

# Internet of Bots The Distributed Brain

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communication is collaboration

# The real-time story

2005 - Voice for PBX services

2007 - Video

2008 - Instant messaging

2014 - AI powered services

2016 - Real-time Bots

2018 - Real-time IoT

Over 20 real-time services across 2 platforms:

VoipNow and Hubgets

# IoT market status

8.3 Billion devices connected

\$1,700 Billion market

Customer segment - more devices (5.2B, 63%)

Business segment - more valuable (900B, 57%)

Growing strong to a projected \$3,000 Billion market by 2020



Source: Gartner 2017

# IoT in business has an accelerated growth

Phases in IoT: hobby -> consumer -> business

5G will help business IoT

Cross industry business IoT still limited (lighting, HVAC, security). No killer app!

Vertical specific business IoT growing fast (manufacturing, plant sensors, healthcare)

IoT for business is usually subscription based



# IoT is a harsh ride for all players: customers - service providers - software vendors

Software vendors moving to the Service Providers space with high-value services

IoT product development cycle is complicated, interdisciplinary, leading to high costs

Service Providers missing opportunities - there is much more than bandwidth/connectivity

Many concerns for business customers - is IoT secure and fully transparent? Software wins!

# Challenges in IoT, many and diverse

**Management** - each vendor has its own platform

**Security** - bad track record, a lot of obscurity

**Interoperability** - no common language, many islands

**Mis-focus** - many companies creating their own stack in order to deliver very basic service

No entity can address them all, no magic bullet.

Many different devices and applications,  
one common point - **the Network**

# The Service Provider opportunity, more than network and mobile phones

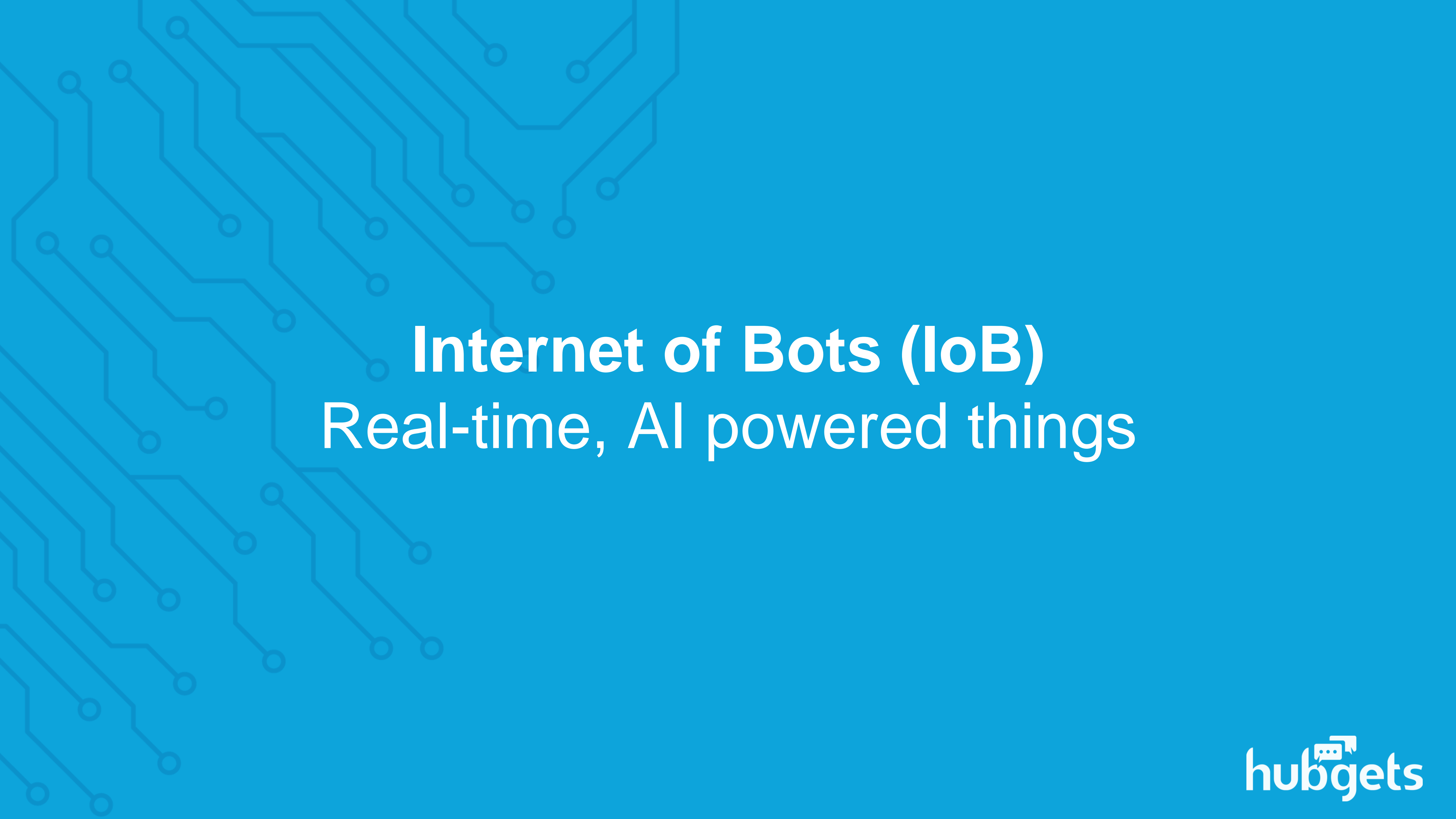
Deploying IoT happens at a large scale and it's accelerating

