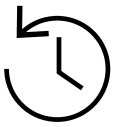
Microsoft Intelligent Cloud and Edge Solutions

Microsoft for Edge Applications

The emergence of cloud infrastructure is fundamentally altering how businesses conceive and execute products. The impact of continuous connectivity and on-demand scale are enabling a new generation of connected products. From the network edge to the cloud, new business models that capitalize on novel value-added services, that simultaneously open new modes for humans to interact with machines are coming to the fore. While many choices and infrastructure options are available for customers to build an end-to-end connected product, the optimal choice involves a combination of strong cloud ecosystems, secure, reliable infrastructure, and rapid business enablement.

Microsoft Azure is now an established option for customers with its comprehensive feature sets aimed at offering cost-effective flexibility and scale along with a fast time to market. Azure infrastructure is particularly effective in IoT related product lines as it enables product deployment and services management from the farthest node to the central hub.



Productive

- Deploy in minutes
- Build on open-source innovation
- Strong ecosystem of partners and solutions

Hybrid

- Devices, OS, and protocols
- Deploy cloud logic to the edge
- Connect only when needed

Intelligent

- Intelligent analytics
- Spatial and edge intelligence
- Time-series data

Trusted

- Provision and manage IoT devices
- Build enterprise ready IoT solutions
- Built-in security features

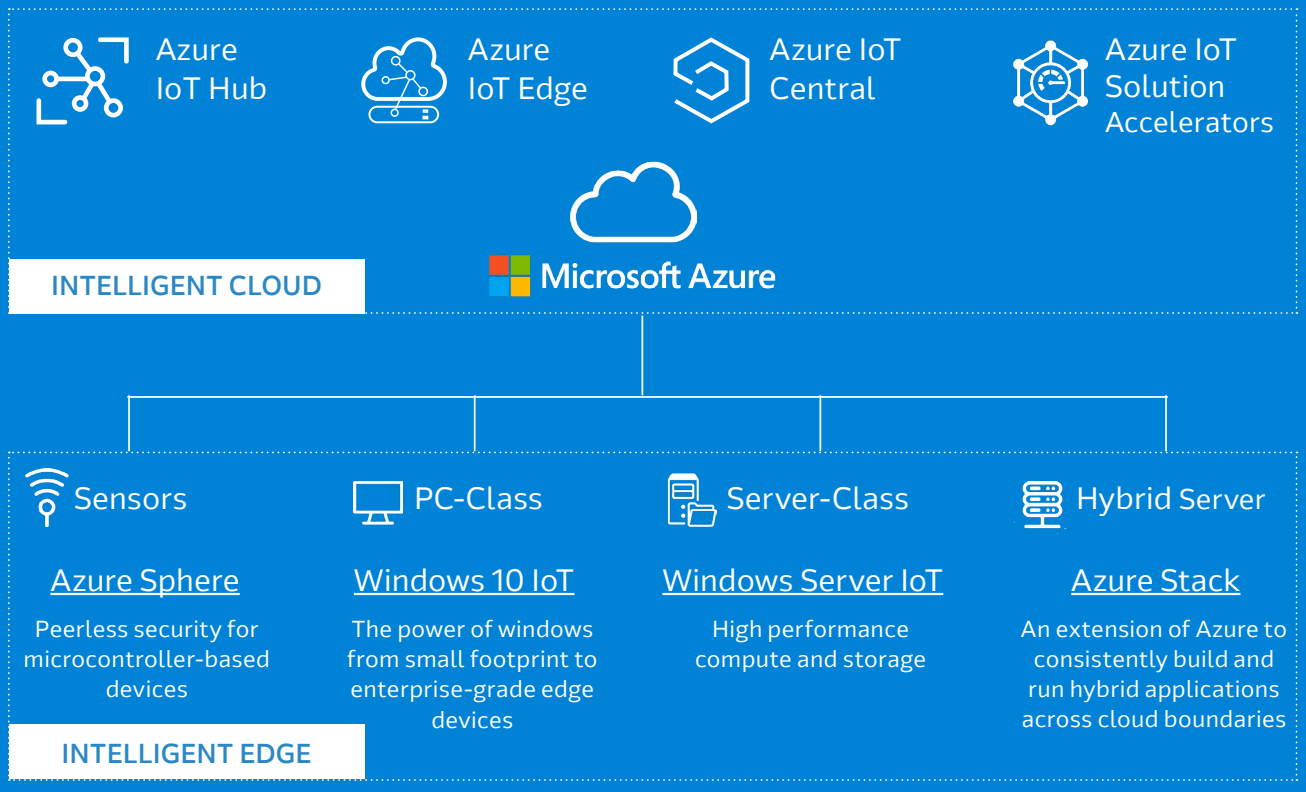
Microsoft IoT Products and Services Overview

