Intel® Gateway Solutions for the Internet of Things

Intel® Quark™ SoC X1000 Applications Marketing Seminar

Anaheim, California
Oct. 29, 2014

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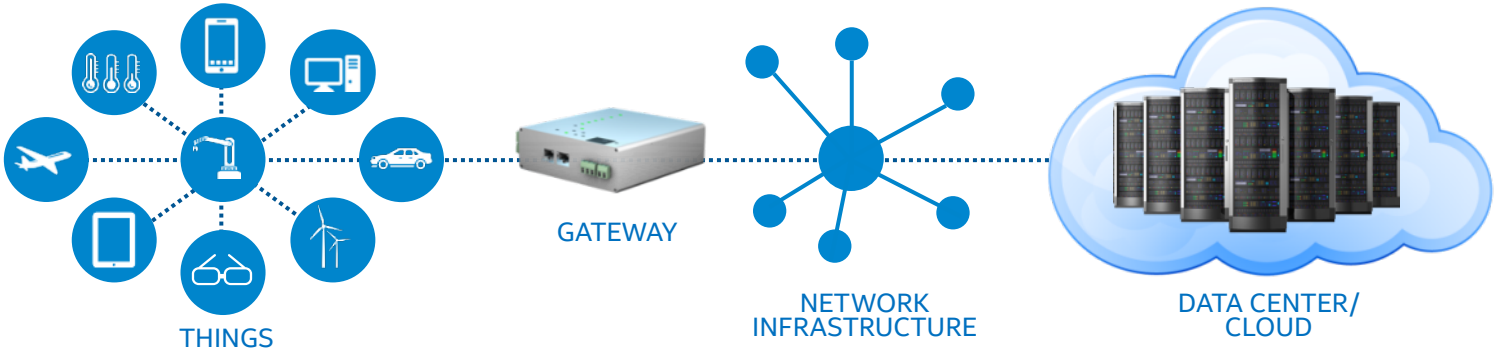
Internet of Things Group

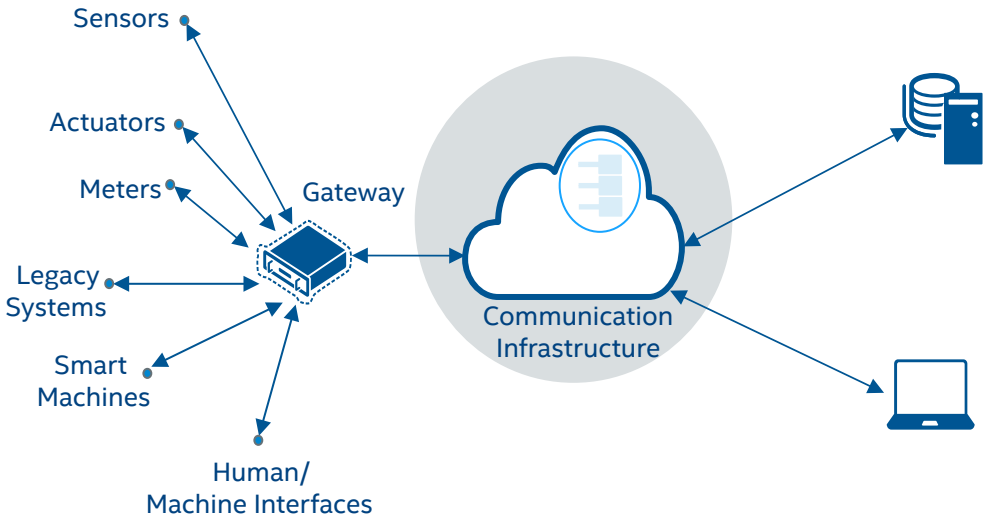
Lead the industry in transforming businesses and the way we live by making it simple to create exciting, new IoT solutions



THE INTERNET OF THINGS:

Devices that connect to the Internet integrating greater compute capabilities using data analytics to extract information

What is a Gateway?



