

## Roving Reporter: An intelligent framework for connecting the Internet of (medical) Things

Blog Post by JenniferH-OSM

Smart is the new cool, and if there's any machine among the plethora of Internet-connected gadgets and systems available today that you'd want to be smart, it's the one that's monitoring or even sustaining your health.

The Internet of Things is hyping great expectations now and in the near future for the deployment of billions of intelligent devices that promise to enhance productivity, increase safety, and in general make life easier for businesses and consumers. Everyday objects - everything from your table lamp to your coffee maker - will be able to talk to each other and possibly learn how to customize operations to your preferences.

Embedded technology companies who are producing these smart devices are smart enough to recognize that this new era of über connectivity presents a number of challenges that must be overcome to capitalize on the opportunities for growth, not the least of which is figuring out what to do with all this data being communicated from device to device. This data manageability issue is particularly concerning for the health care sector, adding to the complications of incompatible electronic medical records and stringent privacy requirements.

Intel is working to address the data dilemma

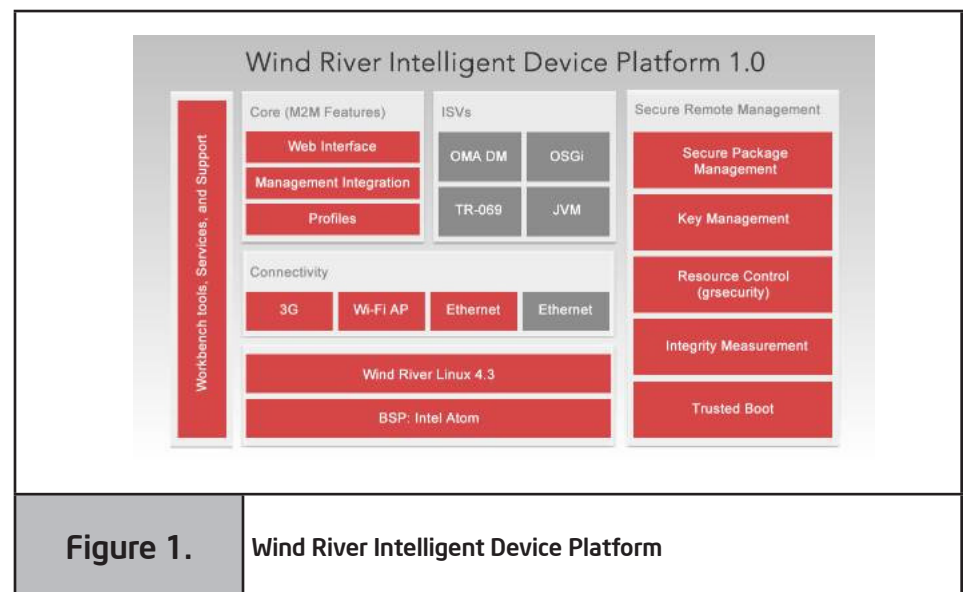
posed by the Internet of Things by developing the Intel® Intelligent Systems Framework, an evolving set of interoperable solutions designed to enable connectivity, manageability, and security across devices in a consistent and scalable manner. From embedded devices to the data center and cloud, the Intelligent Systems Framework enables interoperability in end-to-end systems and helps OEMs extract greater value from their data. To meet the needs of intelligent systems, Intel processor platforms including the low-power Intel® Atom™ architecture and the high-performance Intel® Xeon® architecture provide the processing power required for handling burgeoning volumes of data, while Intel technologies such as Intel® Active Management Technology (Intel® AMT) and Intel® Trusted Execution Technology (Intel® TXT) provide solutions for data manageability and security, respectively.

Members of the Intel® Intelligent Systems Alliance including Wind River are supporting

the Intelligent Systems Framework by contributing their technologies and expertise to achieve interoperability across the network of intelligent devices. In the following interview, Santhosh Nair, general manager of intelligent platforms at Wind River, discusses how the two companies are promoting initiatives to simplify intelligent systems development and deployment and reveals how these efforts will help the health care market get smarter and more connected.

RR: How will the Intel® Intelligent Systems Framework utilize software and middleware from Wind River?