Microsoft Solutions take the power of the cloud down to the edge to respond, reason, and act in real time even in areas with limited or no connectivity. With Azure, cloud, and edge applications are built as a single solution and yet run in a distributed fashion – optimized to take advantage of both robust cloud capabilities and edge localization.

The intelligent edge is continually expanding into a set of connected systems and devices that gather and analyze information close to the physical world. Using data to deliver real-time insights and immersive experiences that are highly responsive and contextually aware is key differentiation separating IoT winners and losers. Microsoft brings the Intelligent Edge and Intelligent Cloud together, with AI running across all systems to deliver smart, seamless, and secure IoT insights.

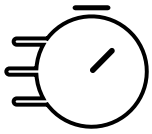
Watch Video:
Thyssenkrupp Embarks on a Digital Transformation Adventure.

Comprehensive Overview of Microsoft IoT Offerings



Windows IoT: The Foundation for Intelligent Edge

Windows IoT simplifies the Internet of Things by powering smart devices that bring intelligence to the edge and the cloud for deeper insight. Now you can harness data that empowers employees, drives customer engagement, unlocks new products and business models and streamlines operations in the most secure way.



Fast Time-to-Market

- The most complete and best integrated Azure IoT support
- The Visual Studio dev experience
- A complete platform (e.g. retail peripherals, built-in connectivity)

Edge-Ready

- Modern, familiar UI development with UWP
- NUI (e.g. ink, voice, and gesture) and world-sensing support
- Great support for Azure IoT Edge

Secure

- Turnkey platform security that's always up to date
- Device and app update services that give control to partners and customers

Benefits of Win 10 IoT Ent LTSC vs Win 10 Pro

	Windows 10 Professional (SAC)	Windows 10 IoT Enterprise (LTSC)
Channel	Direct OEM + OEM system builder	OEM IoT Embedded
Target device	General use computer	Dedicated IoT Appliance
Licensed by	Physical computer	Processor w/3 Price tiers
Pricing	High end	High end, value, entry
Life cycle	Short	Long
Support cycle	18 to 30 months	10 Years
Windows update	Forced	Controlled
Update type	Features & quality	Quality only
Re-imaging rights	Not included	Included
External recovery	Not allowed	Allowed
Global shipments	Limited	Unlimited
Customization	Limited	Unlimited
Real-time	No	No
Product key	Unique	Single

Windows 10 IoT Enterprise

Windows 10 IoT Enterprise is a full version of Windows 10 that delivers enterprise manageability and security to IoT solutions. Windows 10 IoT Enterprise shares all the benefits of the world-wide Windows ecosystem. It is a binary equivalent to Windows 10 Enterprise, with the same development and management tools as client PCs and laptops.

Watch Videos:

- What is Windows 10 IoT Enterprise LTSC 2019?
- Get Started with Windows 10 IoT Enterprise LTSC 2019.

Windows Server IoT 2019

As IoT solutions become more complex, they require more computing power, storage, and connectivity. Fixed function appliances using Windows Server IoT 2019 can handle big workloads, like analyzing multiple video streams, and can use the results locally or send them to the cloud. With advanced security, high availability, and manageability, Windows Server IoT 2019 enables faster innovation with modern container technologies managed by Azure IoT Edge.

Benefits of Windows Server IoT 2019 include:

- Aggregates data from a large number of 'things'
- Stores and analyzes very big databases to discover valuable business insights
- Advanced security and resiliency features
- Leverages the Azure cloud hosting containers managed by Azure IoT Edge

Watch Video:

Windows IoT Server 2019 Roadmap Features Part Numbers

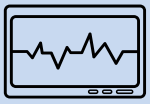
Windows IoT Core

Built for small, secure, smart devices, Windows 10 IoT Core is a version of Windows 10 that is optimized for smaller devices with or without a display that runs on both ARM and x86/x64 devices. Windows 10 IoT Core Services is a subscription that provides 10 years of operating system support along with services to manage device updates and assess device health.

