Company Overview

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IoT App Platform & Analytics

Updated: May 2015

Company Confidential

Aeris Company Overview

People

- 135 people, diverse backgrounds
- > 50% in engineering
- Privately held

Facilities

- Corporate headquarters in Silicon Valley (Santa Clara, CA)
- Locations in the UK and India
- NOCs in Santa Clara, Las Vegas, and London; Delhi under construction

Technology

- Purpose-built network, optimized for M2M
- Supports CDMA, GSM, and LTE
- Carrier agnostic
- Global coverage with a single SIM/APN

Markets

- Cellular connectivity for enterprise IoT programs
- IoT platform for cellular carriers
- Cloud-based application-enablement platform with best-in-class, next generation data analysis capabilities

Aeris in Numbers

A robust history of growth, stability and industry advances

50 industry patents	**100%** annual growth (last 4 years)	**99.995%** infrastructure reliability
Operational reach in **190** countries	**1 in 4** new cars sold in U.S. built by Aeris customers	
Top 10 No. of connected IoT devices	**8.7 billion** M2M events per day	

Business Overview

Aeris Portfolio Overview

	Enterprise Connectivity Service	Aeris GSP	AerCloud & Analytics
What is it	• Managed cellular connectivity service (IaaS) • Available in 190+ countries • All technologies – CDMA, GSM, LTE	• Complete M2M technology stack • Sold as PaaS	• Application Enablement Platform • Integrated into core stack • Cloud-based, "infinitely" scalable • Device & application analytics
Target Customers	• Enterprise and M2M solutions providers • All verticals – auto, fleet, health care, utilities, industrial	• MNO's building an M2M business	• Enterprises and M2M solutions providers building apps • MNO's reselling service
Routes to Market	• Enterprise sales team • Telesales • Resellers • Self-service (launching in Oct)	• Aeris MNO sales team • Cisco OEM – IoT Cloud Connect • Tech Mahindra resell	• Enterprise sales team • Telesales • Self-service (launching in Jan)
Competitors	• MNOs • M2M MVNOs	• Jasper • Ericsson	• Thingworx • Axeda • Others

Aeris Advantage

Industry's Only Network Dedicated for M2M

M2M
Applications

Devices

Mobile Core
Network

Radio Access
Network

Service Provider

Customer Experience

	Service Provider	Radio Access	Customer Experience
MNO	Network built for smart phones and tablets Limited M2M features No M2M support expertise	Biased towards own network	Not optimized for M2M
M2M MVNO	No mobile core network Resell MNO data plans: expensive No real-time visibility, support skills	Same as carrier partner; no control	Fundamentally limited through technology approach
Aeris	Purpose-built mobile core network for M2M Leading visibility, control, TCO Optimized features: SMS Direct, eCall, AerTap, and others	Optimized for maximum coverage	Superior coverage, reliability, and TCO

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Coverage and Reliability

Optimized for maximum coverage across both CDMA, GSM

CDMA + GSM

CDMA

Optimized for coverage across 52 carriers in North America

Inherent redundancy

GSM

Single SIM across 550 Carriers

Over 190 countries

Single global APN

Enhanced Service Selection

- Customer-optimized preferred roaming list
- Supported in multiple radios
- Key differentiator with indoor coverage environments

Redundant Carriers Access

- Access to multiple carriers in many countries
- Customer driven ability to choose/block carriers

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Neo™–Self service connectivity, launched in Q4'14

Platform capabilities drive dramatic improvements in delivery cost and cycle time

