Internet of Your Things

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• Changing World, a new perspective
• Defining IoT
• Azure IoT Suite
• Advanced Analytics
• Demo
A Changing World – a new perspective

“A chicken in every pot.”
~ Henry IV of France – 17th Century

“A computer on every desk and in every home.”
~ Bill Gates (1977)

“A computer in every pot and chicken.”
~ (today)
IoT 2015

**HOME**
- Smart appliances
- Sleep tracking
- Home security
- Home automation

**COMMUTE**
- Food and nutrition tracking
- Air conditioning and temperature control
- Leak detection

**WORKPLACE**
- Identity
- Office equipment
- Environmental sensors
- Garden, lawn and plant care

**COMMUTE**
- Behavior modification
- Indoor navigation
- Beacons and proximity
- Smart vending machines
- Information capture
- New devices and sensors

**HOME**
- Smart lighting
- Pet tracking
- Medication adherence
- Child and elder monitoring
- Sports and fitness
- Trip tracking and car health
- Object tracking
- Bike ride stats and protection
- Entertainment systems
- Control
Defining Internet of Things

Things

Connectivity

Data

Analytics
IoT is an Inflection Point

- Hardware is cheap
- Connectivity is pervasive
- Development is easy
- Huge benefits fuel demand
- New Innovative Scenarios
Disruptive Forces

Moore’s Law

Transistors

Metcalf’s Law

Koomey’s Law

And more importantly:
what can you do by combining and analyzing signals from all of these IoT devices?
Internet of Things opportunity

25 billion
Connected “things” by 2020
—Gartner

$1.7 trillion
Market for IoT by 2020
—IDC

70%
of value enabled by IoT will come from B2B scenarios
—McKinsey & Company
Microsoft’s view on IoT
The Internet of Things starts with your things

- Enable connectivity to both existing and new devices
- Facilitate new insights by harnessing power of untapped data
- Enable fast solution development
Why the Internet of Things matters

Gain insight and agility
Build competitive edge
Open new business opportunities
Redefine customer service
Business is being transformed by three trends

Big Data

Cloud

Intelligence
Scenarios

Improving visibility and making accurate predictions
- Remote monitoring
- Demand forecasting
- Risk and compliance management

Getting the right products to the right places
- Inventory management
- Supply chain optimization
- Marketing mix optimization

Offering customers exactly what they want, when they want it
- Personalized offers
- Product recommendations
- New product introduction

Fixing problems proactively before they start
- Predictive maintenance
- Operational efficiency
- Customer service improvement

Exploring new business opportunities
- Cross-sell and upsell
- Product-as-a-service
- New data-driven services
Azure
30 Hyper-scale Azure regions around the world

More than AWS and Google Cloud combined
Microsoft Azure

CORE INFRASTRUCTURE
- Compute
- Storage
- Networking
- Security

ADVANCED WORKLOADS
- Web + Mobile
- Internet of Things
- Microservices
- Data + Analytics
- Identity Management
- Media Streaming
- High Performance Compute
- Cognitive Services

TOOLS
- Visual Studio + Visual Studio Code + Visual Studio Team Services + Xamarin
Microsoft Azure

INTERNET OF THINGS
- IoT Hub
- Stream Analytics
- Logic Apps

CLOUD INFRASTRUCTURE
- Azure + Azure Stack + Operations Management Suite
Microsoft Azure IoT Suite

- Device Connectivity & Management
- Data Ingestion and Command & Control
- Stream Processing & Predictive Analytics
- Workflow Automation
- Dashboards and Visualization
- Preconfigured Solutions
Capture and analyze untapped data to transform your business

Connect and scale with efficiency

Analyze and act on new data

Integrate and transform business processes

- Analytics
- Device Registry
- Rules and Actions
- Dashboards & Visualization

Real-time operating systems

And more
Transform data into intelligent action

Data Sources → Apps → Sensors and devices → Data

Information Management:
- Data Factory
- Data Catalog
- Event Hubs

Big Data Stores:
- Data Lake Store
- SQL Data Warehouse

Machine Learning and Analytics:
- Machine Learning
- Data Lake Analytics
- HDInsight (Hadoop and Spark)
- Stream Analytics

Machine Learning and Analytics:
- Cognitive Services
- Bot Framework
- Cortana

Intelligence:
- Power BI

Dashboards & Visualizations:
- Power BI

Data Sources → Apps → Web → Mobile → Bots

Action

Microsoft
Accelerate time to value with preconfigured solutions

Start quickly with preconfigured solutions

- Get started in minutes
- Modify existing rules and alerts
- Add your devices and begin tailor to your needs