A basic gateway features two or more interfaces:

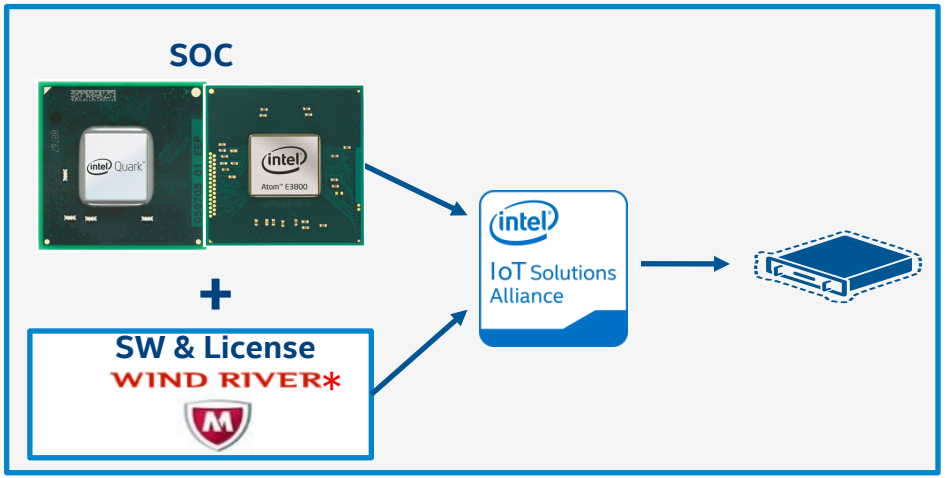
- Interface(s) to devices and sensors to collect data
- A connection to a LAN, Cellular, or Wi-Fi network that will transmit data to the cloud

Gateways need to provide security features like proper authentication of the devices and services, as well as data encryption.

Gateway devices may support a broad range of connectivity protocols to satisfy vertical specific requirements: e.g. Industrial Ethernet for manufacturing automation

Why Should Gateways Be Smart?

- 85% of existing industrial "things" are not
- Apps & Services can offer predictive maintenance, energy savings, and more ..
- Gateways translate data from specific protocol



Why Intelligent Gateways?

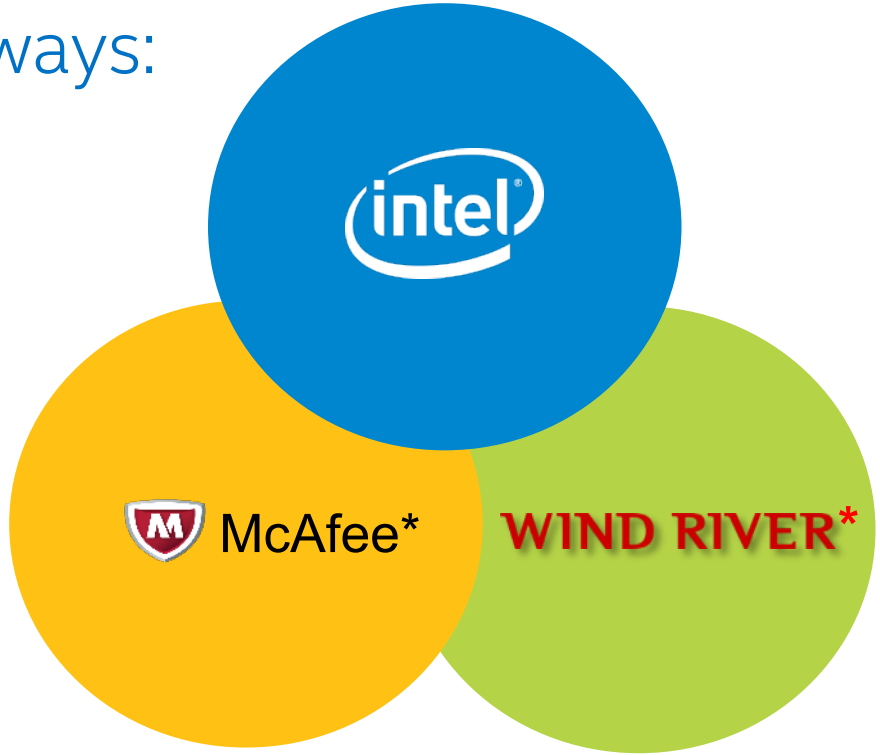
- Storage & Connectivity are Expensive
- Connectivity Introduces Risk

