INTEL INSIDE®
SMART IOT SOLUTIONS AND SERVICES OUTSIDE

ARDIC IoT Ignite*

The "things" in Internet of Things (IoT) generally refers to sensors, actuators, mobile devices, and other edge devices working cooperatively under the umbrella of a common ecosystem. This ecosystem enables access to solutions and services, provided by the IoT platform, ARDIC IoT Ignite*, for diverse vertical market segments such as education, healthcare, retail, government, enterprise, and more.

Intel® IoT Gateways

A seamless IoT solution supporting "things" that differ in hardware, computing, networking or intelligence capabilities requires an enabler hub for easy deployment, interoperability, operation, and system maintenance. An IoT gateway with the right set of features and capabilities can play the enabler hub role and fulfill that requirement. The features of the Intel® IoT Gateways that play an important role in enabling end-to-end security, networking and interoperability are:

- **Connectivity.** Supporting several networking protocols, such as ZigBee*, Bluetooth* with low energy, built-in Internet connectivity via Ethernet*, Wi-Fi, and more
- **Manageability.** Providing a centralized point of access and management
- **Security.** Providing secure communication channels between the clients and service providers
- **Hardware identification.** Providing a unique hardware ID for edge devices where most sensors and actuators lack the ability
- **User identification.** Coupling devices to users
- **Runtime environment.** Providing a supplementary computing environment where solution-specific applications are executed as needed

In addition, a gateway may have built-in features like Global Positioning System (GPS), temperature, accelerometer sensors, audio recorder, or camera support. IoT solutions become more flexible when these functions are already available at a point closer to the edge network.

Operating system selection for the IoT Gateway

The important factors in selecting the operating system (OS) for the IoT gateway are:

- Development, maintenance, and operation costs
- Local and remote management
- Network and peripheral support
- Security

- Sandbox and third-party applications support
- Physical size
- Firmware efficiency
- Support for remote and local administration consoles

Android* has a proven record and is the most popular mobile operating system (OS) on smartphones[1]. It runs on media boxes and there are smart dongles for TVs. PCs can also boot from Android USB sticks. Official support becomes available for car dashboards and TV sets with the arrival of Android's Lollipop* version. Android advantages include:

- Ability to run on different hardware
- It can run third-party applications without affecting the OS
- It is open source and readily available for customization
- It has smart built-in features such as mobility, user experience, and power management
- It supports various network connections including latest technologies like near field communication (NFC), Beacon*, and Bluetooth Low Energy* (BLE*)
- It has a practical user interface supporting various displays and input devices
- It comes with built-in sensors like accelerometers, GPS, built-in cameras, and audio recorders
- It has basic gateway functions supporting wireless and mobile connections
- Many communities already are in place for OS, application development, and support
- Its Linux* kernel enables easy integration for existing and future Linux apps

Customization

Android can be customized to recognize new smart wireless IoT networks, new sensors, or actuators with its new USB adapters. A customized launcher offers easy local setup and configuration. The customized IoT agent enables IoT and gateway communication.

A built-in cloud agent establishes a secure communication channel for cloud-based IoT services. Figure 1 shows some IoT examples that could be connected to the ARDIC IoT Ignite platform for a variety of vertical market segments.
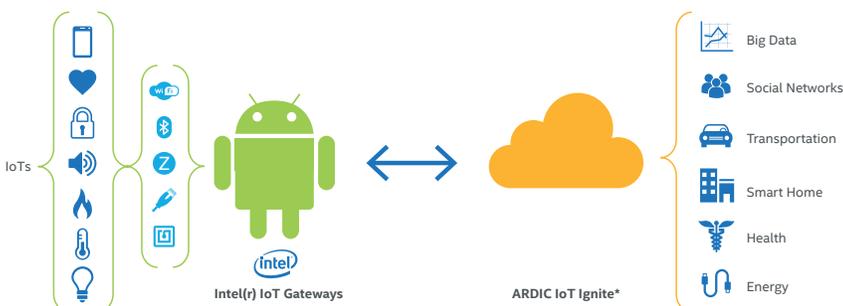
Figure 1: Examples of "things" that can connect to the ARDIC IoT Ignite* platform

