HEALTHCARE INDUSTRY
TRANSFORMATION WITH EHR AND
VBLOCK™ INFRASTRUCTURE
PLATFORMS

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Table of Contents

Executive Summary ........................................................................................................................................... 3

Industry Challenges ....................................................................................................................................... 3
  Operational Inefficiency & Rising Costs ........................................................................................................... 3
  Fraud & Mistakes ............................................................................................................................................. 4
  The Health Information Technology for Economic and Clinical Health Act (HITECH) .................................... 4
  Governance, Risk Management & Compliance ................................................................................................. 4
  Imperfect Clinical Treatments & Outcomes ...................................................................................................... 4
  Business & Administrative Obstacles ............................................................................................................... 4

Industry Solutions............................................................................................................................................ 5
  Improving Operational Efficiency & Reducing Costs ..................................................................................... 5
  Preventing Fraud & Mistakes .......................................................................................................................... 5
  Complying with the HITECH Act .................................................................................................................... 5
  Managing Governance, Risk Management & Compliance .............................................................................. 6
  Improving Clinical Treatments & Outcomes ................................................................................................... 6
  Business & Administrative Solutions ............................................................................................................... 6

Vblock Infrastructure Platforms – The Healthy IT Choice for Healthcare Transformation ................................... 7
  Implementing Best-In-Class Technology Solutions ....................................................................................... 7
  Predictable & Scalable ...................................................................................................................................... 7
  Flexible & Responsive ..................................................................................................................................... 8
  Cost-Effective.................................................................................................................................................. 8
  Optimized Storage .......................................................................................................................................... 9
  Business Continuity & Disaster Recovery ....................................................................................................... 9
  Simple to Manage .......................................................................................................................................... 10
  Secure & Compliant ...................................................................................................................................... 10
  VCE Seamless Support Experience ............................................................................................................. 10

Conclusion ......................................................................................................................................................... 11

Next Steps ......................................................................................................................................................... 11

References .......................................................................................................................................................... 12
Executive Summary

In 1991, the venerable Institute of Medicine strongly encouraged the greater adoption of computer systems in healthcare. In 2004, then-President George W. Bush stated, “By computerizing health records, we can avoid dangerous medical mistakes, reduce costs, and improve care.” By taking advantage of computerized medical records like Electronic Health Records (EHR), Electronic Medical Records (EMR), Personal Health Records (PHR), Payer-based Health Records (PBHR), the RAND Corporation estimates the US healthcare industry can save more than $81B per year.

Against the backdrop of these delays, nearly 100,000 deaths occur every year in the United States alone due to prescription and dosage errors. Fraud is rampant, costs are rising, and the quality and range of services are being curtailed. A shortage of skilled workers ranging from doctors to technicians and nurses, and an aging population economically strained by recent events, are combining to form the perfect storm. Despite the ongoing debate over healthcare reform and the huge sums of money the Obama administration has made available for healthcare reform and the adoption of electronic health records, the industry still faces significant challenges.

Twenty-first century medicine and its administrative requirements are quickly outpacing the organizational practices developed 100 years ago. Hospitals and providers that fail to change today in order to meet these challenges will find it difficult to thrive in tomorrow’s healthcare marketplace. Healthcare providers still face challenges on numerous fronts because of difficulties adopting the information technology (IT) necessary to take advantage of advances like Electronic Health Records (EHR):

• Operational Inefficiency & Rising Costs
• Fraud & Mistakes
• HITECH Financial Incentives Program
• Governance, Risk Management & Compliance
• Imperfect Clinical Treatments & Outcomes
• Business & Administrative Obstacles

Vblock™ Infrastructure Platforms provide a simplified, cost-effective IT infrastructure to run mission critical mixed workloads in a high performance converged infrastructure. This allows healthcare organizations to deploy clinical and business critical applications to address today’s market challenges and develop new applications for tomorrow’s opportunities, while meeting the stringent requirements of an industry critically important to the world’s health and economy.

Industry Challenges

Operational Inefficiency & Rising Costs

According to RNCOS, a leading market researcher, spending on healthcare IT is expected to reach $40 billion before the end of 2011. The greatest driver for this spending will be EHR systems, complying with new government requirements and standards, and supporting new online and mobile applications. The expected growth rate of 24% annually in US healthcare IT spending may be great news for technology vendors, but it puts even greater pressure on healthcare providers to ensure that they get the greatest return from their investment. Similarly, healthcare software spending rose nearly 21% during the last year, from nearly $6.8 billion to more than $8.2 billion projected in 2011. The disruption, operational costs, planning, management, and other elements of deploying complex, expensive and mission-critical technology solutions further adds to the healthcare industry’s operational costs. It is essential for healthcare providers to identify and deploy technology solutions that minimize costs, maximize efficiency, simplify and accelerate deployments, and lead to better healthcare outcomes in a shorter period of time.
Fraud & Mistakes

Agencies tracking healthcare costs estimate that healthcare fraud now ranges between 3-15%, with a general consensus that the figure hovers around 10%. This translates into nearly $100 billion/year in healthcare fraud and related crimes. According to the President of the United States the rising cost of healthcare is a huge driver of the federal budget deficit endangering our economic future. Medicare alone has an annual cost of almost a half a trillion dollars, and nearly $60 billion of that is lost to fraud every year. This problem stems from the sheer volume of data being increasingly generated by healthcare providers (Medicare alone administers over 1 billion claims every year). The Obama administration is providing an additional $200 million in the stimulus package to fight Medicaid fraud and provide incentives for EHR. To spend this money effectively, healthcare providers need scalable, cost-effective, and easy to manage platforms.