* IHS, IDC Research

Intel's Approach to IoT Gateways:

Aligning

Assets to Deliver Value



Integrated, highly optimized platforms

Industries with the Highest Potential Value for Gateways …Have Long Replacement Cycles

Industrial Automation

5-25 Years

Energy Grid

10+ Years

Transportation

5-10 Years

Gateways “bolt on” to existing assets
Capture existing data and address the installed base

Intel® Gateway Solutions for the Internet of Things

Family of scalable gateway platforms:
Intel® Quark™ Processor -> Intel® Atom™ Processor-based SoCs

Connect and aggregate data sources and secure hardware, applications and data

Integrated, validated solution with McAfee* and Wind River* SW

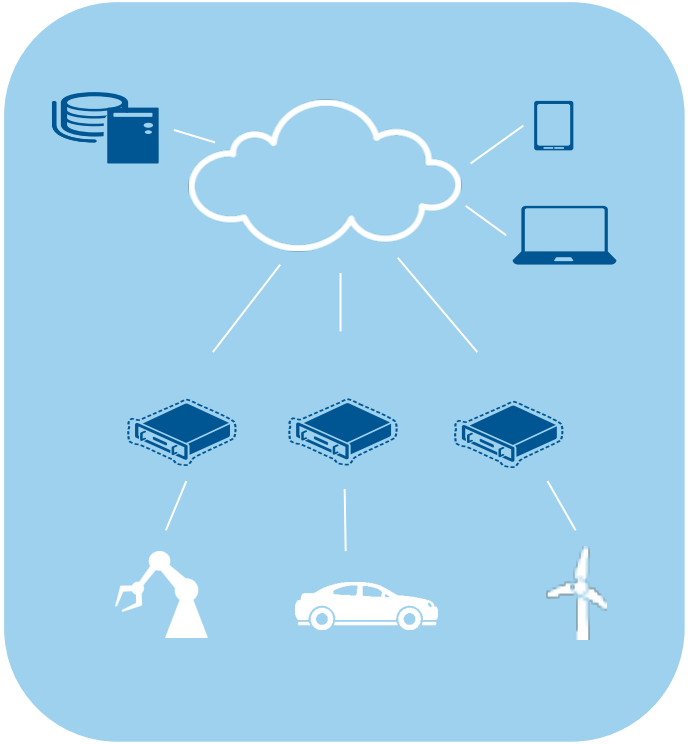
Unified software licensing model and Intel support

Optimized to meet specific vertical markets

Open platform integrates with ecosystem applications and services

Intel® Gateway Solutions for the Internet of Things Value Proposition

- Fast Time to Market
- Integrated Security Features
- Unmatched Scalability



Benefits of Intel® Gateway Solutions

Connectivity

- Pre-integrated connected capabilities enable rich network options to save development time and costs.
- Provides an extensive network of connectivity
  - Wired
  - Wireless
  - Cellular
  - Short-range

