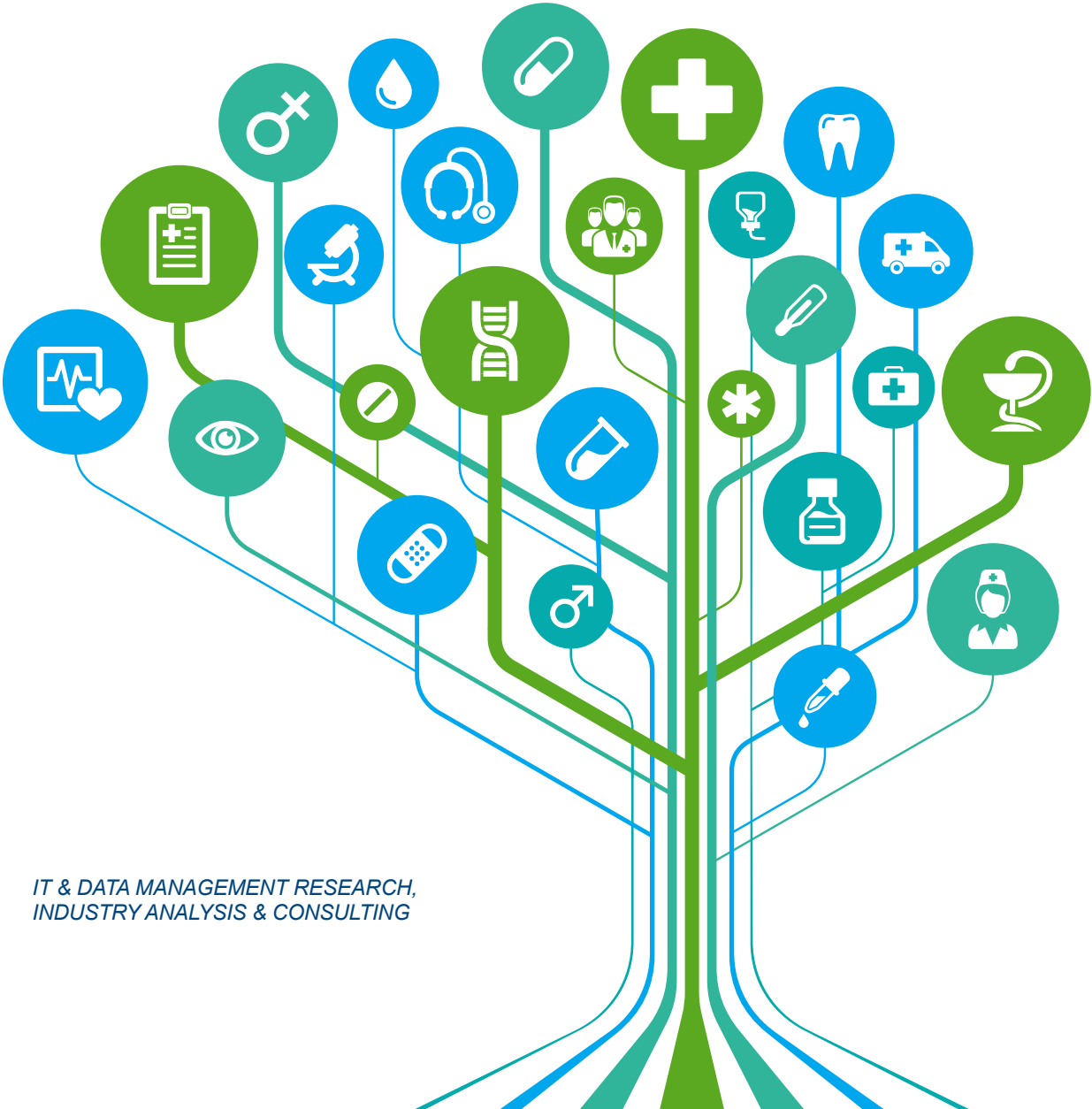


Effective Systems Management for Healthcare

An ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) White Paper
Prepared for SolarWinds

