



# RED HAT OPEN SOURCE TECHNOLOGIES IN HEALTHCARE IT

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## INTRODUCTION

Healthcare organizations are increasingly dependent on complex information technology systems to support clinical decision making and patient care delivery. The information technology infrastructure supporting these systems must provide life-critical reliability, availability, and security. Moreover, the traditional IT infrastructure at provider organizations is extremely fragmented, consisting of solutions from multiple vendors for various different subsystems. Due to the fragmented nature, the integration and interoperability between various subsystems has become a central issue for most healthcare organizations.

In the past, lack of comprehensive, standards-based technologies in healthcare organizations have introduced significant complexity and increased costs. It has also created vendor lock-ins and limited interoperability. Open source technologies are based on open standards, and they facilitate transparency. Open source has also demonstrated that it eliminates infrastructure complexities while improving performance and reducing costs. Because of some of the inherent characteristics of open source, the healthcare industry is steadily incorporating open source solutions based on Red Hat technologies in its IT infrastructure to achieve its technology goals in a scalable and cost-effective manner.

Due to their increasing dependence on information technology, healthcare organizations need technology infrastructure that is reliable, secure and facilitates interoperability for transparent, yet authorized information sharing. Red Hat technologies address these needs. Red Hat provides healthcare organizations with the technologies necessary to build a reliable IT infrastructure necessary for their life-critical applications, while at the same time helping them comply with the stringent security requirements. Red Hat understands that the safety of patients is of prime importance to hospital IT decision makers. By providing reliability, security, and interoperability in a simple way, Red Hat's open source technologies help hospitals achieve their goals of patient safety. And they do so while maximizing performance and minimizing costs. Thus Red Hat enables healthcare organizations to focus their efforts on their primary role, care delivery, without having to worry about complexities in their IT infrastructure.



#### **Red Hat technologies enable healthcare organizations to:**

- Maintain full control of IT investments.
- Optimize open standards-based integration, enabling vertical and horizontal information sharing.
- Consolidate services by extracting higher performance without increasing budget requirements.
- Improve data and network security protecting critical information, assisting the healthcare organizations to better comply with regulatory requirements.

## **RELIABLE INFRASTRUCTURE**

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Patient lives depend on availability of healthcare organizations' IT infrastructure. Hospitals cannot allow their IT systems to go down. Red Hat Enterprise Healthcare Platform is a reliable, affordable information technology platform designed for delivering safe, high-quality patient care. It packages Red Hat Enterprise Linux, JBoss Enterprise Middleware, updates via Red Hat Network and services specifically tailored to the needs of the healthcare environment.

The Red Hat Enterprise Healthcare Platform integrates virtualization, application failover features, and clustered file system capabilities to provide continuous availability for life critical systems. Applications deployed in a virtual environment can be seamlessly migrated live from one system to another in the event that a system goes down for planned or unplanned outages. Critical updates to the Healthcare Platform are managed by Red Hat Network, which can also manage and monitor thousands of systems as easily as a single system. These updates are provided for seven years after the initial product release, providing a stable platform that healthcare organizations can depend on.

Health First (<http://www.redhat.com/solutions/successstories/healthcare/healthfirst/>) used the application failover and clustering capabilities of the Healthcare Platform to dramatically improve the reliability of its Picture Archive and Communication System. This improvement, coupled with its integration into the tiered storage environment in place at Health First, enables Health First's cardiologists to more effectively care for their patients.

The McKesson Horizon Clinicals Solution Suite (<http://www.redhat.com/solutions/successstories/healthcare/mckesson/>) was the first to adopt the Red Hat Enterprise Healthcare Platform to provide affordable reliability to customers. By standardizing on an open source, reliable platform, McKesson was able to optimize product development and testing resources and pass those cost savings on to customers.



## **SECURITY**

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Healthcare IT systems handle sensitive patient data and thus security is of utmost importance when building a healthcare IT infrastructure. It is unacceptable to expose patient medical data to unauthorized access. Regulations such as HIPAA demand that patient data be properly secured. Moreover, there are rising business and social costs to security breaches. Red Hat has been proactive in developing security features and has continued to lead the industry in providing secure solutions.

