Edison Overview

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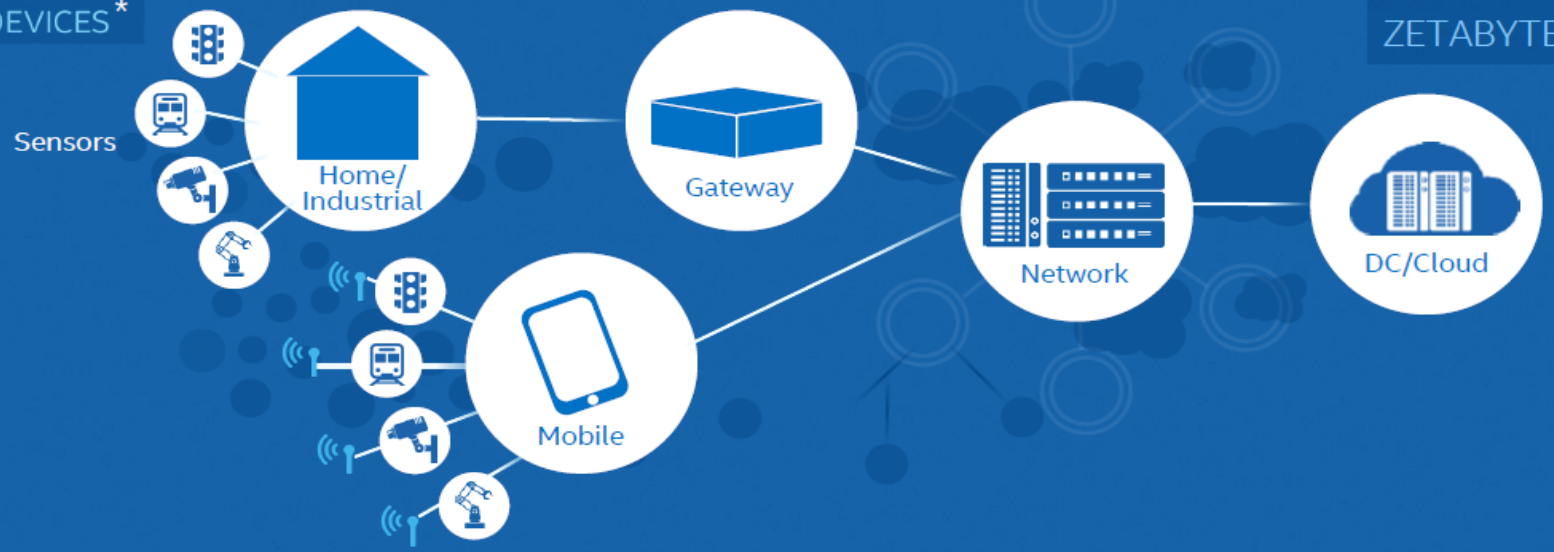
Intel Corporation

The Internet of Things is…
Intelligence Everywhere

50B DEVICES*

44 ZETABYTES**



COST OF SENSORS **2X** PAST 10 YEARS

COST OF BANDWIDTH **40X** PAST 10 YEARS

COST OF PROCESSING **60X** PAST 10 YEARS ***

* IDC

** IMC/EDC: The Digital Universe of Opportunities

*** Goldman Sachs

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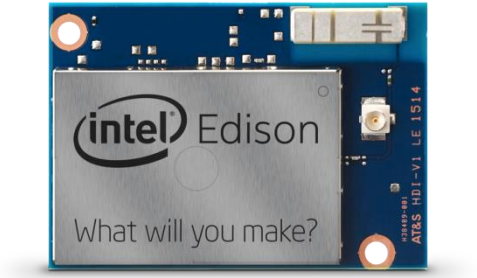
VALUE PROPOSITION

The Intel® Edison development platform is designed to lower the barriers to entry for a range of Inventors, Entrepreneurs and consumer product designers to rapidly prototype and produce IoT and wearable computing products.