Long-term Servicing Channel (LTSC) 2019 for Fixed-Function Devices

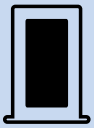
Provides 10 years of support (through 2029) for Windows 10 IoT Enterprise and Windows Server 2019 Operating Systems.

Ideal for fixed-function devices such as PCs that control medical equipment, point-of-sale systems, digital signage systems, ATMs, and industrial control systems that require a longer services option.



Medical equipment

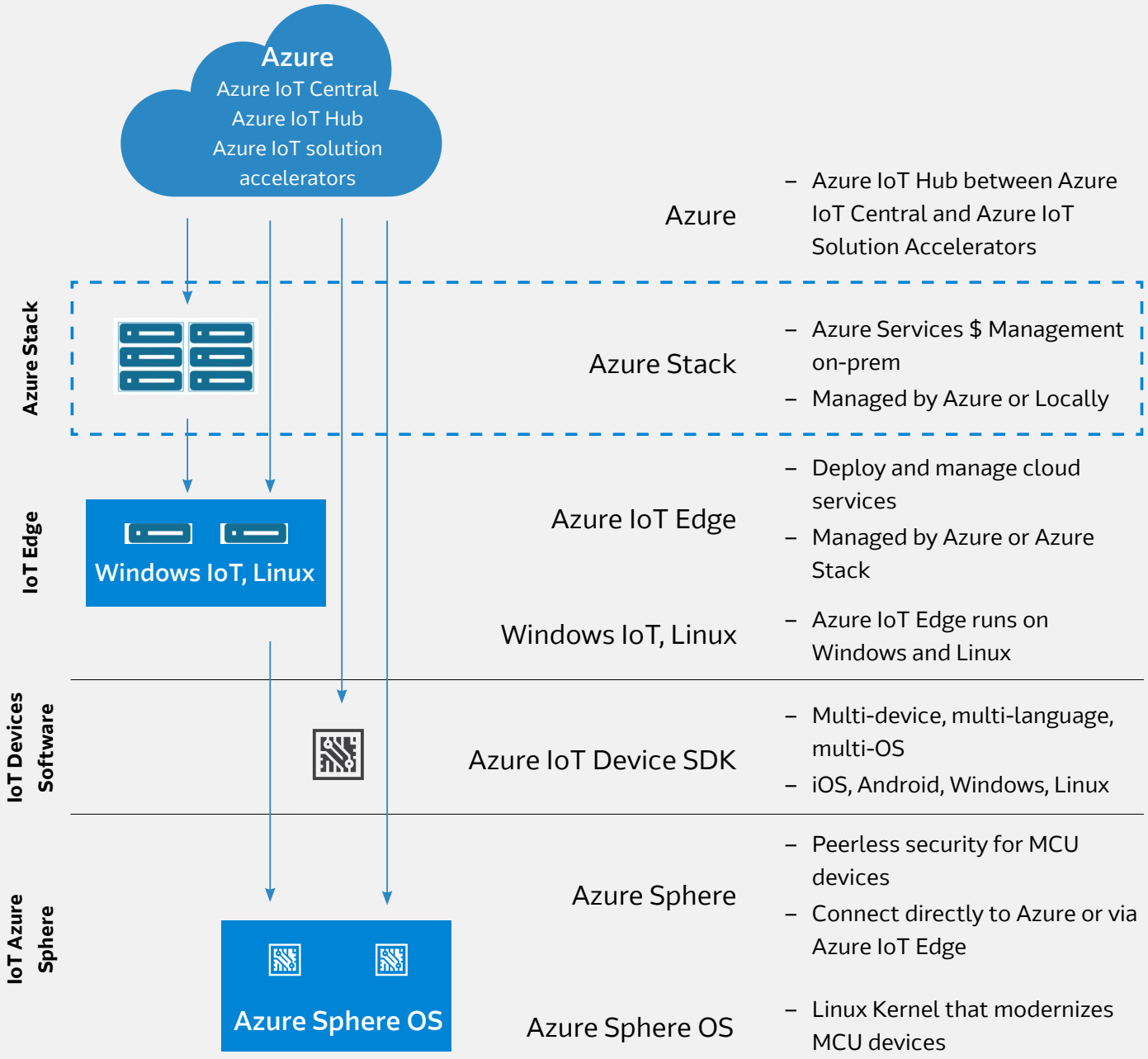
Point-of-sale



Digital signage

ATMs

Intelligent Edge using Microsoft Windows IoT Operating System and the Microsoft Azure Platform