January 2014



*IT & DATA MANAGEMENT RESEARCH,
INDUSTRY ANALYSIS & CONSULTING*

Effective Systems Management for Healthcare

Table of Contents

Introduction	1
Healthcare Specific Challenges	1
HIPAA Compliance	1
Storage and Data Warehousing	2
Desktop Virtualization and Mobile Devices.....	3
Healthcare Applications	3
Conclusion	3
How SolarWinds Fits the Bill	4
Single Pane of Glass for Applications and Systems	4
Automatic Detection and Remediation of Security Events.....	4
Strong Storage Capabilities.....	4
Rapid Deployment and Easy Management	5
Simplicity and Usability	5
Application-Centric Approach	5
EMA Perspective.....	5

Introduction

As described in a recent ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) white paper¹, application-aware systems management is a central challenge within modern enterprise IT. This application centricity is specifically important in healthcare settings, such as hospitals, specialty care centers and doctors' offices. These healthcare institutions cannot afford downtime or lackluster performance, as they must optimally utilize the time of doctors, nurses and other medical staff to ensure the best possible patient care, as well as financial viability of the overall organization. Furthermore, high-dollar medical equipment, such as MRI, CT or digital X-ray machines rely on the optimal operation of the institution's medical applications and the servers, network and storage resources on which they depend.

Healthcare IT environments need a pragmatic monitoring and management solution that is easy to deploy, operate and manage. This EMA white paper will explore systems management requirements derived from the specific challenges faced by the healthcare institutions today.

Healthcare IT environments
need a pragmatic monitoring
and management solution
that is easy to deploy,
operate and manage.

Healthcare Specific Challenges

In addition to the traditional challenges of healthcare organizations, such as the negative impact of downtime due to the high cost of medical facilities, equipment and staff, there are numerous further considerations to bear in mind when exploring optimal systems management solutions:

HIPAA Compliance

The Health Insurance Portability and Accountability Act (HIPAA) of 1996 prescribes a set of highly complex requirements regarding privacy and overall systems, data and facilities security. Implementing these requirements is aggravated by the lack of specific technical and technological guidance provided by this law. Therefore, HIPAA audits place a significant strain on most healthcare organizations, requiring vast numbers of staff hours for creating the reports needed to demonstrate that the following five key pillars of HIPAA compliance are adhered to:

- Access control and protection of patient data
- Controlling physical access to systems and facilities
- Protecting information processing and maintenance
- Data protection during network transmission
- Activity log review of all systems containing patient information

The Health Information Technology for Economic and Clinical Health Act (HITECH) provides HIPAA with an additional set of teeth, by increasing the legal liability for compliance violations. HITECH constitutes a strong basis for enforcement of the HIPAA law and requires healthcare organizations to ensure HIPAA compliant conduct of their business associates. It also obligates the department of Health and Human Services (HHS) to conduct regular audits. Furthermore, unauthorized use or disclosure of unencrypted patient data must be reported to the affected patients and in severe cases to HHS. Violations are now subject to fines by the Office for Civil Rights and attorney generals are suing healthcare organizations that are in violation of HIPAA and HITECH. All this increases the regulatory burden for healthcare, resulting in a more and more demanding set of **systems management requirements**:

¹ *It's All About the App: Application-Centric Systems Management*, EMA
<http://www.enterprisemanagement.com/research/asset.php/2674/It's-All-About-the-App:-Application-Centric-Systems-Management>

- Centralized control over all security- and privacy-relevant systems involved in handling patient data – firewalls, antivirus, intrusion detection, and operating systems – is key to ensuring comprehensive data protection and security.
- This centralized control enables streamlined HIPAA auditing, which is needed to quickly and automatically produce compliance reports.
- Proactive enforcement of antivirus, encryption (loss of strongly encrypted data is not considered a breach) and firewall policies is key to maintaining data security and ensures optimal application health.