The Intel® Edison Offering

Maker	Pro-Maker & Entrepreneur	Consumer IoT	Light Ind. IoT *No extended temp or life*

Hardware	Edison Module + Derivatives
	Expansion Boards
Software	Yocto + Various Runtimes, IDE & Developer Tools
Cloud	Developer cloud solution and partner-based solutions for scale
Support	Managed on-line community, trouble ticketing, drawings, schematics, datasheets, code libraries, webinars, etc.
Ecosystem	ISVs, Incubators, Crowd Source funders & SIs

Retail Configurations

Maker

Pro-Maker & Entrepreneur

Consumer IoT

Light Ind. IoT

No extended temp or life

Intel® Edison Kit for Arduino*

$85 RCP

Intel® Edison Breakout Board Kit

$60 RCP

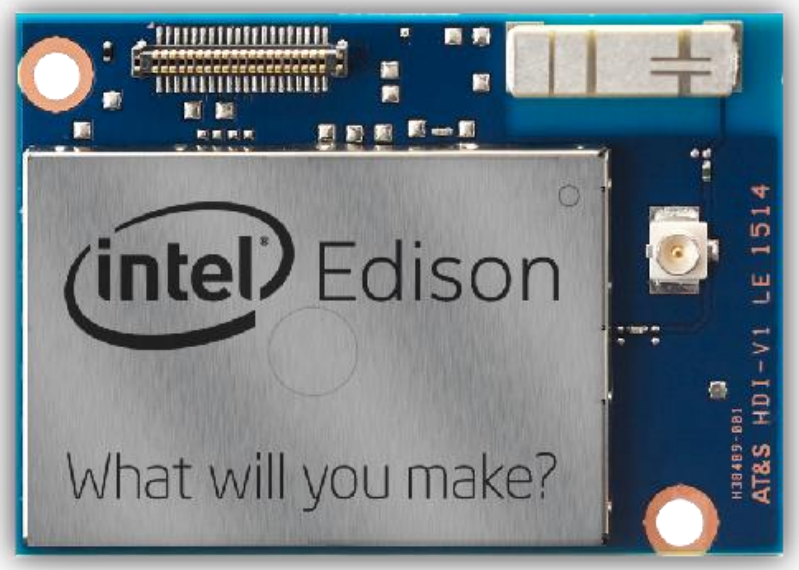
Intel® Edison Module

$50 RCP

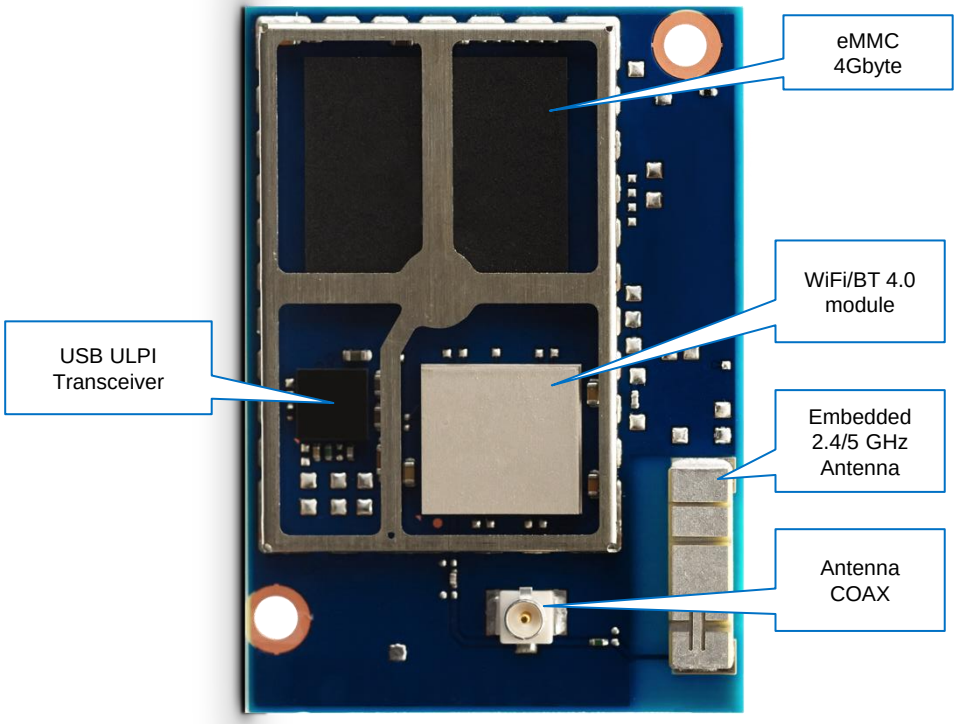
Intel® Edison Compute Module

New Devices Group

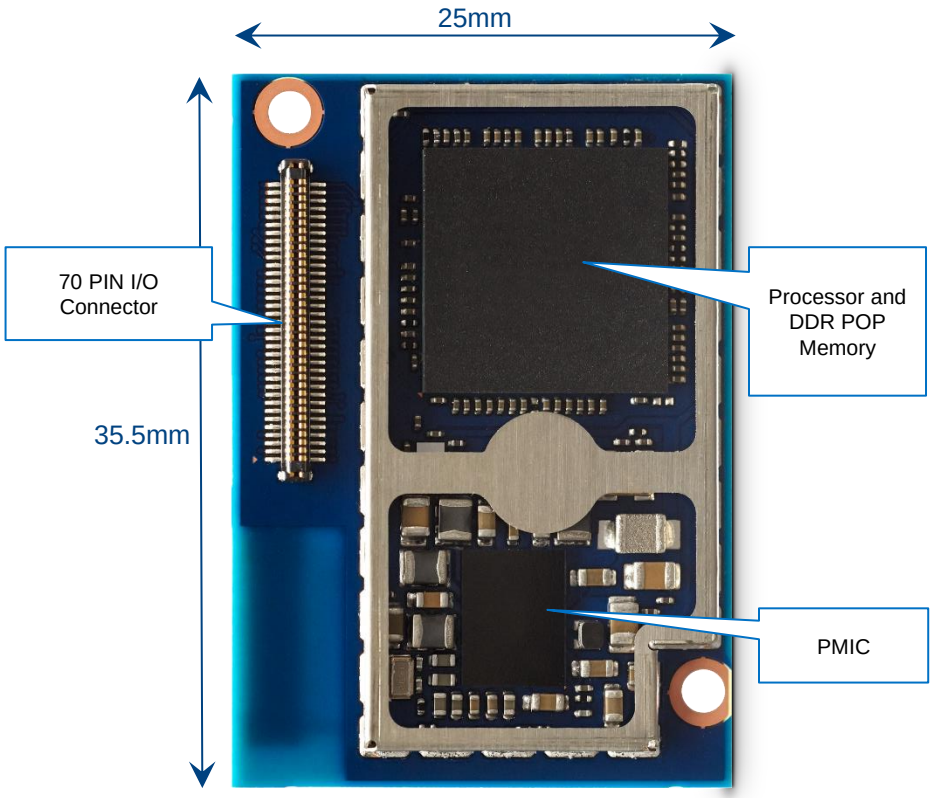

2013
USA
FOREVER


intel Edison
What will you make?
AT&S HDI-V1 LE 1514

Intel® Edison Mechanical Layout



Top Side



Bottom Side