Jumpstart IoT: Planning an Operator's Success

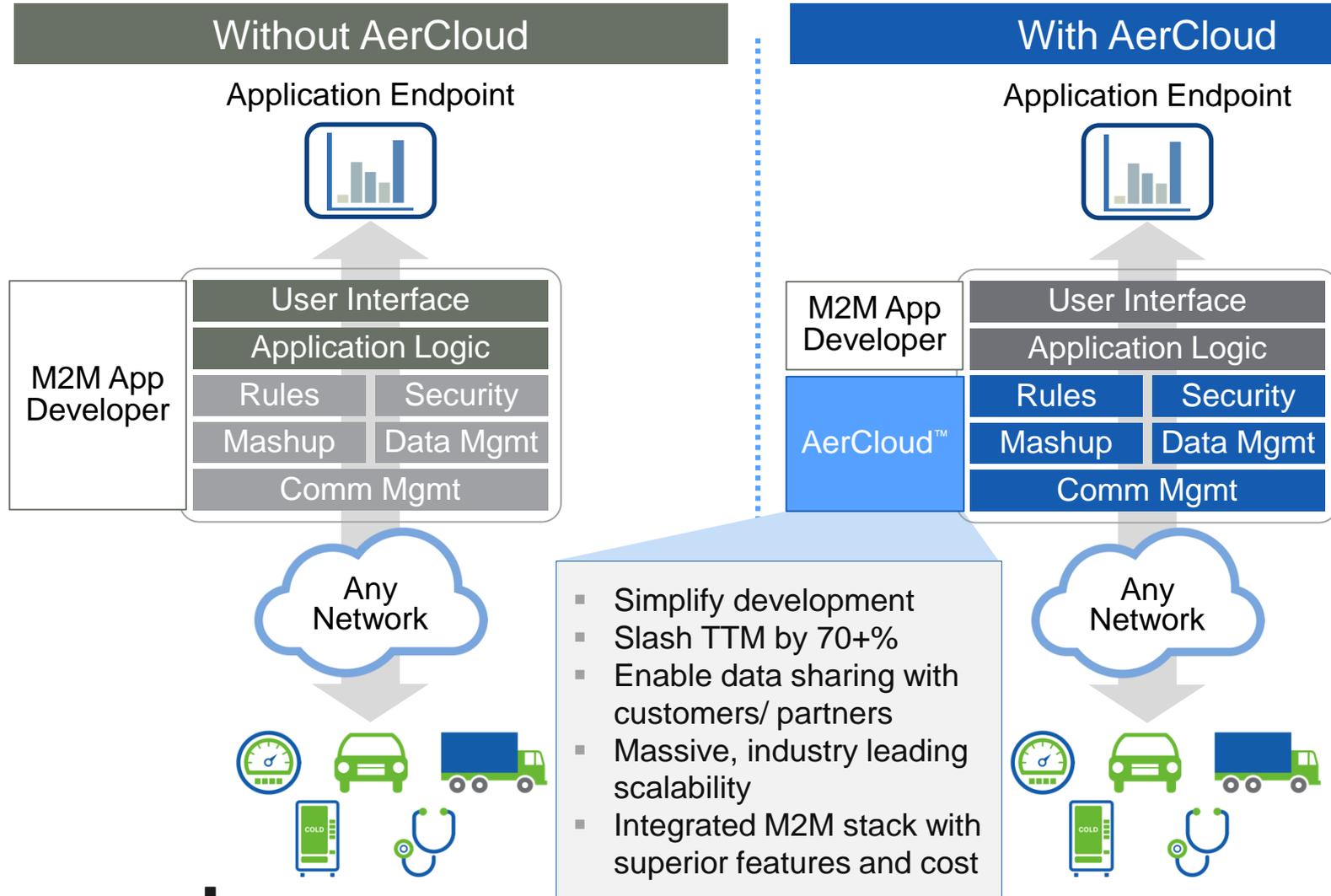Addressing an Operator's most stubborn challenges: Effective Market Entry
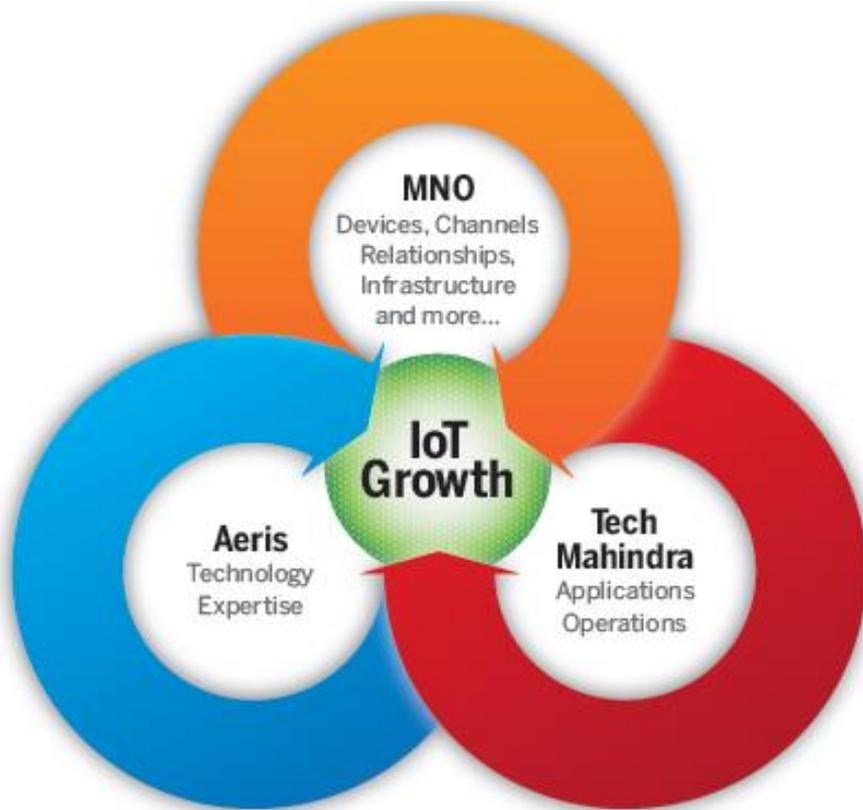
Jumpstart IoT combines:

