Delivering IoT Value Through oneM2M Compliance

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Hewlett Packard Enterprise (HPE) Point of View
Enabling customers to capitalize on IoT

The opportunity is huge – 26B devices – 10% of world data – $1.9T economic value add – $322B vendor revenues are expected by 2020*

Situation today
Digitization affects every industry. Requiring disruptive thinking – across the whole organizations

Disruption
Today agile programming, analytics, edge computing and improved connectivity provide the disruptive foundation to accelerate

Transformation
IoT demands a broad range of capabilities and across an open and scalable ecosystem

Partnership
HPE is a well established player in the IT industry. Our business know how enables us to be an ideal integration partner for the enterprise

* Gartner and IDC

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# Hewlett Packard Enterprise (HPE) in IoT

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<th>Ecosystem</th>
<th>HPE Platforms</th>
<th>Edge Infrastructure</th>
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<td>Aruba Mobile First Platform</td>
<td>Universal IoT Platform</td>
<td>Converged Edge Systems</td>
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<td>Connectivity, Security and Asset Tracking</td>
<td>Data acquisition, normalization, device management</td>
<td>Compute, control and data acquisition</td>
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## Ecosystem

- Robin
- CITRIX
- skyfii
- trackimo
- sens.it
- TracFind
- SAP
- PTC
- Tech Mahindra
- VENUE NEXT
- Skype for Business
- IEM
- BH Technologies - Dataspace
- PREDIX
- NATIONAL INSTRUMENTS

## HPE Platforms

- **Connectivity, Security and Asset Tracking**
  - Aruba Mobile First Platform
  - Universal IoT Platform
- **Wide Area IoT / Smart Cities**
  - Converged Edge Systems
- **Industrial / Manufacturing**
  - Compute, control and data acquisition

## Edge Infrastructure

- LAN
- Wi-Fi
- BLE
- WAN
- LTE / LPWAN
HPE Universal IoT Platform Value Proposition

**IoT Platform**
Enable and manage the value chain

**Single-source Provider**
- Software, Hardware, Services, Consulting – along with a Continuously Growing large partner ecosystem for deploying IoT services.
- Carrier-grade scalability and SLA in compliance to meet Enterprise IT-grade requirements.

**HPE Universal IoT Platform**
- A “Horizontal” Platform to enable “Vertical” Use Cases:
  - Connected Cars, Smart Cities, Track & Trace, etc.
- Network-Agnostic:
  - Cellular (3G/4G), LPWAN (LoRa, SigFox), Short-Range (Wi-Fi, BLE, ZigBee, Z-Wave)
- Differentiators:
  - OneM2M and 3GPP standards aligned
  - Support for both SIM and Non-SIM IoT devices
  - IoT device vendor-independence
  - Support for IoT data acquisition over any IoT protocol
  - Powerful and world-class IoT analytics

**Pricing Model with Unmatched Values**
- Best possible pricing based on HPE’s global scale, cost efficiencies, best-of-breed components and deep vertical expertise
- Pricing model also aligned with IoT market with low ARPD
- Price Per Device – along with Volume-based Tiered Pricing
# IoT GTM Focus Areas and customer accounts

## Future Cities
- Smart Lighting
- Smart Transportation (Parking and Traffic)
- Smart Waste management
- Remote Water Quality Management

## Connected Cars
- Rain Detection
- Strong Wind Detection
- Pothole Detection
- Location-based Headlights (Geofencing)
- Smart Home Integration (Home Automation Integrations)

## Smart Surveillance
- Smart Home (from burglaries, baby monitoring)
- Independence for the Elderly
- Smart Law Enforcement

## Fleet Management
- Increase productivity
- Eliminate false overtimes
- Track stolen vehicles
- Track vehicle routes

## Precision Agriculture
- Smart irrigation management
- Smart plantation assets tracking / management
- Remote monitoring of yield efficiency
- Smart pest control
- Agribots
- Smart drones / tractors
Managing Complexity Requires Platform Approach (not silos)

- Connectivity & connected objects
- Operations
- Data, reporting, exposure
- Innovation / new services
- Costs

HPE Universal IoT Platform

- Video surveillance
- Waste Management
- Fire detection
- Fleet Management
- Smart metering
- Driving behavior
- Public facilities
- Smart parking
- Smart lighting
- Environmental sensing

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HPE Universal IoT Platform
Solution Architecture Details

**Device & Service Management**
Manages end-to-end lifecycle of the IoT device, service and associated systems

**Connectivity Management Platform**
Provides portal to enterprises and CSPs to manage the entire IoT SIMs/eUICs subscriptions and Inventory

**Network Interworking Proxy**
Provides interoperability between heterogeneous devices, sensors and gateways and the uniform oneM2M-compliant data model

**Data Service Cloud**
Enables rapid development of IoT applications through reusable attributes, **reducing the cost and time-to-market**

**Data Analytics**
Discover meaningful patterns in data collected from sensors to expose and monetize through applications

**Back-office Systems**
Provides consolidated operational view of devices, gateways, and network information to ease day-to-day operations

**Data Acquisition & Verification**
Supports secure bi-directional data communication transforms, validates and processes the IoT data and triggers actions such as Complex Event Processing (CEP).

