IT4893 Internet of Things: Applications and Security

Module 2 IoT Architecture

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Is IoT even a new thing?

- **Depending on who you ask, IoT is either:**

Nothing new

"We've been doing this for 40 years"

A unicorn

Magic, and will soon change everything.

Command and control scenarios have much in common with some parts of IoT

But falling hardware costs, cloud services and relatively ubiquitous communications do enable new approaches

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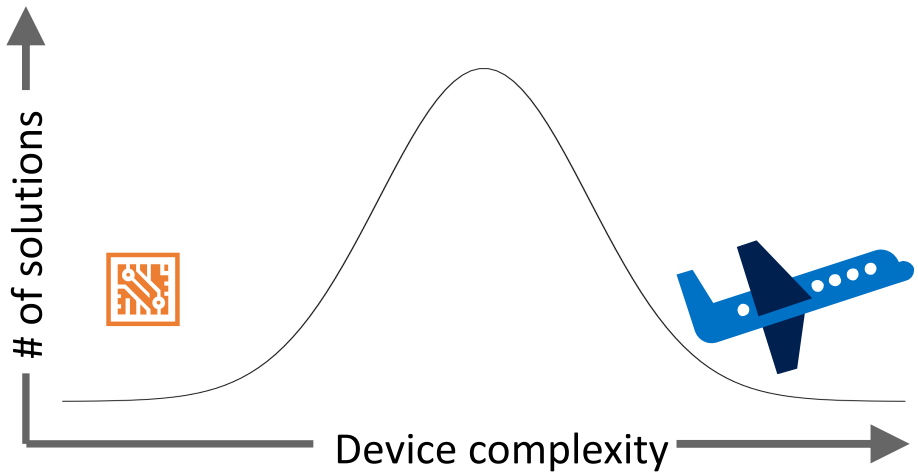
IoT solutions until now

- Most of the early successful IoT deployments were either…
- For very complex and expensive devices, where the cost of a custom hardware/software solution is acceptable compared to the cost of the device, or…
- For high-volume, homogeneous devices, where the software needs are relatively simple..



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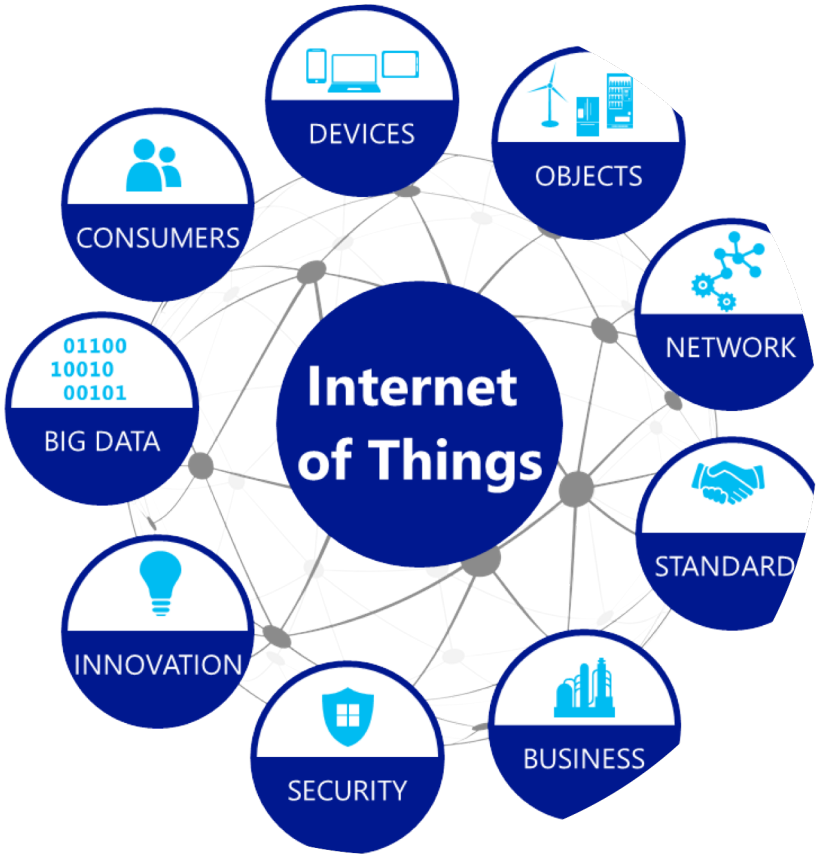