- Aeris's flexible, low cost service delivery platform
- Tech Mahindra IoT applications and customization capabilities
- MNO's sales, marketing and wireless services reach

A jointly developed and structured go-to-market plan to maximize the Operator's opportunity and to ensure Operator success

What Is AerCloud™?

Next generation M2M application enablement platform

Without AerCloud

Application Endpoint

M2M App Developer

User Interface	
Application Logic	
Rules	Security
Mashup	Data Mgmt
Comm Mgmt	

Any Network

With AerCloud

Application Endpoint

M2M App Developer

AerCloud™

User Interface	
Application Logic	
Rules	Security
Mashup	Data Mgmt
Comm Mgmt	

Any Network

- Simplify development
- Slash TTM by 70+%
- Enable data sharing with customers/ partners
- Massive, industry leading scalability
- Integrated M2M stack with superior features and cost

AerVoyance – IoT Analytics

Provides insight, management, control & optimization of M2M / IoT device footprint

- Enables customers to gain visibility & insight into the device, usage & billing info.
- It also enables alerts, anomaly detection & prediction providing relevant debugging & actionable info to effectively manage IoT / M2M deployment using a simple graphical interface.

Account Dashboard
Obtain an overall view of the device portfolio including billing, usage, and status

Visibility & Insight
Visibility into billing & usage information leveraging simple graphical interface

