

STM32 with Azure IoT Cloud Portfolio with Demo

Shailendra Miglani/James Yun
Sr. Technical Specialist
2022.08.01



Agenda

- IoT Potential and Challenges
- IoT Product Portfolio
- Azure IoT Hub and Device Provisioning Service
- Demo- STM32F7 to IoT Hub and Device Twin (C2D Messages)
- Demo – STM32F7 to Device Provisioning Service
- IoT Central/PnP device
- Demo
- Secure IoT Central
- ADU
- Next Steps – Call to Action (Azure for Students)

IoT can unlock great business impact



\$100 million
average increase in operating
income among more digitally
transformed enterprises¹



90% of organizations now
consider IoT as **critical to the
overall success** of their business⁶



80% of companies have
increased revenue as a result
of IoT implementation³



56% of organizations
improve **efficiency and
productivity** with IoT⁴



49% of organizations
improve **product or service
quality** with IoT⁵

Customers face many challenges



TOO COMPLEX
TO SCALE

43%

are overwhelmed
by options



LACK OF EXPERTISE OR
INFRASTRUCTURE

90%

lack partners
to help



NO END-TO-END PLAN
FOR ADOPTION

100%

don't have a
comprehensive plan



SECURITY
CONCERNS

91%

worry about
security issues

Industry leading IoT product portfolio & partner ecosystem

End-to-end security

IoT priority verticals



Manufacturing



Energy



Smart Cities



Transportation



Healthcare



Retail



Telco

IoT Solutions

Azure IoT Central (SaaS)

Dynamics Connected Store (SaaS)

Dynamics Connected Field Service (SaaS)



Azure Defender for IoT

Azure Services for IoT

Azure IoT Hub
 Azure IoT Hub Device Provisioning Service
 Azure Digital Twins
 Azure Time Series Insights
 Azure Maps

Azure Stream Analytics
 Azure Cosmos DB
 Santa Cruz Service
 Azure Cognitive Services
 Azure AI/ML
 Azure Logic Apps

Azure Active Directory
 Azure Monitor
 Azure DevOps
 Power BI
 Azure Data Share
 Azure Spatial Anchors

IoT & Edge device support

Azure RTOS
 Azure Sphere
 Azure IoT Device SDK
 Azure IoT Edge
 Azure Stack Edge

Windows IoT
 Azure Certified for IoT—Device Catalog
 Azure Stream Analytics
 Azure Storage

Azure ML
 Azure SQL
 Azure Functions
 Azure Cognitive Services

Azure devices and appliances

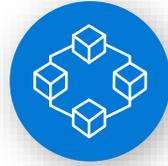
Azure Percept
 Azure Stack Edge

Azure IoT Hub



Bi-directional communication

- Millions of Devices
- Multi-language, open-source SDKs
- HTTPS/AMQPS/MQTT
- Send Telemetry
- Receive Commands
- Device Management
 - Device Twins
 - Queries & Jobs



Enterprise scale & integration

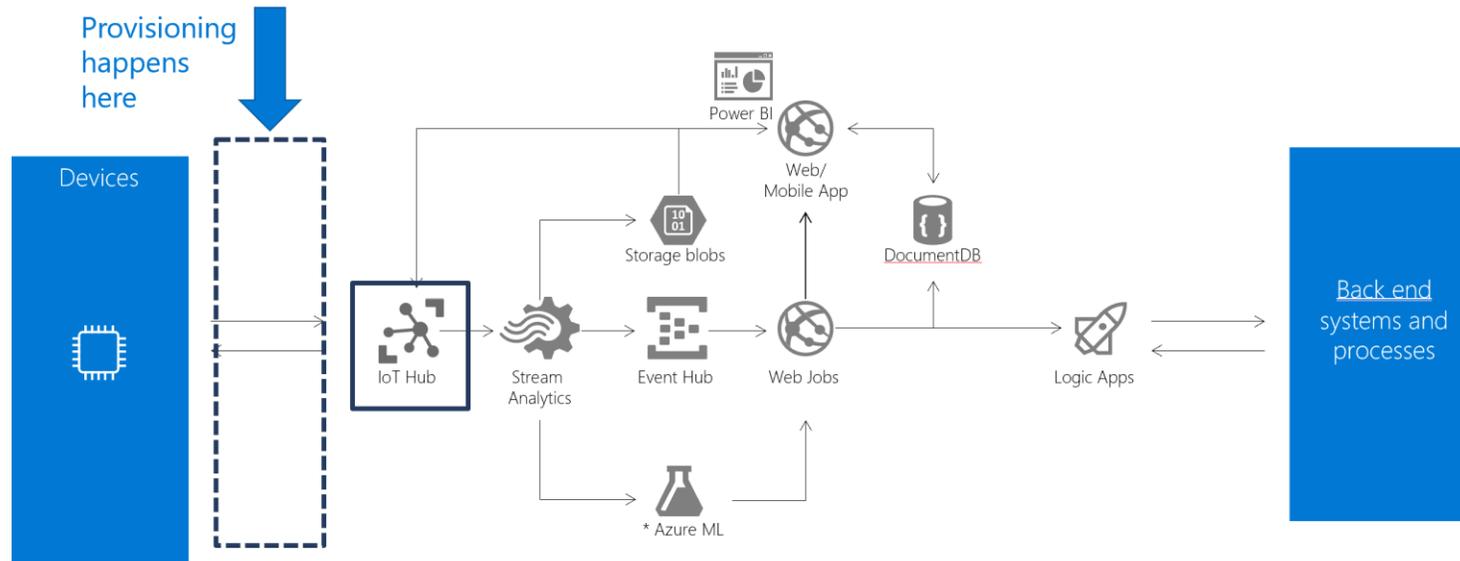
- Billions of messages
- Scale up and down
- Declarative Message Routes
- File Upload
- WebSocket's & Multiplexing
- Azure Monitor
- Azure Resource Health
- Configuration Management



