Internet of Things Mythbusters

7 Myths Debunked

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Introduction

Everyone loves a good myth. It makes for entertaining dinner table conversation. But sometimes myths get in the way of solving problems and unfortunately in the technology world, this can mean wasted time, money and resources.

The Internet of Things (IoT) buzzword is everywhere, as it should be. The Internet of Things market is expected to grow from USD 170.57 Billion in 2017 to USD 561.04 Billion by 2022, at a Compound Annual Growth Rate (CAGR) of 26.9%, according to the June 2017 MarketsandMarkets research report, *Internet of Things (IoT) Market by Software Solution* (Real-Time Streaming Analytics, Security Solution, Data Management, Remote Monitoring, and Network Bandwidth Management), Service, Platform, Application Area, and Region - Global Forecast to 2022.

IoT market forecasted to grow to $561.04 Billion by 2022 with a 26.9% CAGR.

The problem is that these Internet 'things' have myths surrounding them, some of which are impacting how organizations develop the apps to support them -- It's time we bust these myths.

Myth 1 – Put Computing Closer to the Sensors

According to the MarketsandMarkets report "The fundamental problem posed by the Internet of Things is that network power remains very centralized. Even in the era of the cloud, when you access data and services online you're mostly communicating with a relative few massive datacenters that might not be located conveniently close to you. That works when you're not accessing a lot of data <u>and</u> when latency isn't a problem, but it doesn't work in the Internet of Things, where you could be doing something like monitoring traffic at every intersection in a city to more intelligently route cars and avoid gridlock. In that instance, if you wait for that data to be sent to a datacenter hundreds of miles away, processed, and then sent commands back to the streetlights, it is too late — the light has already changed."

Latency is a big challenge when it comes to the IoT. Consider first responders in an emergency, traffic updates or a more consumer-focused example, Google Glass. If latency exists, then getting real-time information becomes a problem. One solution, according to a [Wired article](#) is that "organizations will need to put their data and computing infrastructure in close proximity to users and the devices, and be able to connect directly to their trading partners and digital supply chain."

However this isn't always possible. You cannot, for example, put a datacenter in the middle of the ocean (even though Google did discuss this a few years back) to support marine shipping, RFID updates from containers or the many planes crossing it daily to reduce latency. And in these situations, if there is an emergency you need information as quickly as possible.

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Market-to-Market says the solution is to do more computing closer to the sensors that are gathering the data in the first place. Thus, the amount of data that needs to be sent to the centralized servers is minimized and the latency is mitigated. This data crunching capability could be put on the router.

Computing location is only part of the story. Getting the right data from the right device at the right time is not just about hardware and sensor location -- it is about data intelligence. If systems can understand data and only distribute what is important, at the application level, this is more powerful than any amount of hardware thrown at the problem. A network cannot prioritize data because it doesn't understand data, it just moves it. This prioritization of data should be done at the application level where there is logic. Combine this with data caching at the network edge and you have a solution that reduces latency.

To achieve low latency, IoT apps require a combination of intelligent data distribution, with an architecture designed to put the data as close to the end user as possible – whether that is a machine, device or person.

Myth 2 – IoT is Just Like Mobile Data Distribution

Distributing data over a mobile network can be an issue because a huge amount of data is sent from a server to a device somewhere in the world. Unfortunately, the network can be unreliable and this causes issues with speed and performance. For IoT, that model is flipped backwards. The data is coming in over an unreliable network and sent infrequently in some cases.

When approaching IoT, you cannot approach it in the same way you do mobile. You need a strategy for collecting all the data from 'things' at scale over unreliable networks, the intelligence to only pass on what is relevant, resilience to cope with the data coming in and efficiency so you are not exhausting bandwidth.

When approaching IoT, you cannot approach it in the same way you do mobile. You need a strategy for collecting all the data from 'things' at scale over unreliable networks, the intelligence to only pass on what is relevant, resilience to cope with the data coming in and efficiency so you are not exhausting bandwidth. In many cases the data is sent to a warehouse for storage in the event of auditing or reporting, but some of it needs to go through your CEP engine or real-time tools, for example fraud prevention or risk detection for processing. Once processed, your data then needs to be distributed, similar to a mobile strategy. You need to understand at speed what needs to be handled, send it for processing and distribute it to your machines – whether that is telling your first responders they need to change routes due to traffic, or changing traffic light signals to improve the flow.

Myth 3 – IoT Data is Outdated and the App Useless

Some IoT users report that most of the time the data in their apps, sent from IoT devices, is out of date making the app useless. This is actually true. If you don't send the right data at the right time, your app will be useless. However, that's a challenge of the data distribution strategy, not the apps. Unfortunately, quite oft n, organizations are trying to solve these issues using traditional techniques and solutions that are not built for this new exciting world.

Static applications, such as mobile news apps, will only load a page once and be done, but conversational apps must be constantly updated with new data.

For the IoT to be successful, you need data to be sent conversationally as required. This means that the apps need to maintain a consistent flow of data back and forth – and, therefore, function in real time. Static applications, such as mobile news apps, will only load a page once and be done, but conversational apps must be constantly updated with new data. If an end user wants to find out what the temperature is in his or her house, you need to give that accurate information via the app now. A smart city app needs real-time information on how full the trash bins are; otherwise it doesn't help efficiently planning routes for bin collection.

Myth 4 – Sensors/Small Devices Won't Put Pressure on the Internet

The myth here is that most of the IoT will use sensors and small devices that only update periodically with small amounts of data. As a result, the bandwidth pressure on the Internet won't be that great. However, if you have 50 billion connected IoT devices sending and receiving information in real-time, alongside all the other computing resource utilizing the Internet, it will put bandwidth pressure on the Internet.