ARDIC and Intel's IoT solution

Figure 2 shows the high-level architecture and components of the ARDIC and Intel IoT ecosystem.
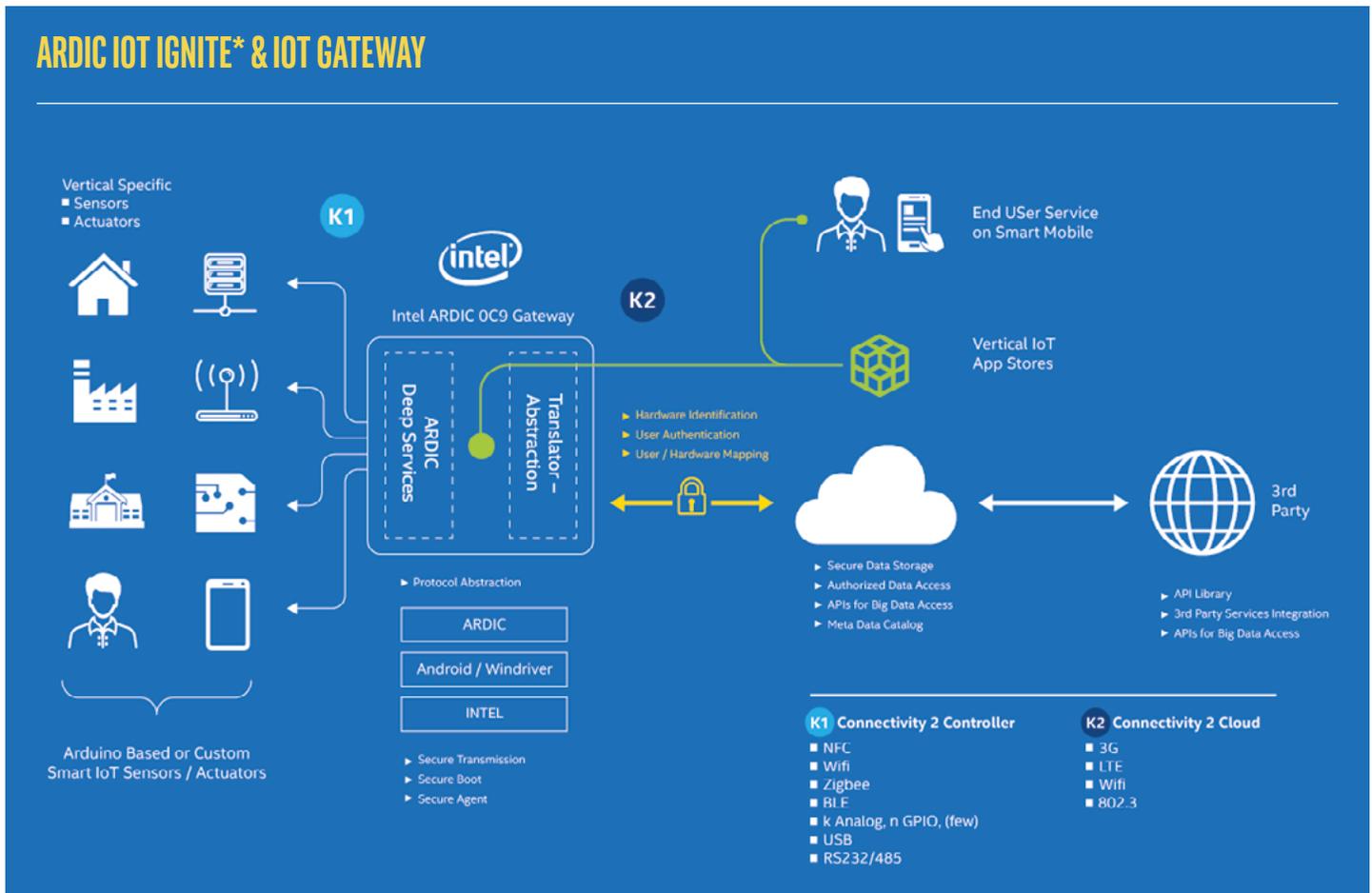
Figure 2: Architecture and components of the ARDIC and Intel ecosystem

ARDIC'S IoT Ignite solution is formed by its customized Android on-edge devices working in harmony with ArCloud*. A built-in cloud agent within a gateway establishes a secure communication channel for cloud-based IoT services and easily extends the benefits of the ARDIC IoT Ignite solution to the edge devices within the network. Intel IoT Gateways connect edge devices—including mobile devices, sensors, and actuators—to the ARDIC IoT Ignite platform and extend the entire set of IoT services and applications of the ecosystem to the clients. These services include:

- Seamless integration with edge devices and third-party services
- Flexible deployment options to diverse vertical market segments via built-in application and content stores

- Wireless, Bluetooth, BLE, and TCP/IP communication support for edge devices
- Secure communication channels
- Edge device data collection, storage, and processing
- Complex event handling and processing
- Remote administration consoles for edge device monitoring and management
- Easy deployment (provisioning, profiling), maintenance (application and service update, upgrade over-the-air (OTA) upgrades, log collection, management (policy management), and application and content store support
- Collection, computation, analysis, and secure and authorized distribution of data
- Integrated enabler platform for business owners, service providers, and application developers

Learn more about Intel and the Internet of Things here.
Learn more about ARDIC IoT Ignite Services here.