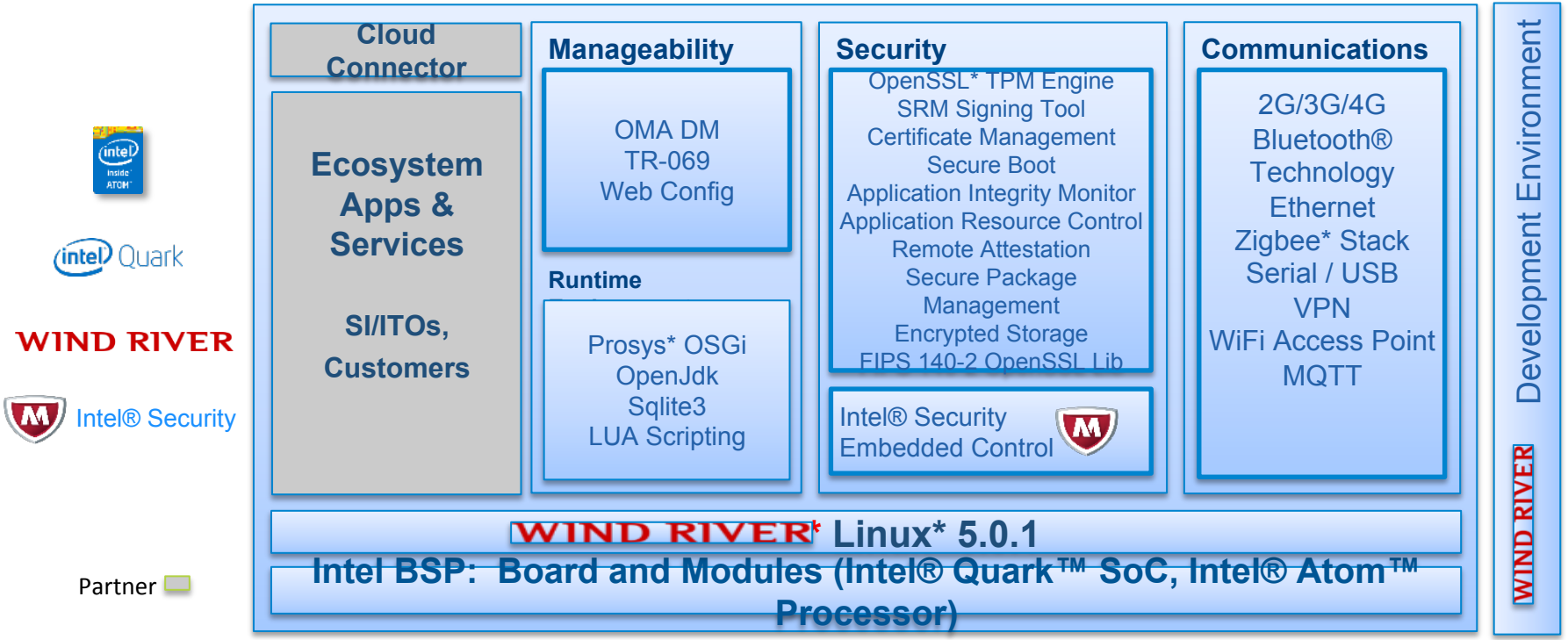
Security Features

- Helps protect devices for trust and control
- Helps protect the Device
- Helps protect the application
- Helps protect the data at rest and in flight

Manageability

- Enable common provisioning frameworks
- Enable remote, secure upgrades
- Provide web-based configuration utilities

