Secure Data Fabric Enabling the Industrie 4.0

INDUSTRY 4.0 IN PRACTICE

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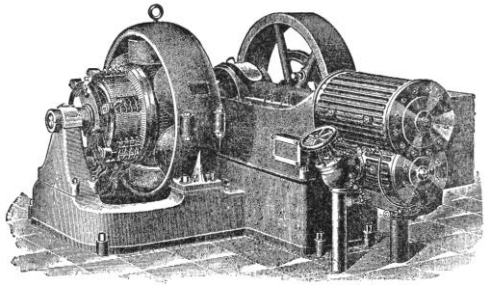
Industrie 4.0 – End of an era for ”thingmakers”

Brief history – ”a company that makes products”



Physical product

Smart product

Connected product

Sample from ”consumer IoT” side - Polar

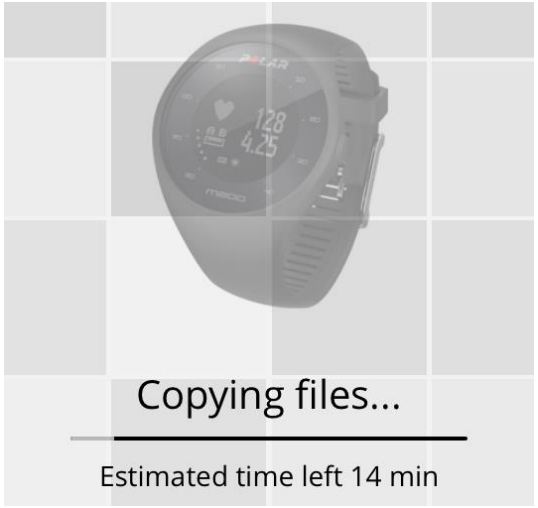
A smart product to begin with... (1982)

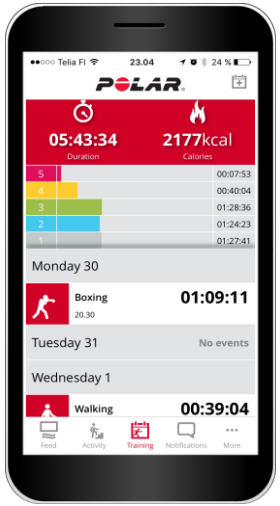
...now, much smarter, and maybe even more importantly: connected by default (2017)

Pictures:
www.polar.com

Note: examples in this presentation are not meant for endorsements for any of the companies mentioned, I just use real-world examples of companies that are well-known publicly for having achieved great things in IoT

How things change for connected products?





Why should you care?

- Real-time soil analysis
- Yield forecast
- Real-time weather information
- Remote diagnostics
- Machine performance

Sell Harvesters

Revenue at point of sale

Transaction-based engagement

Product-centric

Deliver Services

Recurring revenue

Ongoing engagement

Service-centric

The big picture – what is changing?

How Smart, Connected Products are Transforming Competition

STRATEGY FEATURE by Michael E. Porter and James E. Heppelmann

The new strategic choices every company is facing.

"In many companies, smart, connected products will force the fundamental question,

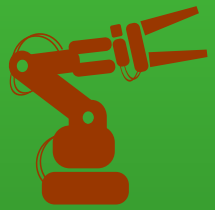
'What business am I in?'"

Michael E. Porter and James E. Heppelmann

Bluetooth + smartphone app, just how this relates to Industrie 4.0?

Large things
(more a system of interconnected things in a single location)

Medium-sized things
(a single device or product)

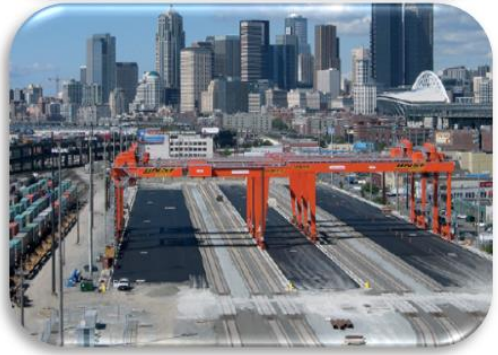


Small to tiny things
(a single sensor or component, typically part of a larger installation)

Example ”things”: KONECRANES Lifting Businesses™

Large

- Typically a system of interconnected products



Medium-sized

- A single product, even if relatively large in size
- E.g. a single large overhead crane in a plant (when not part of a larger system)
- Also: service trucks etc.

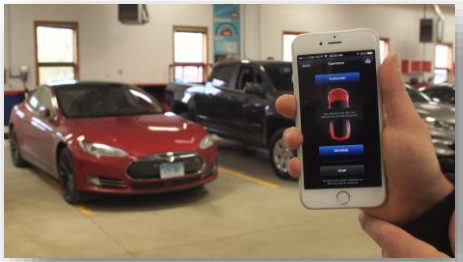
Small-to-tiny

- Workstation lifting equipment
- Small parts of the larger equipment / systems – something currently unconnected

Connectivity types

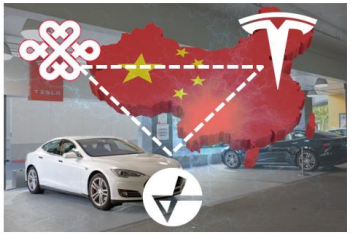
One-to-one

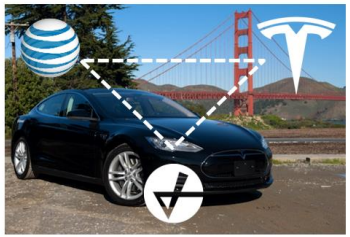
- An individual product connects to the user, the manufacturer, or another product



One-to-many

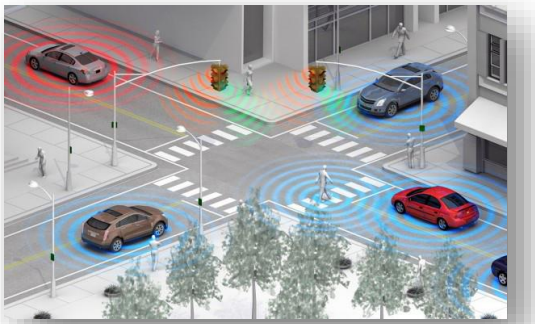
- A central system is continuously or intermittently connected to many products simultaneously