intel Edison

Physical	
Form Factor	Board with 70-pin connector
Dimensions	35.5 x 25.0 x 3.9 mm max
C/M/F	Blue PCB with Shields / No enclosure
Connector	Hirose DF40 Series (1.5mm, 2.0mm, or 3.0mm stack height)
Operating Temperature	0 – 40 degC

External Interfaces	
Total of 40 GPIOs which can be configured as:	
SD Card	1 Interface
UART	2 Controllers (1 full flow control, 1 RX/TX)
I2C	2 Controllers
SPI	1 Controller with 2 chip selects
I2S	1 Controller
GPIO	Additional 12 (with 4 capable of PWM)
USB 2.0	1 OTG Controller
Clock Output	32 KHz, 19.2 MHz

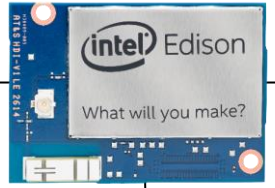
Major Edison Components	
SoC	22-nm Intel® SoC that includes a dual-core, dual-threaded Intel® Atom™ CPU at 500Mhz and a 32-bit Intel® Quark™ microcontroller at 100 MHz
RAM	1 GB LPDDR3 POP memory (2 channel 32bits @ 800MT/sec)
Flash Storage	4 GB eMMC (v4.51 spec)
WiFi	Broadcom* 43340 802.11 a/b/g/n; Dual-band (2.4 and 5 GHz) On board antenna or external antenna SKU configurations
Bluetooth	BT 4.0