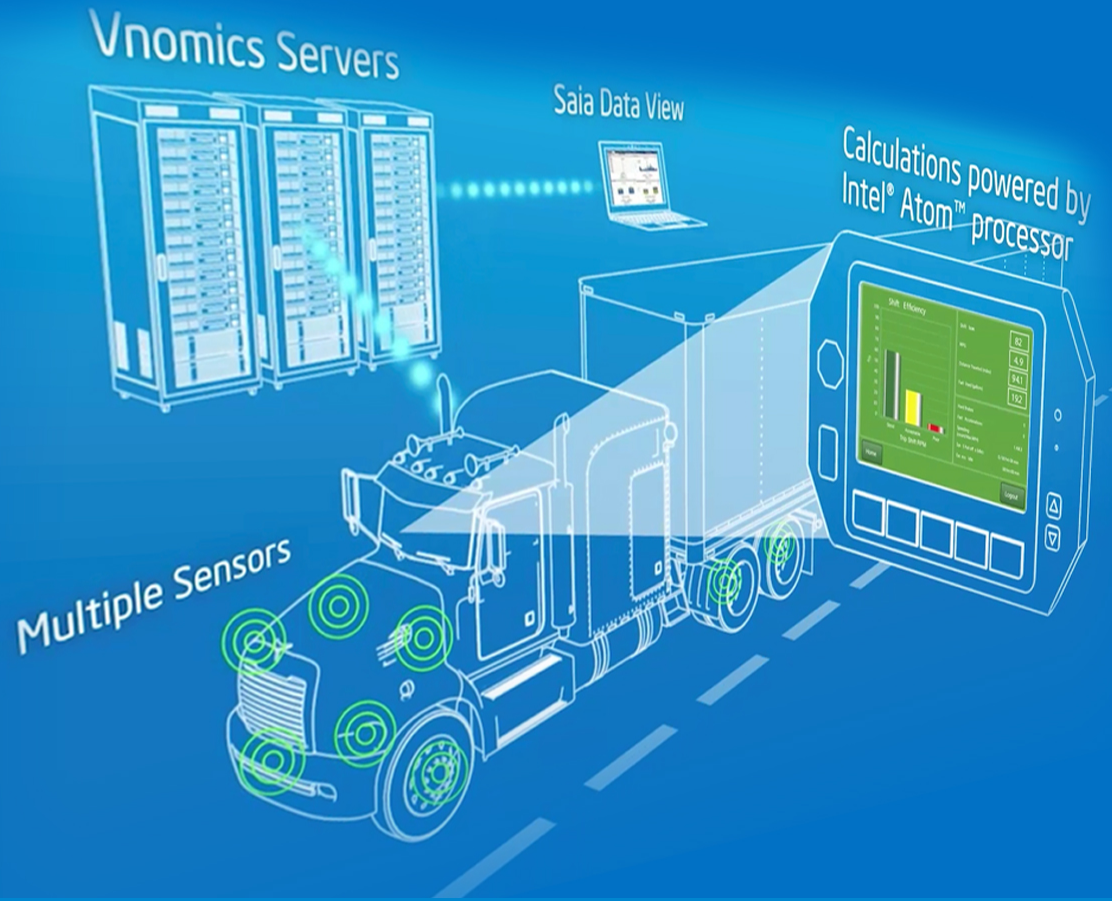
Intel® Gateway Solutions Software Stack



vnomics
DRIVING PERFORMANCE

SAIA Trucking wanted a solution to:

- Connect the vehicle's siloed systems
- Optimize driver behavior and fuel
- Provide fleet wide data to HQ



Intel® technology enabled Vnomics to provide SAIA a complete solution:

- Manage all of their inventory holistically
- Increasing their trucks efficiency via real time alerts
- Providing a cleaner and safer environment for SAIA drivers

Intel® Gateway Solutions Development and Deployment

Purchase Dev Kit

- Purchase development kits (typically 1-5 systems)
- Download and register software with perpetual development license

Develop Software

- Build target image, develop SW and Services
- Connect to sensors and the cloud
- Host third party applications and services
- Develop security policies and beta test

Deploy

- Buy **production gateways from ODM**
- Integrate & provision gateway with apps and services and provisioned
- Deploy gateway in production environment; deploy services

Intel Branded Dev Kits

System + Development Environment and Tools

ODM Branded Dev Kits

System + Development Environment and Tools

ODM Branded Production Gateways:

Device + SW Entitlement

Intel® Gateway Solutions for the Internet of Things Development Kits

Approved Countries for shipment: US, Canada, EU	DK 50 Series 	DK 100 Series 	DK 200 Series 	DK 300 Series 
Target Markets	Developers, Enthusiasts	Industrial & Energy	Transportation	Multi Vertical
Compute	Intel® Quark™ SoC X1000	Intel® Quark™ SoC X1020D	Intel Quark SoC X1020D	Intel® Atom™ Processor E3826
Kit Contents	Board and Power Supply Only	Board, radio(s), chassis, power supply	Board, radio(s), chassis, power supply	Board, radio(s), chassis, power supply
Software Components	Wind River* Linux* OS, IDP XT, Wind River Workbench Tools, McAfee* Embedded Control			
SW License	Non-production, 6 Month Term License; Includes 6 months of SW Support from Intel to ODM	Perpetual License; Includes 1 year of SW Support from Intel to ODM		
Security	Open SSL* Library, McAfee Embedded Control	Open SSL Library, SRM Signing Tool, Certificate Management, SecureBoot, Application Integrity Monitor, Application Resource Control, Secure Package Management, Encrypted Storage, McAfee Embedded Control		
Manageability and Provisioning	OMA DM, TR-069, Web-based configuration interfaces			
Communications and Connectivity	Serial, USB, VPN, MQTT	Bluetooth®, Serial, USB, VPN, Wi-Fi Access Point, MQTT, ZigBee*†		Cellular 2G/3G/4G, Bluetooth, Serial, USB, VPN, Wi-Fi Access Point, MQTT
Memory and Storage	512KB SRAM; 256MB DDR3, onboard microSD card	512KB SRAM; 1 GB ECC DDR3, onboard microSD card	512KB SRAM; 512MB ECC DDR3, onboard microSD card	Up to 8 GB DDR3, 2.5¨ SSD via onboard SATA