Many-to-many

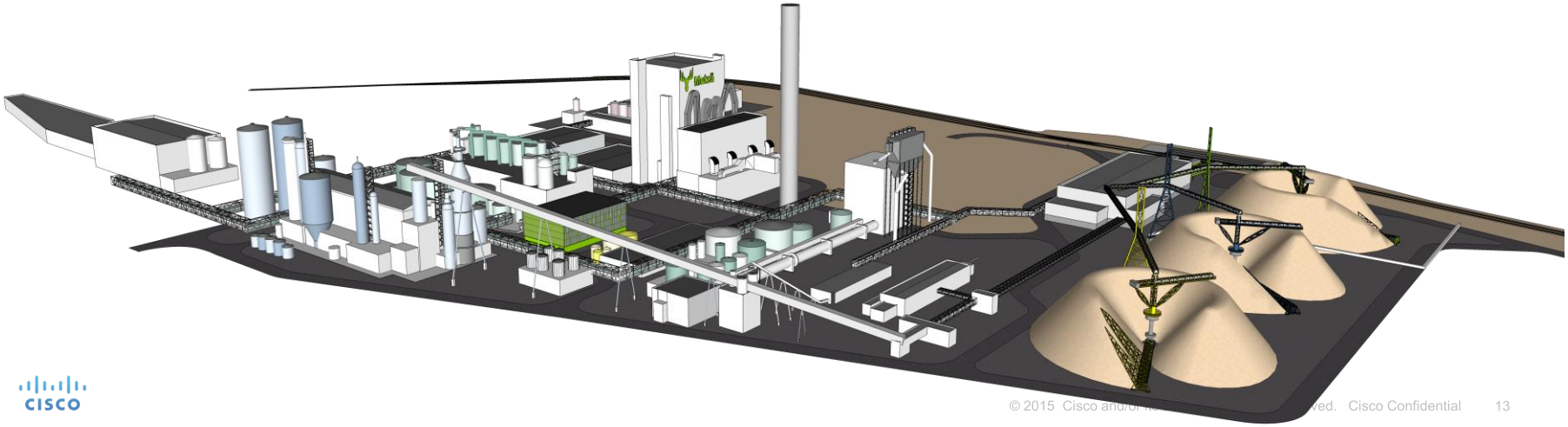
- Multiple products connect to many other types of products and often also to external data sources




“The era of the static product is over.”

The era of the static product is over – or is it?

- Metsä Group Bioproduct mill – largest forest industry investment in Finland
  - *Investment of EUR 1.2 billion, annual pulp production capacity of 1.3 million tonns (up from 0.5 M tonns)*
- Is their main product a smart or a connected one? Could it be?
- Does it make them bystanders in all of this? (by no means!)
- Could they want a smarter factory for building their product?



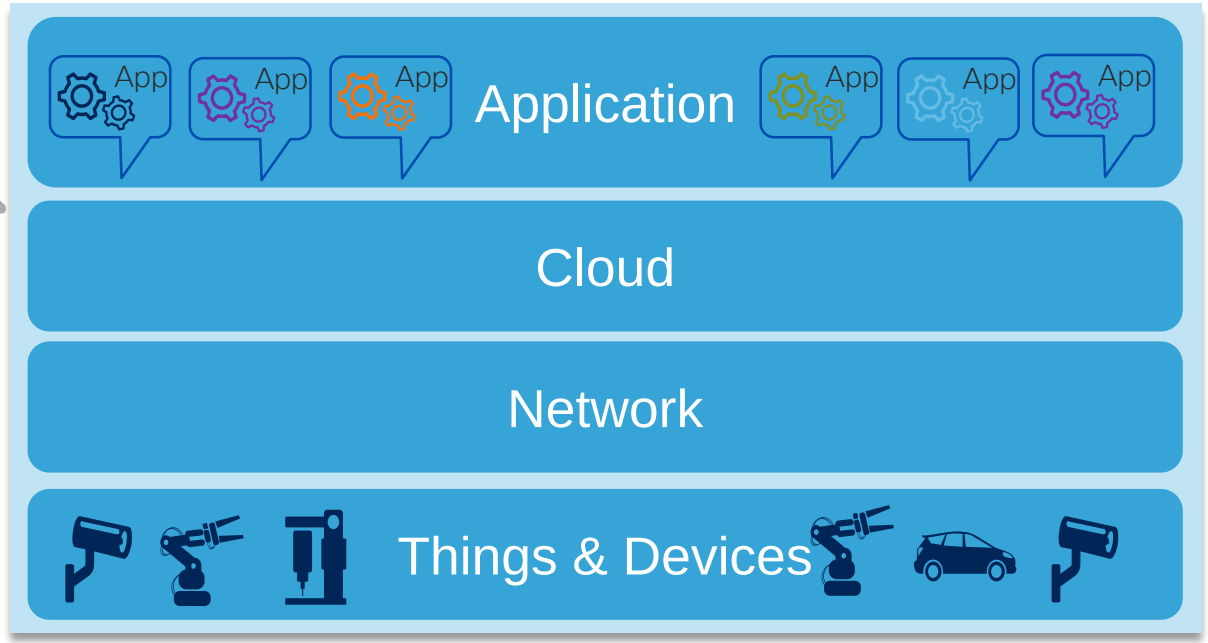
Unlock the Value of Data

Companies want to
derive value from data

Industrie 4.0 and IoT
exponentially increase
the amount and types of data

To get value from data...