End-to-end security

- Per Device Certificates
- Per Device Enable/Disable
- TLS Security
- X.509 Support
- IP Whitelisting/Blacklisting
- Shared Access Polices
- Firmware/Software Updates

Azure Device Provisioning Service



- Simplify with zero touch provisioning
- Supports multiple locations
- Easiest way to mass-provision devices
- URL stability
- Enhanced security through HSM
- For any device compatible with IoT Hub
- Remove human error
- Minimize manual connection requirements
- Multitenancy support



Table with 2 columns: Category, Value. Includes rows for Industry, IoT Hub, and Device Provisioning.



Azure Device Catalog

<https://devicecatalog.azure.com/>



32F746GDISCOVERY

Device class: **Sensor**
Geo Availability: **Worldwide**
Target industries: **Manufacturing, Healthcare, Smart Buildings**
Device type: **DevKit**
Operating Systems: **Azure RTOS**



Shop 1 distributor(s)

The 32F746GDISCOVERY Discovery kit is a complete demonstration and development platform for STMicroelectronics Arm® 32F746GDISCOVERY Discovery kit is used as reference design for user application development before porting to the final or applications taking benefit from audio, multi-sensor support, graphics, security, video and high-speed connectivity features. specialized add-on boards The 32F746GDISCOVERY board is provided with the STM32CubeF7 MCU package, which offers an

Links
Get started guide Manufacturer's page Source code

Device specifications

Device class: **Sensor**
Device type: **DevKit**
Operating Systems: **Azure RTOS**
Geo Availability: **Worldwide**
Operating conditions: **IP XX**

github.com/azureml/rtos

Azure RTOS - Additional samples

This repository hosts additional samples for Azure RTOS.

Embedded IDE samples

You can find Embedded IDE (AI) Workbench and semi-IDE sample projects in addition to the contents in the getting-started repository. Each board-specific sample project contains a series of projects that cover Azure RTOS components (ThreadX, Next Duo, GUI, FileX and USB) as well as connecting to Azure IoT samples using Azure IoT Middleware for Azure RTOS depending on the actual capability of the board.

The following ZIP files can be downloaded from the release associated with this repository or the direct links

Company	Devkit	Samples
Microchip	ATS44ES4-APPD	VR / MPLAB
NXP	M1030T1060-EUK	VR / MCOIExpress
STMicroelectronics	STM32F746G-DISCO	VR / STM32CubeIDE
STMicroelectronics	B-4535-IC010A	VR / STM32CubeIDE
STMicroelectronics	B-4595-H0702A	VR
Renesas	R0824 Cloud Kit	VR / e² studio COEX / e² studio GNURX
Renesas	R021 FSX	VR / e² studio
Renesas	R0130 Target Board	VR / e² studio COEX / e² studio GNURX
Renesas	R0624 FSX	VR / e² studio COEX / e² studio GNURX
Renesas	RSK R0661	e² studio COEX / e² studio GNURX
Renesas	R0671 FSX	VR / e² studio COEX / e² studio GNURX

White
Black

- ARM Cortex-M7
- ARM Cortex-M4
- ARM Cortex-M3
- ARM Cortex-M0
- ARM Cortex-M0+
- ARM Cortex-M23
- ARM Cortex-M33
- ARM Cortex-M55
- ARM Cortex-M85
- ARM Cortex-M85P
- ARM Cortex-M85R
- ARM Cortex-M85S
- ARM Cortex-M85T
- ARM Cortex-M85U
- ARM Cortex-M85V
- ARM Cortex-M85W
- ARM Cortex-M85X
- ARM Cortex-M85Y
- ARM Cortex-M85Z
- ARM Cortex-M85AA
- ARM Cortex-M85AB
- ARM Cortex-M85AC
- ARM Cortex-M85AD
- ARM Cortex-M85AE
- ARM Cortex-M85AF
- ARM Cortex-M85AG
- ARM Cortex-M85AH
- ARM Cortex-M85AI
- ARM Cortex-M85AJ
- ARM Cortex-M85AK
- ARM Cortex-M85AL
- ARM Cortex-M85AM
- ARM Cortex-M85AN
- ARM Cortex-M85AO
- ARM Cortex-M85AP
- ARM Cortex-M85AQ
- ARM Cortex-M85AR
- ARM Cortex-M85AS
- ARM Cortex-M85AT
- ARM Cortex-M85AU
- ARM Cortex-M85AV
- ARM Cortex-M85AW
- ARM Cortex-M85AX
- ARM Cortex-M85AY
- ARM Cortex-M85AZ

IoT Central/PnP device