



inovex

Meetup: Azure

Azure IoT Edge

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Karlsruhe, 12 March 2019



Maximilian Bischoff

Cloud Platform Engineer

- Team ITO since 2018
- Kubernetes stuff
- Cloud technologies
- Been a little on edge recently

What about you?

A hand is holding a white rectangular sign with a black border. The sign has the words "STAY" and "FOCUSED" printed on it in a light blue, sans-serif font. A solid blue horizontal bar is overlaid across the middle of the sign, and the word "Motivation" is written in white, sans-serif font on this bar. The background is a blurred, grayscale image of a natural landscape with trees and hills. In the bottom left corner, there is a dark gray geometric shape consisting of several overlapping triangles.

Motivation



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Hundreds of Enterprise Services Reportedly Hit by AWS Outage

By David Ramel • 03/05/2018

Hundreds of critical enterprise services were reportedly affected by an Amazon Web Services Inc. (AWS) outage on Friday.

The service interruption occurred in the cloud platform's AWS-East Region (Ashburn) region and centered on the Direct Connect service, which AWS offers in order to "provide a more consistent network experience than Internet-based connections."

"There was a loss of power to one of AWS's redundant Internet connection points in Virginia that created connectivity issues for a small number of AWS customers who are using Direct Connect services in AWS US East," an Amazon spokesperson said. "AWS resolved the issue and is working with its partner to prevent recurrence."

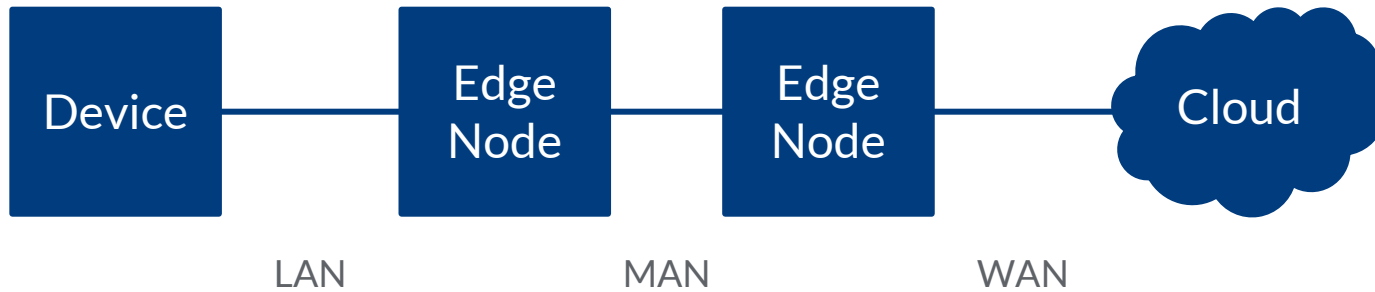


Issues with IoT + Centralized Cloud

- Bandwidth usage
 - expensive
 - slow/limited
- Latency
- Connectivity
 - Moving devices

Edge Computing

Solution



Cloud



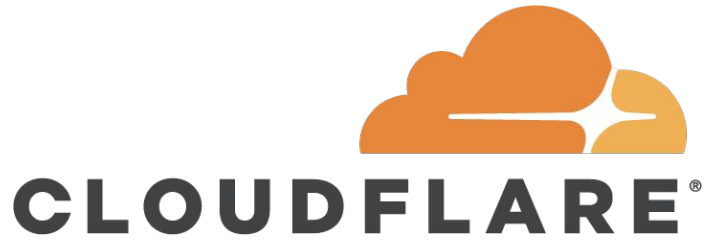
Edge Devices



Use Cases

- Smart Factory -> Edge Node / Building instead of permanent cloud connectivity, compute power does not have to be in devices
- Connected cars -> sharing alerts about hazards with low latency (no peer-to-peer & on-car-computing required)
- Aggregating data from multiple dumb sensors that only speak Bluetooth, send only important data to the cloud

Wait, That already exists! Cloudflare
does it since forever...