Azure Sphere

Azure Sphere is a secure, high-level application platform with built-in communication and security features for internet-connected devices. It comprises an Azure Sphere Micro-controller Unit (MCU), tools, and an SDK for developing applications, and the Azure Sphere Security Service, through which applications can securely connect to the cloud and web.

Security capabilities include:

- Protects every device
- Prevents malicious actors from taking control of devices or compromising data
- Keeps devices secured as new threats emerge
- Restores the health of compromised devices with automated updates
- Only runs signed and authentic software

Azure Sphere builds on decades of Microsoft experience in hardware, software, and cloud to provide a turnkey solution for IoT devices.

- Certified chips from hardware partners have built-in Microsoft security technology to provide connectivity and a dependable hardware root of trust
- OS adds layers of protection and ongoing security updates to create a trustworthy platform for new IoT experiences
- Security Service brokers trust for device-to-cloud communication and detects emerging threats by continually renewing device security

Azure Stack

Azure Stack is an extension of Azure that provides a way to run apps in an on-premises environment and deliver Azure services. With a consistent cloud platform, organizations can confidently make technology decisions based on business requirements, rather than business decisions based on technology limitations.

Azure Stack is built on industry-standard hardware and enables consistent DevOps processes as it is managed with the same tools used for managing Azure subscriptions. The Azure Stack architecture provides Azure services at the edge for remote locations or with intermittent or no connectivity. Hybrid solutions that process data locally in Azure Stack and then aggregate it in Azure for additional processing and analytics are also enabled. Azure Stack makes it easy to meet specific regulatory or policy requirements as it affords the flexibility of deploying cloud apps on-premises without changing any code.

Core to the Azure Stack is a set of industry-leading capabilities:

- An integrated delivery experience with purpose-built Azure Stack integrated systems from trusted hardware partners
- Straightforward integration into datacenters with system center operations manager management pack or Nagios extension
- Flexible identity management using Azure Active Directory (Azure AD) for Azure and Azure Stack hybrid environments
- An Azure-consistent app development environment to maximize developer productivity and enable common DevOps approaches across hybrid environments