The Health Information Technology for Economic and Clinical Health Act (HITECH)

The HITECH Act was put in place to provide a carrot-and-stick approach to encourage and accelerate the rollout of EHR and similar technologies. On the one hand, HITECH provides financial incentives to healthcare providers implementing EHR; on the other, it imposes greater penalties on healthcare providers failing to comply with more stringent HIPPA regulations contained within it. While HITECH provides clear economic incentives to adopt EHR, US Rep. Reneé Elmers (Chairwoman of the Healthcare and Technology Subcommittee) reports by June 2011, only $75 million of the $27 billion in incentives had been paid out. Financial, legal, and IT challenges are keeping small medical practices from implementing electronic health records. Because of the different types of technologies involved, the IT integration necessary for a meaningful EHR implementation has typically posed significant challenges to smaller practices.

Governance, Risk Management & Compliance

As if medicine and health sciences were not complex enough, the healthcare industry has to take on even larger, more complex regulatory challenges. HIPPA, JCOHA, OSHA, FDA, HHS, AARA, HITECH, PSQI, PACI, and countless other compliance measures, requirements, standards, regulations, and agencies are directly impacting healthcare. In the last few years, many new regulations have been passed, many of which require action by 2015. Organizations that use best-in-class industry applications to manage these requirements will reduce the exposure to risk associated with these complex requirements. Investigations and audits due to noncompliance are costly, and managing compliance using legacy applications and IT is inefficient and requires significant OPEX resources that could be redirected to other vital clinical and administrative areas.

Imperfect Clinical Treatments & Outcomes

Modern clinical care is growing in complexity, and many argue outdated and inefficient. This is having a direct impact on quality of care, cost, outcomes, and overall patient experience. Legacy systems are too cumbersome and insular to allow for the speedy and secure delivery of clinical information to those assessing, diagnosing, and caring for patients. This difficult and vexing problem requires IT investment to securely coordinate information across departments, organizations, infrastructures, and frameworks – through a variety of computing devices.

Business & Administrative Obstacles

Increasing pressure on healthcare providers to serve with ever-greater accountability, accuracy, efficiency, compliance, and security is occurring at the same time as serious cuts in public and private sector healthcare budgets. Managing these complex and often contradictory requirements is a daily obstacle for healthcare providers, with effects on employee morale and the daily workloads of everybody from the CIO to frontline caregivers.
Healthcare providers are typically forced to achieve these goals with a mix of new and old technology platforms, applications, and devices. Some of the most critical functions of day-to-day operations are carried out on well-known brand name packages, which prove to be unreliable infrastructures that do not provide the five nines – 99.999% availability – which is essential in today’s environment. Healthcare organizations need to deploy technology platforms that can be leveraged across multiple business units, functional areas, and applications; and which provide high reliability, compliance, security, and the ability to leverage the same infrastructure across multiple uses.

Industry Solutions

There is no silver bullet for all the problems the industry faces. This is especially true for an industry as vast, complex, and with as many stakeholders as healthcare. However, healthcare and technology professionals, working together over the last many years have come up with Electronic Health Records (EHR) and Electronic Medical Records (EMR) as one of the best solutions to target many of the problems above. No single EHR solution can provide an answer to all the challenges the industry faces, but the government recognition of healthcare IT and EHRs as a long-term solution has greatly accelerated deployment. EHR/EMR serve many purposes and address the key challenges in several ways.

Among the many benefits EHR provides includes:

- Timely, accurate and easily accessible documentation of interactions with patients
- Secure and compliant access to view medical history and insurance information
- Ordering and reviewing results of lab work and tests
- Sending and receiving electronic prescription requests to pharmacies (reducing fraud, risk of error and other problems)
- Alerting health care providers to dangerous drug interactions; and making and receiving referrals

Improving Operational Efficiency & Reducing Costs

EHRs provide significant improvements in operational efficiency by providing the right information, to the right people, at the right time, at the point of care. EHR systems reduce the manual reentry of data at different points in the process of medical care, and they reduce the work required by multiple, redundant, and sometimes conflicting standalone applications. Many EHR systems give physicians and caregivers tools for decision support, clinical guidelines, personalized summaries for patients, as well as the benefits of integration with other business applications.