Analytics
Analyze billing & usage data enabling account admin to manage cost and devices.
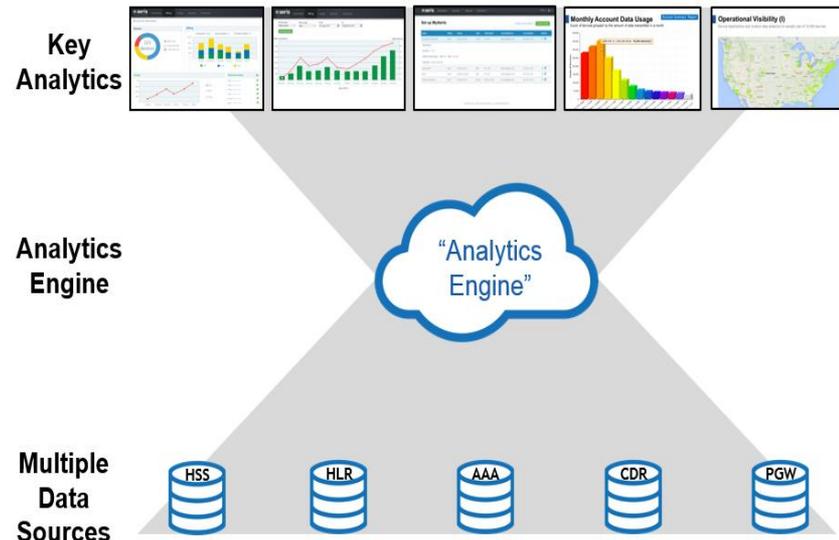
Diagnostics
Root cause and fix issues related to billing, usage and behavior of devices
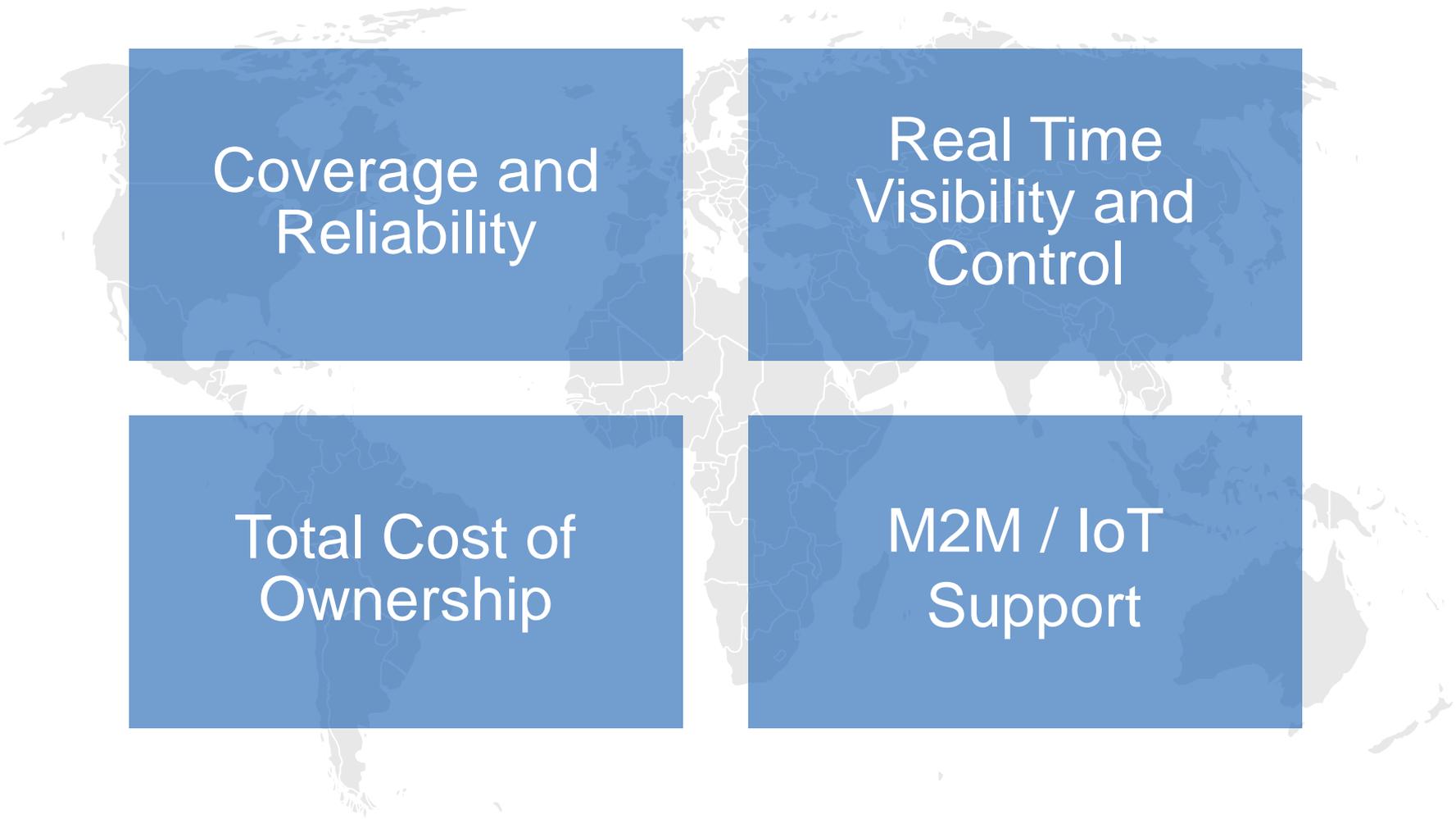
Anomaly & Alerts
Bubble up and present key anomalies and learn from user reaction and feedback

Prediction & Action
Learning engine to predict device behavior for pre-emptive action

Key Analytics

Analytics Engine

"Analytics Engine"