You'll face scalability issues if all the 'things' connect back to your servers at the same time. In addition, if you need to send a message to hundreds of thousands of 'things' at the same time, you'll need to scale in real time to distribute that message. All the sensors and small devices will put pressure on the Internet, it's a myth to think otherwise.

Myth 5 – My Sensors are Not Accessible to the Internet; I Don't Need to Worry about the Network

There's an argument by some people that just because their sensors (for example nuclear power plant valve sensors) will never access the Internet, they do not need to worry about network latencies, or unpredictable network availability, or bandwidth issues. This is a myth.

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Wi-Fi networks, although they may have higher bandwidths than mobile networks, suffer from some of the same reliability problems as mobile networks and the bandwidth available does fluctuate according to position and environmental factors. As such, for critical devices that require constant monitoring and real-time responses, it is essential that updates and alerts are delivered to the appropriate devices and apps, whilst consuming as little network bandwidth as possible.

Private satellite links used for devices in remote locations, such as the middle of the ocean or at 36,000ft in the air suffer from severe latency delays and bandwidth is hugely expensive. Ensuring that device communication is kept as efficient as possible is fundamental. This requires the ability to distribute data reliably across the networks, while at the same time understanding data to only send what has changed.

Myth 6 – We Cannot Keep Up with IoT Data

The IoT is producing an avalanche of data. According to IBM , there are in excess of 1 Trillion connected objects and devices generating 2.5 Billion gigabytes of data, every day. Amongst all the data that is produced by the IoT, not all of it needs to be communicated to end-user apps such as real-time operational intelligence apps. This is because a lot of the chatter generated by devices is useless and does not represent any change in state. The apps are only interested in state changes, e.g. a light being on or off, a valve being open or shut, a traffic lane being open or closed. Rather than bombarding the apps with all of the device updates, apps should only be updated when the state changes.

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Myth 7 – The Datacenter is Where All the Magic Happens

Some argue that the datacenter is where all the magic happens for IoT. The datacenter is absolutely an important factor for the IoT; aft r all this is where the data will be stored. But the myth here is that the datacenter is where the magic happens. What about the network? Aft r all, IoT is nothing without the Internet actually supporting the distribution of information. So you might be able to store it or analyze it in a datacenter, but if the data cannot get there in the first place, is too slow in getting there or you cannot respond back in real time, there is no IoT.

The Reality – IoT Needs Intelligent Data Distribution

The reality of the IoT is that if you can distribute data from the 'thing' across the network in real time over unreliable networks, you can be successful. This requires intelligent data distribution. To lighten the load on the network by reducing your bandwidth usage, you need to understand your data. By understanding the data, you can apply intelligence and only distribute what's relevant or what has changed. This means only small pieces of data are sent across the congested network. The result is IoT apps with accurate, up-to-date information, at scale – at scale because you'll be able to cope with the millions of devices connecting to your back end. You won't be hit with huge pieces of data at once, shutting down your services.

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How Diffusion™ & Diffusion Cloud from Push Technology Can Help
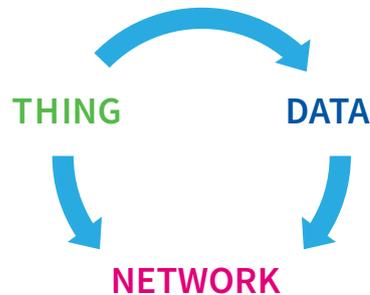
THING   DATA

NETWORK

Push Technology's Diffusion products are real-time, streaming data and messaging distribution solutions that allow you service the millions of connected 'things.' across unreliable networks at huge scale. Diffusion is a software platform that removes the complexity and challenges of developing for scale, coping with the explosion of IoT data across networks, and delivering a reliable application experience in real-time.

Diffusion is "data aware. This means that it intelligently and automatically handles data transmission and it will remove out-of-date and/or redundant data -- companies, customers, and "things" (machines, devices, sensors) can efficiently and reliably exchange ever-changing data and information in real time with huge numbers of simultaneously connected system users.

Diffusion, solves the hard part of data distribution allowing developers to focus on application differentiation and innovation, and the business can focus on identifying new revenue opportunities.

Diffusion offers:

- **Efficiency** – Send initial topic load (snapshot) and then deltas of change, reducing the amount of data sent across the network, offering better quality of service and improved bandwidth efficiency

- **Speed** – Distribute high volumes of fast-changing data in real time with very low latency

- **Scale** – Huge numbers of simultaneous connections supported on commodity hardware. Start small and seamlessly scale

- **Interactivity** – Real time, full duplex, bi-directional interactions

- **Platform Independence** – Streaming support for all IoT Desktop, Mobile and Web Apps

About Push Technology

Push Technology pioneered and is the sole provider of real-time delta-data streaming and messaging technology that powers mission-critical business applications worldwide. Leading brands including: 888 Holdings, DAB Bank, IHSMarket, Consors Bank/BNP Paribas, Lloyds Bank, Racing Post, and William Hill, use Push Technology to fuel revenue growth, customer engagement, and business operations. Available on-premise, in-the-cloud, or in a hybrid configuration, to fit the specific business and infrastructure requirements of the applications operating in today's mobile obsessed, everything connected world. Learn how Push Technology can reduce infrastructure costs, and increase speed, efficiency, and reliability, of web, mobile, and IoT applications at www.pushtechnology.com.

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