Nair: Wind River Intelligent Device Platform, a complete software development environment built exclusively for Machine-to-Machine (M2M) applications, is a key software enabler of the Intelligent Systems Framework. It provides a simple yet powerful software platform to design, build, and operate intelligent connected embedded devices. Intelli-



**Figure 1.**

**Wind River Intelligent Device Platform**



gent Device Platform is built on Wind River's embedded Linux operating system and tools, as well as integrated middleware addressing connectivity, manageability, and security at the device level. A simple way to think about the Intelligent Systems Framework and Intelligent Device Platform is the following: Intelligent Systems Framework is the end-to-end framework (device to data center and in between), and Intelligent Device Platform is the embedded device software stack that aligns with this framework.

RR: How will Intelligent Device Platform benefit the health care market?

Nair: There is a marked trend in the medical industry toward smarter, connected devices and a shift in focus from illness toward wellness. Through emerging applications such as patient monitoring and in-home patient care for seniors and patients with chronic conditions, mobile health technology enables physicians and family members to cost-effectively improve care, respond to emergencies, and more accurately monitor and treat illnesses. Wind River Intelligent Device Platform can be a key enabler for medical device developers to fuel rapid innovation and deployment of safe, secure, and reliable connected health care devices.

Think about Intelligent Device Platform as a software component that enables medical devices to connect well with each other and to the backbone, so as to advance interoperability in health care. In addition, Intelligent Device Platform allows post-deployment in managing these systems securely and providing secure remote updates. All these are cost and efficiency drivers in the industry and will directly address the bottom line for device manufacturers by providing them with an industry-leading infrastructure based on safety, security, connectivity, and manageability.

RR: How can Intel and Wind River platforms and technologies be used to maximize the

value of data in intelligent medical systems?

Nair: Approximately 75 to 80 percent of all U.S. health care spending is related to one or more chronic conditions (for example, heart, kidney, or lung issues or other forms of ongoing serious illnesses or disabilities). Smart M2M devices, services, and applications enable health care professionals to understand patients' conditions and make accurate, timely, and realistic recommendations. In some cases actions can be taken (such as taking insulin for diabetes), or a caregiver can be alerted to assist a patient needing help. There are hundreds of M2M-based health care services in hospitals, doctors' offices, and homes, and on mobile applications as well.

While some operators and device manufacturers may adopt a do-it-yourself approach and try to build internal competence rather than outsource key aspects of creating new devices and services responsible for managing the growing sensor and other patient data intelligence, this investment strategy likely doesn't match the company's value equation. Intel and Wind River are enhancing paths to revenue for health care companies by eliminating the need to develop internal competency in areas that don't help differentiate their products from their competition.

RR: What innovations are needed to improve connectivity and address data demands in medical devices?

Nair: Connectivity is ubiquitous in almost every industry out there except the medical industry. And in general, there is not much innovation needed in the connectivity arena regardless of industry. The key is to use leading platforms that enable connectivity and basic standards, allowing medical device makers to focus on applications built on this standard infrastructure that provide value to patients and physicians. The bigger question at hand is how to address manageability, analytics, and data. Big Data is as big a theme in the medical industry as it is in other industries. The fol-

lowing initiatives are key for addressing data demands in medical devices:

Developing standard interfaces and infrastructure at the endpoints to generate high-quality data

Ensuring world-class security in designs for end devices and the entire ecosystem

Generating proactive statistics that enable better decision making regarding system health

Most importantly, having analytics that feed into better decision support for clinicians and patients based on the information generated

To make these high value-add applications work, it is paramount that a strong, solid foundation is laid for connectivity, manageability, and security - and the Intel® Intelligent Systems Framework and Wind River Intelligent Device Platform enable just that.

Download this recently recorded webcast to hear how Wind River and Intel are collaborating on a reference design for a mobile therapeutic device that combines Intel's high-performance multicore processing technology with Wind River virtualization software, and check out this previous blog Q&A with Santhosh to learn how embedded vendors can protect mobile medical designs. Read this Roving Reporter blog for an overview on the key elements comprising the Intel® Intelligent Systems Framework, and check back for future blog posts on this subject involving other members of the Intel® Intelligent Systems Alliance.

The embedded industry moves fast. Keep up with the Embedded Innovator magazine that brings you cutting-edge design ideas from industry leaders [intel.com/go/embeddedinnovator](http://intel.com/go/embeddedinnovator). Join the discussion at [intel.com/embedded/community](http://intel.com/embedded/community). Learn more about the Intel® Intelligent Systems Alliance [Intel.com/go/intelligentsystems-alliance](http://intel.com/go/intelligentsystems-alliance).

Wind River is an Associate member of the Intel® Intelligent Systems Alliance.

