White Paper

IoT Solutions from Arrow and IBM

Author
Andrew Bickley
Arrow Electronics EMEA
Technology Marketing Director, IoT

May 10, 2017

The enormous potential of the Internet of Things (IoT) will be powered by new infrastructure paradigms and unprecedented mechanisms for not only human-to-machine interactions but also for machine-to-machine interactions. From the end-sensor node to the cloud application, enterprises must traverse many hardware, software and networking domains. Simultaneously, customers want access to services anywhere and anytime and on any device interface. New entrants and established players all find this new landscape and customer expectations challenging, expensive and very risky. Accompanying the market demands, stakeholders are also confronted by alack of skilled personnel, non-standard protocols, hard to integrate operating environments and the absence of one unified approach to application development. Application developers seeka new approach that dramatically simplifies the development environment and affords rapid scale.

The complexity and diversity required to execute these emerging systems are enormous. Stakeholders must surmount a wide range of issues when planning, developing and deploying IoT infrastructure and applications. In this article, we examine how Arrow and IBM are solving the challenge and ushering in a new paradigm for developing and delivering connected solutions.

Contents

IBM Bluemix & Watson IoT Platform

While a wide variety of IoT platforms are available in the marketplace, few platforms match the scale, scope, and sophistication of IBM. Customers need their IT for IoT to be low cost, scalable and flexible to serve a variety of needs. Customers see application development as a core competence and need simple IT infrastructure that can afford rapid development. These needs are often a mismatch for traditional IT environments characterized by slow development, an inability to scale rapidly, expensive monolithic infrastructure and bureaucratic provisioning of resources. Further, IoT relies on sophisticated analytics to drive applications. This single emerging technology domain is particularly difficult as new skills are needed. IBM Bluemix and the IBM Watson IoT platform aim to solve these aspects.

IBM Bluemix plays the role of a comprehensive integrated development environment with a wide range of functionality available in the cloud. The platform makes deployment of applications simple with global scaling capabilities and on-demand capacity expansions. In addition, the Bluemix platform encapsulates IoT application provisioning and application-level security services into standard APIs. It integrates hundreds of 3rd party and open source libraries, enabling rapid prototyping, testing, and deployment of new applications.

IBM Watson complements Bluemix as the leader in cognitive technology. Incorporating the latest in machine learning and artificial intelligence, the Watson analytical platform provides predictive, cognitive, real-time and social context to IoT data. The platform provides a real-time analytics engine and analytics capability that enables the contextualization and monitoring of IoT device data, speeds understanding of current conditions, and improves decision-making. It uses a simple rules-based composition model and an extensible framework to help customers leverage IoT data, combine it with master asset data, analyze situations in context, and automate responses to improve operations, availability, and service levels. The table below summarizes the features and capabilities of the Bluemix and Watson platforms and highlights use-cases and applications where they are best suited.

	IBM Bluemix	IBM Watson IoT Platform
Summary	Scalable cloud platform for data storage, analysis and visualization. Platform also offers end-device management capabilities	Platform with advanced analytical capabilities for applications dealing with large volumes of unstructured data (images, videos, voice, text, etc.)
Features	Platform-as-a-service (PaaS) with these features • Scalable data storage and information management (rules, alerts, etc) • Basic analytics of structured data • Data visualization • Device management • Security and risk management features • APIs to integrate a host of IBM and 3rd party applications and services	Advanced analytical capabilities including 1. Analysis of unstructured data 2. Cognitive computing 3. Natural language processing 4. Machine learning and Artificial Intelligence (AI)
Ideal for	Any OEM building IoT applications and need a platform to store, manage, analyze and visualize structured data (for ex: temperature or pressure sensor data)	Systems needing high-performance analytics of unstructured data. Typically implemented on top of the IBM Bluemix platform
Applications	Temperature and humidity monitoring in a production environment, lighting control in a small business facility, etc.	Connected manufacturing, predictive analysis for device maintenance, city energy management and optimization