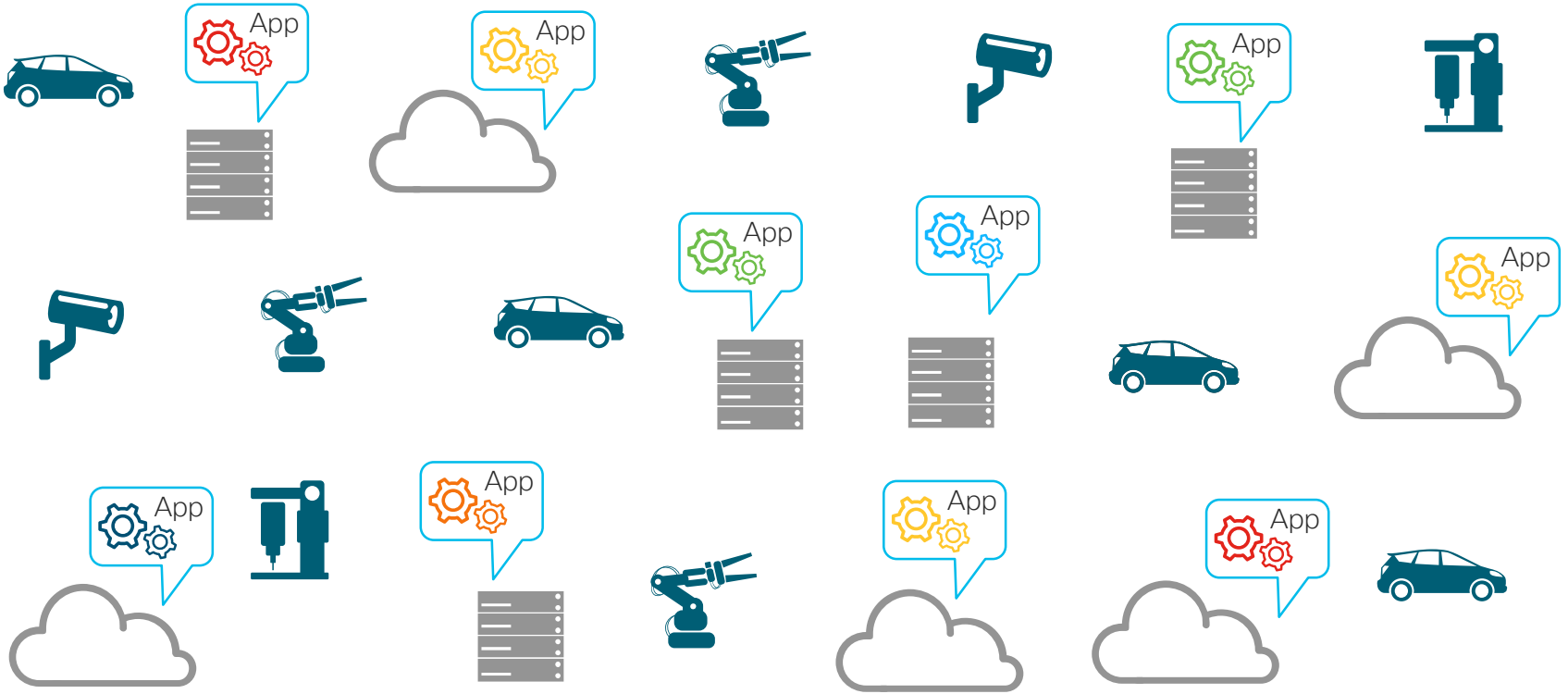
Extract & move data from things to apps



Derive business value

$$$

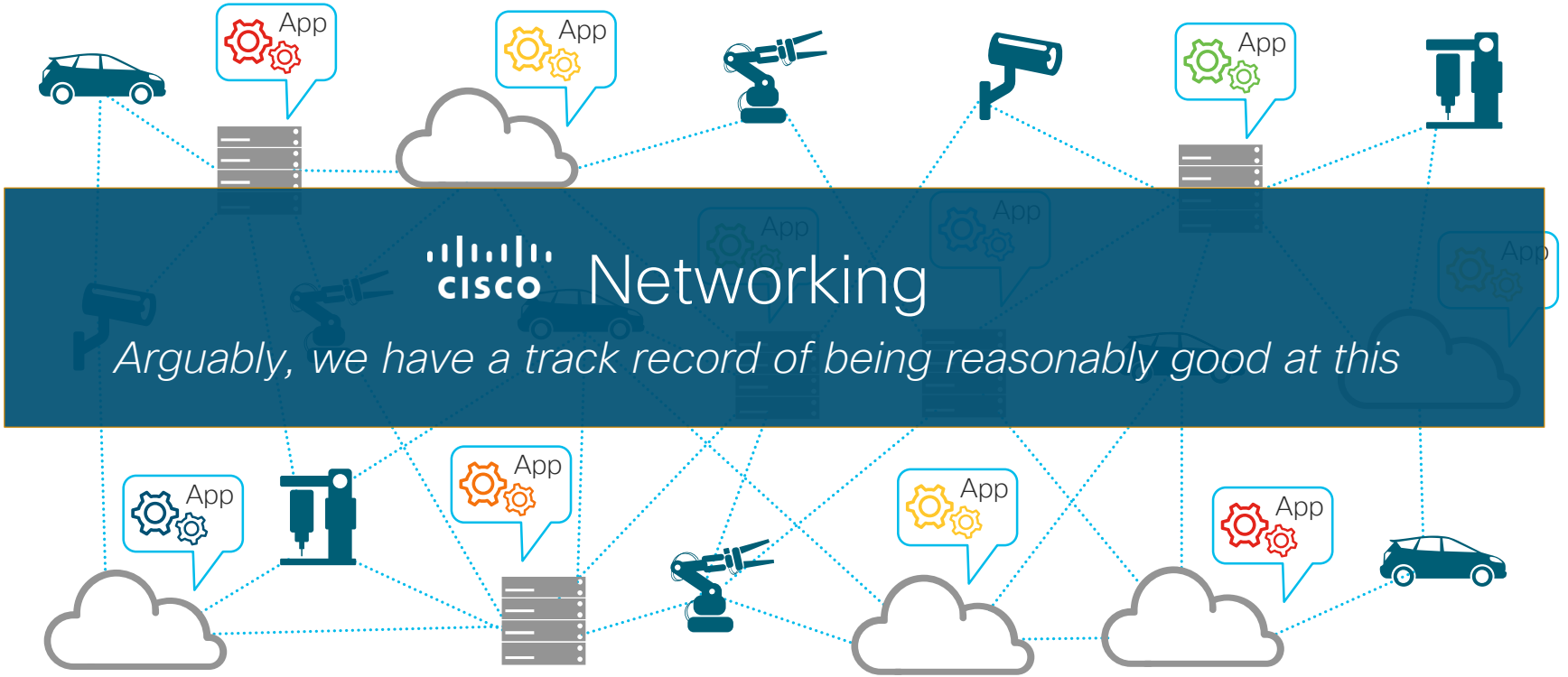
And these things and apps are distributed



Challenges

- ✘ Complexity of connecting, securing and managing diverse devices
- ✘ A lot of data remains locked inside its sources
- ✘ Flexibility to compute data at the edge, data center and/or cloud
- ✘ No programmatic way to move *right data* to *right apps* at *right time*
- ✘ No software control to enforce ownership, privacy & security

An IoT network fabric is needed



What else do we need?
The network becomes the PLATFORM

”Best of networking”

”Best of compute”