Power	
Input	3.3V – 4.5V
Output	100ma @3.3V and 100ma @ 1.8V
Power	Standby (No radios): 13mW Standby (BT 4.0): 21.5mW (BTLE in Q4'14) Standby (WiFi): 35 mW

Firmware + Software	
CPU OS	Yocto Linux* v1.6
Development Environments	Arduino* IDE Eclipse supporting: C, C++,& Python Intel XDK supporting: Node.JS & HTML5
MCU OS	RTOS
Development Environments	MCU SDK and IDE

Intel® Edison Expansion Boards

Intel® Edison Family: *Supporting the long tail via Expansion Boards*



Intel Expansion Boards

Partner Expansion Boards

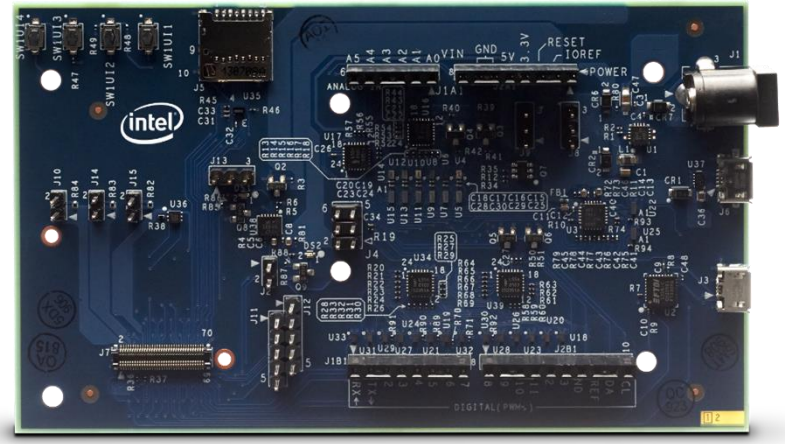
Built to Order Expansion Boards

Intel® Edison Board for Arduino*

Market position: Similar to Arduino Yun (Arduino Sketch, Linux, WiFi & BT)

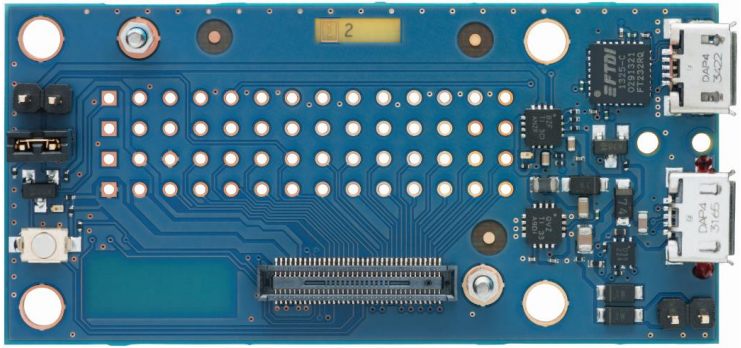
Board I/O: Compatible with Arduino Uno (except only 4 PWM instead of 6 PWM)

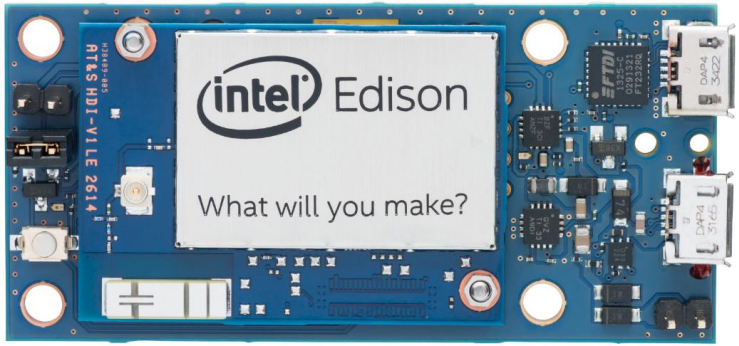
- 20 digital input/output pins including 4 pins as PWM outputs
- 6 analog inputs
- 1 UART (RX/TX)
- 1 I2C
- 1 ICSP 6-pin header (SPI)
- Micro USB device connector OR (via mechanical switch) dedicated standard size USB host Type-A connector
- Micro USB device (connected to UART)
- SD Card connector
- DC power jack (7V – 15V DC input)



Intel® Edison Breakout Board

Market position: The Edison Breakout board is for non-Arduino users. This breakout board has a minimalistic set of features and is slightly larger than the Edison module.





