Agile IT for Accountable Care Success: End-to-End Cloud Solutions for Healthcare Providers

INTRODUCTION

This Industry Brief examines the roles of cloud services technologies and integration in provider IT environments preparing for healthcare reform. Healthcare provider business models have been in a constant state of change since the passage of the HITECH Act of the American Recovery and Reinvestment Act of 2009; these changes are expected to continue indefinitely as the industry transitions from fee-for-service to value-based accountable delivery models. Providers need to meet meaningful use requirements today with new applications at the point of care, while healthcare reform is driving changes to come in all aspects of the IT environment, as providers seek to lower costs and add efficiencies. The transition to accountable care is affecting risk-based commercial and Medicare providers and integrated delivery networks, as well as their payer counterparts. When one considers the current and future changes to business models, it is clear that agile IT environments will be the key to meeting the demand as providers’ needs change.

Agile strategies must include provisions for changes to new application deployments, ownership changes and consolidation among providers and IT suppliers, the growing use of analytics, and the need for mobile strategies that include device independence alongside support for provider and patient engagement. Cloud services address providers’ current needs while providing the agility to prepare for the future. With new clinical applications in use at the point of care, providers need solutions that offer high usability, availability, and performance; options for business continuity and disaster recovery; and solutions to ensure security and regulatory compliance. This Industry Brief analyzes the business demands driving the need for changes to IT platforms, examines the value proposition for leveraging cloud services to achieve meaningful use, and provides a description of VMware’s vCloud for Healthcare solution.
SITUATION OVERVIEW

In the provider environment, complex processes make it necessary to architect change slowly and carefully. Provider organizations have been working to implement meaningful use technologies since 2009, and although many started long before, they are still struggling to meet approaching meaningful use deadlines. With healthcare reform to come, further change is a certainty, and providers need to prepare their organizations to become more agile so that they can respond to cost, delivery, and quality demands in a timely manner, allowing them to survive and profit. For healthcare providers, the cloud presents strong opportunities to create efficiencies, flexibility, and agility while increasing service levels for applications. The features of cloud services have particular appeal to providers participating in healthcare reform or accountable delivery because they promise to better enable collaboration among care teams and help firms lead and compete in the accountable delivery environment.

IDC defines cloud services simply as consumer and business products, services, and solutions delivered and consumed in real time over a network (most often, the Internet). Public cloud services are shared among unrelated enterprises and consumers, open to a largely unrestricted universe of potential users, and designed for a market, not a single enterprise. Private cloud services are shared within a single enterprise or an extended enterprise — with restrictions on access and level of resource dedication — and defined/controlled by the enterprise (and beyond the control available in public cloud offerings), can be onsite or offsite, and can be managed by a third party or in-house staff. In healthcare, cloud takes many forms, but the private cloud is among the most common for line-of-business applications. Public or private cloud systems, like their installed counterparts, must be specifically engineered for the regulatory environment in healthcare to manage HIPAA-related risk surrounding data containing personal health information (PHI). PHI must be kept secure and private with specific technical and audit requirements, which are subject to breach-related penalties and financial risk. The management of HIPAA security is a key concern for healthcare organizations considering changes to the IT environment, including a move to the cloud.

The transition to cloud computing starts with virtualization. Virtualization of hardware and server resources, desktops, applications, storage, and data presents economic advantages over traditional approaches and can allow organizations to provision IT in a more agile manner, responding to changing business demands. Current commercially available software products encompass three main types of virtualization: server virtualization, application virtualization, and, most recently, client or desktop virtualization. In addition to these types of virtualization, mobile device, data, and storage virtualization represent emerging areas where virtualization may be leveraged. Implementing virtualization allows providers to realize many benefits,
including reduced operating costs, improved performance, and added scalability and agility for the future. Key steps for providers considering a move to virtualization include:

- **Start with IT production applications.** The learning curve for staff is one of the most common obstacles to moving to virtualization. Early virtualization of IT production applications allows staff to leverage the technology on production applications that are more likely to be available for virtualization and provides a testing ground to demonstrate the advantages of virtualization to IT and the organization while gaining the skills needed to move to more complex virtualization projects.

- **Look at both the economic benefits and the service benefits.** For organizations that are constructing a new hospital or datacenter, the economic benefits are clear cut; however, for organizations with existing datacenter resources and infrastructure, the cost/benefit analysis on a project basis may be affected more by the initial investment. Organizations should consider the immediate costs as well as the future operational costs, performance, and service levels associated with both virtualization and cloud computing investments. Performance, availability, and uptime can be critical factors in the adoption and use of technology, such as EHR and CPOE applications for meaningful use.

- **Move from server/datacenter virtualization to application/desktop virtualization.** While the initial benefits from virtualization are strong, the benefits accrue more rapidly as organizations move deeper into cloud adoption and virtualization becomes pervasive in the organization. As organizations begin to virtualize applications and desktops and move services to the cloud, benefits such as security, disaster recovery, agility, and efficiency in management, among others, build more quickly, and cost savings are enhanced. Mobile solutions can be secured in the virtual environment, and providers can leverage these mobile solutions to accelerate adoption of EHR and CPOE for meaningful use, care management, and other clinical applications.

- **Leverage virtualization as a first step in moving to the cloud.** As U.S. healthcare organizations move toward accountable delivery under healthcare reform, leveraging the cloud in the new network-based healthcare environment will be critical. In addition to the cost, service, scalability, and security benefits, the on-ramp to the cloud that is built by virtualization will be critical to future business and IT strategies and successful participation in accountable delivery networks.
Cloud computing has the promise of added efficiency, agility, and economic return on investment. As with all emerging technologies, purchasers should use caution when selecting, implementing, and migrating applications and services. Net-new virtualization and cloud computing projects may initially add some complexity to infrastructure for some organizations, but in many cases, they are able to reduce complexity compared with the legacy infrastructure already in place.