Microsoft Azure: The Foundation for Intelligent Cloud

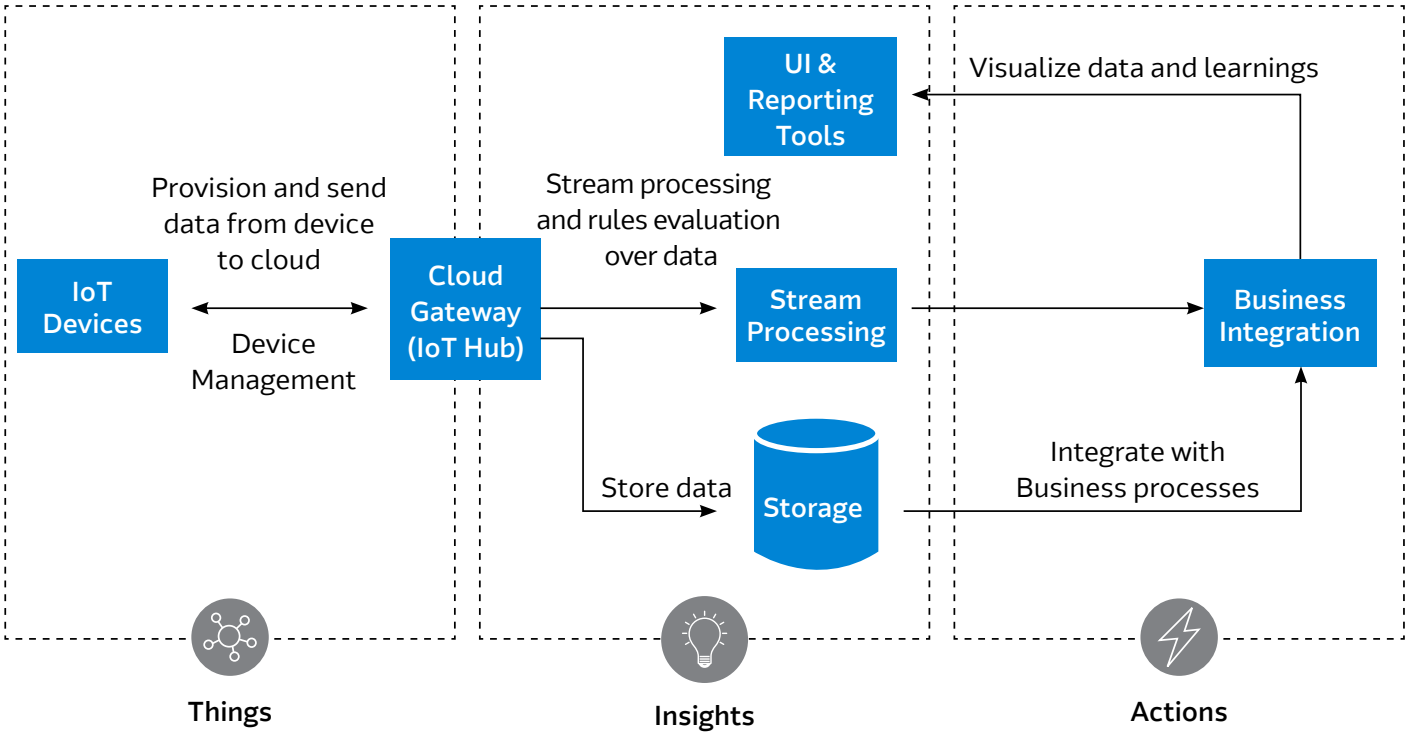
Azure IoT Hub

Azure IoT Hub is the core Azure Platform as a Service (PaaS) that supports reliable and secure bidirectional communications between millions of IoT devices and a cloud solution. Azure IoT Hub helps developers meet IoT implementation challenges like:

- High-volume device connectivity and management
- High-volume telemetry ingestion
- Command and control of devices
- Device security enforcement

Azure IoT Hub enables building IoT applications with two-way communication

- Enables highly secure and reliable communication between the IoT application and the devices it manages
- Cloud-hosted solution backend to connect virtually any device
- Facilitates IoT solution extensions from the cloud to the edge with per-device authentication, built-in device management, and scaled provisioning



Azure IoT Central

Azure IoT Central is a fully managed IoT Software as a Service (SaaS) solution that uses a model-based approach to building enterprise-grade IoT solutions without requiring expertise in cloud-solution development.

Features include:

