



CHAPTER 1

Cisco Imatis Mobile Care Solution Overview

Cisco Imatis Mobile Care is a solution for healthcare that improves the communication flow for hospital staff. By deploying Cisco Imatis Mobile Care, employees in a hospital can access, receive, and utilize information from numerous disparate hospital communication systems via the Cisco Unified Communications (UC) platform and Cisco Unified Wireless Network across a Cisco network infrastructure. Caregivers in a hospital see improved care, increased patient satisfaction, and reduced cost of care. Other hospital employees receive vital clinical information while not at their primary location, wherever and whenever they want it, greatly improving their effectiveness in providing patient care. Patients can make requests from the bedside, gather information about their condition, or order services that would have otherwise required staff interaction.

Cisco Imatis Mobile Care can be viewed as an extension to the Cisco Unified Communications system that currently supports hospital environments. This solution also addresses the important requirement to upgrade a hospital's legacy communication systems. In other cases, Cisco Imatis Mobile Care might be an adjunct to the hospital's legacy communication system. In all these cases, the underlying architecture leverages Cisco network designs for places in the network (PINs), such as the campus network or a wireless infrastructure to support voice. Key technologies that bring these new services to the hospital include Cisco Unified Communication, Cisco Unified Wireless Network, and Secure Mobility. Cisco's partner Imatis provides the gateway to hospital systems and Nurse Call systems and facilitates the delivery of critical information to mobile handsets.

Executive Summary

The challenges facing healthcare are well known and extend to many areas, including cost of care, regulations and compliance, lack of information, growing numbers of patients, etc. A common framework for interoperability, based on open standards, is needed to enable secure information sharing, simplify organizational processes, improve system performance, and reduce costs. Typical comments include:

- “Public health service is underfunded and unevenly distributed.”
- “Increases in health care spending have been attributed in part to an aging population.”
- “The cost of health care is one of the largest components of the U.S. economy and is rising faster than the rate of inflation.”
- “Healthcare companies today are faced with the daunting challenge of reducing costs while retooling systems and processes throughout their business to support electronic document exchange and comply with HIPAA”
- “Problems are embedded in the work processes and lack of adoption and use of technology, and patients, doctors, nurses, deserve and can build a better system.”

The goal of the Cisco Imatis Mobile Care solution enabled by key Cisco technologies and the partnership with Imatis is to return to staff and caregivers the time and resources that were lost because of poor communication flow. Improvements result when mobile staff can receive essential information anywhere in a hospital setting and when patients can retrieve information themselves without involving staff. The time and resources saved by hospital staff can then be directed back to their primary roles in the hospital.

Solution Description

The Cisco Imatis Mobile Care solution is an end-to-end system integration that provides hospital IT and system integrators with the information required to design and deploy a system that supports nurse call, stat alerts with HL7 ancillary systems, and hospital building systems. The primary focus is to facilitate a more efficient information flow from these systems to the caregivers, hospital staff, and patients. The three focus areas are:

- **Nurse Call Integration**—The Nurse Call component complements the primary notification system being used by a particular Nurse Call vendor. Nurse call alarms are typically those initiated by the patient, usually through the use of a pull station or bedside-attached nurse call device. These alarms are still delivered to the primary Nurse Call Station, while secondary messages are delivered to Cisco 7921G Wireless IP Phones for the mobile caregiver staff. The 7921G phone is then programmed with an option to call back the room that originated the alarm.
- **Ancillary System Integration**—The IMATIS Order Entry Alerts component provides mobile care givers with critical, results-oriented clinical information without regard for their physical location inside the healthcare enterprise. Through the use of Cisco 7921G phones, the caregivers responsible for the care of a patient are pushed updates critical to their care. These updates may be abnormal clinical results from a number of ancillary systems. Business rules are applied for formatting, scheduling, acknowledgment, and escalation mechanisms for these alerts.
- **Hospital Service Integration**—These integration points are examples, but each hospital may have unique integration points that should be addressed in conjunction with Imatis and Cisco. Some examples of hospital services that are requested by the care provider on an ad-hoc bases are:
 - Summons/team assembly
 - Building and fire alarms
 - Orderly requests (e.g., housekeeping, transportation, and dietary)
 - Text messaging

The foundational technology to support the delivery of this information to Cisco 7921G IP phones when staff are mobile include:

- **IMATIS Platform (Hospital Communication System)**—The foundation for an event-driven, service-oriented architecture including:
 - **Integration and Orchestration Server**—Combines messaging and connectivity to collect, transform, and distribute real-time events. Key performance indicators and metrics are established to help enterprise organizations continuously improve operational efficiencies, staff productivity, and decision-making.
 - **Adapters**—Imatis has designed and developed adapters to integrate third-party vendors throughout the enterprise to a standards-based, Web services format.
- **Cisco Unified Communications System**—Increases business agility by helping you integrate communications more closely with business processes, ensuring that information reaches recipients quickly through the most appropriate medium.

- Cisco Unified Wireless Network—Delivers secure connections, rich experiences, and intelligent services to help your organization.
- Cisco VoWLAN—Provides reliable voice communication anywhere in your facility.
- Cisco Campus and Data Center Designs—Deploy more robust business continuance and enhance data security for applications and servers.

Imatis should be contacted for specific information and considerations for integrating these medical devices and systems:

- Nurse Call System
- Ancillary systems (e.g., laboratory systems)
- Hospital Service systems (e.g., building and fire alarm systems)

Target Market

The Cisco Imatis Mobile Care solution is focused on solving communication bottlenecks within mid-size to large-size medical facilities. The benefits are even more amplified when large numbers of staff are involved and information flow between departments does not scale well. The solution is targeted at:

- Mid-size to large-size healthcare organizations (>150 beds)
- Hospitals with older voice and data technologies
- Hospitals with a very mobile work staff within the campus
- Hospitals with Point of Care system like Nurse Call Systems, Information Systems with HL-7 interfaces, building systems for fire or security alarms, and administrative systems such as dietary systems.

