



SOLUTION BRIEF

Health and Life Sciences

Internet of Things

Improve Outcomes and Costs with Remote Patient Monitoring

Using a next-generation remote health gateway from Intel, ConnectedHealth improves chronic care management with a practical solution for vital signs monitoring

Meeting the Challenge of Chronic Care

With aging populations and rising rates of chronic disease, healthcare providers face increasing pressure to provide more efficient, affordable patient care. Vital signs monitoring (VSM) and other remote monitoring solutions are increasingly recognized for their role in achieving these objectives. However, VSM solutions have often been impractical to implement. These solutions:

- Were typically piecemeal and complex
- Involved burdensome device setup and configuration
- Were based on proprietary technologies that made the solutions costly and difficult to scale

ConnectedHealth Delivers a Robust, Scalable Solution

The ConnectedHealth vital signs monitoring solution solves the problems of cost, complexity, and scale that have slowed the adoption of remote VSM. ConnectedHealth has accomplished this by building a system that:

- Provides an end-to-end platform as a service (PAAS) medical VSM solution for healthcare organizations
- Supports standards such as Continua* to improve medical device interoperability
- Is architected to ensure patient data privacy, with data owned and hosted by the healthcare organization
- Utilizes robust, security-enabled gateway technology from Intel

Using the Intel® Remote Patient Monitoring Gateway, ConnectedHealth provides a robust, scalable solution for secure transmission of VSM data from a remote location such as a patient's home to a health record system.

“Building our system around the Intel Remote Patient Monitoring Gateway has allowed ConnectedHealth to build a robust, security-enabled and scalable vital signs monitoring platform. The fact that the Intel gateway is open also provides our customers with the confidence that the system can be adapted to different use cases as they evolve.”

– Mike Holt,
CEO, ConnectedHealth

Solution Architecture Based on the Intel® Remote Patient Monitoring Gateway

Using the ConnectedHealth VSM solution, healthcare providers can simplify the collection of vital signs data (such as weight, glucose readings, and blood pressure) from medical devices situated at a remote site and more securely forward that data to health data organizations (HDOs) for further processing (see Figure 1). These HDOs include independent diagnostic testing facilities (IDTFs), hospitals and clinics, health maintenance organizations (HMOs), clinical research organizations, insurance companies, and healthcare IT companies (developers of electronic health and electronic medical record systems).

The ConnectedHealth VSM Device Management (VSM-DM) platform manages device and gateways, separating these administrative functions from clinical data and helping preserve the privacy of health information. This platform maintains a medical device registry, monitors system usage, updates device software, and manages the provisioning and delivery of health kits.

A key component of ConnectedHealth's VSM solution is the Intel® Remote Patient Monitoring Gateway. Intel's open architecture allows for customization of applications and medical device support on the gateway itself. The open architecture also allows for scaling and edge analytics. By using the Intel gateway, ConnectedHealth can rapidly add new monitoring devices and rapidly adapt the gateway to route data to specific health data organizations.