Multiple Data Sources

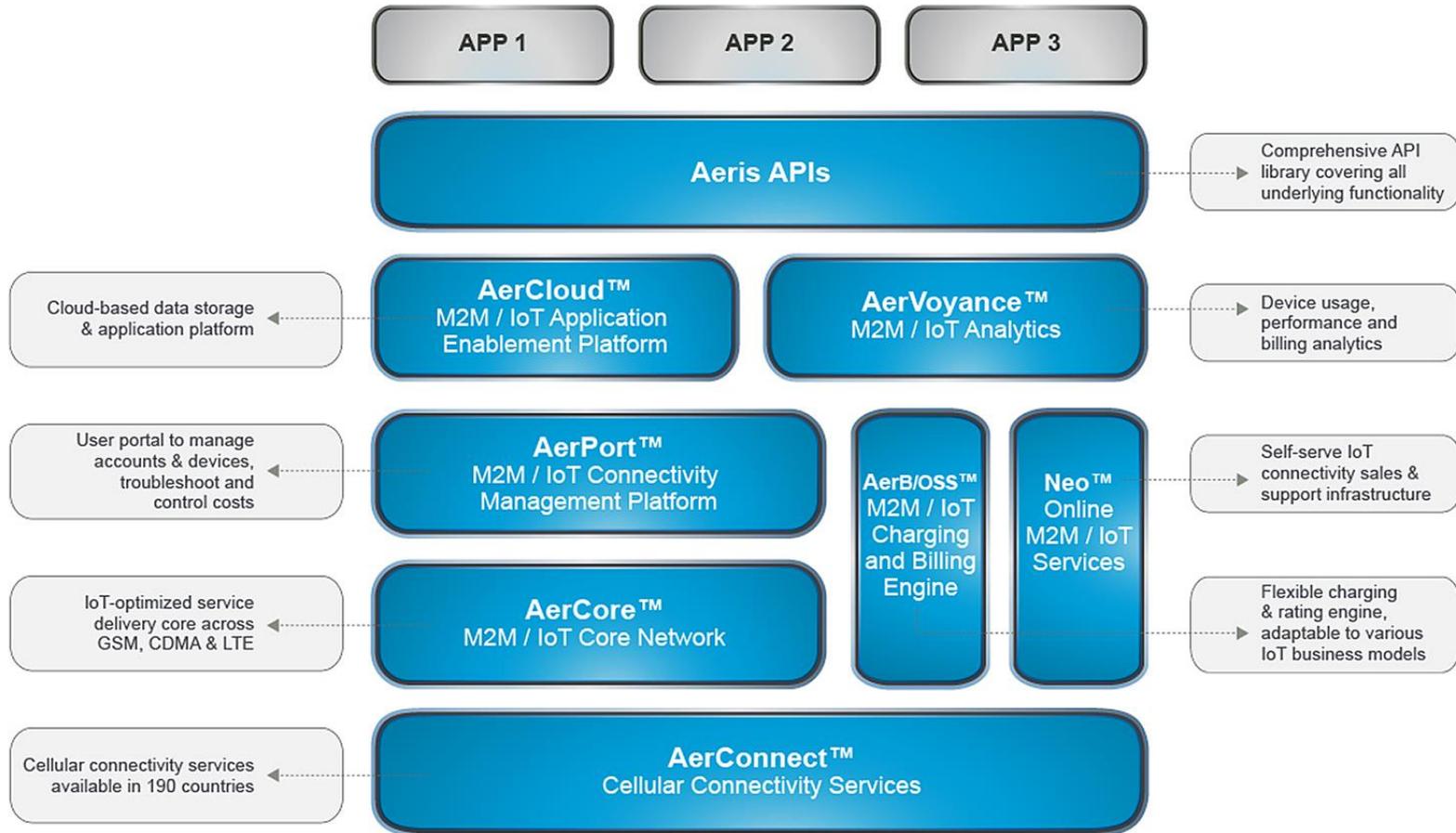HSS   HLR   AAA   CDR   PGW

Why Does Aeris Win?

Coverage and Reliability

Real Time Visibility and Control

Total Cost of Ownership

M2M / IoT Support

Technology Overview

Aeris M2M / IoT Platform

APP 1   APP 2   APP 3

Aeris APIs
— Comprehensive API library covering all underlying functionality

AerCloud™ M2M / IoT Application Enablement Platform
AerVoyance™ M2M / IoT Analytics

Cloud-based data storage & application platform
Device usage, performance and billing analytics

AerPort™ M2M / IoT Connectivity Management Platform
AerB/OSS™ M2M / IoT Charging and Billing Engine
Neo™ Online M2M / IoT Services

User portal to manage accounts & devices, troubleshoot and control costs
Self-serve IoT connectivity sales & support infrastructure

AerCore™ M2M / IoT Core Network

IoT-optimized service delivery core across GSM, CDMA & LTE
Flexible charging & rating engine, adaptable to various IoT business models

AerConnect™ Cellular Connectivity Services

Cellular connectivity services available in 190 countries

IoT Optimized Service Delivery Platform

Case Studies

Key customers using the platform

Automotive	Fleet	Health	Monitoring	Utilities

Value in action

HYUNDAI

- Full Verizon and Sprint footprint
- Ability to select strongest signal
- Increased success rates by 5% over OnStar comparison

ResMed

- Aberrant devices found during ramp
- Early identification of product issue
- SW change avoided 1M unit recall

Badger Meter

- Enabled new business model
- Moved to cellular at each meter
- Competitors forced to follow

SILICON controls

- Devices flipping between towers
- Early identification of battery life issue
- PRL updates to resolve and avoid 20K truck rolls

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AerCloud & AppExpress

June 2015

Gurinder Dhillon

Sr. Director, IoT App Platform & Analytics

High Level Value Proposition

AerCloud and Application Express help our customers deliver better M2M and IoT applications faster

AerCloud Principles

From prototype to
Production

Fully
Customizable

Developer
Friendly

Scalable

Reliable

What Is AerCloud?

