SOLUTION BRIEF

Welcome to the Industrial IoT Revolution

Intel® IoT Gateway

Intel teams up with Citrix to change the way you integrate the Internet of Everything

The Impact of Things

In a historical shift that has the potential to be larger than the industrial revolution, the Internet of Things (IoT) has grown well beyond smart watches and fitness wearables.[1] IoT is changing the future of business with its now billions of "things." In addition to those things, billions of sensors track, monitor, and feed data to those things, and analysts predict 30 billion devices will be connected in the next 5 years.[2]

What Can the IoT Do for My Business?

In the next 7 years, IoT is expected to generate more than $2.5 trillion of net profit globally per year, and companies are eager to claim their share.[3] Implementing enterprise IoT solutions is a tangible, proven way to increase efficiencies and boost productivity.[4] But without a thorough understanding of these gains, the risks associated with complicated setup and securing data can overshadow the benefits. Businesses need a simple solution to help them take advantage of the promise of IoT—the promise not only of measurable savings but also of new revenue opportunities.

Intel and Citrix: a Simple Solution for IoT

Technology from Intel and Citrix simplifies the deployment of IoT solutions. Citrix Octoblu* software helps companies create IoT services with secure real-time exchange of data. Octoblu runs on the pretested Intel® IoT Gateway, a hardware gateway with built-in security and management features. Together, these technologies let devices communicate seamlessly with each other, people, legacy applications, and cloud services so that companies can more easily create IoT solutions.

These solutions can then help deliver cost savings and revenue opportunities through efficiency and productivity gains. But CEOs today struggle to wrap their heads around these massive revenue opportunities. Companies need a roadmap that shows them how to get in on IoT in simple, small ways.

For instance, consider how IoT can impact something as commonplace as a meeting. Meet Anja, the CEO of a bioinformatics company.[5] Like many business users, she spends more time in meetings in a single day than on any other work task, so efficiency improvements in meetings can quickly add up to significant time savings.

Table 1. A comparison of the time and productivity gain when holding a meeting assisted by Intel and Octoblu.

SCENARIO: ANJA IS RUNNING 10 MINUTES LATE TO HER BOARD MEETING DUE TO HER PREVIOUS MEETING GOING OVER.	
TODAY'S TYPICAL MEETING	**A MEETING EMPOWERED BY INTEL AND OCTOBLU**
This standard conference room is equipped with a projector and adjustable lighting. Anja's company uses Citrix GoToMeeting* as its conferencing solution with Citrix ShareFile* to share meeting documents.	In this scenario, the conference room is equipped with an Intel® IoT Gateway running Octoblu and with an Apple iBeacon* device. Attendee mobile phones are running the Gateblu Mobile* app.
1. Anja enters Conference Room A.	1. Anja enters Conference Room A, and Octoblu notifies the meeting attendees of Anja's tardiness through a text message.
2. Anja physically adjusts the lights and temperature in the room.	2. Octoblu senses Anja and automatically adjusts the climate and lights to Anja's preferences. GoToMeeting starts automatically and calls Anja. Octoblu begins a session recording.
3. Anja logs on to her laptop and launches Citrix GoToMeeting*.	3. When Anja exits the conference room, Octoblu ends the GoToMeeting conference and uploads a recording of the meeting to ShareFile.
4. Anja remembers at the last minute to record her meeting and clicks Record in the GoToMeeting app.	4. Octoblu automatically emails the ShareFile link to Anja's meeting participants.
5. When the meeting is over, Anja closes her computer, turns off the lights, and walks back to her desk.	
6. Anja opens her computer when she's back at her desk after lunch; she begins an email to the attendees of her meeting, but she can't remember exactly who was on the call.	
7. Anja searches her meeting information to verify attendees.	
8. Anja shares the meeting recording file to Citrix ShareFile* and waits for 15 minutes as it uploads.	
9. Anja sends the email to attendees with a link to the ShareFile recording.	