In short, in order to guarantee and document HIPAA compliance, systems management and security software should “talk” among each other and be able to generate a comprehensive set of audit reports.

In short, in order to guarantee and document HIPAA compliance, systems management and security software should “talk” among each other and be able to generate a comprehensive set of audit reports.

Storage and Data Warehousing

MRI, digital X-ray and CT imaging cause tremendous storage requirements in healthcare, as digital copies do not only have to be produced for immediate use by medical staff, but must be archived in accordance with an ever-stricter set of government healthcare regulations, including HIPAA. Healthcare institutions today are moving to standardized software vendor-neutral archives, where images from different systems can be accessed through generic viewers. This enables doctors and other medical staff to view each other’s images, without the traditional compatibility issues. In addition to images, there are electronic health records, hospital communications and large numbers of administrative files that have to be managed and archived in a compliant manner.

Data warehousing plays an increasingly larger role within a hospital context, as medical staff more and more relies on advanced analytics capabilities, where patient data from a myriad of different sources is correlated to help improve care standards. Often, this means that all data has to be copied into one place, the data warehouse, where all the processing and advanced queries are executed. For queries to perform optimally, they need to be written well and have enough server, network, storage resources available to execute in a flawless manner. Healthcare applications in their entirety – imaging, electronic record keeping, data warehousing etc. – put a significant strain on the corporate storage infrastructure. To prevent or troubleshoot issues, healthcare organizations require the ability to map application performance to the underlying virtual machines, datastores and the storage arrays, LUNs and spindles they run on. Only when there is visibility from the application down to the storage hardware, can storage be managed in an intelligent fashion that ensures performance and reliability, without the typical waste that results from overprovisioning as an “insurance policy.” Following EMA research, finding the most cost-efficient home for each data type is a key challenge in enterprise IT, due to this typical lack of visibility. At the same time, storage administrators require the ability to view the application impact of the LUNs and disks they maintain on a daily basis. Only when a storage administrator knows the impact of performance degradation or downtime of a specific spindle, array or LUN, can provisioning, tiering, management and capacity planning for storage be conducted effectively.

Quickly identifying slow queries causing application or database performance issues is another significant challenge. Query performance problems may not at all be related to hardware performance, but could simply result from poorly formed queries.

Desktop Virtualization and Mobile Devices

Medical staff, as well as administrative staff, requires mobile access to patient data at specific locations and particular points in time in order for the entire healthcare institution to provide better care, while at the same time improving financial results. Mobile device support requires backend infrastructure that is always available, resilient, secure and well performing, as every security break or systems outage results in medical staff being a lot less productive or patient confidentiality being compromised.

For rapid issue resolution, the ability to quickly identify the physical host cluster of each virtual desktop is critical. Ideally, there should be one central dashboard showing virtual machine properties together with metrics of other workloads located on the same host, as well as the actual health status of the physical host servers and the capacity and performance of the underlying storage arrays. Only this level of visibility across traditional silos – applications, virtual machines, physical servers and storage hardware – enables effective management of virtual desktop infrastructure and mobile device access.

Proactive security management for endpoints is key to preventing confidential patient data from being disclosed as well as malware from spreading within the walls of the hospital. Therefore, systems management within the healthcare sector must be able to monitor events that are created by antivirus, firewalls or intrusion detection systems. Ideally, systems management software will then be able to respond to these events in a proactive manner that goes beyond simply alerting IT operations staff. For example, when the presence of malware on a specific desktop is reported, this desktop could be automatically disconnected from the network, while all other desktops on the same network segment receive a deep malware scan.

