DoE Solid State Lighting workshop

Connected Lighting

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Today's Discussion

- ## Connected Lighting and IoT
  - ### Components of IoT
  - ### Phases of IoT

- ## Outdoor Lighting Evolution
  - ### Now and Beyond

- ## Reference Platform for Connected Lighting
  - ### Connectivity Options

IoT everywhere . . . Why Now?

50B	212B	85%	44
devices[1]	sensors[1]	Unconnected[4]	zetabytes[2]

Things

network

CLOUD

Cost of Sensors[1] Past 10 Years	2X ⬇	Cost of Bandwidth[2] Past 10 Years	40X ⬇	Cost of Processing[3] Past 10 Years	60X ⬇

1. IDC
2. MC/EDC: The Digital Universe of Opportunities
3. Goldman Sachs
4. IMS Research

3 PHASES OF IOT

CONNECTED

SMART

AUTONOMOUS

CONNECT THE UNCONNECTED
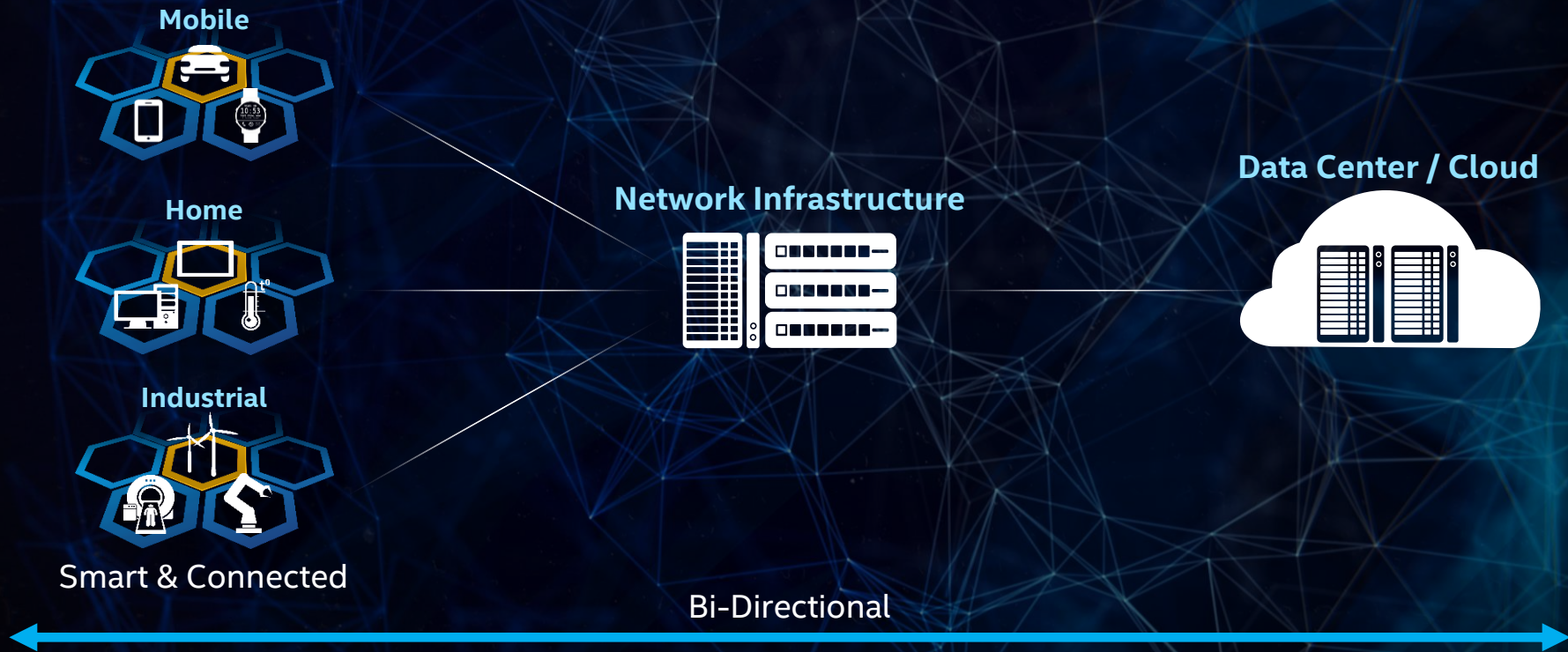## MOVE THE DATA

Network Infrastructure

Data Center / Cloud

Simple Sensors

One Direction

SMART AND CONNECTED THINGS
MOVE THE DATA TO THE COMPUTE

Mobile

Home

Industrial

Smart & Connected

Network Infrastructure

Data Center / Cloud

Bi-Directional

SOFTWARE-DEFINED AUTONOMOUS WORLD