<table>
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<th>Enterprise Specific Applications or Use Cases</th>
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<tr>
<td>Data Service Cloud (DSC)</td>
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<tr>
<td>Device &amp; Service Management (DSM)</td>
</tr>
<tr>
<td>Data Analytics (DA)</td>
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<tr>
<td>Data Acquisition &amp; Verification (DAV)</td>
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<td>Back-Office Systems</td>
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**IoT Network Core**

<table>
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<tr>
<th>Cellular</th>
<th>Fixed</th>
<th>LoRa</th>
<th>SigFox</th>
<th>Satellite</th>
<th>Wi-Fi</th>
<th>BLE</th>
</tr>
</thead>
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**IoT Gateways**

**IoT Devices, Sensors, and Connected Objects**
Decoupling Application/Business From Connectivity
Streamlining provisioning, security, etc.

Example IoT Applications

<table>
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<tr>
<th>Smart Parking</th>
<th>Waste Management</th>
<th>Smart Lighting</th>
<th>Connected Car</th>
<th>Health/Patient Monitoring</th>
<th>Smart Safety / Track &amp; Trace</th>
<th>Smart Environment</th>
<th>Smart Factory</th>
<th>Precision Agriculture</th>
<th>Fleet Management</th>
<th>Personal Tracking</th>
</tr>
</thead>
</table>

- Data Monetization
- Provisioning
- Security
- Device Management

HPE Universal IoT Platform
Enable and manage the value chain

Cellular
- Track & Trace
- OBDII
- Personal tracking

Wi-Fi
- Video Surveillance
- Android App
- Fleet Management

LPWAN
- Sigfox
- LoRa
- Cat-M1/2
- Cat-NB1

Others (fixed, satellite, RF...)
- Temperature and Humidity
- Air quality
- Smart parking
- Waste management

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LoRa/LPWAN on The HPE Universal IoT Platform

Tata Communications is deploying the world’s largest LoRa network across cities and towns in India, covering 400M people in the first phase. HPE Universal IoT platform helps deliver health safety and IoT connectivity services.
Human Safety use case
HPE UIoT Platform enables addressing Woman Safety concerns in India

The **HPE Universal IoT Platform** provides multiple network communication channels for bi-directional messaging, device configuration and access control for different stakeholders.

1. Woman in danger presses SoS button
2. Sends SOS Message to Family & Security Companies with GPS Location
3. Woman initiates trip start
4. User location tracked with timestamp and shared with stakeholders
5. When Stop button pressed, location tracking system disabled

**Diagram Description:**
- **LoRa Network** connects to **Cellular Network** through **HPE UIoT Platform**.
- **Trigger Devices** activate the system.
- **Security Company**, **B2B2C Partner**, **Service Provider**, and **Collaborative Tracking App** are connected through the platform.

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Tata Communications
Using the HPE Universal IoT Platform to deliver IoT services

Requirements

The device and network-agnostic HPE Universal IoT Platform will help Tata Communications to develop new products and services across multiple industry verticals using a variety of connectivity options, protocols and interfaces.

- Tata Communications, part of the $100 billion diverse Tata Group conglomerate, is deploying the world’s largest LoRa network across cities and towns in India, serving hundreds of millions of people and companies. The first phase targets to cover 400 million people across Tier 1, 2, 3 and 4 cities.

- The market leading device and network-agnostic HPE Universal IoT Platform will help Tata Communications in its digitization of smart cities and to develop new products and services across multiple industry verticals using a variety of connectivity options, protocols and interfaces.
Customers: Identidad IoT
Using the HPE Universal IoT Platform to deliver IoT services

Requirements

The device and network-agnostic HPE Universal IoT Platform will help Identidad IoT develop new products and services across multiple industry verticals using a variety of connectivity options, protocols and interfaces.

“Identidad IoT has the knowledge and expertise to develop complete turnkey solutions for customers ranging from mobile network operators to service providers to end users. The HPE Universal IoT Platform is a robust IoT solution and we are confident that HPE is the right partner to lead our customers into the IoT era”

Andres Sanchez, CEO, Identidad IoT
Mobile satellite service provider Inmarsat is helping a palm plantation in Malaysia to optimize its operations with sensors and data-driven intelligence. With HPE’s cloud-based Universal IoT platform and IoT sensors placed throughout the plantation, tracking precise water consumption, humidity levels, and other critical data ensures more efficient operations.
Thank you

For more information please visit our web site

hpe.com/CSP/IoT