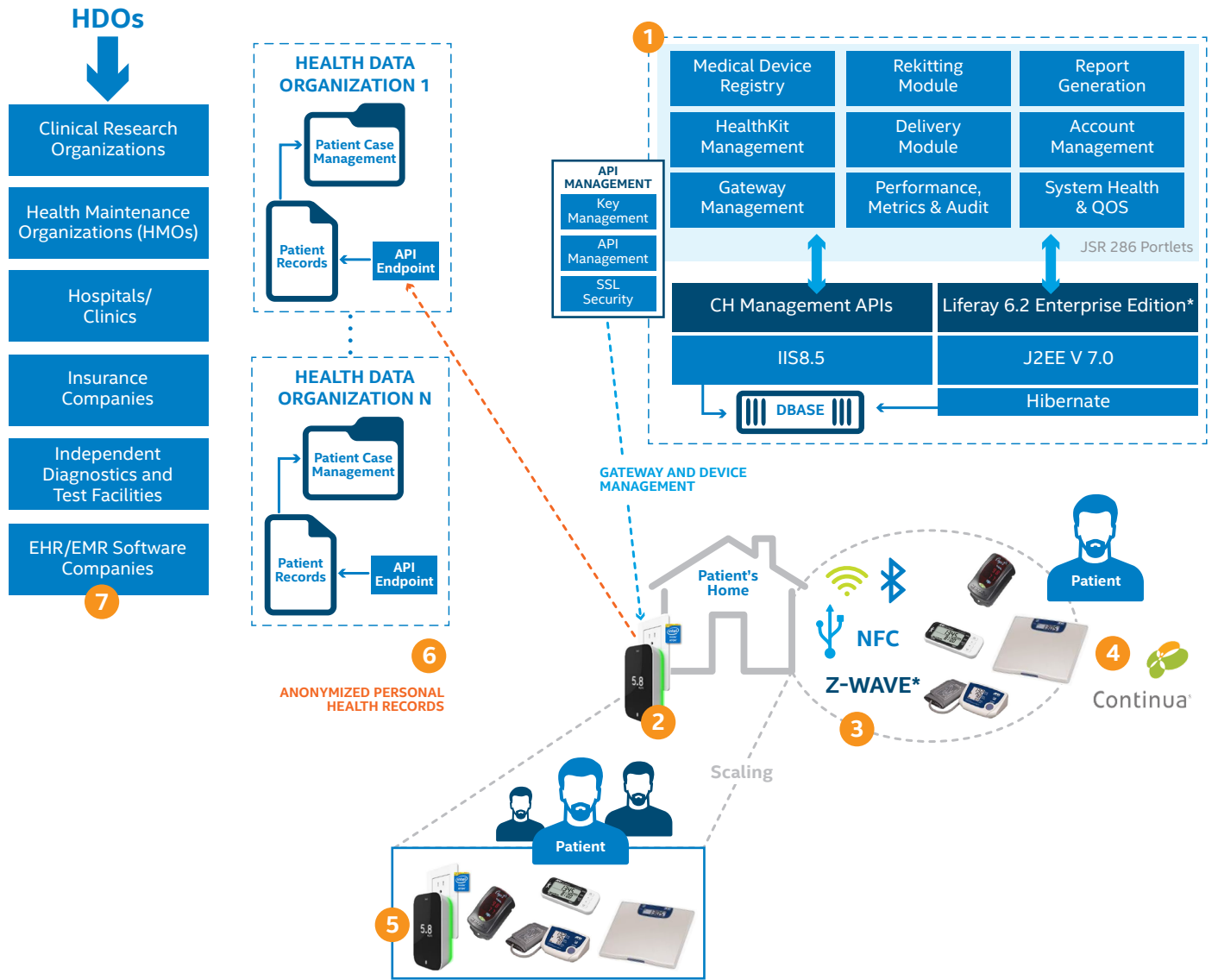
Patient Data and Privacy

ConnectedHealth's VSM solution is designed to ensure that a patient's personal health information is more securely transferred from the device to the HDO and not stored or compromised during transit. All patient data is ultimately hosted and managed by the HDO, reducing the complexity surrounding patient data ownership and privacy issues.

Value Proposition

The ConnectedHealth solution, in combination with protocols and procedures defined by HDOs, enables HDOs to:

- Reduce total cost of ownership (TCO) by utilizing ConnectedHealth's platform as a service offering.
- Reduce the complexity of managing devices and gateways.
- Provide a flexible framework for integration with other information systems.
- Support improved care and management of patients with chronic medical conditions and provide a framework to better monitor post-operative discharge patients with the goal of reducing hospital readmissions.



- 1 ConnectedHealth's VSM Device Management Platform (VM-DM), manages provisioning, asset tracking, metrics—essentially all administrative tasks associated with managing Remote Patient Monitoring gateways and devices. Generalized analytics and system metrics are captured and made available via APIs for customer use.
- 2 Once installed in the Patient's home, the Intel® Remote Patient Monitoring Gateway enables Bluetooth® medical devices to seamlessly send data to the Health Data Organization via a secure cellular connection.
- 3 The gateway is built on Android* and supports Z-Wave,* enabling Home Automation (controlling lights, appliances) and also supports a WiFi Hotspot feature, allowing patients to use tablets or other devices to securely communicate with clinicians. In addition, the gateway supports NFC technology, allowing patients to uniquely identify themselves. Customized "edge" applications can be developed on the gateway to extend use cases.
- 4 The Intel gateway supports the Continua protocol enabling communication with a host of medical devices, such as weighing scales, blood pressure monitors, pulse oximeters, in addition to lifestyle devices such as the Intel® Basis™ Health Tracker.
- 5 The system is designed to scale to support thousands of patients, with each gateway configurable to point to different Health Data Organizations.
- 6 All data transferred from the gateway is anonymized. No personal information is stored or transmitted by the system.
- 7 End customers are HDOs (Health Data Organizations). All data belongs to or is managed on behalf of their customers by HDOs.

Figure 1. ConnectedHealth Vital Signs Monitoring Solution

Key Features of the Intel® Remote Patient Monitoring Gateway

- Scalable, open solution for cost-effective remote vital signs monitoring.
- PaaS solution, resulting in lower TCO for health data organizations.
- Robust medical device interoperability using the Continua* standard.
- Integrated provisioning engine with robust asset and deployment management.
- Integrated 3G data plan, allowing for rapid regional and global deployments.
- Support for Bluetooth*, Wi-Fi*, Z-Wave*, and USB connectivity to cloud and devices.
- Data is owned by the end user. No patient data resides on the gateway or on the VSM platform.

Conclusion

The ConnectedHealth VSM solution, based on the Intel Remote Patient Monitoring Gateway, allows health data organizations to rapidly integrate a remote patient VSM solution into their workflow. "Building our system around the Intel Remote Patient Monitoring Gateway has allowed ConnectedHealth to build a robust, security-enabled, and scalable vital signs monitoring platform. The fact that the Intel gateway is open also provides our customers with the confidence that the system can be adapted to different use cases as they evolve," says Mike Holt, ConnectedHealth CEO.

"The Intel Remote Patient Monitoring Gateway supports a 3G plan, which allows us to rapidly deploy the VSM platform wherever our customers happen to be," Holt adds. "We also benefited enormously from Intel's robust wireless technologies, which are integrated in the gateway, including Bluetooth*, Z-Wave*, and Wi-Fi* connectivity, along with a robust USB implementation. These well-integrated solutions dramatically reduced our engineering effort, and have given us the confidence to support national-level VSM programs."

To find out more about Intel remote health gateways, contact your Intel representative or visit www.intel.com/healthcare.

To learn more about ConnectedHealth RPM solutions, visit www.connhealth.com.



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