A versatile Swiss Army knife for all IoT needs

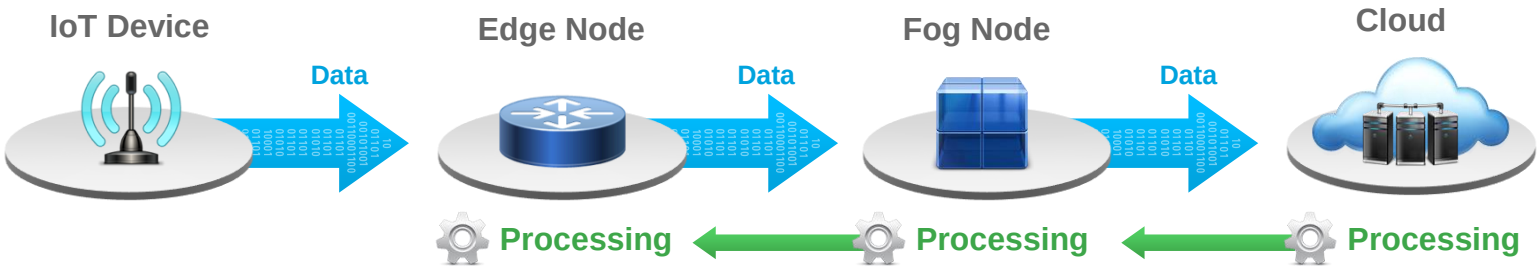
Why This is So Unique

IoT Computing is a New Computing Paradigm

Data to Processing

- Cloud
- Big Data
- Analytics
- Applications

Processing to Data



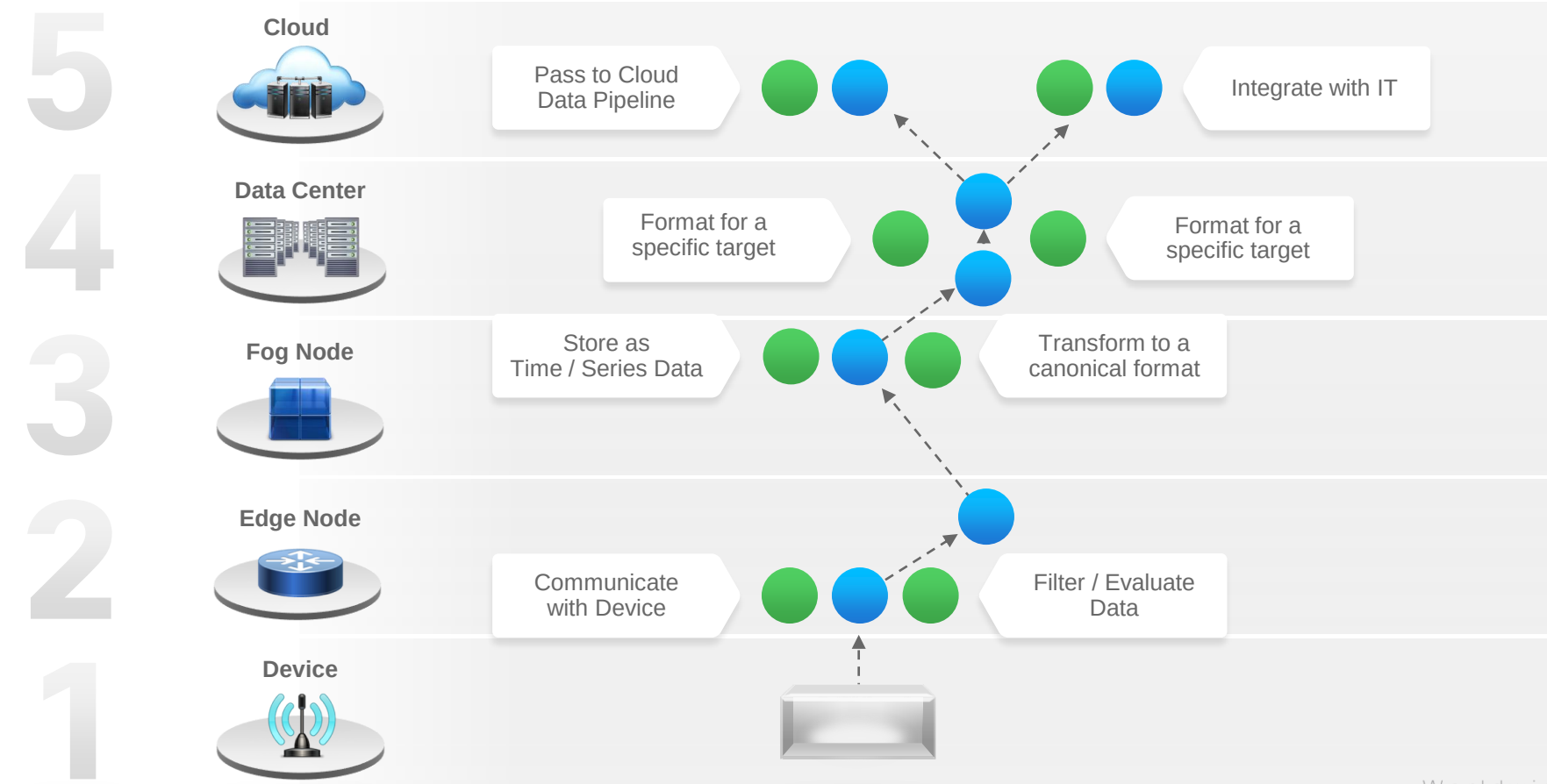
But challenges remain…

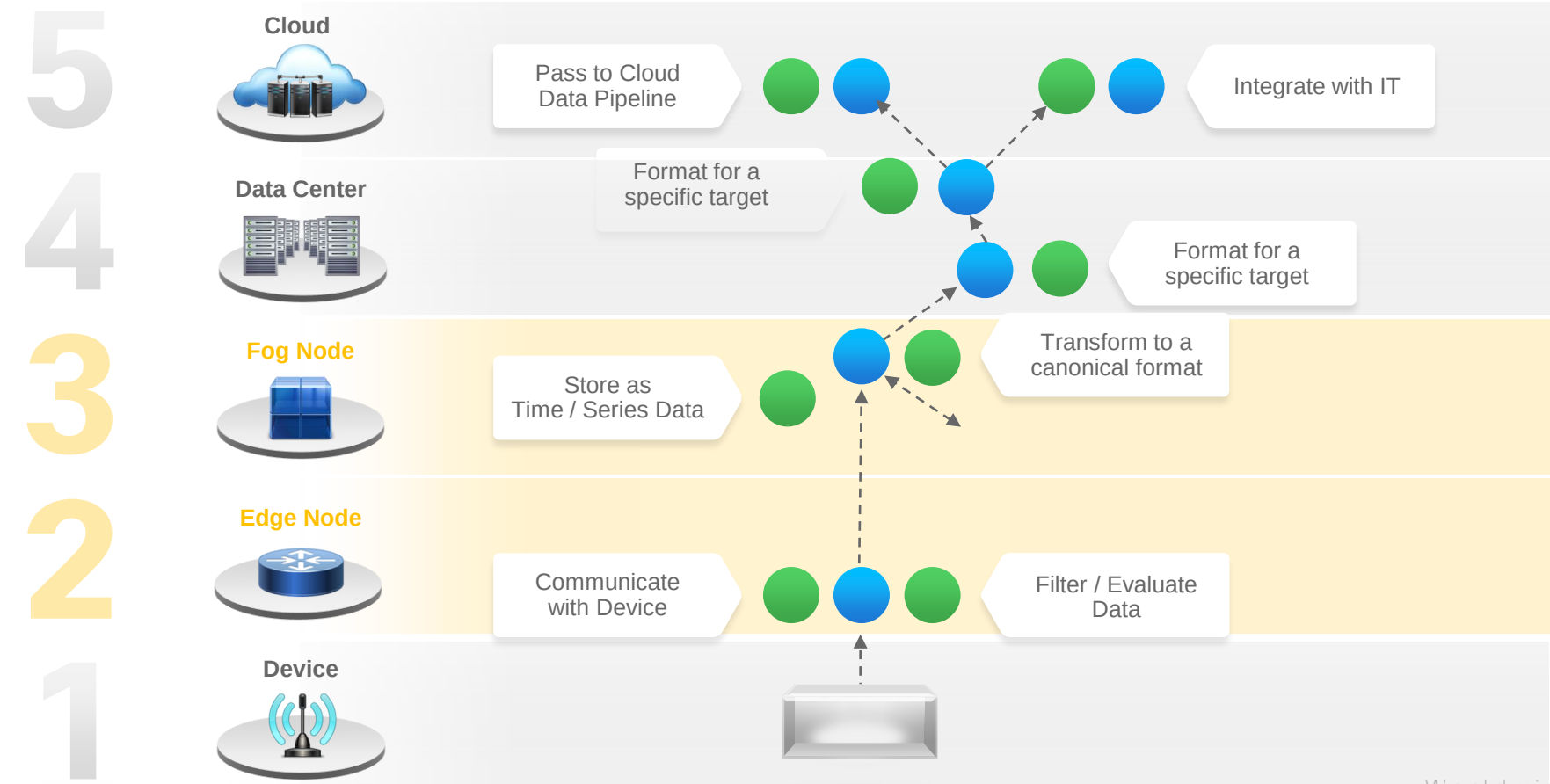
- ✔ Complexity of connecting, securing and managing a set of diverse devices
- ✔ Flexibility to compute data at the edge, data center and/or cloud
- ✘ A lot of data remains locked inside its sources
- ✘ No programmatic way to move the *right data* to the *right apps* at the *right time*
- ✘ No software control to enforce ownership, privacy and security