MOVE THE COMPUTE TO THE DATA

Mobile

Home

Fog

Network Infrastructure

Data Center / Cloud

Industrial

Real Time

Virtualized, Reconfigurable, Software-Defined, Autonomous
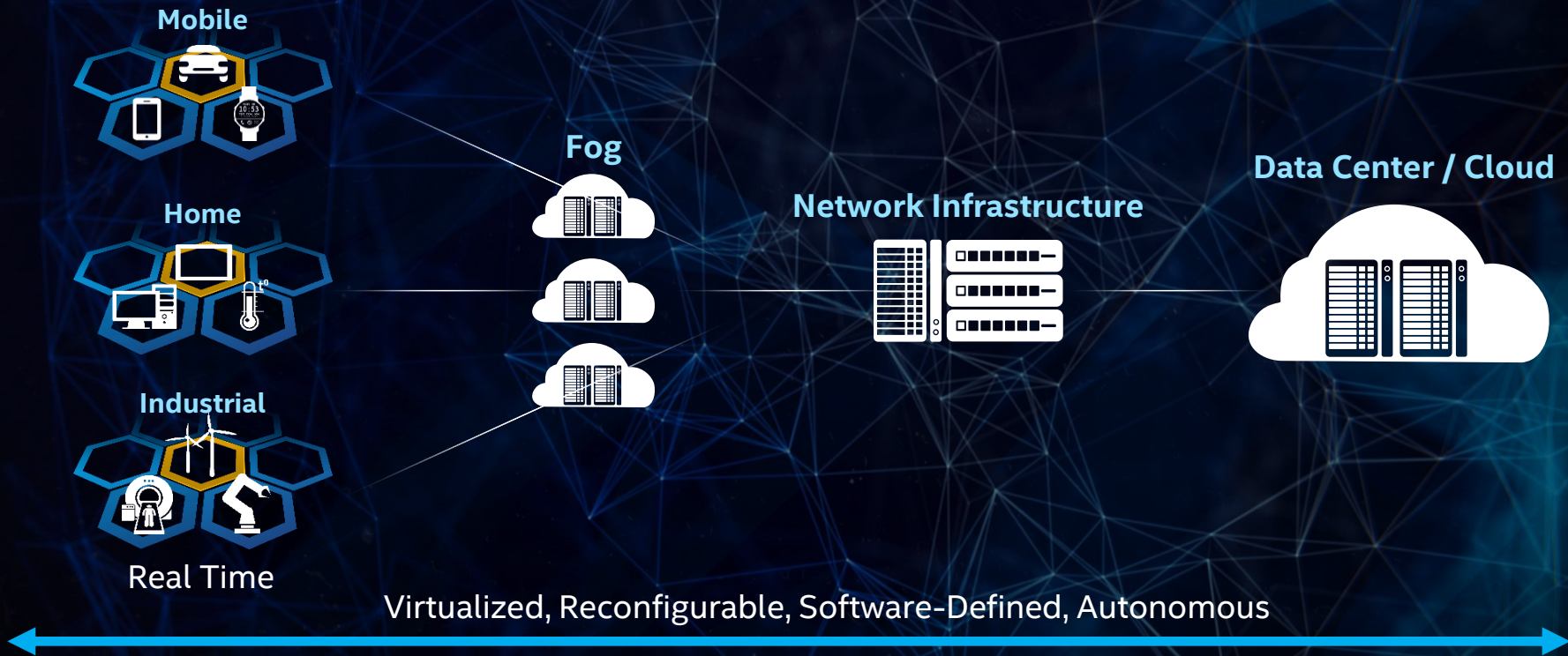
CHALLENGES

TECHNICAL POV

- SECURITY AND TRUST
- INTEROPERABILITY
- INTEGRATION OF OT/IT
- ADVANCED ANALYTICS

BUSINESS POV

- SOLUTION SCALABILITY
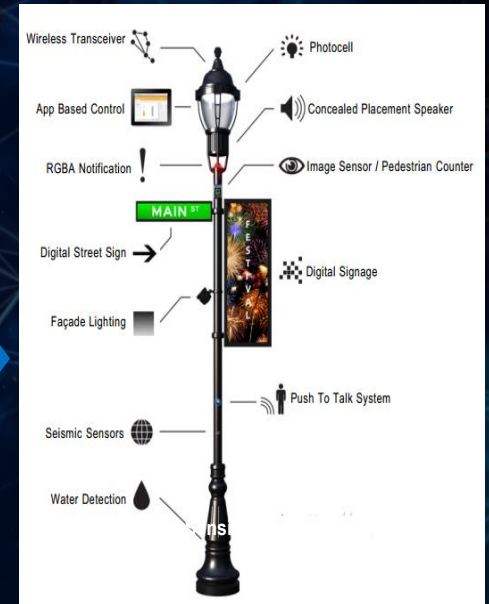- COST/ROI
- SECURITY AND PRIVACY
- FRAGMENTED SOLUTIONS

SMART OUTDOOR CONNECTED LIGHTING

Source – Illuminating Concepts

Yesterday

We are somewhere in-between

Tomorrow

IOT PLATFORM
NEEDS TO BE SECURE, SCALABLE, INTEROPERABLE

REFERENCE ARCHITECTURE

3rd Party Cloud

Things

Security | Management | Data Processing | API Libraries, APIs, SDK

Local Area Network Connectivity

Wide Area Network Connectivity

5G/4G/2G/3G/Wifi/6LoWPAN/LoRa/ZigBee/SigFo

Network

Gateway Devices

Security | Management

Data Processing | API Libraries, APIs, SDK

Network Infrastructure

Cloud

Data Management | Batch & Stream Analytics | Storage

Security | Management | API Libraries, APIs, SDK