Red Hat's security model starts with the operating system. Security innovations such as SELinux, ExecShield, PIE, and auditing are integrated into the operating system and operate automatically and transparently. These technologies eliminate entire classes of security exploits. Red Hat recognizes that sophisticated security features are useless if they are not turned on, so Red Hat ships systems that are secure by default and tests to ensure that these security systems are transparent to the user and applications.

Beyond the operating system, the JBoss Enterprise Middleware Platform provides a secure environment for application development and deployment. At the data layer, Red Hat MetaMatrix technology provides sophisticated, single-query access control to disparate data sources, preventing any unauthorized access to sensitive data. Finally, the Red Hat Directory Server and Certificate System work together to provide a unified user management system that can be used for authentication and access control.

Despite all of the effort Red Hat invests in preventing security attacks before they happen, exploits do occur. The open availability of Red Hat's source code subjects it to the continuous scrutiny of millions of users and developers. Any potential exploits are rapidly identified, triaged, and fixed. This global community is augmented by Red Hat's 24x7 dedicated security response team that analyzes any security issues and coordinates the appropriate response. Software patches that have critical security impact, while infrequent, can be rapidly made available to customers over the Red Hat Network.



## INTEROPERABILITY

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The healthcare industry today is faced with a combination of operational, regulatory, and information challenges. On the business front, companies must increase their productivity and reduce their costs to maintain shareholder return, despite the fact that the cost of delivering care is accelerating at unprecedented rates. On the regulatory front, tighter governmental regulations, such as HIPAA, are forcing providers to manage access to electronic healthcare records in a more vigilant manner. Unfortunately, in the face of these challenges, much of a company's information structure is organized around the functional silos of major delivery areas—laboratory, imaging, nutrition, pharmacology, and the many different therapeutic avenues. These areas function autonomously in many cases and sometimes are multiplied by the number of different providers that comprise today's large-scale healthcare institutions.

Integration of information is a key enabler of the many decision processes driving everything from patient care delivery to research to complying with regulatory authorities. Many of these processes are fed by heterogeneous sources of distributed information. Timely access to this information can be a daily struggle.

The JBoss Enterprise Middleware provides a platform for building and deploying applications using a standards-based, service oriented architecture. Coupled with the JBoss Enterprise Service Bus, these technologies enable applications to communicate across a wide variety of data protocols and messaging implementations at the service level.

At the data level, MetaMatrix is able to integrate key data assets from various dispersed systems, presenting a single, real-time view of patient-centric clinical data and consolidated business data. Using the unique metadata-driven approach that MetaMatrix provides, organizations are able to allow the implementation of their unified view to evolve over time in response to changing information requirements and to changes brought about by the implementation, upgrade, and migration of clinical systems.



## **COST**

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The healthcare industry is facing acute cost pressures. While improvements in IT will enable productivity improvements and reduce medical errors, the reality remains that healthcare organizations need to achieve their IT goals while containing cost.

The open source development model enables Red Hat to efficiently amortize development costs of commodity software with an ecosystem of partners, customers, and competitors. With its unparalleled track record of UNIX to Linux migration, Red Hat enables healthcare organizations to use standards-based commodity hardware platforms. Red Hat's focus is on providing valuable service and support for freely available software. By eliminating licensing costs and enabling customer choice of hardware and service providers, Red Hat delivers a fundamentally different cost savings to customers.

Highmark (<http://www.redhat.com/solutions/successstories/services/highmark/>) used Red Hat solutions to achieve its performance and security goals while reducing cost.

## **CONCLUSION**

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Information technology has become a critical component of the healthcare industry in order to support clinical decision making and to enable safe patient care. Traditional IT infrastructure, based on proprietary technologies, is costly, rigid, and complex to manage.

Red Hat has made consistent and continued investments in technologies that benefit the healthcare industry. The Red Hat Enterprise Healthcare Platform delivers the next generation infrastructure for healthcare organizations that make care delivery safe and transparent. This platform is scalable and flexible to deliver the agility needed in a changing environment. Based on open standards, it facilitates interoperability and simplicity while minimizing cost. Using Red Hat's open source technologies, healthcare organizations can start focusing on their primary objective of care delivery without having to worry about complexities of underlying IT infrastructure.