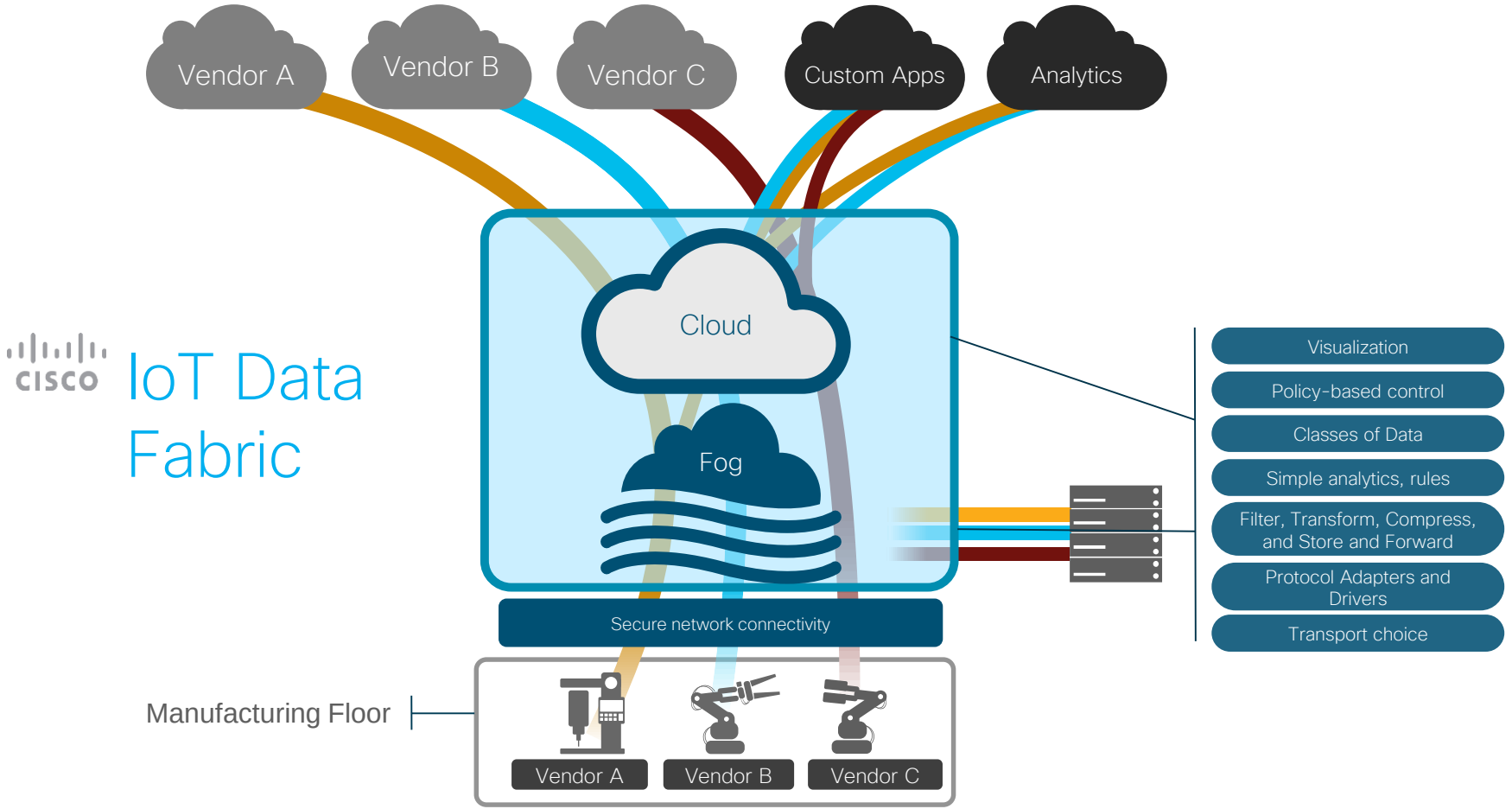
IoT Network Fabric

IoT Data Fabric is needed

Secure Data Fabric

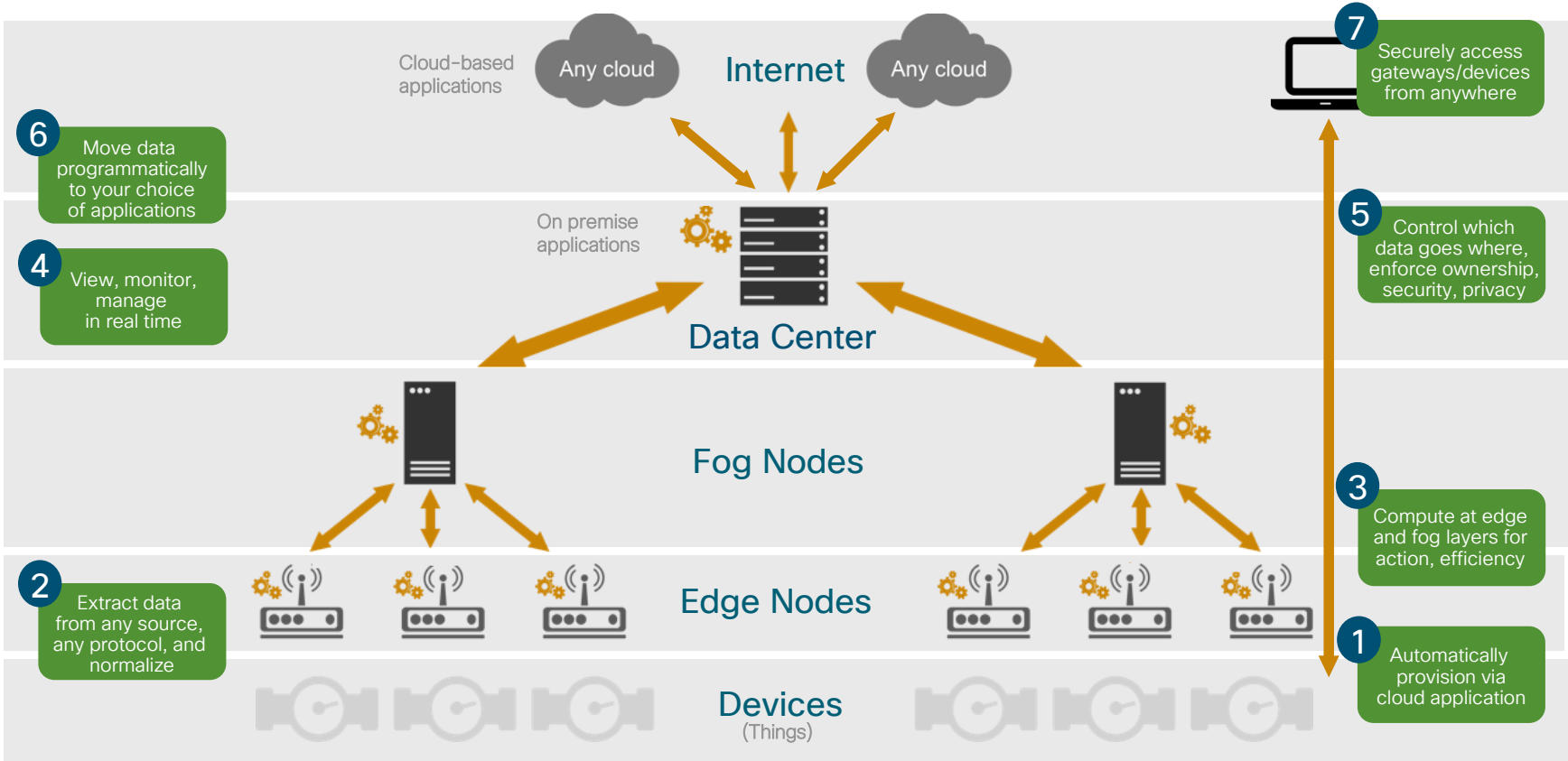




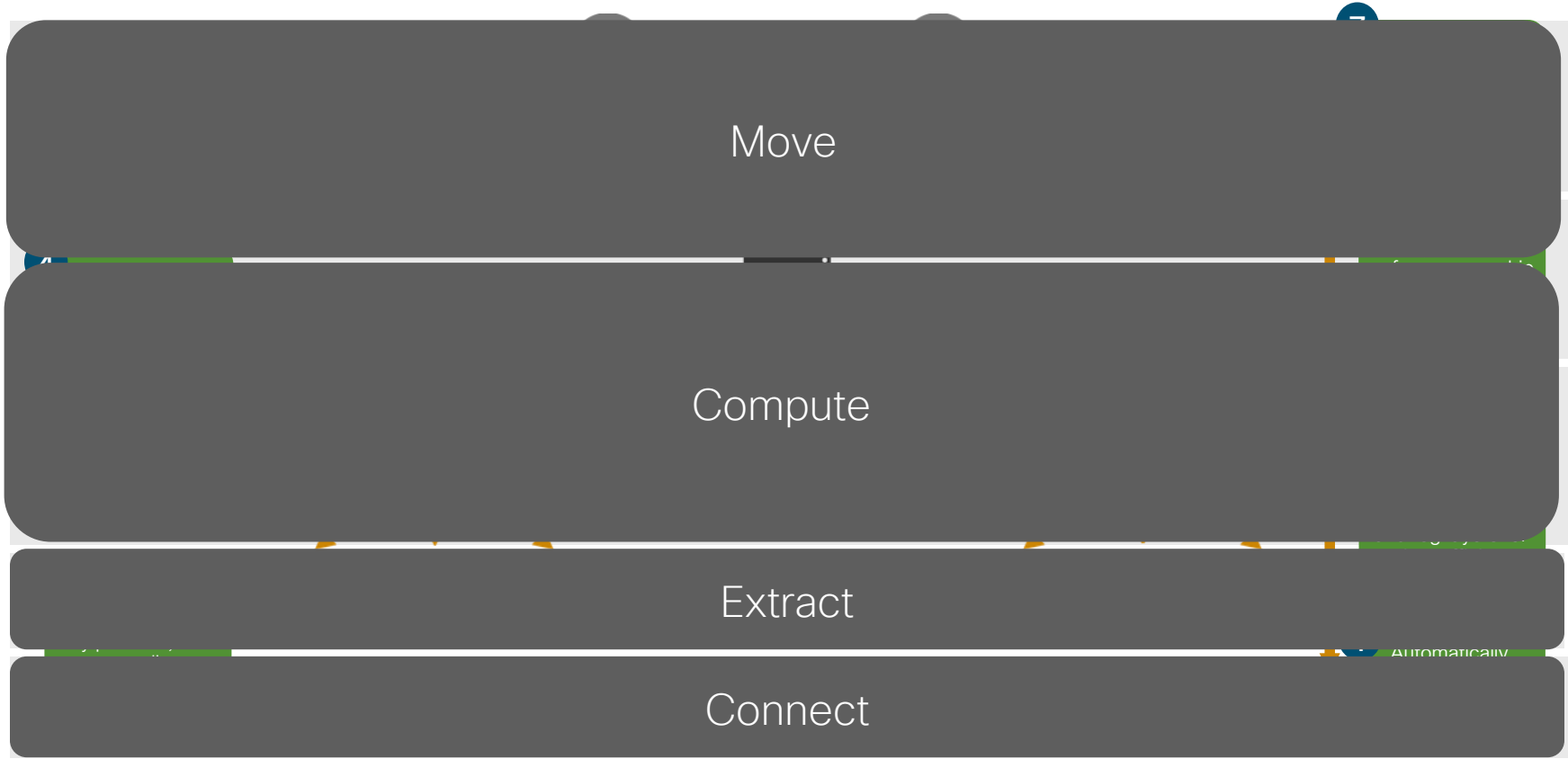


IoT Data Fabric

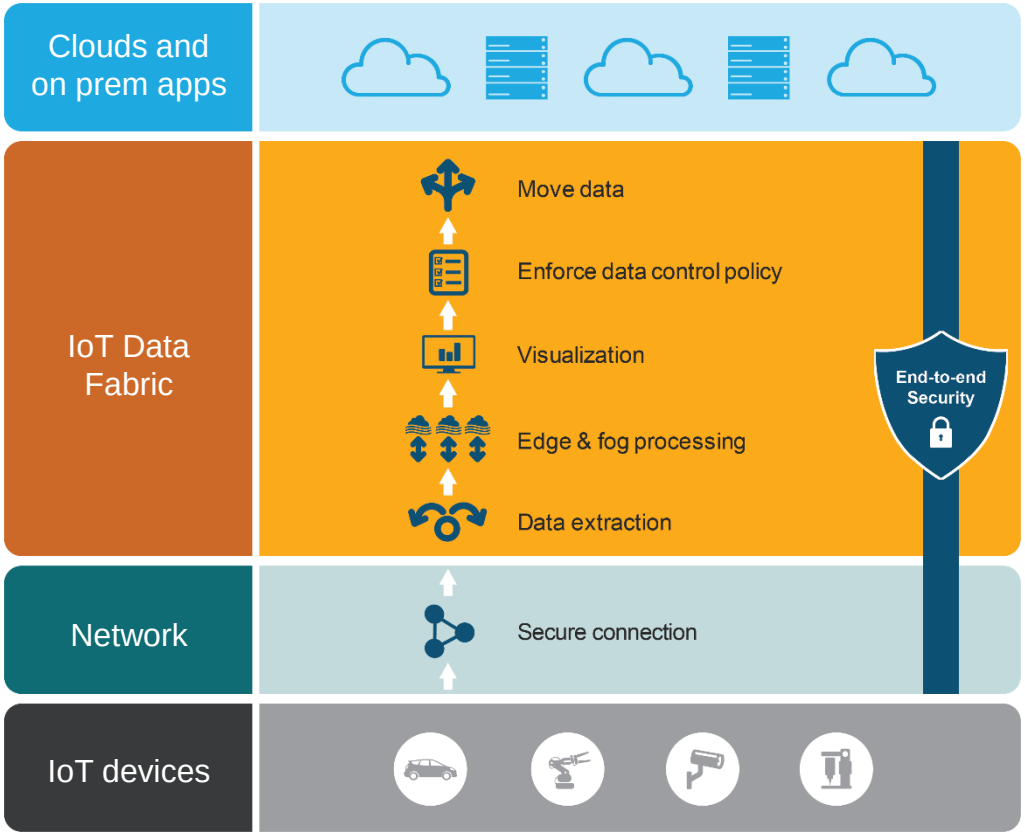
How can you use the IoT Data Fabric?



How can you use the IoT Data Fabric?



Between Things and Clouds – The IoT Data Fabric



Are we stepping outside our comfort zone?

We've built the network to connect these:

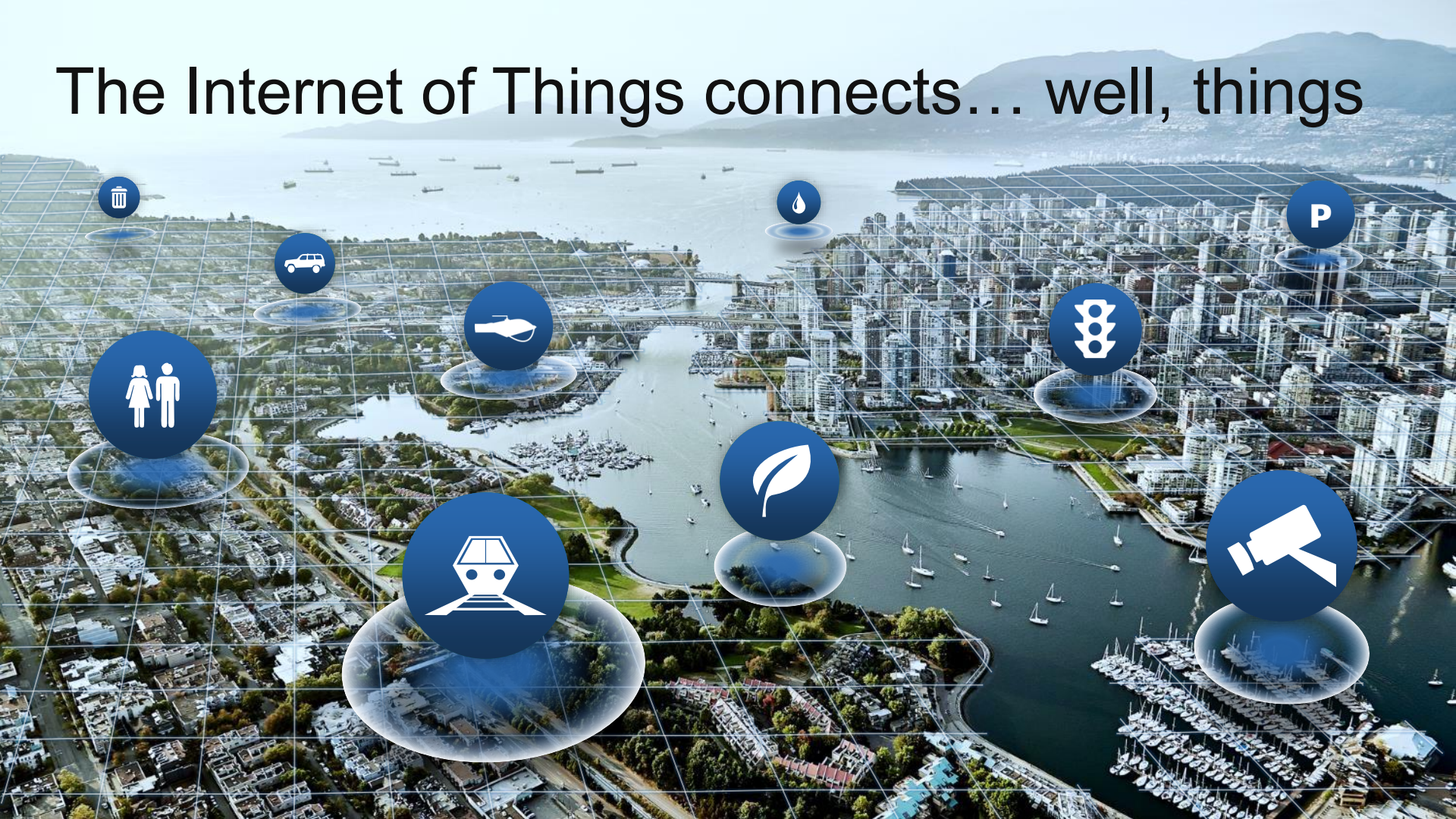
Application

Cloud

Network

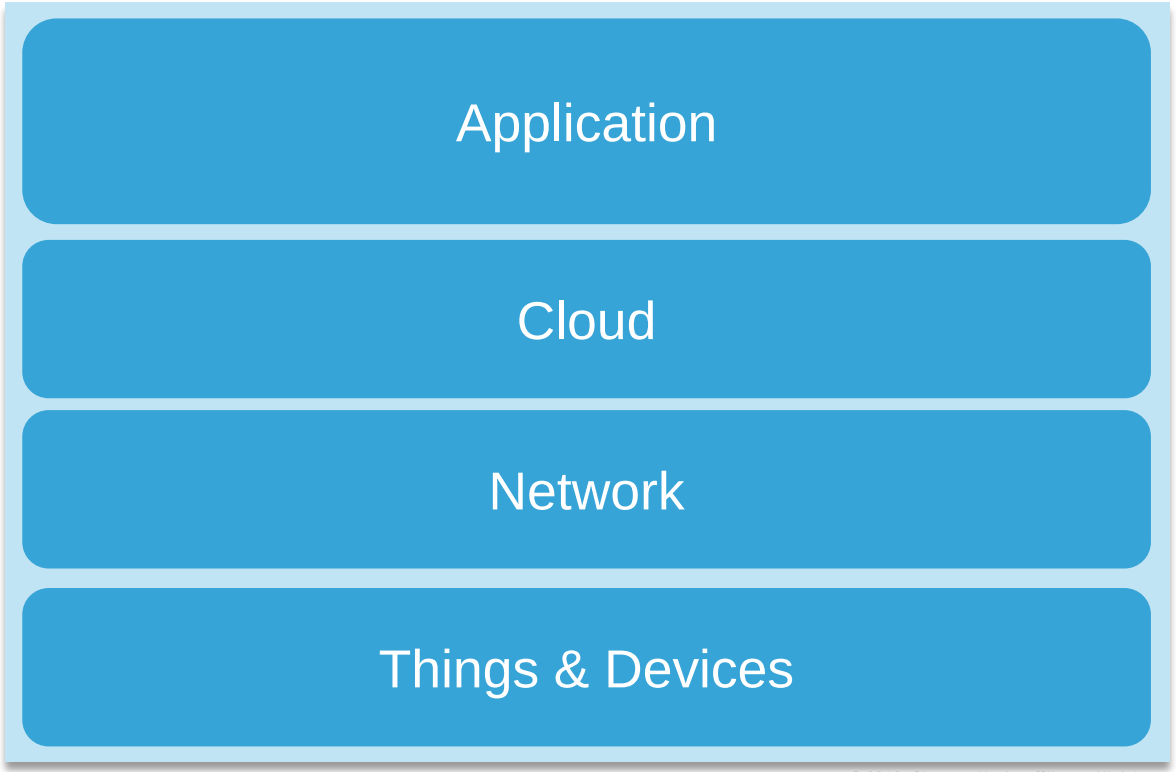
Things & Devices

The Internet of Things connects… well, things



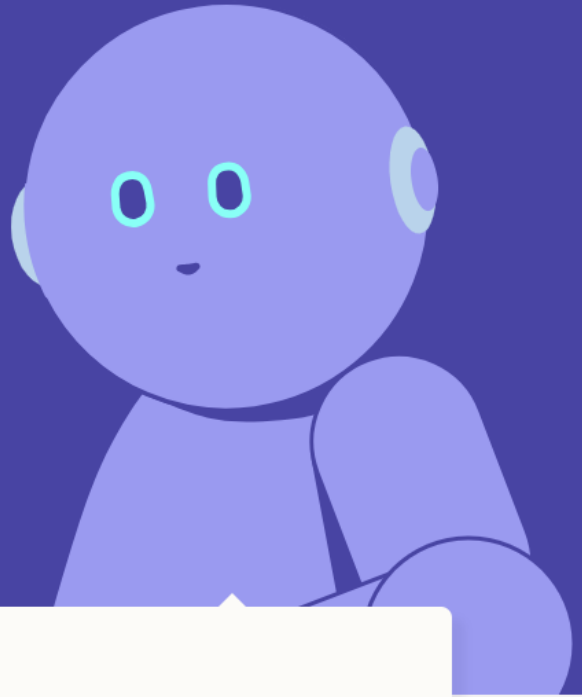
Network as the platform

And our perspective is just a part of the equation



Welcome to the Elements of artificial intelligence free online course

Start the course



- Do you wonder what AI really means?
- Are you thinking about the kind of impact AI might have on your job or life?
- Do you want to understand how AI will develop and affect us in the coming years?

Then this is the course for you!

Reaktor UNIVERSITY OF HELSINKI

Thank you!

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