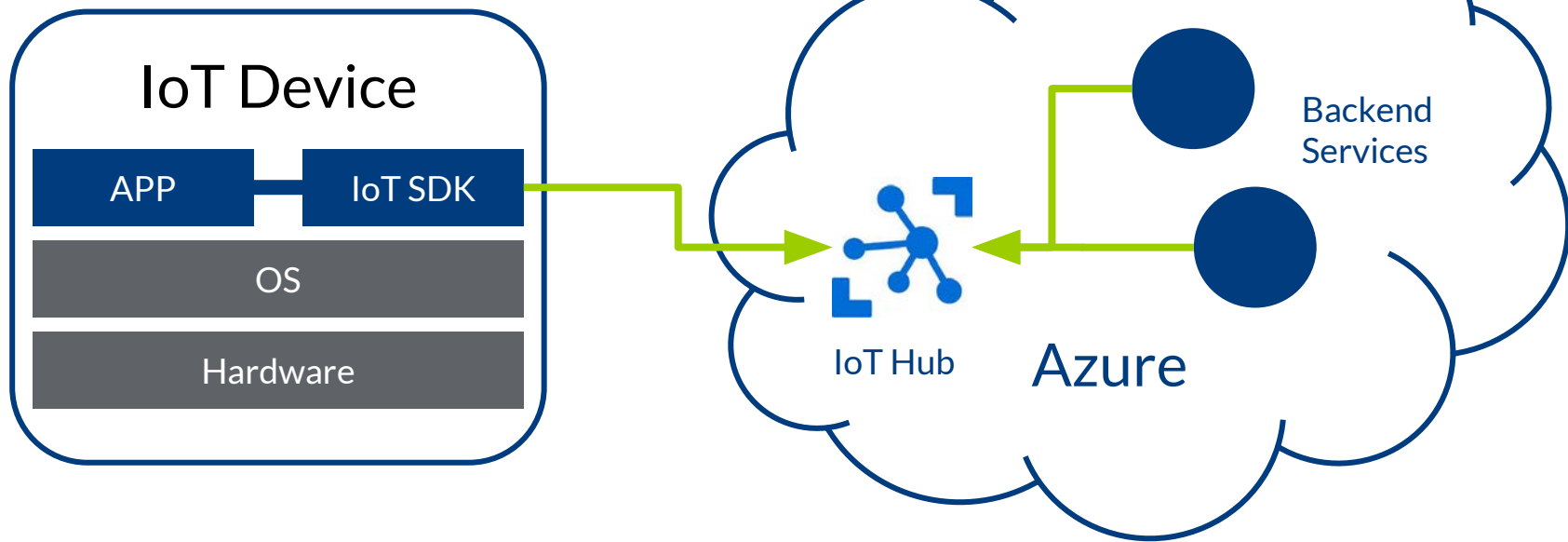




Azure IoT Edge

About

- Extension of Azure IoT Framework
- Management of Modules (Docker images / containers)
- Communication Proxy for IoT Hub



