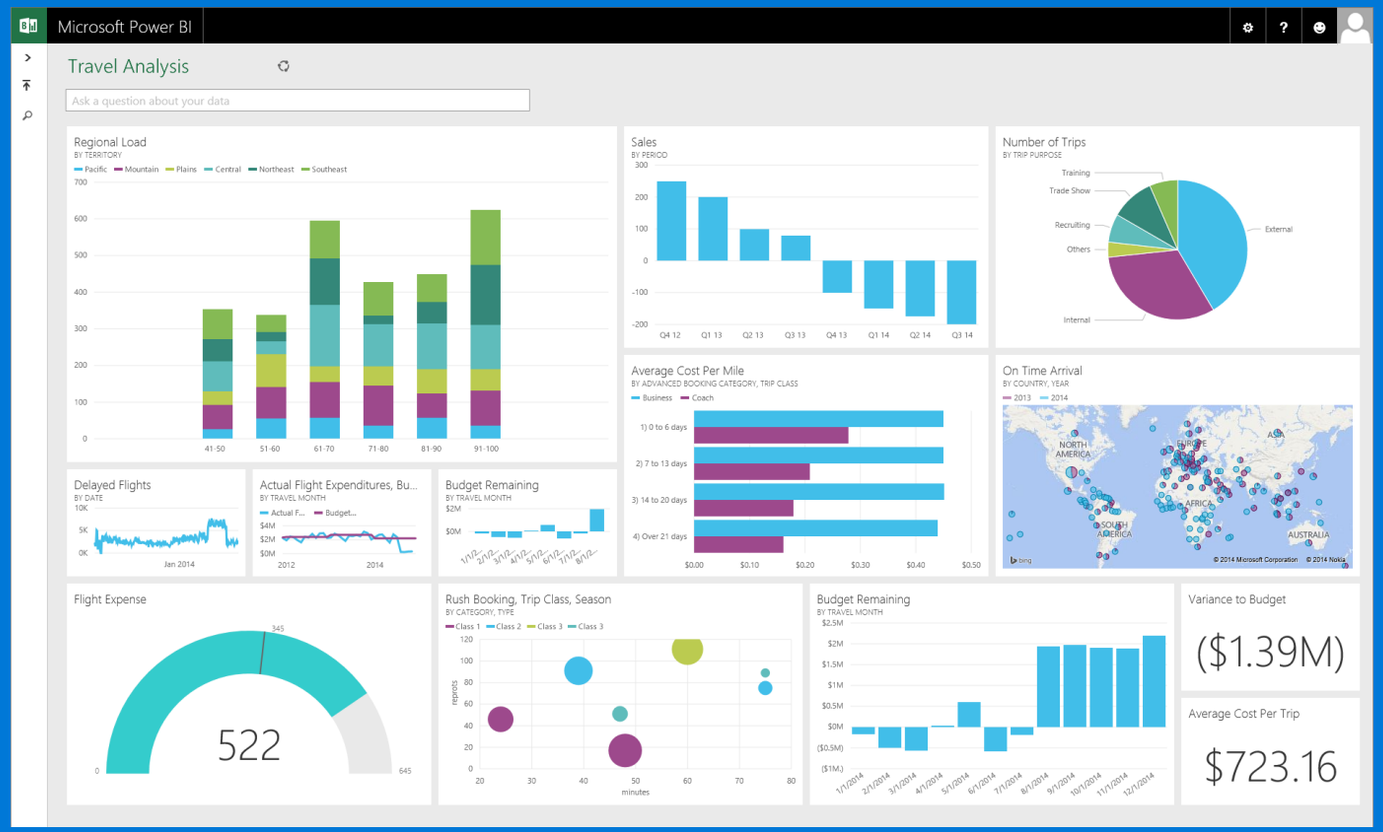
String: `Len, Concat, Charindex, Substring, Patindex, Lower, Upper`

Typy

Type	Description
bigint	Integers in the range -2^63 (-9,223,372,036,854,775,808) to 2^63-1 (9,223,372,036,854,775,807).
float	Floating point numbers in the range - 1.79E+308 to -2.23E-308, 0, and 2.23E-308 to 1.79E+308.
nvarchar(max)	Text values, comprised of Unicode characters. Note: A value other than max is not supported.
datetime	Defines a date that is combined with a time of day with fractional seconds that is based on a 24-hour clock and relative to UTC (time zone offset 0).