The large number of devices proves problematic - security and management

Service Providers are the middleware between customers and software vendors

Management is the key word. Building IoT apps will become more accessible.



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# Internet of Bots (IoB)

## Real-time, AI powered things

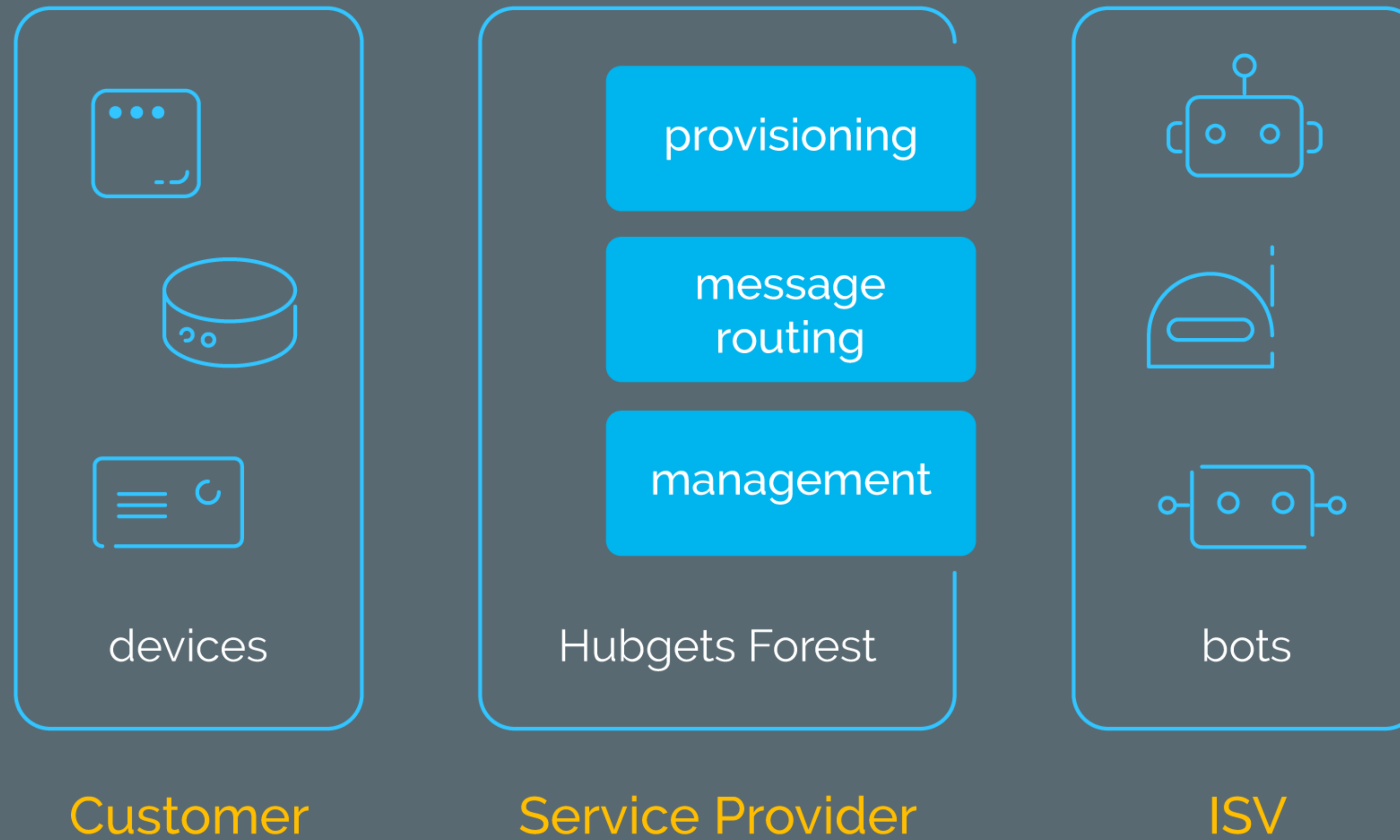
# Hubgets Forest, real-time IoT

An IoT framework designed to capitalize on the Customer

- Service Provider - ISV relationship, delivering:

- Communication / Interoperability
- Provisioning
- Management
- Security and Transparency
- Distributed Sensing with Cloud Brain

# Architecture



Hubgets Forest allows software vendors to deploy  
IoT apps at scale, fast.

Software stack can run on low-cost devices (< 5 US\$!)

# Communication / Interoperability

Real-time Sense & Brain, human nervous system like

Implemented with DataChannel (real-time messaging)

Rule-based and AI automated message routing

No message structure, no API barriers

Always connected, low power mode capabilities

Massive scalability - billions of connected devices, millions of messages per second

# Provisioning IoT devices

Large scale capabilities, yet easy for the end-user

Very fast: manual (< 1 minute) or automated (< 1 second)

Devices are dumb (only the provisioning software)

Devices are assigned to a Bot provided by the software vendor. Dumb Device -> Live Device

Devices communicate with the Bot using Hubgets Forest - Service Provider infrastructure

# Software and device management

The customer manages devices

Delegation to Service Provider / ISV possible

The Service Provider connects devices to ISV

Software vendors provide the software (Bot)

All devices are trackable in any moment (status, internal state)

Devices can be assigned to different ISV Bots or disconnected

# Security

Only HTTP/WS TLS communication

Very simple stack, no device login/passwords

Automated updates rolled by Bots (no user intervention)

Very limited exploitability vectors

AI-based anomaly detection for both devices and Bots

Suspicious devices are automatically removed from the network (seppuku mode) and reported



# Distributed Sense with Cloud Brain

Devices are cheap, but specialized

They are controlled by the software vendor's Bots

The user is not aware of/interested in the device, but in the results provided by the Brain

While the intelligence is in the Cloud, the device can be equipped with powerful local processing (e.g.: automotive)

