Microsoft

From Device to Cloud
IQRF → Windows 10 IoT → Azure

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Internet of Things

From Device to Cloud

Windows 10 IoT Core

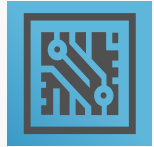Azure IoT Hub   Azure Stream Analytics   Power BI   Azure IoT Hub

1. Collect   2. Process   3. Analyze   4. Control

Today's demo

IQRF
sensors

Raspberry Pi 3
Windows 10
field gateway

Cloud

Stream Analytics
processing

Azure IoT Hub
cloud gateway

Power BI
visualization
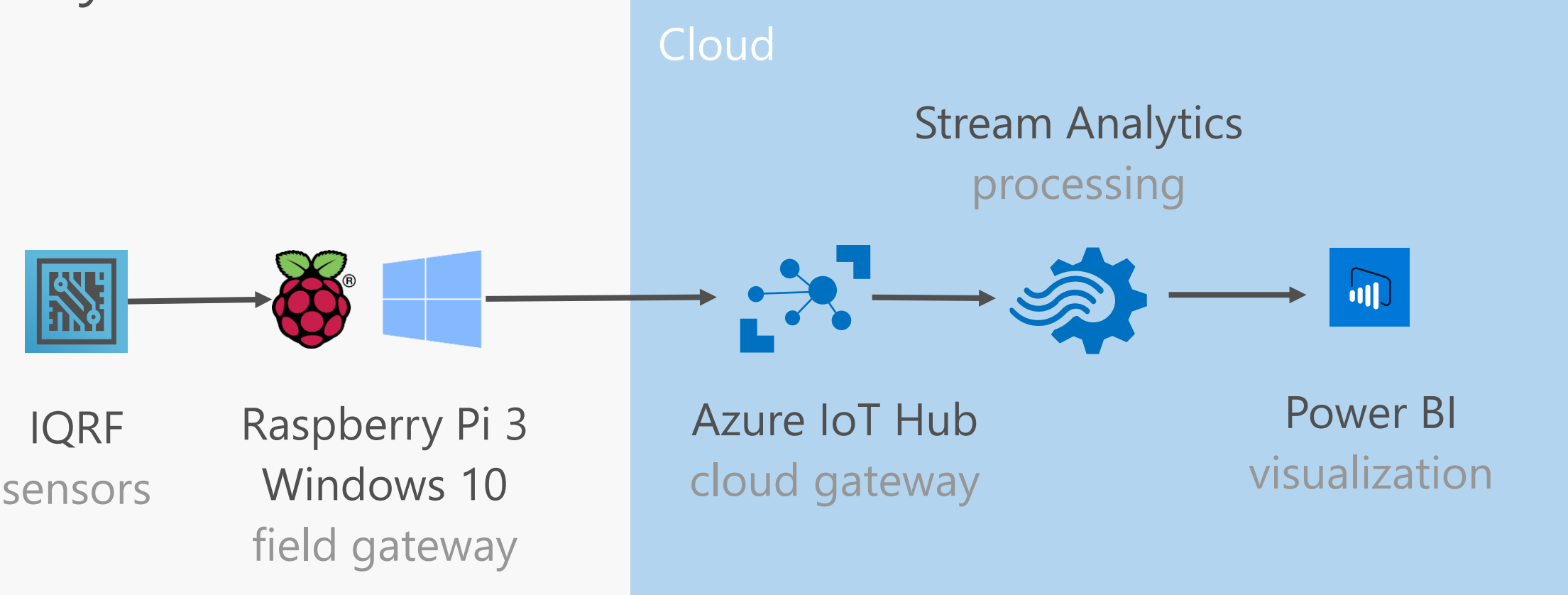
DEMO

Using Windows 10 IoT Core and Azure to collect and vizualize data from IQRF

More information

Windows 10 IoT

- http://microsoft.com/en-us/WindowsForBusiness/windows-iot
- http://WindowsOnDevices.com

Azure IoT

- http://www.InternetofYourThings.com
- Azure IoT Dev Center – http://aka.ms/azureiotdev

Power BI

- http://powerbi.microsoft.com

Continue learning

- Microsoft Virtual Academy – http://mva.ms

Thank you!

Microsoft

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Backup Slides

Azure Services for IoT

Azure IoT Hub
Connect, secure, communicate, monitor and manage billions of devices

Azure Stream Analytics
Real time stream processing for billions of IoT devices

Azure Storage
Blob, SQL, DocumentDB, Data Lake. Storage to meet every need at the scale of IoT

Azure App Service
Web and mobile apps for any platform on any device

Power BI
Dashboards and data connectors to visualize any data

Logic Apps
Powerful workflows to automate business processes

And More...