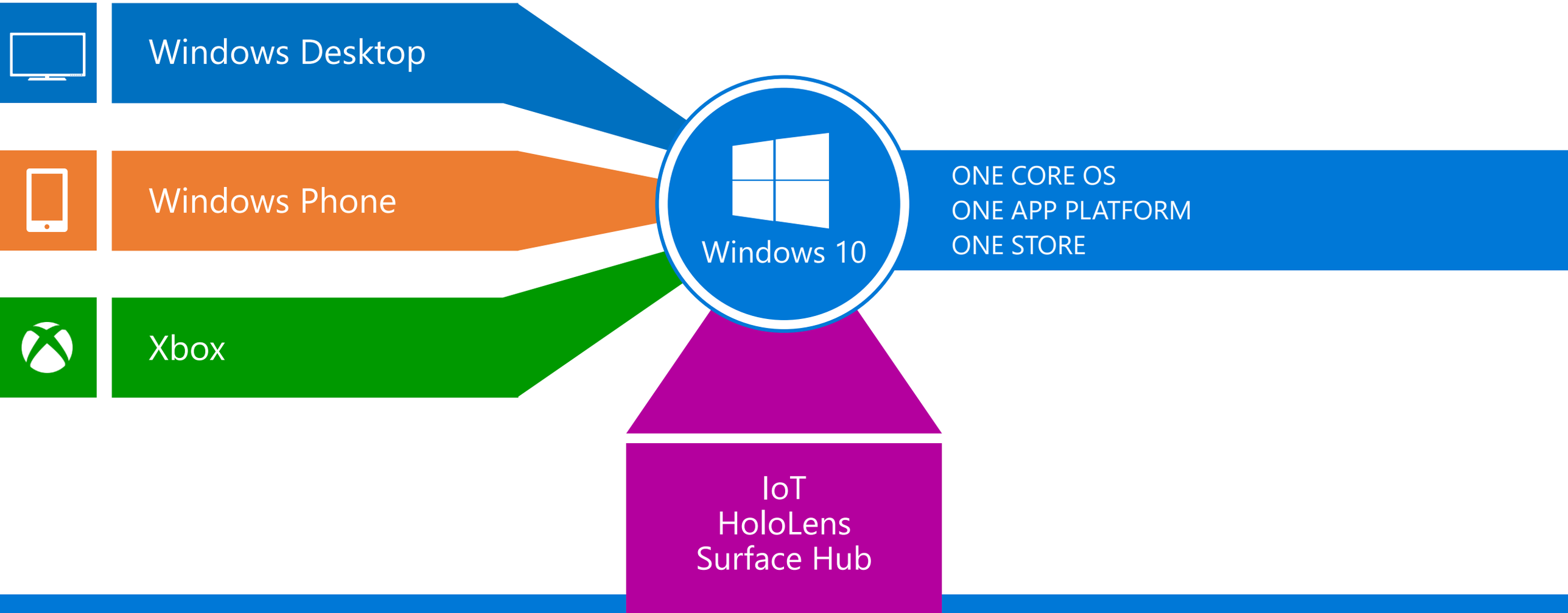
Power BI

Dashboards



- Monitor live dashboards for the data that matters most
- Track your data in real-time with support for streaming data
- Drill through to underlying reports to explore and discover new insight
- Pin new visualizations and KPIs to monitor performance

One Windows…


Windows Desktop
Windows Phone
Xbox
Windows 10
ONE CORE OS
ONE APP PLATFORM
ONE STORE
IoT
HoloLens
Surface Hub

on a full range of devices…

Phone

Phablet

Small Tablet

Large Tablet

2-in-1s
(Tablet or Laptop)