IoT Edge Device

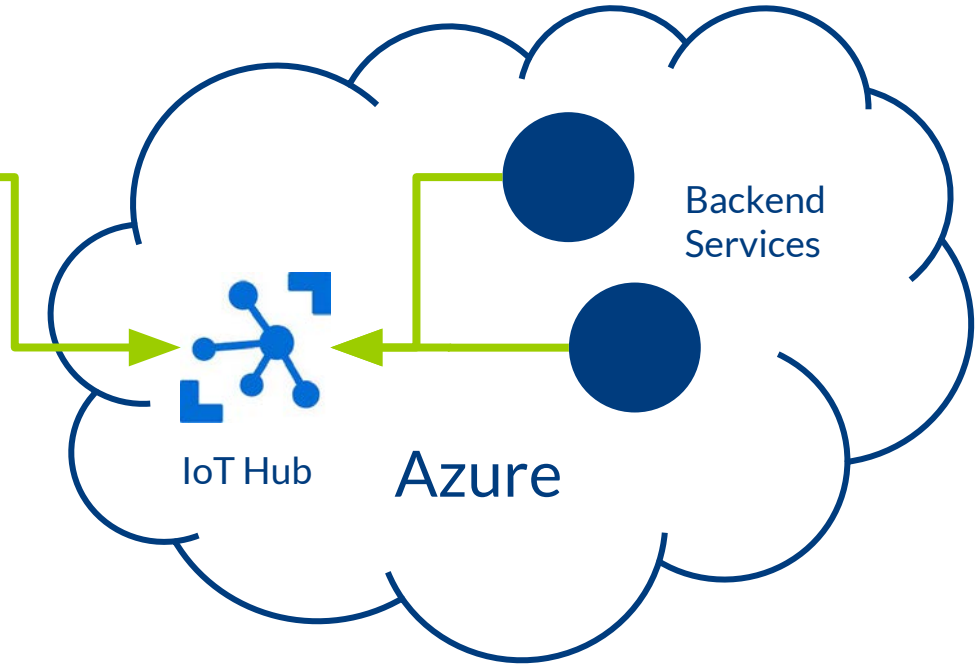
Edge Agent

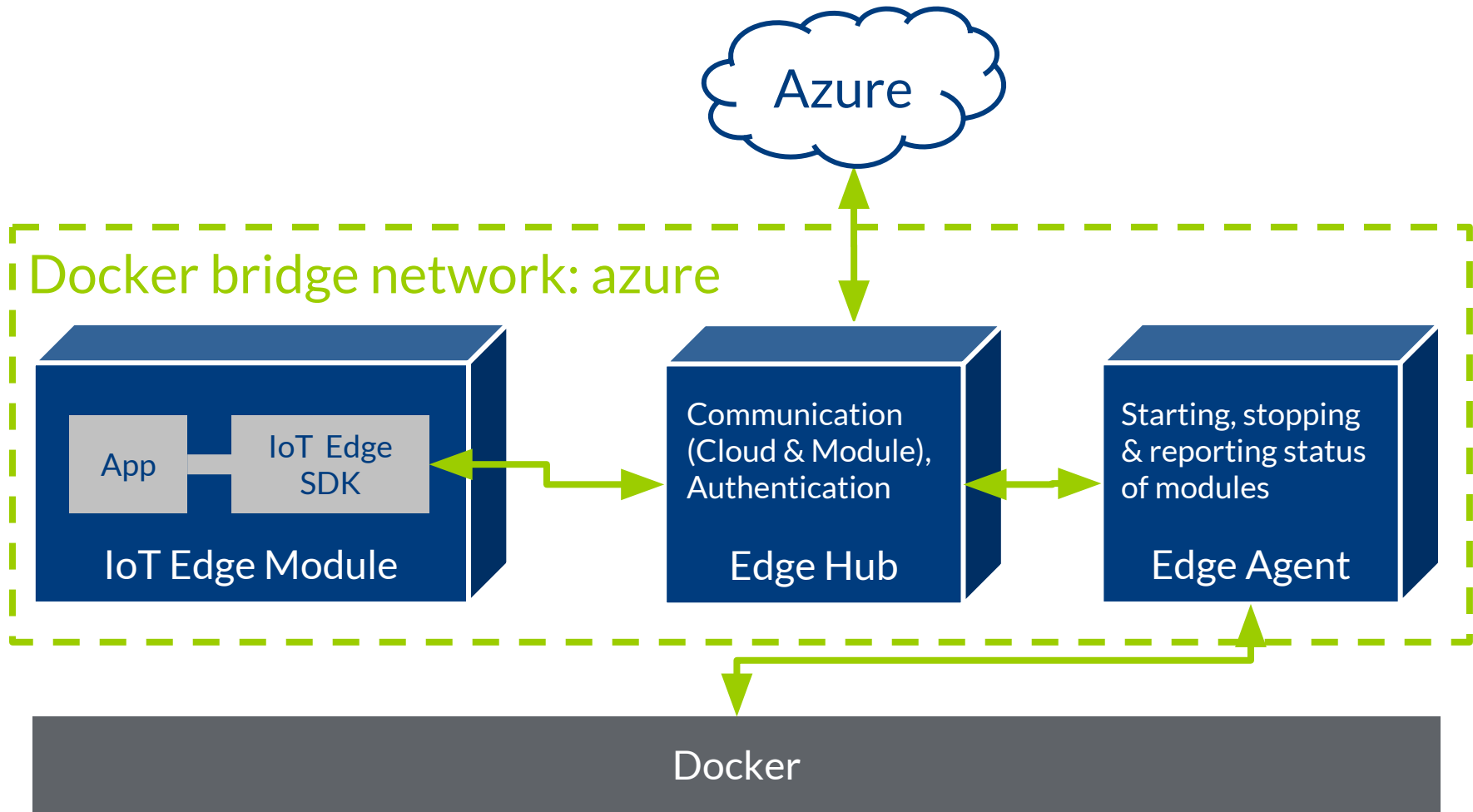
Edge Hub

Docker

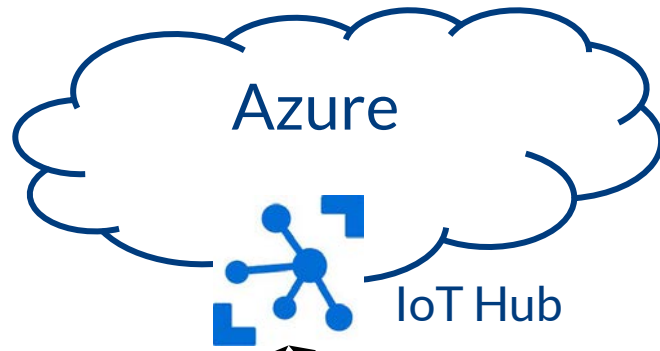
OS

Hardware





Cloud



Edge Nodes



Edge Devices



Security

- Standards (e.g. MQTT/AMQP with TLS)
- Authentication (Certificate based for Edge nodes, tokens/certificates for devices)
- Authorization -> Privileges for devices/modules must be explicitly granted
- Support for hardware security (e.g. TPM)

Integrations

as advertised

- Azure Stream Analytics on IoT Edge
- Custom Vision (preview)
- Azure Functions
- Azure SQL Database

-> Some integrations for Container based services

Pricing

IoT Hub edition type	price per unit (per month)	total number of messages/day per unit
Free	Free	8,000
S1	\$25	400,000
S2	\$250	6,000,000
S3	\$2,500	300,000,000

Azure IoT Edge

Strengths & Weaknesses

- + Easy deployment onto remote devices
- + Built-in security
- + Support for MQTT & AMQP -> Open standards
- + Offline functionality (preview)

- No module to module (downstream) communication
- HTTPS not supported atm, still under development
- Deployments must be complete, no built-in patching

Thank you

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