IoT Hub Limits

Common

256 kB message size from device to cloud
64 kB message size from cloud to device

Free

8 000 messages/day
500 device identities

S1

400 000 messages/day/unit
200 units via portal (more through Support)

S2

6 000 000 messages/day/unit
200 units via portal (more through Support)

Stream Analytics Limits

Throughput

1 MB/s per unit

12 units per region & subscription, can be larger via Support

IQRF
Resource group

⚙ Settings   ➕ Add   🗑 Delete   ↻ Refresh

Essentials ⌃   ☁ 👥 🏷

Subscription name   Subscription ID
Customer demo

Last deployment   Location
21. 5. 2016 (Succeeded)   North Europe

All settings →

Summary

Filter items...

NAME	RESOURCE GRO...	LOCATION	TYPE	SUBSCRIPT
iqrf-demo	IQRF	North Europe	Cloud ser...	Customer
iqrfsaclasic	IQRF	North Europe	Storage a...	Customer
iqrf-test	IQRF	North Europe	IoT Hub	Customer
iqrf	IQRF	North Europe	SQL server	Customer
iqrf	IQRF	North Europe	SQL data...	Customer
iqrfsa	IQRF	North Europe	Storage a...	Customer
iqrf-ext-temperature	IQRF	North Europe	Stream A...	Customer
iqrf-temperature	IQRF	North Europe	Stream A...	Customer

---

iqrf-temperature
Stream Analytics job

⚙ Settings   ▶ Start   ⬛ Stop   🗑 Delete

ℹ Running

Essentials ⌃   ☁ 👥 🏷

Resource group   Send feedback
IQRF   ✎ **UserVoice**

Status   Created
Running   sobota 21. května 2016 11:50:12

Location   Started
North Europe   sobota 21. května 2016 13:21:14

Subscription name   Last output
Customer demo   ✎ pondělí 23. května 2016 16:45:00

Subscription ID

All settings →

Job Topology   Add tiles ⊕

Inputs	Query	Outputs
1 ⊡	**< >**	**2** ⊡
input		PowerBI-avg
		sql

Monitoring   Add tiles ⊕

InputEvents, OutputEvents and one more metric past hour

Edit
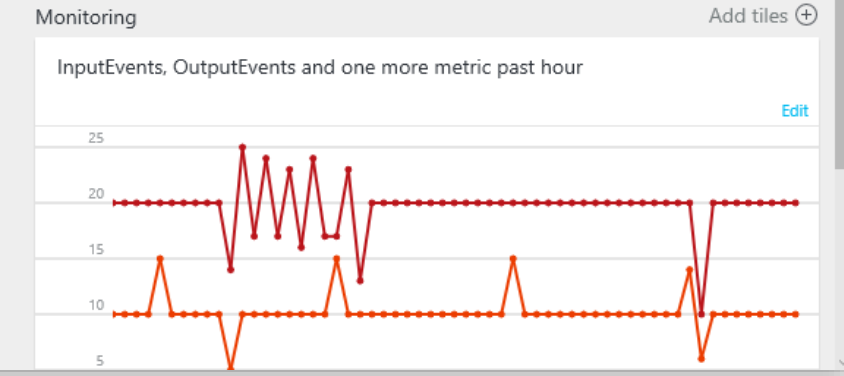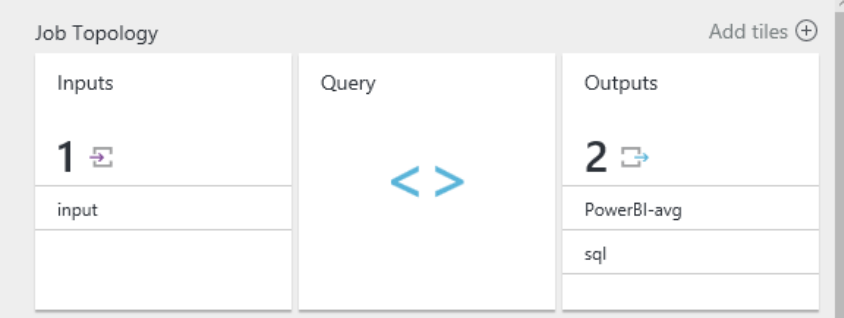
iqrf-temperature
Query