Finish with your Internet of Things application

- Fine-tuned to specific assets and processes
- Highly visual for your real-time operational data
- Integrate with back-end systems
Preconfigured Solutions: Remote Monitoring

- Remote Monitoring
- Predictive Maintenance
- Asset Management
Remote Monitoring

How to approach a remote monitoring project

Imagine if you could monitor thousands of devices located around the world without physically inspecting them

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<tbody>
<tr>
<td>1</td>
<td>Establish monitoring objectives and requirements</td>
<td>2</td>
<td>Profile the devices involved</td>
<td>3</td>
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<td>4</td>
<td>Categorize the data</td>
<td>5</td>
<td>Define alerts and actions</td>
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Azure IoT Suite solutions come with pre-built sample scenarios that include:

- Background information on the business need and objectives
- Simulated devices and sample data
- Pre-set rules and alerts, pre-defined dashboards, and more
What you get with remote monitoring preconfigured solution

Azure IoT Suite Remote Monitoring

- Devices
  - C# simulator
- Back end systems and processes
  - Power BI
  - Logic Apps
  - DocumentDB
  - Web Jobs
  - Event Hub
  - Stream Analytics
  - IoT Hub
  - Storage blobs
  - Web/Mobile App
- Azure
  - Active Directory
One OS
Universal Windows Apps
Universal Windows Drivers
Natural User Interface

Enterprise-grade security
Trusted Platform Module
Advanced Lockdown
Multi-user Profiles

Industry peripheral support
Interoperable
Deploy, service, manage
Azure IoT-ready
Explore new business opportunities

**ThyssenKrupp Elevator develops new services capabilities**

**Scenario**  
Variable elevator uptime | The need for competitive differentiation

**Solution**  
Several Azure technologies, including Machine Learning, that enable monitoring via a real-time dashboard and that instruct technicians on optimal maintenance activities through dynamic predictive models

**Result**  
- Increased elevator uptime
- Reduced costs for ThyssenKrupp and its customers
- Rich, real-time data visualization and awareness of issues
- The ability offer predictive maintenance services for customers around the globe

“We wanted to go beyond the industry standard of preventative maintenance, to offer predictive and even preemptive maintenance.”

Andreas Schierenbeck  
CEO, ThyssenKrupp Elevator
## Explore today

1. **Learn more**
   - [https://InternetofYourThings.com](https://InternetofYourThings.com)
   - [https://github.com/Azure](https://github.com/Azure)

2. **Get trained**
   - [http://azure.com/mydriving](http://azure.com/mydriving)
   - [http://azureiotsuite.com](http://azureiotsuite.com)

3. **Watch more**
   - [https://channel9.msdn.com](https://channel9.msdn.com)
   - [http://aka.ms/msdnnz](http://aka.ms/msdnnz)
Thank you!

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Demo: Vehicle health and driving behavior patterns
Turning telemetry data from vehicles into insight

75% of the cars shipped globally by 2020 will be built with the necessary hardware to connect to the Internet.

So what can we do with that data?

- Roadside assistance
- Fleet management: Show me the location of all vehicles within 50mi of my location
- Engine emission control: What is the emissions status of vehicle B204?
- Eco-driving: How does the reported MPG compare to actual MPG?
- Engine performance remapping: What parts of the engine are not meeting requirements?
- Usage-based insurance: Are there any vehicles below the insurance price break threshold?
Example of Cortana Intelligence Suite in action

**Data Sources**
- Ingest
  - Diagnostic Streaming
  - Sensors and devices
- Prepare
  - Event Hubs
  - Stream Analytics
- Analyze
  - Machine Learning
  - Stream Analytics
  - HDInsight
- Publish
  - SQL Data Warehouse
- Consume
  - Power BI
  - Cortana

**Key Tools and Services**
- Data Factory: Move data, orchestrate, schedule and monitor
- Data Catalog: Register, annotate, understand, discover data sets
With Cortana Intelligence, better predict needs and trends

- **Roadside assistance**: Tow truck is on its way to vehicle B204
- **Eco-driving**: 14/15 vehicles meet standards and 1 is scheduled for maintenance
- **Fleet management**: 24 vehicles are shown on a map, showing status
- **Vehicle diagnostic**: The front brakes are needing to be serviced sooner than expected
- **Engine emission control**: Vehicle B204 is driving in eco-mode 78% of the time
- **Engine performance**: Temperature is beyond the ideal range for 13 vehicles
- **Usage-based insurance**: 3 vehicles have daily mileage that qualify them for reduced rates
Pricing

Cost of running this in your subscription

- A team of no more than five (+ observing stakeholders).
- Running for about a month.
- 100 users with 4 trips per day.

Total = $157 (Free Azure Credits for a new account is $200)

Get started today at https://azure.com/mydriving