Board I/O:

- Exposes native 1.8V I/O of the Edison module
- .1” grid I/O array of through-hole solder points
- USB OTG with USB Micro Type-AB connector
- USB OTG power switch
- Battery Charger
- USB to device UART bridge with USB Micro Type-B connector
- DC power supply jack (7V – 15V DC input)

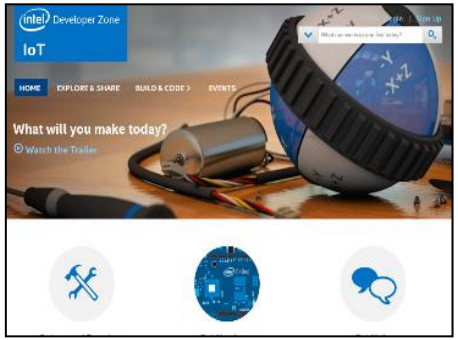
Intel® Edison Software

Intel® IoT Developer Kit – Product Brief

"Intel® IoT Developer Kit with Intel® Edison solution is a versatile, performance-optimized and fully integrated end-to-end IoT solution with hardware, free software tools, security, and cloud connectivity. Designed for Hobbyists, Innovators and entrepreneurs eager to invent the future, The Intel® IoT Developer kit lowers the barriers to entry by combining a small, powerful and production ready hardware platform together with a comprehensive IoT Developer program and a highly engaged global developer community."

Software included in the IoT Dev Kit:

- The Yocto* Linux system
  - Provides resources for creating applications in various programming languages: C/C++, Python, Node.js and visual programming
- Integrated Development Environments (IDEs) and Tools
  - Allows developers to create, run and debug applications directly on the Galileo and Edison boards: Eclipse* (C/C++), Intel® XDK IoT Edition (Node.js), Wyliodrin* (Visual)
  - Intel® System Studio for IoT: development suite that provides deep hardware and software insights to speed development, testing and optimization
- Intel® IoT Analytics
  - Provides cloud APIs for data collection, data visualization, reports, rules engine and analytics
- Middleware libraries
  - Provides developers high level API access to Galileo and Edison boards and middleware libraries to easily control the various sensors and actuators