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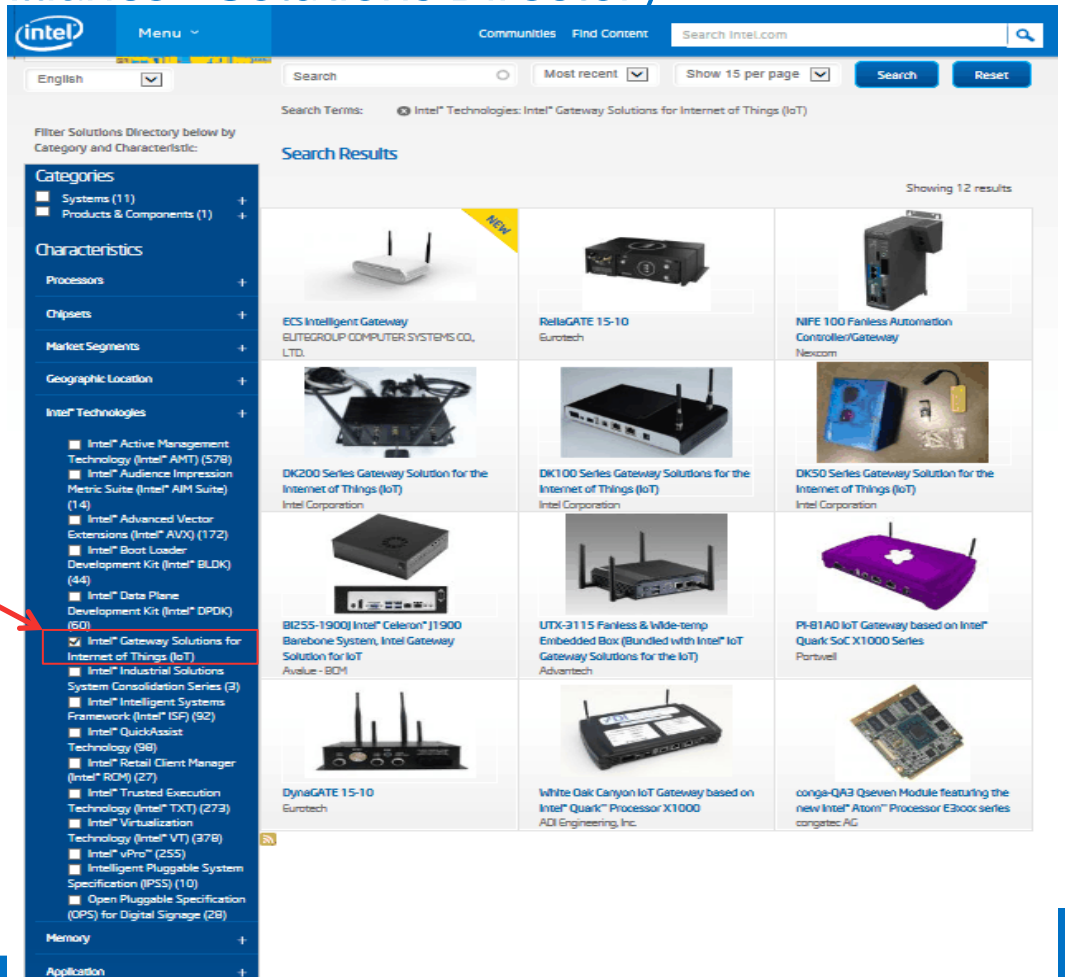
Intel® Internet of Things Solutions Alliance - Solutions Directory