Octoblu running on Intel® IoT Gateways can reduce the time and effort that Anja spends on meeting details. In this scenario, Anja can focus on the business discussed in her conference call, instead of the tedious, administrative details surrounding the meeting itself.

Get in the IoT Game with Intel and Octoblu

How can businesses jump into the IoT revenue stream without adopting complex solutions that pose potential security risks? With an Intel® IoT Gateway and Octoblu software, you can get in the IoT game with a simple, well-established IoT solution that is built on a secure foundation. The entire Octoblu software suite can run on a single Intel® IoT Gateway, enabling connections between devices regardless of protocol or API.

Simple Setup and Deployment Can Get You Up and Running Fast

Intel® IoT Gateway development kits include pre-integrated and pre-validated hardware and software from Intel, McAfee, and Wind River. The kits help businesses quickly develop, prototype, and deploy intelligent gateways and maintain interoperability between new intelligent infrastructure and legacy systems, including sensors and data center servers.[6]

Whether you're using a sensor, a cloud service, an embedded device, or industrial machinery, Octoblu allows for easy setup and deployment through features such as:

- Drag-and-drop designers that let you deploy your automations without ever writing a single line of code
- Agnostic platforms that let you incorporate various devices and protocols
- Multiple deployment options: on premises, hybrid, or all cloud
- Future-proof scalability to meet any needs, whether the nodes are smart devices, wearables, sensors, cloud resources, drones, or microcontrollers such as Intel® Edison and Intel® Galileo

End-to-End Security Helps Protect the Hardware, Software, and Data

The result of a collaboration with McAfee and Wind River, Intel® IoT Gateways connect legacy and new systems and enable seamless and secure data flow between edge devices and the cloud. The Wind River Helix Device Cloud* enables devices to securely connect to a centralized console and helps customers aggregate data from the edge, run analytics, and securely update software.[7] The Intel® IoT Gateway software stack contains the McAfee security suite, which includes whitelisting and blacklisting to protect the software. The solution also supports Secure Boot and deep-packet inspection, which work to lock down the hardware.[8]

Octoblu's core communication layer helps boost the solution's security with features like secure message encryption and a fine-grained permission model to monitor who is listening to the constant chatter of data generated by IoT.[9]

Octoblu Software Suite at a Glance

Meshblu* is the core communication layer of the Octoblu solution. It is a scalable cloud-based system that enables communication between smart devices, sensors, cloud resources, microcontrollers, and any other IP-based hardware devices, non-IP based hardware devices, or software APIs. And it has security features built in to help protect your data. Learn more at https://developer.octoblu.com.

Gateblu* is the smart software hub working within the Octoblu platform. It connects Meshblu with any device, whether that device has an IP address or not. Learn more at https://gateblu.octoblu.com.

Gateblu Mobile is the mobile-hub application based on Android* or iOS* that allows the connection of plugins, devices, or sensors to the app on the mobile device. Learn more at https://mobiblu.octoblu.com.

Microblu* is the Octoblu device operating system that allows the connection of microcontrollers such as Arduino*, Spark*, BeagleBone*, Intel® Galileo, Pinoccio*, Raspberry Pi*, or Tessel* devices to Meshblu with or without the use of a CPU. Visit the developer hub for resources to help you get started: https://microblu.octoblu.com/

Figure 1. The Octoblu drag-and-drop visual editor is powerful enough to handle complex interactions, yet simple enough for even non-engineers to use.

The combination of Intel® IoT Gateway end-to-end security measures and the Octoblu permissions and encryption features forms a virtual shield for your cloud environments and mesh networks.

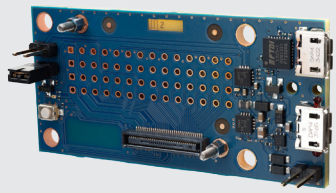
Join the Frontrunners in the Industrial IoT Revolution

With an easy-to-use solution for deploying IoT at an industrial scale, Octoblu and Intel have made it easy for you to pioneer powerful enterprise IoT solutions. Intel and Octoblu can help you achieve productivity gains and boost process efficiency as you take advantage of the next technological revolution.