Healthcare Applications

As healthcare applications – custom and off-the-shelf – are critical for patient care and flawless billing, a proactive approach is required that looks at systems management from an application-centric perspective. Adding application context to traditional server, storage, network and virtualization management tasks enables the entire IT department to conduct daily management tasks, troubleshooting and capacity management with the overall hospital requirements in mind. Within today's often massively heterogeneous healthcare IT environments, consisting of a myriad of storage, network and server hardware, as well as frequently relying on public cloud services, auto-discovery of new resources or configuration changes through an agentless approach is key to ensuring reliability and flexibility of systems monitoring and management. This comprehensive knowledge of the entire IT environment, in combination with the constant ability to understand the application context, brings systems management for healthcare institutions to the next level. Ideally this new approach changes the perception of “IT-as-a-Nuisance” to medical and administrative staff viewing IT as a valuable strategic partner.

Conclusion

Detecting issues with a purely systems-centric approach is difficult, reactive and can take hours or days. Healthcare institutions cannot afford this type of disruption and therefore require a systems management approach that keeps an eye on the application and uses advanced analytics to correlate application performance and reliability issues with incidents at the systems – hardware and virtualization – and security layer.

Ideally, there should be one central dashboard showing virtual machine properties together with metrics of other workloads located on the same host, as well as the actual health status of the physical host servers and the capacity and performance of the underlying storage arrays.

How SolarWinds Fits the Bill

SolarWinds enables a proactive approach of detecting issues – performance, security, compliance – before they turn into actual problems affecting patient care or the financial bottom line. This approach is based on the following key components.

Single Pane of Glass for Applications and Systems

The integration of SolarWinds Server & Application Monitor, Virtualization Manager, and Storage Manager is at the heart of SolarWinds' application-centric systems management capabilities. Today's typically very heterogeneous healthcare IT environments, with their limited financial and human resources, are presented with near-comprehensive visibility into each layer of the application stack. Application performance can be correlated with the behavior of individual systems at a granular level, which is key for rapid problem diagnosis and remediation.

The integration of SolarWinds Server & Application Monitor, Virtualization Manager, and Storage Manager is at the heart of SolarWinds' application-centric systems management capabilities.

Automatic Detection and Remediation of Security Events

SolarWinds Log & Event Manager adds centralized monitoring and response to security and compliance relevant incidents and automates a major portion of the information system activity review process, demonstrates diligence towards detecting security breaches, monitors access to healthcare data and provides automated remediation capabilities. These capabilities, in combination with SolarWinds' premade HIPAA compliance reporting packages, constitute a strong set of tools for healthcare organizations to cut through the myriad of regulatory requirements they are faced with on a daily basis. The SolarWinds business rule designer does not require scripting knowledge for systems administrators to define proactive responses to events in near real time. SolarWinds supports in-memory correlation of event data for rapid response, even before events are written to the log and indexed by a database system. Automated responses to potential security threats can involve the lockout of unapproved USB devices, the detaching of entire workstations from the network or simply the revoking of user privileges via Active Directory. SolarWinds Firewall Security Manager applies security and compliance rules to corporate firewalls to eliminate network security weaknesses within multi-vendor environments. The ability to centrally manage and audit firewall rules, as well as the software's capabilities of analyzing Serv-U FTP server logs, resolving and preventing Serv-U related security events and generating compliance reports, can be seen as particularly vital for fluid environments that are subject to strict regulation.

SolarWinds' well integrated approach to systems management offers the very positive side effect of comprehensive cross-domain reporting. Standard HIPAA report templates are offered for creating comprehensive compliance reports, making HIPAA audits a less gruesome experience.

Strong Storage Capabilities

SolarWinds Storage Manager integrates with SolarWinds Virtualization Manager through to SolarWinds Server & Application Monitor, enabling healthcare customers to proactively manage the storage required for their data warehouses, virtual desktops, imaging systems and specialized applications. SolarWinds Storage Manager provides the insights required to take charge of existing storage arrays, as well as plan the purchase of new storage, based on the software's detailed capacity analysis capabilities.