Save **Discard** **Test**

Need help with your query? Check out some of the most common Stream Analytics query patterns here.

```
 1  SELECT
 2      System.Timestamp as UtcTimeStamp,
 3      GatewayID,
 4      GatewayName,
 5      NodeID,
 6      Temperature
 7  INTO
 8      sql
 9  FROM
10      input TIMESTAMP BY UtcTimeStamp
11
12  SELECT
13      System.Timestamp as Time,
14      GatewayID,
15      GatewayName,
16      NodeID,
17      AVG(Temperature) as Temperature
18  INTO
19      [PowerBI-avg]
20  FROM
21      input TIMESTAMP BY UtcTimeStamp
22  GROUP BY
23      TUMBLINGWINDOW(minute, 15),
24      GatewayID,
25      GatewayName,
26      NodeID
```

Device Explorer

Configuration | Management | **Data** | Messages To Device

Monitoring

Event Hub: `iqrf-test`

Device ID: `0E238D8D-61E5-4B5C-9AFA-CE86EFEA2D7C`

Start Time: ☐ 05/24/2016 18:19:12

Consumer Group: `$Default`   ☐ Enable

[Monitor]   [Cancel]   [Clear]

Event Hub Data

Receiving events...
24. 5. 2016 18:19:23> Device: [0E238D8D-61E5-4B5C-9AFA-CE86EFEA2D7C], Data:
[{"UtcTimeStamp":"2016-05-24T16:19:23.6571574Z","GatewayID":"0E238D8D-61E5-4B5C-9AFA-CE86EFEA2D7C","GatewayName":"RPiIqrfGw","NodeID":1,"Temperature":4.0}]
24. 5. 2016 18:19:23> Device: [0E238D8D-61E5-4B5C-9AFA-CE86EFEA2D7C], Data:
[{"UtcTimeStamp":"2016-05-24T16:19:23.7691903Z","GatewayID":"0E238D8D-61E5-4B5C-9AFA-CE86EFEA2D7C","GatewayName":"RPiIqrfGw","NodeID":2,"Temperature":9.0}]
24. 5. 2016 18:19:23> Device: [0E238D8D-61E5-4B5C-9AFA-CE86EFEA2D7C], Data:
[{"UtcTimeStamp":"2016-05-24T16:19:23.8446534Z","GatewayID":"0E238D8D-61E5-4B5C-9AFA-CE86EFEA2D7C","GatewayName":"RPiIqrfGw","NodeID":3,"Temperature":-6.0}]
24. 5. 2016 18:19:23> Device: [0E238D8D-61E5-4B5C-9AFA-CE86EFEA2D7C], Data:
[{"UtcTimeStamp":"2016-05-24T16:19:23.9540175Z","GatewayID":"0E238D8D-61E5-4B5C-9AFA-CE86EFEA2D7C","GatewayName":"RPiIqrfGw","NodeID":4,"Temperature":0.0}]
24. 5. 2016 18:19:23> Device: [0E238D8D-61E5-4B5C-9AFA-CE86EFEA2D7C], Data:
[{"UtcTimeStamp":"2016-05-24T16:19:24.054542Z","GatewayID":"0E238D8D-61E5-4B5C-9AFA-CE86EFEA2D7C","GatewayName":"RPiIqrfGw","NodeID":5,"Temperature":24.0}]

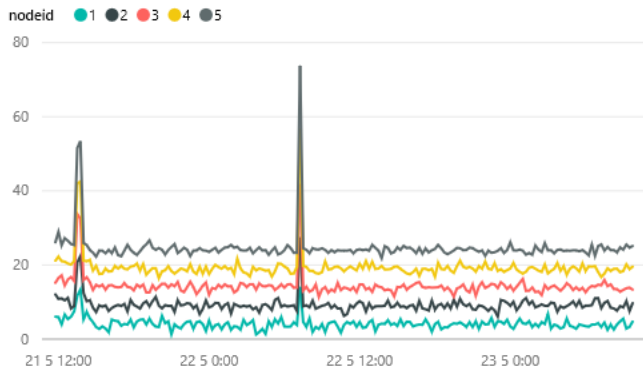Power BI — IQRF

Položte otázku související s vašimi daty.