For more information on Intel in the IoT market, visit www.intel.com/iot. To learn more about the powerful Intel® IoT Gateways, visit www.intel.com/iotgateways.

Read more about Octoblu at www.octoblu.com. Find real-life inspiration in the successes that Octoblu helped realize for companies such as Thingsee (www.thingsee.com) and Server Density (www.serverdensity.com).

Get to Market Faster with a Prototype Developed on Intel® Edison and Intel® Galileo



Intel® Edison technology is a hardware/software platform that, when combined with sensors and your imagination, enables you to invent new Internet-enabled products and solutions. Learn more at https://software.intel.com/en-us/iot/hardware/edison.

The Intel® Galileo Gen 2 board, designed specifically for makers, students, educators, and do-it-yourself (DIY) electronics enthusiasts, is certified by Arduino* with a fully open-source hardware and software environment for advanced compute functionality. See https://software.intel.com/en-us/iot/hardware/galileo.

FarmBot*: Using Meshblu to Handle Robotic System Administration

FarmBot(http://go.farmbot.it/) aims to increase the world's food production by creating easily accessible farming automation technology.

Problem: Time Consuming System Administration

With limited resources, the FarmBot team needed to devote less time to system management and more time to feature development. Setup of the farming robots was complicated, especially because authentication had to be set up from scratch each time, and running a full server stack drained resources. It was also difficult to work around TCP port restrictions and to handle lost messages if the robot ever went offline.

Solution: Offloading to Octoblu

With the Octoblu platform, FarmBot stopped treating each device like a server, and instead turned them into API consumers of Meshblu, with FarmBot services plugging into Meshblu as clients. This eliminated much of the complex administration required by the previous system and freed resources for more important operations.

- Meshblu handles authentication and helps guarantee message delivery.
- FarmBot can use WebSockets* instead of REST, eliminating the need for polling for real-time events.
- All browsers can connect to Meshblu directly, limiting web-server strain.
- FarmBot does not need to proxy connections or address cross-domain security.

"We chose Meshblu for the FarmBot project because it gives us time to focus on features instead of system administration. Using Meshblu means having one less thing I need to worry about while building an IoT platform. Because Meshblu is open source, we don't need to worry about vendor lock in, either."

— Rick Carlino, Lead Engineer at FarmBot

[1] Forbes. "How The Internet Of Things Is More Like The Industrial Revolution Than The Digital Revolution." February 2014. http://www.forbes.com/sites/oreillymedia/2014/02/10/more-1876-than-1995/.

[2] EMC Digital Universe Study, with data and analysis by IDC, April 2014. "The Digital Universe of Opportunities: Rich Data and the Increasing Value of the Internet of Things." http://www.emc.com/leadership/digital-universe/2014iview/internet-of-things.htm.

[3] Cisco. "The Internet of Everything Is the New Economy." January 2014. http://www.cisco.com/c/en/us/solutions/collateral/enterprise/cisco-on-cisco/Cisco_IT_Trends_IoE_Is_the_New_Economy.html.

[4] Ironpaper. "The Internet of Things Market Statistics—2015." March 2015. http://www.ironpaper.com/webintel/articles/internet-things-market-statistics-2015/#.VaWGU_mrSM_.

[5] Anja is a fictional composite.

[6] To learn more about Intel IoT development kits, visit http://www.intel.com/content/www/us/en/embedded/solutions/iot-gateway/development-kits.html

[7] To learn more about the Wind River Helix Device Cloud, visit https://www-ssl.intel.com/content/www/us/en/embedded/solutions/iot-gateway/wind-river-helix-device-cloud-product-overview.html.

[8] For details about the Intel® IoT Gateway software stack, visit https://www-ssl.intel.com/content/www/us/en/embedded/solutions/iot-gateway/software-building-blocks.html.

[9] To learn more about Meshblu, visit https://developer.octoblu.com.

Cost reduction scenarios described are intended as examples of how a given Intel- based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

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Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at intel.com.

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