Table 1: Overview of the IBM Bluemix and the IBM Watson IoT Platforms

Arrow's IoT Approach

A customer's IoT strategy is not just reliant on the IoT platform at the cloud. It relies on the right choices at the hardware and communication elements of the IoT value chain. Here Arrow works with customers to maximum impact. Arrow has forged strong relationships with a wide range of semiconductor and computing suppliers over the years. These relationships and Arrow's unique position in the IoT value chain have allowed Arrow to build a portfolio focused on helping customers navigate the IoT device and infrastructure landscape. Selecting the right partner for each of these ingredients can significantly lower costs of development and deployment of an IoT system. Further, it is not sufficient to have the best ingredients but these ingredients must be integrated end-to-end and provide scalability and longevity.

Arrow's IoT approach is to bring together a set of resources, device component suppliers and infrastructure providers and drive integrated connectivity and data insights simultaneously. Any component, sensory device or gateway can now be connected to any infrastructure platform. Similarly, data insights are derived by bringing together leading cloud infrastructure and IoT platform providers like IBM Bluemix and Watson IoT platform.

The figure below shows Arrow's end-to-end IoT stack. Tools to enable IoT device integration and applications – Arrow Connect™ and Arrow Insight™ – provide many device management services, data visualization, 3rd party systems integration and user experience. The capabilities and benefits of these tools are discussed below.