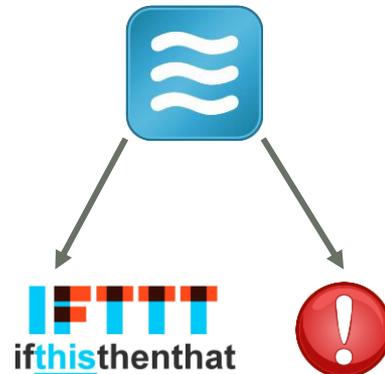**AerCloud** is a platform for **collecting, managing and analyzing sensor data**

How AerCloud works?

Connect devices to AerCloud & receive data	Manage devices & data streams in AerCloud	Build app using AerCloud App Express	Run your IoT application and realize efficiencies

- Any device
- HTTP or MQTT protocols
- Enables to push / pull data from device

- Enables to deploy, provision & manage devices
- Manage data, set alerts, action based on alerts, etc.

- AerCloud App Express has embedded LifeRay capabilities
- Develop app using drag drop widgets
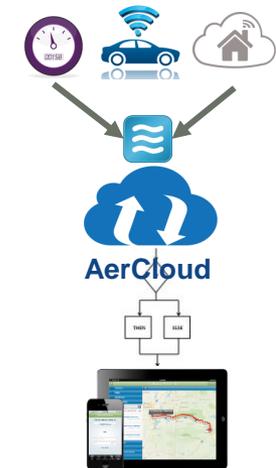
- AerPort, AerCloud and AAE platform are integrated
- Enable end to end capability to IoT and M2M applications

AerCloud Provides The Data Infrastructure

Devices

Any Connectivity

AerCloud

Application

Rest API

MQTT

CoAP

Custom

Rules Engine

Storage

Data Push

Data Pull

AAE

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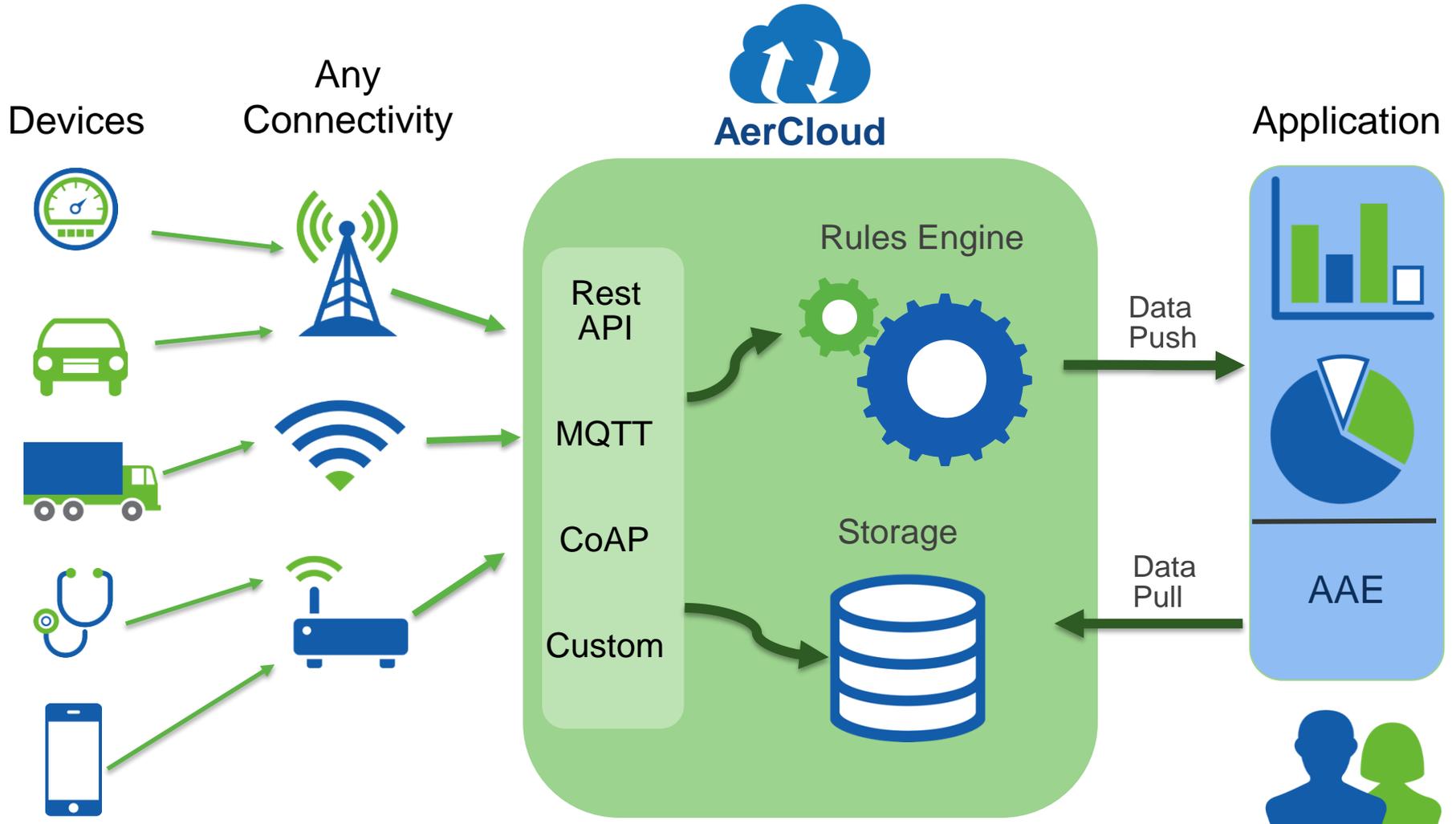
Key features of platform