Online catalogue of Intel® Gateway Solutions for the Internet of Things from ODMs

Select “Intel® Gateway Solutions for the Internet of Things” under Intel Technologies (left hand side of screen under Characteristics).

http://intelintelligentsystemsalliance.com/solutions-directory



CALL TO ACTION

- ✓ Want to learn more about Intel® Gateway Solutions for the Internet of Things? Go to www.intel.com/iotgateways
- ✓ ODMs interested in building Intel Gateway Solutions for the Internet of Things or Development Kits? Contact your local Intel representative
- ✓ OEMs and SI's visit the Solutions Directory to learn more about currently available Intel Gateway Solutions for the Internet of Things.

http://intelintelligentsystemsalliance.com/solutions-directory

BACKUP

Intel® Gateway Solutions for the Internet of Things Development

Approved Countries for shipment: **US, Canada, EU, PRC**	**DK 50 Series** 	**DK100 Series** 	**DK200 Series** 	**DK300 Series** 
Target Markets	Developers, Enthusiasts	Industrial, Energy	Transportation	Industrial, Energy, and Transportation
SoC	Intel® Quark™ SoC X1000	Intel® Quark™ SoC X1020D	Intel Quark SoC X1020D	Intel® Atom™ Processor E3826
Software	Non-production, 6 Month SW License includes, Wind River* Linux* (Host), Wind River Intelligent Device Platform XT, Wind River Workbench, McAfee* Embedded Control	Wind River Linux (Host), Wind River Intelligent Device Platform XT, Wind River Workbench, McAfee Embedded Control		
Security	Open SSL* Library, McAfee Embedded Control	Open SSL Library, SRM Signing Tool, Certificate Management, SecureBoot, Application Integrity Monitor, Application Resource Control, Secure Package Management, Encrypted Storage, McAfee Embedded Control		
Manageability and Provisioning	OMA DM, TR-069, Web-based configuration interfaces			
Communications and Connectivity	Serial, USB, VPN, MQTT	Bluetooth®, Serial, USB, VPN, Wi-Fi Access Point, MQTT, ZigBee*†		Cellular 2G/3G/4G, Bluetooth®, Serial, USB, VPN, Wi-Fi Access Point, MQTT
Runtime Environments	Java, OSGi*	Lua, Java, and OSGi		
I/O	Ethernet 10/100, USB 2.0 host & device, RS-232, full PCIe* mini card slot, UART 5V/3.3V, SPI for Arduino shield, I2C, 14 digital I/O pins, 12-bit 8 channel ADC	2x Ethernet 10/100, USB 2.0 host & device, RS-232, RS-485, ZigBee†, Wi-Fi/Bluetooth mini PCIe Module, SPI (internal), 12-bit 8 channel ADC	2x Ethernet 10/100, USB 2.0 host & device, RS-232, Audio line in/out, CAN*, WiFi/Bluetooth mini PCIe Module, 3 axis accelerometer (internal), 12-bit 6 channel ADC	2x Ethernet 10/100/1000, 2x USB 2.0, 1X USB 3.0, RS-232/422/485, Line in/out, Wi-Fi/Bluetooth mini PCIe Module, Cellular WAN mini PCIe module, HDMI
Memory and Storage	512KB SRAM; 256MB DDR3, onboard microSD card	512KB SRAM; 1 GB ECC DDR3, onboard microSD card	512KB SRAM; 512MB ECC DDR3, onboard microSD card	Up to 8 GB DDR3, 2.5¨ SSD via onboard SATA

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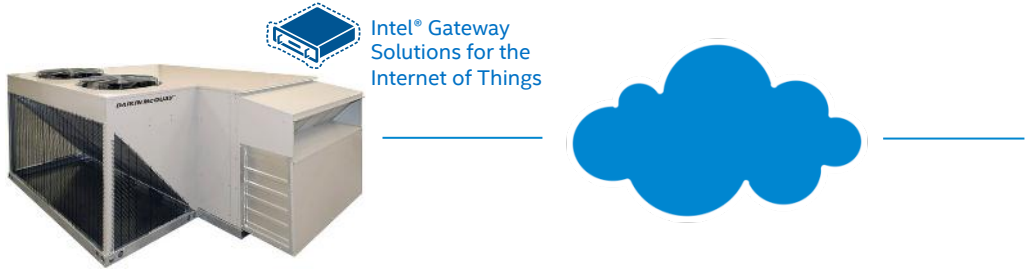
†Enabled by third party hardware on the DK100 Series only.