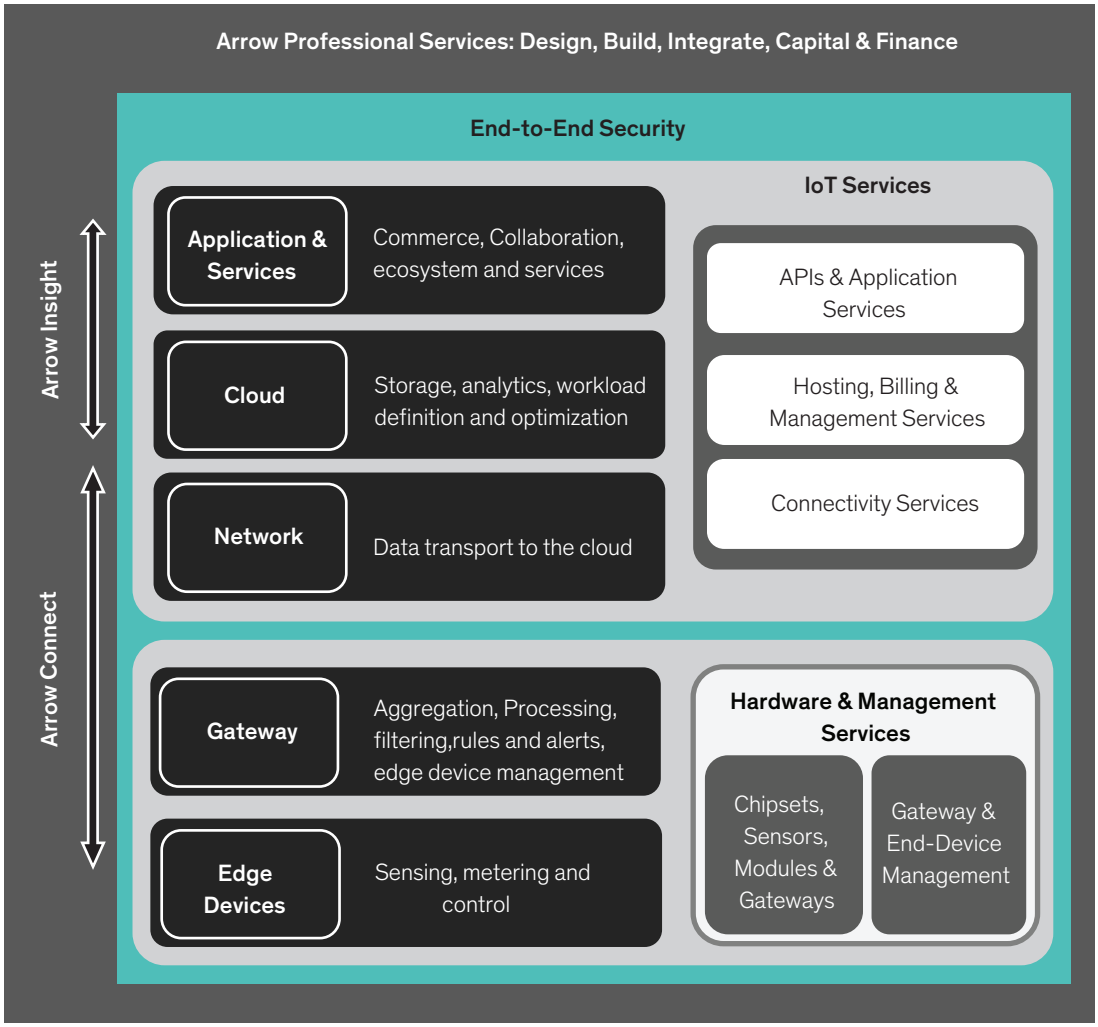

Figure 1: Arrow End-to-End IoT Stack

Arrow Connect™

Arrow Connect is a software solution that plumbs the data from the edge to the cloud. Developed by Arrow and designed with security, scale, flexibility, device management, open APIs and extensibility as core tenants enabling broad use cases across multiple industries.

Arrow Connect can bridge any device to any data platform. Arrow Connect offers the flexibility to select the right hardware and cloud platform for any application and provides the hooks to seamlessly connect it all. As the application requirements evolve, Arrow Connect evolves with it, requiring minimal development effort to upgrade or change hardware, add different gateways, or cloud functionality. Provisioning, control, importing, assigning, activations, updates, suspensions, replacements, deactivations, and more can be performed from a single platform. Arrow Connect helps accelerate the first mile of IoT so OEMs can focus on driving business value via data analytics and machine learning tools. Arrow Connect certified solutions enable rapid solution development and Arrow Connect Gateway SDKs enable connection of any edge device to a wide selection of gateways.

Arrow Connect also provides integrated identity management, roles-based access control, device management and device control with flexibility to store the data within the Arrow Connect or directly into IBM Watson IoT. Leveraging a built from ground up multi-tenant capability, Arrow Connect provides flexibility and the ability to white-label for customers looking to bring a complete solution to market rapidly.

Arrow Insight™

While most people focus on the machine-to-machine aspects of IoT, the machine-to-person aspects are critical to integrate into business and operational processes where solutions are being deployed. Arrow Insight is a comprehensive IT Service Management (ITSM) platform that allows companies to evolve the full-service stack to a modern digital experience and drive productivity improvements. Whether it is about creating the next great IoT application or services to transform existing businesses, having a modern, flexible, and secure platform is critical to driving operational efficiencies over force fitting into existing tools and processes.

Arrow Insight can be white-labeled allowing integrators and MSPs to provide services to monitor sensors, enterprise hardware, and end user devices on a highly scalable, born in the cloud platform built on an ITIL (Information Technology Infrastructure Library) foundation.

Arrow Connect and IBM Bluemix/Watson IoT Platforms Working Together

The Arrow-IBM partnership dramatically simplifies the complex task of IoT application development by enabling any sensor or gateway to be connected to the IBM Bluemix and Watson IoT platforms. Device management, data analytics, visualization and 3rd party app integration processes are simplified. Figure 2 illustrates a real example of how the Arrow Connect integrates with the IBM Watson IoT platform to manage end sensors, store data and setup dashboards that inform users about the status of the nodes. Rules and alerts can be setup to enable users to optimize systems or take the required actions. Similarly, for applications that require cognitive computing and deep analytics capabilities, IBM Watson's analytics can be leveraged.