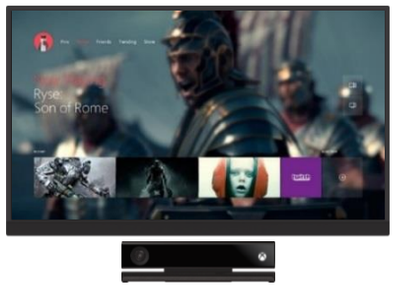
Classic
Laptop

Desktops
& All-in-Ones

Windows 10

Surface Hub

Xbox



Holographic

IoT

tuned to each form factor…

Windows for PCs

Familiar desktop shell

Broad hardware ecosystem

Windows desktop application compatibility

Windows for phones

Familiar mobile shell

Rich telephony

Windows phone app compatibility

Windows on Xbox

10′ shell experience

Shared gaming experiences

Xbox One game and app compatibility

Windows for …

Form factor–appropriate shell experience

Device-specific scenario support

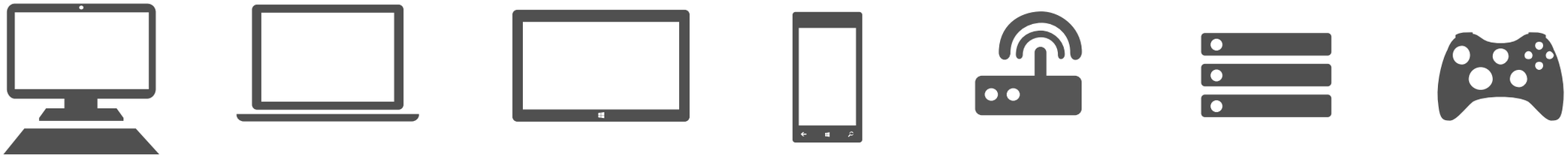
One Core OS

Base OS

App and Device platform

Runtimes and frameworks

with a universal app platform…



Windows Universal Platform
Common & Consistent APIs

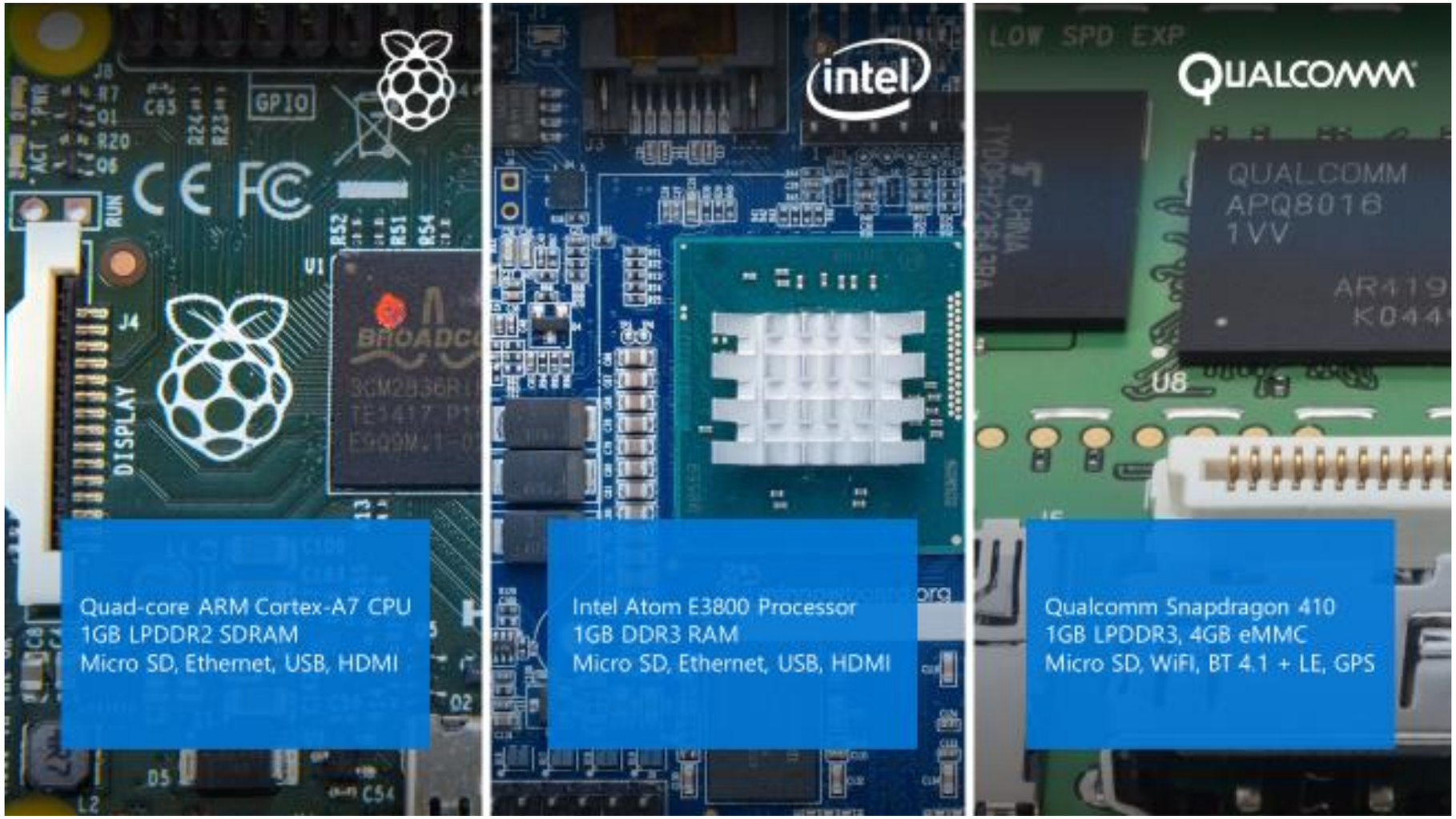
Languages
- C++ /CX
- C#, VB
- JS
- More

UI Frameworks
- HTML
- Xaml
- DirectX

APIs
- WinRT
- Win32
- .NET
- Wiring

Deployment and Execution
- APPX
- Xcopy
- App Isolation

and some pretty cool devices.



…and options to grow

Windows 10 IoT Core	Windows 10 IoT Mobile	Windows 10 IoT Enterprise	Additional
• UWP • Headed or Headless • Single user • Single app	• UWP • Handheld • Roles and identities • Multiple apps	• UWP • Win32 • Headed or Headless • Roles and identities • Multiple Win32 and UWP apps	• .Net Micro Framework • Llilium • Windows Embedded Compact

Windows IoT Taxonomy

http://aka.ms/Win10IoTPlatform