2014 ODM Branded Moon Island Gateway Solutions for the Internet of Things

		ADI Engineering* White Oak Canyon	Eurotech* ReliaGATE 15-10	Eurotech DynaGATE 15-10	ECS* Intelligent Gateway	Portwell* PI-81AIO
Click on model for more info in Solutions Directory						
Segments		Commercial	Industrial, Commercial	Transportation	Industrial	Commercial
CPU		**Intel® Quark™ SoC X1000**	**Intel Quark SoC X1000**	**Intel® Quark™ SoC X1020**	**Intel® Quark™ SoC X1021**	**Intel Quark SoC X1000**
I/O	**LAN WAN PAN**	- 2x Ethernet 10/100 - WiFi 802.11 a/b/g/n + Bluetooth® - 2G/3G Telit* mPCIe* module - ZigBee*†	- 2x Ethernet 10/100 - WiFi 802.11 a/b/g/n + Bluetooth - ReliaCELL* Cellular & GPS - ZigBee†	- 2x Ethernet 10/100 - WiFi 802.11 a/b/g/n + Bluetooth - ReliaCELL Cellular & GPS - ZigBee†	- 2x Ethernet 10/100	- 2x Ethernet 10/100 - Optional WiFi 802.11 a/b/g/n + Bluetooth - Optional Telit HE910 via miniPCIe
	Ports	USB 2.0, RS-232 COM, RS-485, External Antennas	USB 2.0, COM RS-232/422/485, COM RS232/TTL, CAN, Audio, HDMI	USB 2.0, COM RS-232, CAN, Audio, HDMI	USB 2.0, Serial RS-232/485, Analog, I/O Digital I/O	USB 2.0, COM, Audio
	Expansion	1 x Full Size mPCIe 1 x Half Size mPCIe	1 x Full Size mPCIe 1 x Half Size mPCIe	1 x Full Size mPCIe 1 x Half Size mPCIe	1 x Full Size mPCIe 1 x Half Size mPCIe	1 x Full Size mPCIe 1 x Half Size mPCIe
Memory and Storage		- 1GB non ECC DDR3 - MicroSD slot	- 512MB DDR3L (support up to 1GB) - MicroSD Slot (4GB up to 64GB)	- 8 GB MicroSD card 512MB DDR3L	- 512MB DDR3 - MicroSD up to 32Gb	- 1G DDR3-800 - MicroSD
Op Temps		0°C ~ 55°C	-40°C ~ 85°C	-40°C ~ 85°C	-10°C ~ 70°C	0°C ~ 55°C

Use Case: Intel® Gateway Solutions for the Internet of Things Industrial HVAC



Securely* connect to HVAC units and send data to the cloud

Aggregate, Analyze, Manage Data

Cloud Services Creation and Deployment

Performance Management (Owner)

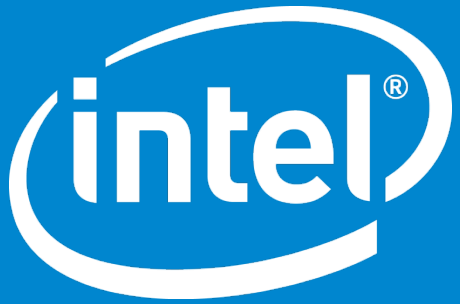
- Energy performance benchmarking
- Utility grade demand response
- Sustainability and regulatory reporting

Asset Management (Service)

- 24/7/365 anywhere access
- Remote diagnostics and monitoring
- Online integrated service and parts locator

Accelerating Business Transformation

*No system can provide absolute security under all conditions. Intel assumes no liability for lost or stolen data and/or systems or any resulting damages.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