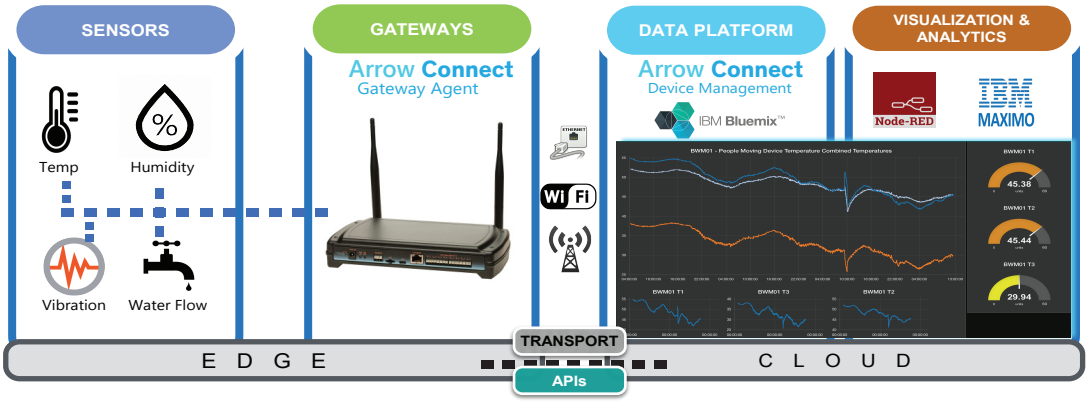

Figure 2: Arrow Connect Working Together with IBM Bluemix

By engaging Arrow for IBM Bluemix and Watson platforms, OEMs can greatly simplify the design and deployment of IoT solutions. The majority of the heavy lifting can be left to Arrow. Beyond the benefits of the Arrow platforms, expertise and IBM's industry leading IoT platforms, there are several advantages for customers. Figure 3 lays out the engagement process between the OEM, Arrow and IBM.

1. **Support at every phase in the design cycle:** Arrow's field personnel and software specialists work closely with key stakeholders in every phase of product development, starting with defining the platform requirements. By being the interface to IBM, Arrow simplifies the service agreement processes and enables a smooth transition from the trial phase to production/-monetization phase.

2. **Flexible payment models:** Arrow offers OEMs the ability to structure flexible pricing models based on usage requirements. Billing terms can be done at monthly, quarterly or annual basis. OEMs can benefit from these arrangements to reduce capital outlays and pay Arrow after receiving payments from their end-customers.

3. **Easy integration of hardware:** By using Arrow Connect, OEMs can attach any device to the IBM platform, and automatically increase system flexibility. With connectivity and access to IBM platforms assured, OEMs can design solutions while enjoying the flexibility of being hardware and vendor agnostic.

4. **Lower pricing:** The Arrow-IBM alliance comes with special pricing advantages for customers. OEMs can take advantage of special pricing on IBM offerings. This pricing is exclusive to Arrow that is not available through other avenues. Tailored options for consumption based pricing can also be obtained.