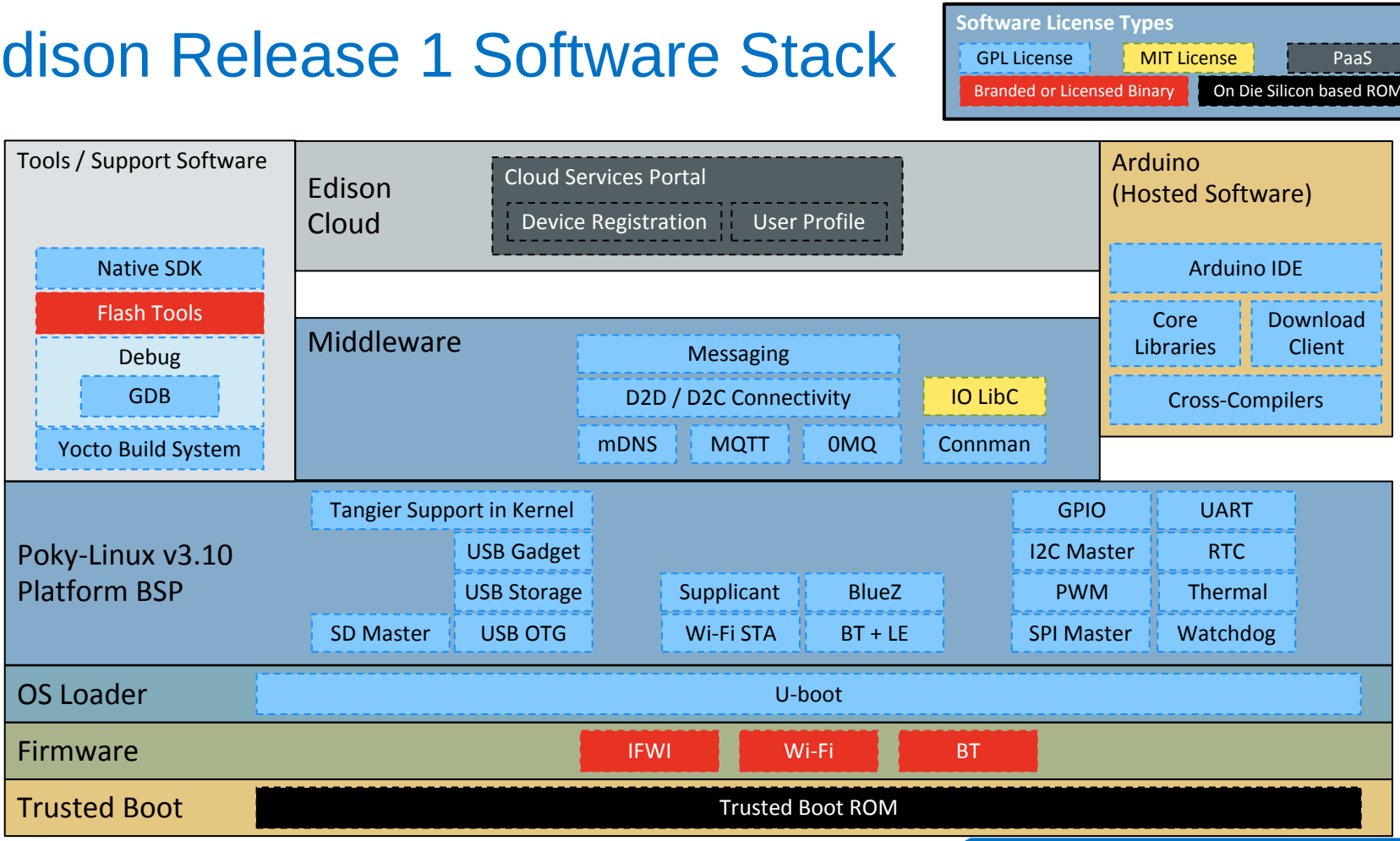
Edison Developer Options

Coming late Sept.

Coming mid 4Q (subject to change)

	Arduino* Developer	Java script Developer	Embedded Developer	Visual Programming	MCU Developer
Cloud	IoT Kit & Mashery*				
IDE	Arduino* IDE Win */ Mac*	Intel XDK Win*/ Mac*/ Linux*	Eclipse Win*/ Mac* / Linux*	Wyliodrin* Web	Win*/ Mac* / Linux*
Programming Language	Arduino* Sketch C++	Javascript (Node JS)	C/ C++/Python	Visual Javascript	C/C++
Tools/ Libraries	Arduino* Libraries	Intel XDK	ISS	Wyliodrin*	MCU SDK
OS / Boot Image	Yocto Linux* 1.6				RTOS

Edison Release 1 Software Stack



Intel® Edison R1 Software Support

Firmware

Intel IFWI (Integrated FirmWare Image) in binary

OS Loader

U-Boot version (2nd stage bootloader in source)

Kernel/BSP

Yocto Linux 1.6

Linux kernel v3.10.17

Tools

Native SDK
- Standard compiler support (GCC 4.8.2), GLIB 2.38.2
- Standard debugger support GDB 7.6.2

Custom Tools: Flash tools (DFU-Util ; XFSTK for stitching & flashing)

Additional Developer Tools & Environments

Arduino IDE for Mac, Windows and Linux OS
- Cross compilers for each of the host
- Core Arduino Libraries

Node.js (Supported by Intel® XDK)

Python (This package is part of BSP)

WLAN/BT Connectivity (BCM43340)

Firmware in Binary: WiFi STA and BT+LE

Drivers in source: BRCM kernel drivers, WiFi Supplicant and BlueZ

Middleware

Connectivity framework for simplified D2D and D2C
- Networking, Messaging, privacy/security

Cloud

Web Portal, Identity Management, User Profile

Device Registration; Device Data Upload/Visualization

Intel® Edison R2 Software Support - December 2014

Firmware

Intel IFWI (Integrated FirmWare Image) in binary

OS Loader

U-Boot version (2nd stage bootloader in source)