Proper care and planning should be applied when implementing virtualization to ensure that it is an efficient approach for utilizing all of the application services that a specific user, or class of users, is accustomed to accessing.

Key considerations include:

- **Cost/benefit analysis.** Cloud-based implementations can shift costs from capital expenses to operating expenses if infrastructure, platforms, and applications are purchased as services rather than installed onsite. Planners should consider total cost of ownership when approaching projects and evaluate the cost of existing and planned onsite investments against the potential benefits of using cloud computing when compared with traditional implementations.

- **Legacy application challenges.** Healthcare applications, particularly clinical applications, have historically hindered the advance of virtualization across the industry — because many have been slow to embrace virtualization or to certify the performance of their products in a virtualized environment. However, clinical applications are increasingly available for virtualization as providers demand it and represent some of the strongest value propositions for provider organizations moving to the cloud due to the addition of clinical mobility.

- **Security.** Security and privacy of PHI are critical concerns for healthcare organizations. As penalties associated with breaches continue to rise, maintaining data security before, during, and after the migration to the virtualized environment is important. While technologies such as server and desktop virtualization that can remove data from endpoint devices significantly enhance security, proper implementation is key to obtaining these benefits.

- **Change management.** As with most new technology, organizations can be averse to change and the disruption it may cause. Healthcare providers can minimize disruption when implementing cloud computing by providing appropriate training for IT teams, leveraging vendor services when needed, and starting with IT production applications that won't disrupt business operations if problems occur.
- **Funding models.** IT projects in healthcare are often funded on a project basis, while virtualization investment is traditionally at the enterprise level. Healthcare organizations should consider alignment of funding models with required investments when planning virtualization projects.

**V C L O U D  F O R  H E A L T H C A R E  S O L U T I O N  D E S C R I P T I O N**

VMware provides a number of solutions, including vCloud for Healthcare, to help hospitals implement virtualization and cloud computing. vCloud for Healthcare is a prescriptive framework of solutions and services that help hospitals build secure private healthcare clouds. Built on the dominant vSphere platform, vCloud for Healthcare offers a suite of synergistic products that enable hospitals to confidently make the jump from server virtualization to private cloud computing. vCloud for Healthcare defines a new baseline for a VMware deployment, enabling hospitals to begin to deliver HIT as a service, including point of care, EHR, and PACS, both in the hospital and, by extension, to affiliated physicians and clinics in the community. Utilizing the same platform, hospitals can then build secure hybrid clouds as well as manage more consumer-oriented public clouds. vCloud for Healthcare offers flexible, customizable support for point-of-care and critical care applications, with the control and transparency necessary for regulatory compliance in the virtual and cloud environment, as well as support for server and desktop virtualization from the leading EHR and clinical application providers. VMware claims that with vCloud for Healthcare, providers can:

- Reduce datacenter and capital costs by as much as 60% and reduce time spent on routine maintenance tasks by one-third, without sacrificing compute performance
- Increase mobility by delivering "AlwaysOn," follow-me cloud-based workspaces to any device, with rapid authentication and high availability
- Protect information privacy by removing data from endpoint devices, securing PHI in the datacenter without compromising end-user experience or mobility on virtual desktops
- Enhance security by removing data from devices and preventing breaches when devices are lost or stolen
- Offer integrate industry security services such as HIPAA, SOX, and PCI while maintaining a trust zone for sensitive data such as PHI
● Maintain compliance with continuous monitoring of the infrastructure and applications, intrusion detection and assessment across physical and virtual systems, audit tools, and automatic remediation

● Add interoperability with the Open Virtualization Framework (OVF), an industry-accepted ANSI standard that supports migration between virtualization and cloud platforms, open APIs, and management and control of workloads across clouds

● Deliver higher system availability and reliability

● Cut datacenter energy costs by up to 80%

● Avoid vendor lock-in by maintaining application portability and cloud interoperability, allowing applications to be moved from one cloud provider to another without loss of productivity or capital

GUIDANCE FOR HEALTHCARE ORGANIZATIONS MAKING THE JOURNEY TO THE CLOUD

Virtualization and cloud computing offer clear benefits for providers that are facing the expense and disruption of implementing meaningful use applications while preparing for the cost and quality requirements of accountable care. The business value of cloud computing for providers includes added agility in the IT environment, as well as operating efficiencies in IT, the datacenter, and clinical departments when cloud computing is used to deliver clinical mobility and enhance provider workflow. Cloud services and the resulting agility of the IT environment can help providers achieve higher availability and performance from clinical and business applications, regulatory compliance, and faster time to market for new applications required for healthcare reform, such as care management and patient engagement. Leveraging a cloud platform, providers can better support infrastructure and platform changes as business models change and require infrastructure to change alongside them.

Essential guidance for provider organizations implementing cloud computing includes:

● Be clear on your cloud road map and strategy before any technology decisions are made. Understand that virtualization and virtual private cloud offerings provide varying degrees of sophistication and compatibility with clinical applications.

● Be sure the supplier has domain expertise on HIPAA security requirements, clinical applications, and workflow, as most cloud suppliers serve multiple industries with varying degrees of healthcare expertise.
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- Minimize technology risk through accurate planning
- Benchmark themselves against industry peers
- Adopt industry best practices for business/technology alignment
- Make more informed technology decisions and drive technology-enabled business innovation

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