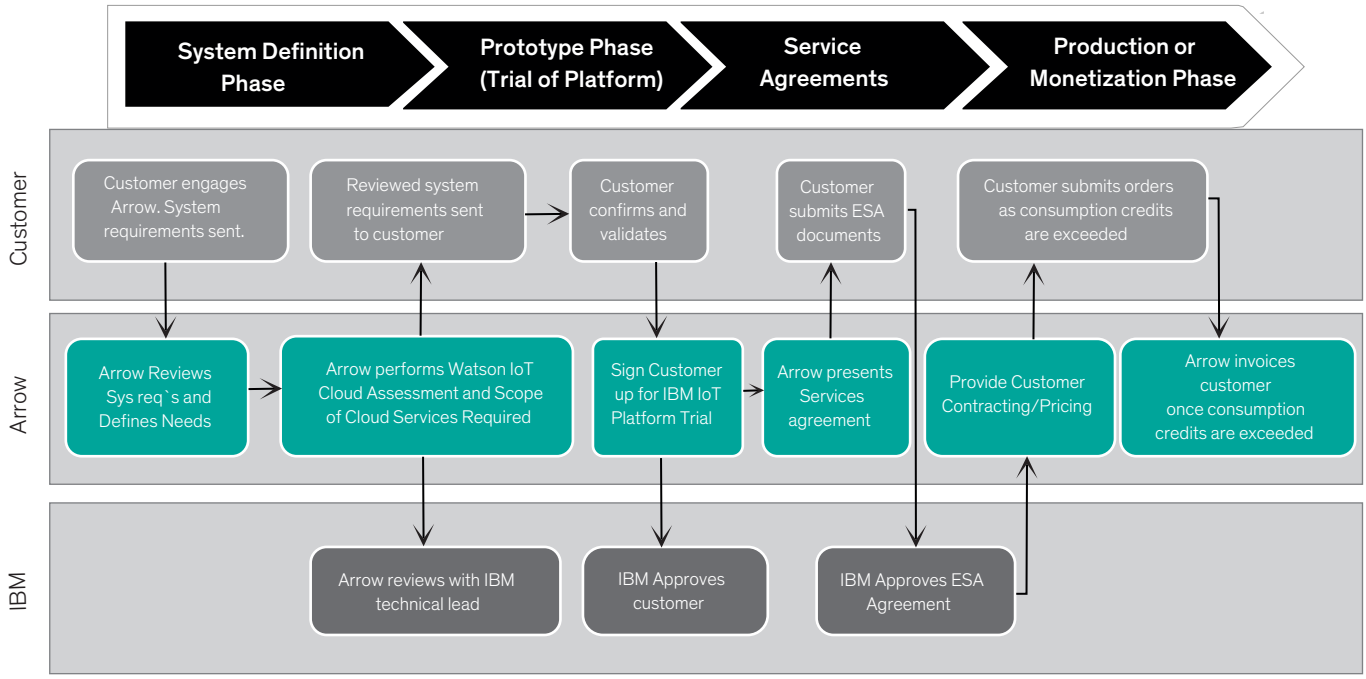

Figure 3: Getting Access to IBM Bluemix and Watson IoT Platforms from Arrow

Summary

The Internet of Things (IoT) paradigm presents a vast business opportunity for many enterprises. At its core, the IoT connects a diverse array of field and facility devices to a cloud ecosystem that adds value by harnessing data based insights. Key requirements for this connected future are the interoperation of many systems, integration of operational devices (examples: sensors, controls) with information-technology (examples: servers, storage, software, applications) and easy to use mobile user interfaces. Implementation of this seemingly simple scenario requires secure, precise and seamless interactions between a complex landscape of hardware, software and services components.

The Arrow-IBM partnership dramatically simplifies the complex task of IoT application development. From choosing the right hardware platform and connectivity architecture to rapidly prototyping and scaling the IoT application, the Arrow-IBM IoT relationship brings together industry leading technologies to speed up time-to-market, reduce cost of application development and most important mitigate the risk of IoT application development. With the cognitive and analytical abilities that Bluemix and the Watson IoT Platform bring to bear, customers can be assured that all the data that their IoT devices will gather will truly yield transformative insights.

For more information, contact your Arrow sales representative or go to iot.arrow.com.

References

> The Forrester Wave™: IoT Software Platforms, Q4 2016
> The Platform of Platforms in the Internet of Things
> Your Cognitive Future
> How to Connect a "Thing" to IBM Watson IoT Platform Connect

Online
iot.arrow.com

Five Years Out

Arrow Central Europe GmbH
Internet of Things
Frankfurter Straße 211
63263 Neu-Isenburg
GERMANY

10_05/17