- **Data collection**
  - Data from device & sensors collected in AerCloud
  - Use HTTP REST API to push XML or JSON encoded data from devices to AerCloud
  - Secure data using HTTPS, data encryption, checksums, etc

- **Data Storage**
  - AerCloud has build-in NoSQL database
  - Data replication
  - Access data using PUSH & PULL mechanisms through APIs

- **Listeners, Rules & Triggers**
  - Rules based queuing and routing
  - Define action in response to specific data receive, store, device connect/disconnect ..
  - Identify corresponding alarms and triggers

- **Device management**
  - Remotely maintain, interact and control devices

- **SDK Application Engine**
  - Enable developer to develop apps quickly

- **Debug logs**
  - Use connectivity analytics and logs to see how the devices interact with AerCloud

- **Custom UI**
  - Leverage existing widgets to develop customer UI

- **Data Export**
  - Ability to export data to other storage services

- **API Key Management**
  - API access is controlled by API keys. This enables fine-grained privilege and visibility management

- **User management**
  - Corporate users can manage other user accounts to help manage account & define custom privileges & visibility

What Is AerCloud Application Express?

AerCloud Application Express is a toolkit for rapidly building web applications on top of AerCloud

Developer can leverage existing widgets
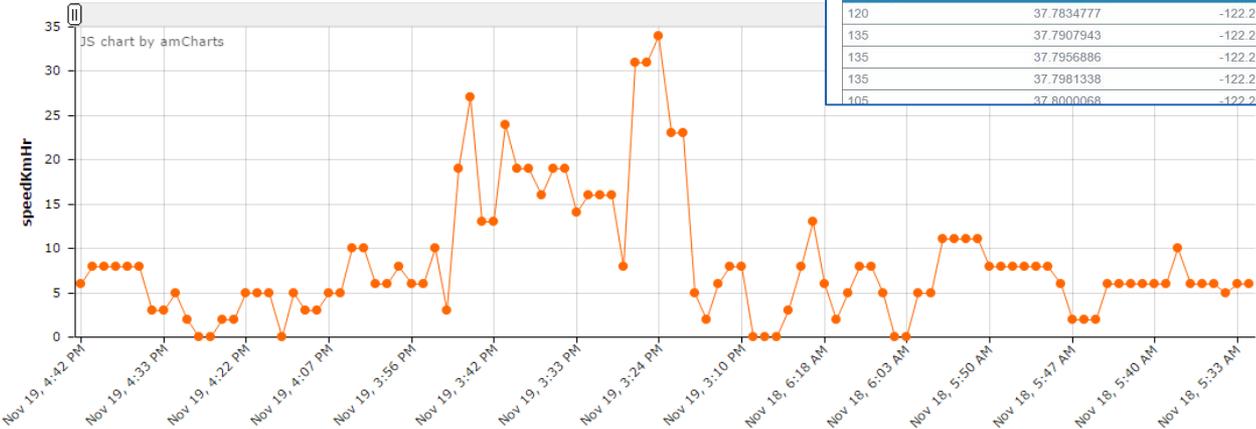
UI Widgets

- AAE is Set of user interface widgets
  - Covers a range of M2M and IoT use-cases
    - Location Tracking
    - Asset Monitoring (Solar, Charging Stations, Tank Monitoring, etc)

- Source code available to customer
  - Full customization supported
  - Widgets are javascript
    - Angular is the toolkit
  - Assumption is that some customization will be needed for every deployment
    - Implies that the customer needs some software development capabilities