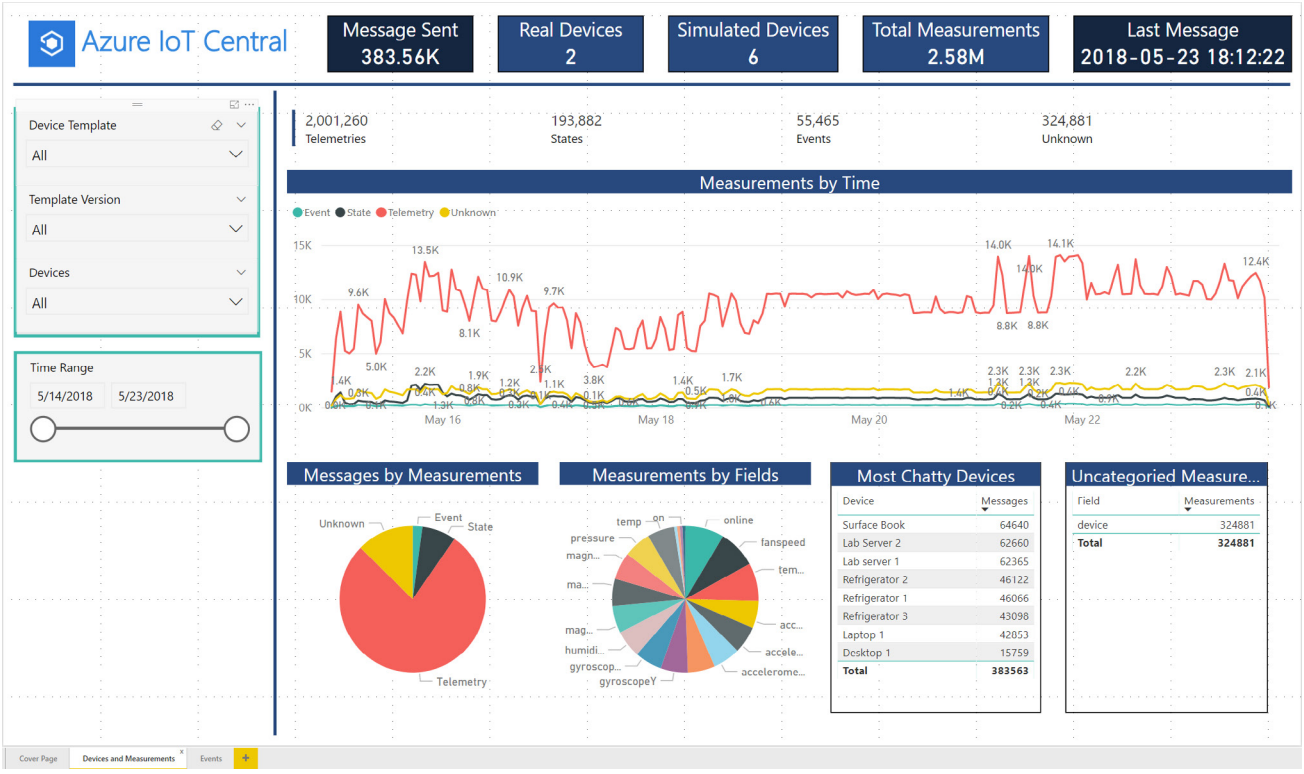
- Fully hosted and managed by Microsoft
- No cloud development expertise required
- Device connectivity and management
- Monitoring rules and triggered actions
- Extensibilities (Flow, Dynamics, Webhooks, etc.)
- Analytics, dashboards, and visualization
- Risk-free trial with simplified pricing

Azure IoT Central is a hosted, extensible Software as a Service(SaaS) platform that simplifies the setup of IoT solutions.

- Enables easy connectivity, monitoring, and management of IoT assets at scale
- Reduces the burden and costs of IoT management, operations, and development
- Provides the infrastructure to deploy superior products and services with pay-as-you-go business models
- Full hosting and management by Microsoft obviate the need for cloud expertise
- Device connectivity and management, monitoring rules and triggered actions are built-in
- Risk-free trial and simplified pricing allows customers to pay for only what they need

Watch Video:

Azure IoT Central Intro Walkthrough



Azure IoT Edge

Azure IoT Edge is an Internet of Things (IoT) service that builds on top of IoT Hub. This service is ideal for solutions that need to analyze data on edge nodes or devices, instead of in the cloud. By moving parts of the workload to the edge, devices can spend less time sending messages to the cloud and react more quickly to events.

Azure IoT Edge is a fully managed service built on Azure IoT Hub.