Kernel/BSP

Yocto Linux 1.6

Linux kernel v3.10.17

Tools

Native SDK
- Standard compiler support (GCC 4.8.2), GLIB 2.38.2
- Standard debugger support GDB 7.6.2

Custom Tools: Flash tools (DFU-Util ; XFSTK for stitching & flashing)

Additional Developer Tools & Environments

Arduino IDE for Mac, Windows and Linux OS
- Cross compilers for each of the host
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Node.js (Supported by Intel® XDK)

Python (This package is part of BSP)

WLAN/BT Connectivity (BCM43340)

Firmware in Binary: WiFi STA and BT+LE

Drivers in source: BRCM kernel drivers, WiFi Supplicant and BlueZ

Middleware

Connectivity framework for simplified D2D and D2C
- Networking, Messaging, privacy/security

Connectivity Framework Enhancements
- Bluetooth Support

Expanded I/O Library Support
- JavaScript & Python Bindings, Additional Sensors

Cloud

Web Portal, Identity Management, User Profile

Device Registration; Device Data Upload/Visualization

Portal Enhancements & Back-end Integration

RESTful Device Data Access

Device Messaging & Notification with Third-Party Service Integration

OTA Software Installation & Update

Logging Features

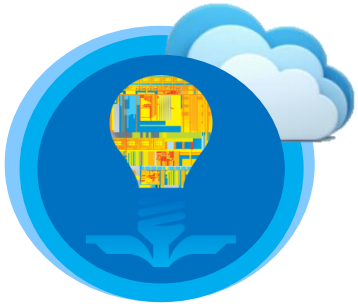
Hosted IDE for Cloud-based Services

Online Forums

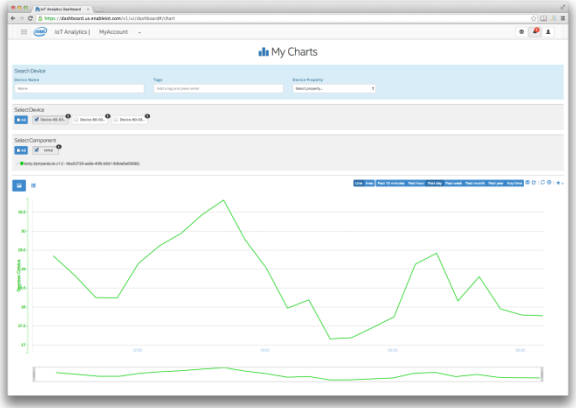
Release 2 Deltas from Release 1 in blue

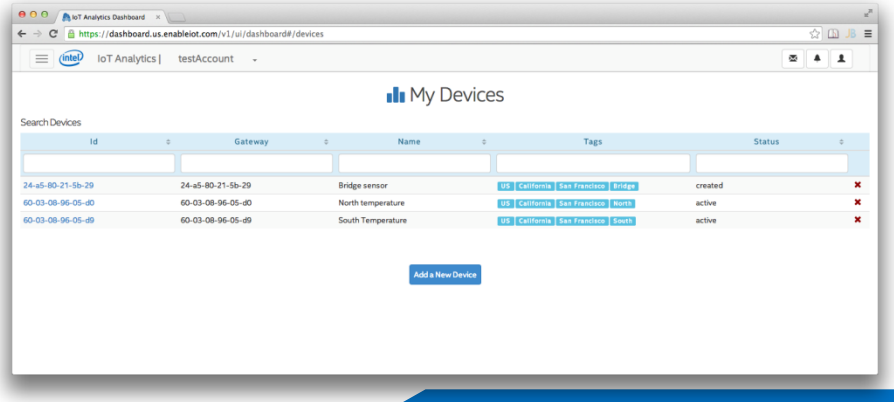
Intel® Edison Cloud

Intel® IoT Analytics Platform



- Provides seamless Device to Device and Device to Cloud communication
- Ability to run rules on your data stream that trigger alerts based on advanced analytics
- Foundational tools for collecting, storing, and processing data in the cloud
- Free for limited and non-commercial use





Legal Disclaimer

Risk Factors

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Rev. 4/15/14