The healthcare provider's IT Infrastructure must adhere to the Cisco Medical-Grade Network architecture for recommendations on voice over wireless designs, Cisco's Unified Communications architecture for voice and security, and Campus/Data Center design practices.

Solution Benefits

The Cisco Imatis Mobile Care solution is focused on improving communication flow inside a hospital environment. The identified use cases focus on three main target groups. The first two target groups are employees of the hospital that are mobile. One group is focused on employees whose primary purpose is providing medical care, such as nurses, doctors, laboratories, etc. The second employee group covers the remainder of the hospital staff that need information and are mobile, such as security personnel, orderlies, and other facilities-related staff. The third group that receives immediate benefit from the solution are hospital patients. Patients are not typically mobile, but usually located in hospital rooms and potentially immobile. They frequently have requests or require information that they cannot obtain without the intervention of hospital staff.

- Caregiver benefits:
 - Receive all messages, alerts, and calls to one device so there is no need for additional devices when a user has an attending role (e.g., attending anaesthesiologist).
 - Voice and data communication anywhere in a hospital
 - Improved workflows

- Ability to receive alerts with information helpful in delivering timely and accurate patient care
- Allows the staff to be more mobile and not anchored to a particular location
- Gives time back to staff for their primary function
- Ability to rapidly assemble specialty teams
- Ability to escalate urgent issues when busy
- Flexibility to order services related to facilities or dietary
- Hospital staff benefits:
 - Receive all messages, alerts, and calls to one device so there is no need for additional devices when a user has an attending role (e.g., attending anaesthesiologist).
 - Voice and data communication anywhere in a hospital
 - Improved workflows
 - Allows the staff to be more mobile and not anchored to a particular location
 - Gives time back to staff for their primary function
 - Ability to receive information to provide accurate services
 - Ability to deal with urgent matters as they arise
 - Flexibility to order services related to facilities or dietary
- Patients:
 - Ability to retrieve information dynamically
 - Ability to request services that previously required manual intervention
 - Ability to order items within a hospital

Scope of the Solution

Deploying the Cisco Imatis Mobile Care solution involves a broad range of technologies and features. To ensure a successful deployment, you must keep in mind key design and implementation considerations that center around an infrastructure that is compliant with the Cisco Medical-Grade Network. These fundamental characteristics can be achieved by adhering to the set of Cisco best practices for each of the technologies being deployed and outlined in the Cisco Medical-Grade Network architecture.

This document focuses on system considerations across campus, Cisco Unified Communications for CUCM, IP Phones, and Cisco Unified Wireless Network in collaboration with the IMATIS Hospital Communication System. Key design considerations and specific implementations across key Cisco products and integration with the IMATIS gateway are covered to deploy Cisco Imatis Mobile Care. Integration concepts with nurse call systems, ancillary systems for HL7, and hospital service systems are also covered to provide a general understanding of the integration challenges.

This document does not cover the installation steps required by each product in the solution. For detailed configuration information we suggest you consult the individual product documentation. Because the solution spans a wide array of technologies and product sets from both Cisco and third parties, we recommend that a certified installation partner be consulted during the planning, configuration, installation, and training phases of a deployment for optimum results.

Imatis Overview

Headquartered in Porsgrunn, Norway, Imatis AS is the leader in innovative software solutions for the healthcare industry. Their products focus on connecting people, information, processes and systems within a healthcare organization. The Integration Engine, Messaging Service and clinical applications will help the customer in achieving their goal of becoming an Integrated Digital Hospital with focus on patient flow and lean thinking. The building blocks relies on the Cisco Medical-Grade Network and the Cisco Imatis Mobile Care solution.

The company was founded in 1991 by Morten Andresen and has its background from large-scale applications in the oil & gas and manufacturing industries as well as 7 years of experience from the healthcare industry. In 2007 the company was split into two separate organizations that will continue to be close technology partners. The oil & gas and manufacturing unit is now named CARDIAC Industry AS (<http://www.cardiac.no>) while the healthcare unit is now named Imatis AS (<http://www.imatis.com>). Imatis is also the name of our main product suite. Imatis has a good reputation and years of experience with implementing software as an integrated part of the hospital work flow and mobile care.

At Imatis AS they utilize their own software product family and have a large in-house product development department. The products included in the IMATIS Suite are standardized as a part of the Integrated Healthcare and Application Portfolio. Imatis work closely with National Instruments, Cisco, HP and Microsoft to embed their framework applications and modules into their products. Cisco Silver and Gold Partners is a part of the Imatis roadmap for delivering the solution portfolio in the international marketplace.

The IMATIS Suite is a service-based infrastructure and application framework. It includes several healthcare applications, like patient bedside terminals, nurse calling, electronic patient charts, vital sign/patient monitoring and notification, bed management, localization services, asset control and patient whiteboard. The platform also supports advanced and flexible services for hospital communication like notifications, team assembly, emergency medical communications, alarm management and voice.

Imatis applications provide an excellent platform for point-of-care as well as mobile services. The IMATIS role-based portal and applications run on Cisco wireless IP phones, mobile phones, patient bedside terminals, wireless computers and PDA's both inside and outside the hospital building to create a true mobile care environment. The Integration Engine can also connect to external applications and services such as a patient registry, birth registry, doctor's office or clinic, directory services, etc.

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