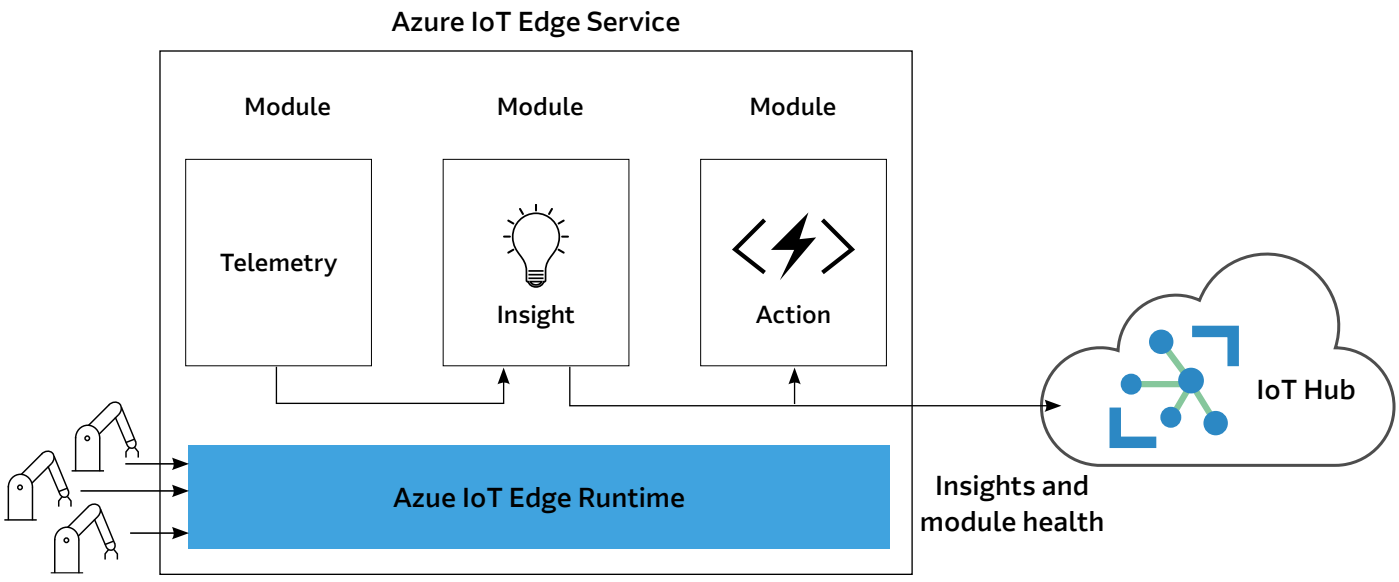
- Deploy cloud workloads - Artificial intelligence, Azure and third-party services, or your own business logic - to run on Internet of Things (IoT) edge devices via standard containers
- By moving certain workloads to the edge of the network, devices spend less time communicating with the cloud, react more quickly to local changes and operate reliably even in extended offline periods

Azure IoT Edge is made up of three components:

- **IoT Edge modules** are containers that run Azure services, third-party services, or your own code. Modules are deployed to IoT Edge devices and execute locally on those devices.
- **The IoT Edge runtime** runs on each IoT Edge device and manages the modules deployed to each device
- **A cloud-based interface** enables you to remotely monitor and manage IoT Edge devices

Watch Video:
Azure IoT Edge

Azure IoT Edge Components



Microsoft IoT Solution Accelerators

Azure IoT solution accelerators are an enterprise-grade collection of solution accelerators built on Azure Platform as a Service (PaaS) that help accelerate the development of custom IoT solutions.

IoT solution accelerators are complete, ready-to-deploy IoT solutions that implement common IoT scenarios. The source code for all the solution accelerators is open source and is available in GitHub. The code can be downloaded and customized for specific requirements.

Microsoft IoT solution accelerator benefits:

- Accelerates custom solutions
- Open-source & fully customizable
- Device connectivity and management
- Dashboards, visualizations, and insights
- Built on the Azure IoT reference architecture

IoT Solution accelerators are available for:

- Azure IoT for remote monitoring
- Azure IoT for device simulation
- Azure IoT for connected factory
- Azure IoT for predictive maintenance

Microsoft Cloud Services Through Arrow

Expertise Portfolio

- Advisory, architecture and general expertise catered to the needs of OEMs and ISVs
- Cloud assessments services — Match business needs with cloud strategy and assess cloud deployment readiness
- Tier 1 support and escalation path
- Engineering services — assess, design migrate and manage. Beyond the cloud, Arrow provides HW, OS, integration services and cloud storage services
- Onsite business model workshop with senior stakeholders to assist with defining value proposition and key activities to get ready

Benefits of Arrow as a CSP

- No terms
- No minimum commitment
- Azure consumption management
- Billing and support

Cloud Development Services

- Migration services
- Readiness assessment
- Design & architecture
- Implementation

Cloud Operations Services

- Operations management
- Services integration
- Performance optimization
- Security & disaster recovery
- Cost analysis & optimization
- Infrastructure managed services

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Arrow Electronics, Inc.
9201 East Dry Creek Road
Centennial, CO 80112 USA

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