Rapid Deployment and Easy Management

Many of today's popular systems management tools require a tremendous amount of customization and rely on extensive deployment and configuration services. SolarWinds Virtualization Manager and Log & Event Manager are delivered as virtual appliances and require four CPU cores and 8GB of RAM, while the rest of the SolarWinds portfolio offers standard Windows and Linux installers (SolarWinds promises installation times of under one hour). This easy deployment process in combination with robust out-of-the-box support for most popular hardware and software, as well as compliance reporting templates, leads to rapid time to value. This easy deployment process is specifically vital for healthcare organizations, with their minimal tolerance for disruptive IT projects.

Simplicity and Usability

Healthcare IT staff typically wears many hats and does not have the time available to learn to operate and manage systems management software. The SolarWinds interface is simple, yet highly customizable, and most importantly, each screen provides access to the contextual information required to view the application impact of a specific action. SolarWinds goes even further by providing system administrators with the capability to play through "what if" scenarios, before committing to a specific reconfiguration action or hardware addition. Finally, it is important to mention the typically agentless approach, eliminating the need for managing, troubleshooting and upgrading operating system- and application-specific agents, which often puts a strain on lean healthcare IT environments.

The SolarWinds interface is simple, yet highly customizable, and most importantly, each screen provides access to the context and information required to view the application impact of a specific action.

Application-Centric Approach

SolarWinds enables application-driven systems management through integration of its tools for server, network, storage, database and application management. This integration provides customers with comprehensive dashboards showing the impact of each component on application performance and overall health. To ensure rapid time to value, SolarWinds offers 150 out-of-the-box application-monitoring and management templates including Exchange, SharePoint, Active Directory, Oracle, and SAP, as well as the ability to create custom templates to support an entire heterogeneous application environment. The SolarWinds capabilities for monitoring and visualizing database health and performance metrics come in handy when application performance issues are caused by faulty or inefficient queries.

EMA Perspective

The SolarWinds portfolio includes the tools necessary to address healthcare-specific resiliency, compliance, performance and security challenges in a proactive and efficient manner. The secret sauce is the solution's flexibility and the integration between the different management software components. SolarWinds Log & Event Manager is specifically interesting within a healthcare context, as it enables real-time response to events across the entire IT environment. This cross-silo capability helps healthcare providers remediate security challenges and prevent performance and reliability issues before they turn into disruptive problems.

EMA is impressed with the comprehensiveness of the SolarWinds portfolio, as well as with the strides the company has made toward providing a truly integrated and application-centric systems management toolkit to healthcare providers that surpasses the traditional players in terms of simplicity and contextual awareness.

About Enterprise Management Associates, Inc.

Founded in 1996, Enterprise Management Associates (EMA) is a leading industry analyst firm that provides deep insight across the full spectrum of IT and data management technologies. EMA analysts leverage a unique combination of practical experience, insight into industry best practices, and in-depth knowledge of current and planned vendor solutions to help its clients achieve their goals. Learn more about EMA research, analysis, and consulting services for enterprise line of business users, IT professionals and IT vendors at www.enterprisemanagement.com or blogs.enterprisemanagement.com. You can also follow EMA on [Twitter](#) or [Facebook](#).

This report in whole or in part may not be duplicated, reproduced, stored in a retrieval system or retransmitted without prior written permission of Enterprise Management Associates, Inc. All opinions and estimates herein constitute our judgement as of this date and are subject to change without notice. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. "EMA" and "Enterprise Management Associates" are trademarks of Enterprise Management Associates, Inc. in the United States and other countries.

©2014 Enterprise Management Associates, Inc. All Rights Reserved. EMA™, ENTERPRISE MANAGEMENT ASSOCIATES®, and the mobius symbol are registered trademarks or common-law trademarks of Enterprise Management Associates, Inc.

Corporate Headquarters:

1995 North 57th Court, Suite 120

Boulder, CO 80301

Phone: +1 303.543.9500

Fax: +1 303.543.7687

www.enterprisemanagement.com

2812.121913