IQRF - demo dashboard
WINDOWS DATA PROCESSING DEMO

Data are based on streaming analytics real-time processing done by Azure. Source data flow is from Raspberry Pi with equipped with IQRF module collecting data from IQRF mesh network.
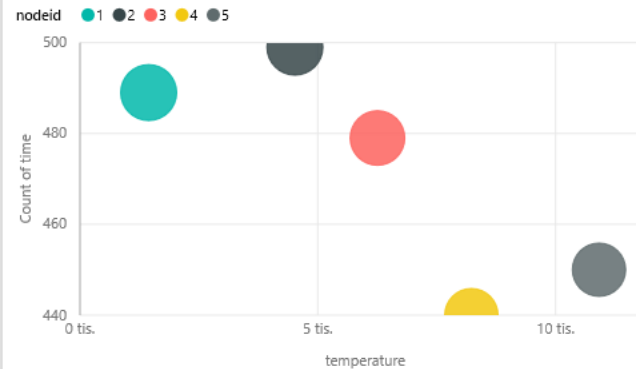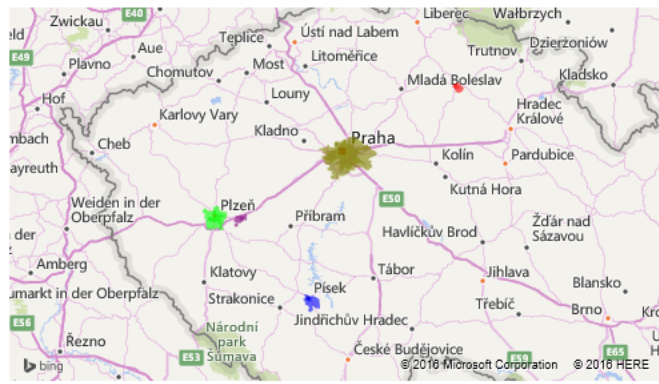
temperature
BY NODEID, TIME

nodeid ● 1 ● 2 ● 3 ● 4 ● 5

Count of time, tempdiff, temperature
BY NODEID

nodeid ● 1 ● 2 ● 3 ● 4 ● 5

Temperature
BY CITY

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Temperature, id
BY UTCTIMESTAMP, GATEWAYNAME, NODEID

GatewayNa...	RPIIqrfGw					
NodeID	1		2		3	
UtcTimeSta...	Temperature	id	Temperature	id	Temperature	
21.5.2016	7,00	654				
21.5.2016			11,00	655		
21.5.2016					15,00	
21.5.2016						
21.5.2016						
21.5.2016	6,00	659				
21.5.2016			12,00	660		
21.5.2016					16,00	
21.5.2016						
21.5.2016						
21.5.2016	7,00	664				
21.5.2016			11,00	665		
21.5.2016					16,00	
21.5.2016						
21.5.2016						
21.5.2016	5,00	669				

time, tempdiff, gatewayname, nodeid

| time	tempdiff	gatewayname	nodeid
21.5.2016	20,00	RPIIqrfGw	2
21.5.2016	21,00	RPIIqrfGw	2
21.5.2016	20,00	RPIIqrfGw	5
21.5.2016	20,00	RPIIqrfGw	5
21.5.2016	21,00	RPIIqrfGw	1
21.5.2016	20,00	RPIIqrfGw	1
21.5.2016	20,00	RPIIqrfGw	1
21.5.2016	20,00	RPIIqrfGw	1
21.5.2016	20,00	RPIIqrfGw	2
21.5.2016	22,00	RPIIqrfGw	2
21.5.2016	22,00	RPIIqrfGw	2
21.5.2016	19,00	RPIIqrfGw	1
21.5.2016	21,00	RPIIqrfGw	2
21.5.2016	20,00	RPIIqrfGw	3
21.5.2016	21,00	RPIIqrfGw	1
21.5.2016	19,00	RPIIqrfGw	3
21.5.2016	19,00	RPIIqrfGw	4

Přidat k oblíbeným   Sdílet

Microsoft IoT

Comprehensive solutions from device to cloud
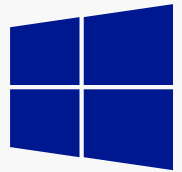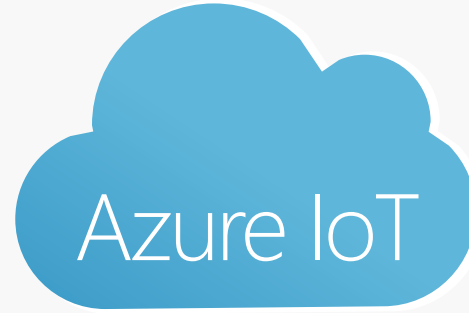
Windows ——— Azure IoT ———

IoT Editions Power a Broad Range of Devices	Cloud-Based IoT Services & Solutions
25 years of history in embedded devices	Easy to provision, use and manage
One Windows platform for all devices	Pay as you go, scale as you need
Enterprise-ready, OEM-ready, Maker-friendly	Global reach, hyper scale
Designed for today's IoT environments	End-to-end security & privacy
Scalable solutions from free Windows IoT Core to Windows IoT Enterprise on PC-Like Devices	Windows, Mbed, Linux, iOS, Android, RTOS support