Communication stack latency  $< 0.5 \text{ ms} \ll \text{network trip}$

# Conclusions

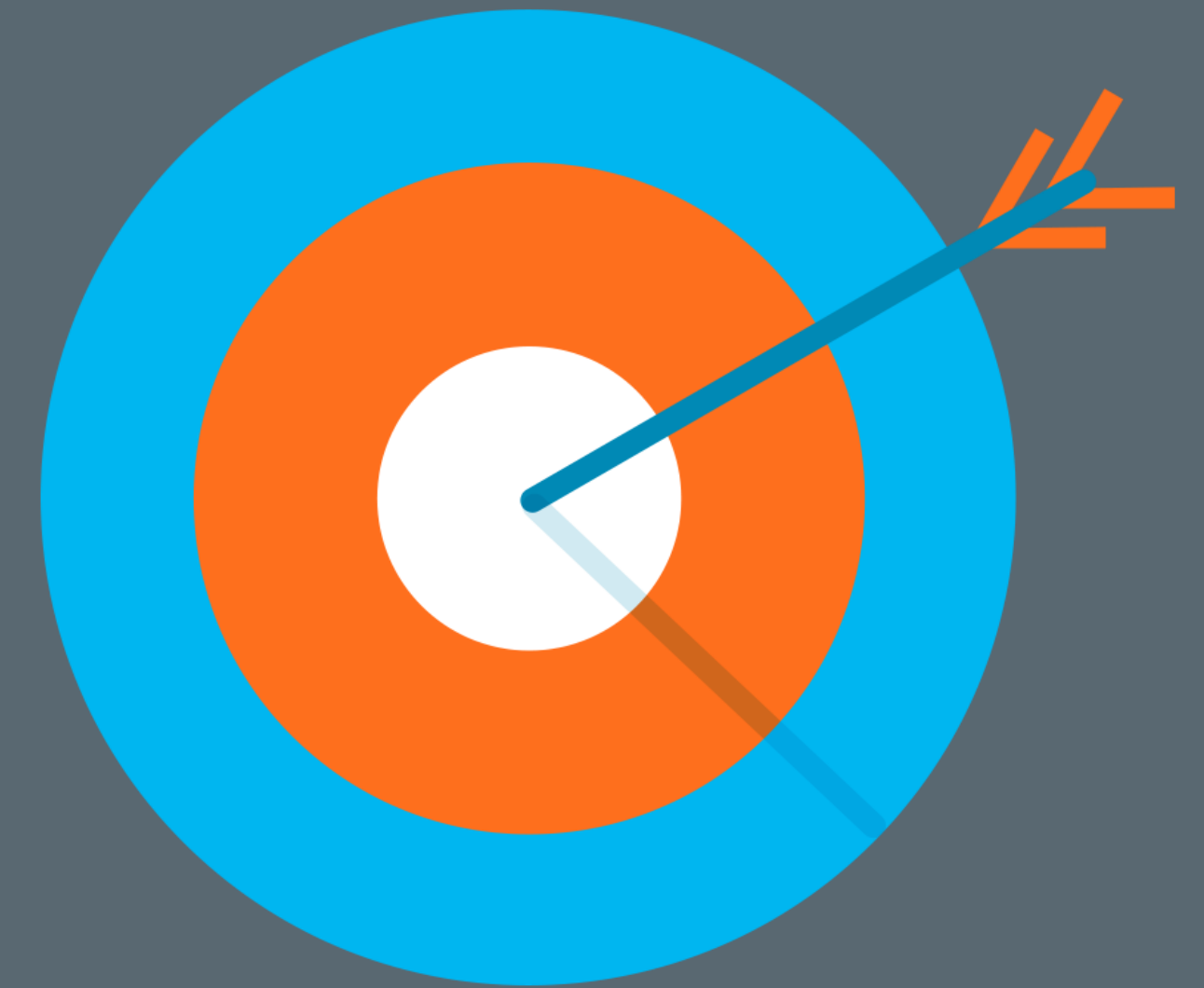
In order to solve IoT challenges, each actor should play his own role - customer, Service Provider, ISV

Most current IoT approaches are opportunistic

A critical opportunity is to allow software vendors to focus and make faster releases

No one has the magic bullet - cloud platforms with IoT services provide some pieces of the puzzle

Service Providers can provide their own IoT apps without major investments



Thank you!



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