Emerging Challenges for IT

- **Scale**

devices >> # users, and growing fast
Volume of data (and network traffic)

- **Pace**

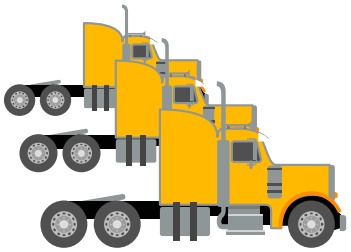
Innovation pressure: analysis, command and control, cost
Skill pressure: data science, new platforms

- **Environment**

IT/OT collaboration
Security and privacy threats
Emerging standards
New competitors

IoT architecture requirements

- Handle extreme hardware and software heterogeneity.
- Build for hyper-scale and enable low data latency.
- Be secure by design; support defense in depth.
- Lower barriers to entry: evaluate -> prototype -> deploy.
- Deliver telemetry and notifications that are meaningful even at extreme scale.
- Provide hot-path and cold-path analysis and action/response.



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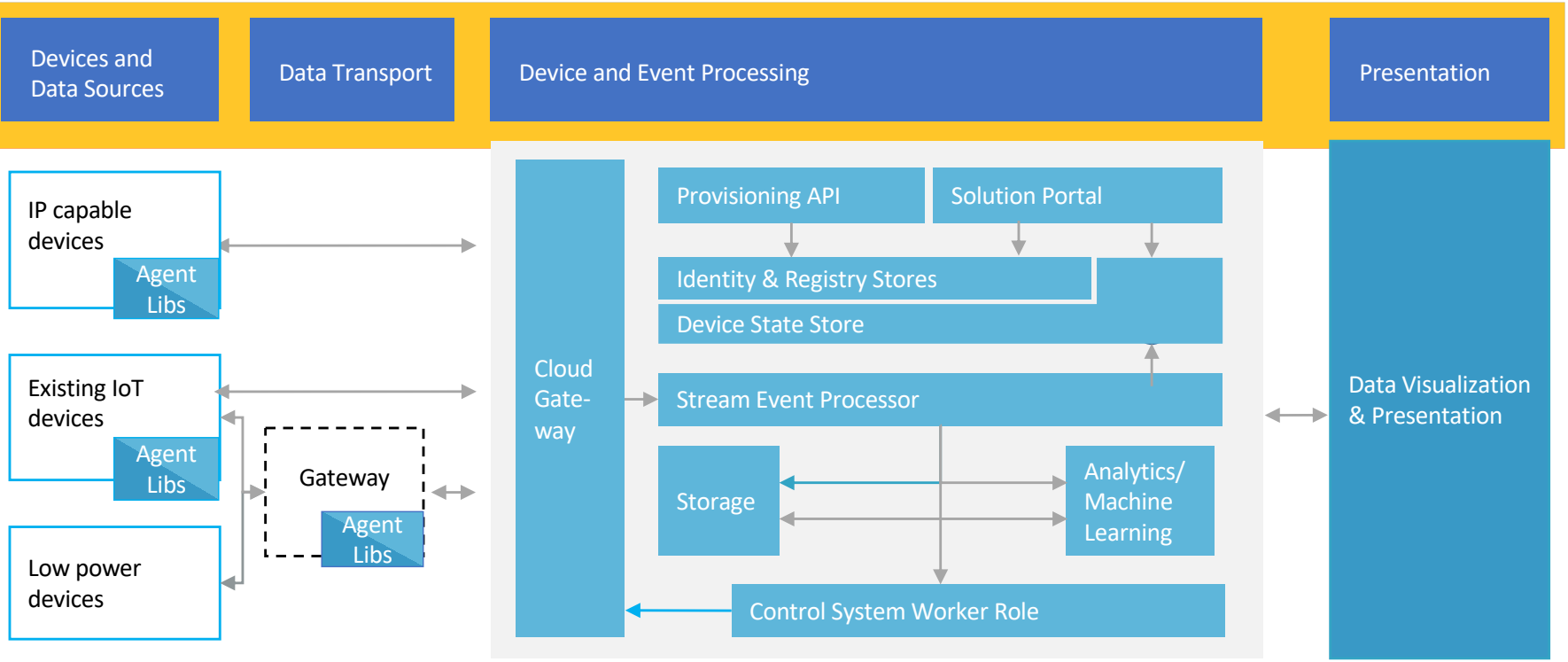
Azure IoT Reference Architecture



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The IoT Stack