Demo Time

Industrial Refrigerator
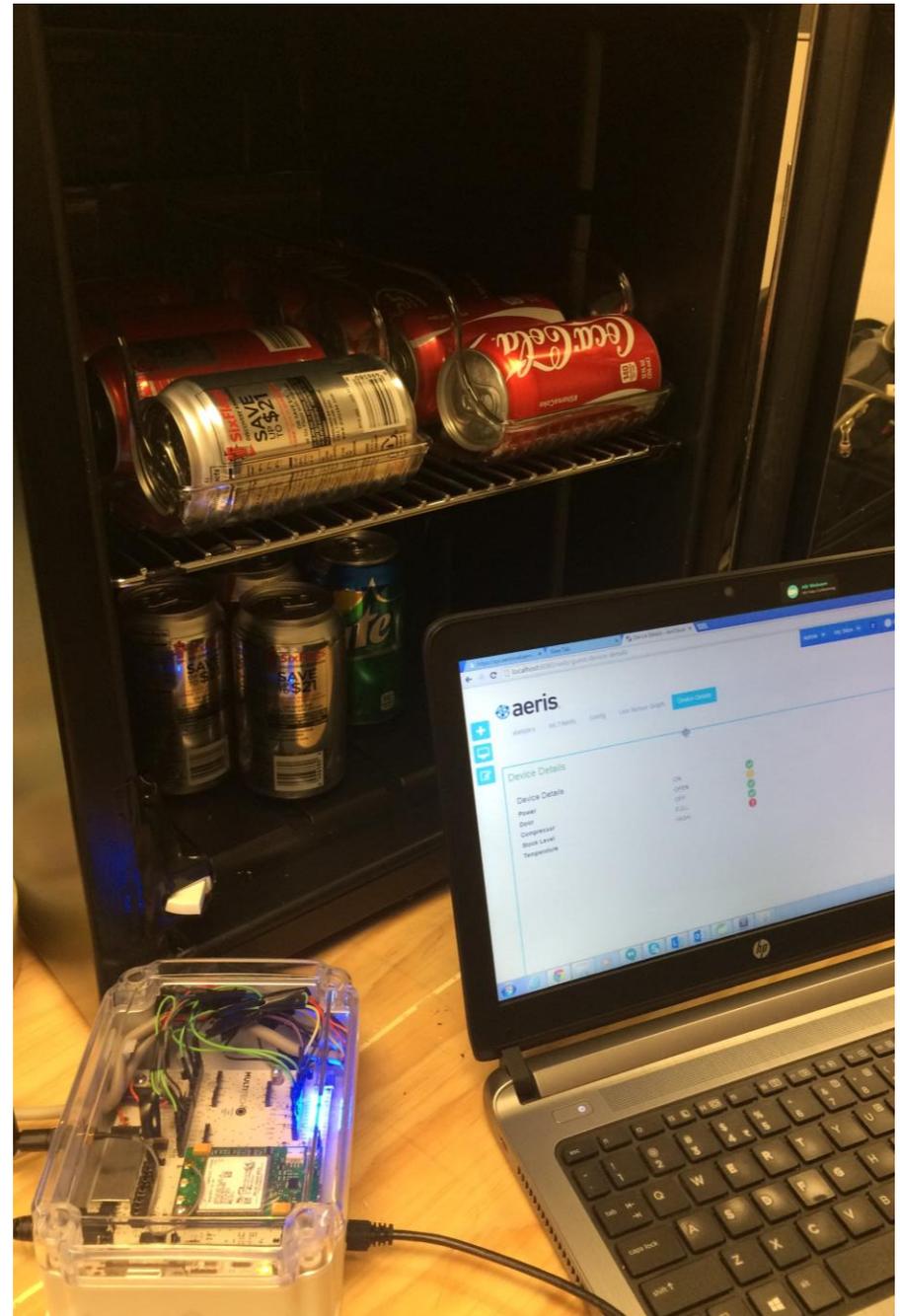
Demo overview

- **Application:**
  - An industrial refrigerator management application with capability to track inventory, temperature, failure of power & compressor and door status

- **Key functionality**
  - Track inventory and send alert when it is too low
  - Alert if someone left the door open to ensure optimal operation
  - Track temperature to ensure meeting the food safety requirements
  - Ensure the compressor is functioning properly and kicks in as required
  - Alert if compressor fails
  - Alert if power failure

Demo Architecture

Sensor & Device

AerPort Connectivity

AerCloud

AerCloud App Express

Rules Engine

MQTT

Storage

Data Push

Data Pull

Analytics

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