Preventing Fraud & Mistakes

The best EHR systems are designed with checks and balances, built-in and external controls, security features, and process controls to help reduce fraud. When used in conjunction with advanced technologies like risk management systems, fraud detection systems, data analytics, and even smart cards, healthcare providers can reduce some of the most common threats exploited by criminals. When providers establish proper controls with their EHR systems, they can address the two broad areas of fraudulent use of medical records: inappropriate billing by providers and inappropriate or illegal access to the system to modify existing patient data for false claims. Healthcare providers can significantly reduce even more serious mistakes, especially related to drug interactions, with comprehensive EHR systems.

Complying with the HITECH Act

The HITECH Act provides that financial incentives are given to physicians and hospitals that effectively implement and use certified and robust networked EHR systems. In this extremely cost sensitive industry, the incentives for meaningful EHR use are of immense value to physicians as well as hospitals. Deploying a certified, robust and reliable EHR system, especially on a scalable, cost-effective converged infrastructure, simplifies and accelerates the deployment of EHR systems.
Managing Governance, Risk Management & Compliance

One of the biggest advantages of using EHR is documenting in one place everything about the various participants in the healthcare process. This allows for far greater detail and easily accessible information, enabling more effective implementation of governance, risk and compliance policies and procedures. It is no longer effective for any individual to remember and function with so many different federal, state, local, organizational, departmental and other compliance requirements. An EHR system enables far greater effectiveness in ensuring GRC compliance.

Modern applications for managing GRC allow healthcare providers to implement centrally managed, integrated GRC systems with surveillance, audit, and reporting mechanisms. These applications minimize the number of manual components in GRC processes and procedures through automation, and they allow healthcare providers to refocus vital medical and clinical staff on patient-related activities.

Improving Clinical Treatments & Outcomes

Electronic Health Records (EHR) allow healthcare providers to integrate evidence-based medicine (EBM) into their diagnostic practices, providing doctors the best data to customize treatment decisions. When EBM is detached from individual patient care, doctors are challenged to constantly perform the research and network with colleagues to review available data, across a wide range of conditions and treatments. EHR integrates this data at the point of care, providing specific information to support timely and informed medical diagnosis and treatment that gives doctors and patients immediate information about cost, efficacy and side effects. The result is two-fold – doctors no longer rely on outdated information, and they are able to inform and educate patients so that they can help choose between competing treatment choice according to their own personal and quality-of-life preferences.

EHR promises to allow data sharing across organizations, which can improve health care in many ways:

- Researchers can harvest information about efficacy and side effects based on real patient data, securely and confidentially – something that has been impossible in the past.
- Practitioners from a wide range of specialties can collaborate in patient diagnosis – more quickly, and with more cross-functional information than ever before.
- Patients can actively participate in their healthcare through education, disease management, wellness, and prevention strategies and initiatives.
- Healthcare providers can treat chronic diseases in ambulatory and home-based setting versus inpatient hospital settings, which is quicker, more convenient, and less costly for consumers and providers.
- Healthcare providers can reduce time spent executing inefficient processes and procedures.

Business & Administrative Solutions

While EHR systems provide the healthcare industry many benefits – they can also require significant investment in hardware and software. It is essential that EHR systems are not established on new silos of infrastructure, but that they run on reliable converged infrastructure – either standalone or in mixed workload environments – so they can coexist with and leverage other software applications, systems and data sources.

Modern healthcare applications running on a converged virtualized infrastructure allow healthcare providers to address today’s business and administrative challenges by running mixed workloads that:

- Facilitate broad and deep communication within the organization
- Streamline processes to reduce costs
- Replace manual processes with automated ones, thus reducing costs and keeping healthcare resources online for better patient care
• Increase recruitment, retention, and morale
• Innovate and position to stay competitive
• Adopt quickly changing clinical processes
• Support the widespread use of ambulatory, wellness, and prevention practices

**Vblock Infrastructure Platforms – The Healthy IT Choice for Healthcare Transformation**

With Vblock Infrastructure Platforms, VCE delivers the industry’s first completely integrated IT offering that combines best of breed virtualization, networking, computing, storage, security, and management technologies with end-to-end vendor accountability. This converged infrastructure enables rapid virtualization deployment so customers can quickly see a return on investment. Vblock Infrastructure Platforms offer varying storage capacities, processing and network performance, and support for such incremental capabilities as enhanced security and business continuity.

Vblock platform helps healthcare organizations address the challenges caused by increasing demands and aging infrastructure. Vblock platforms:

• Address the security, reliability, performance, management, and stability requirements of data center managers, network operators, and medical community.
• Present core healthcare, operations, and business applications as a holistic entity by aggregating the diverse requirements of healthcare industry’s infrastructure management with a streamlined and predictable approach to deployment, expansion, and long-term support
• Simplify the management of complex environments and operational processes through use of management tools and service catalogs.

Vblock platforms are a best of breed converged infrastructure platform that provides health organizations, network operators, governing bodies, and the medical community the security, reliability, and efficiency they require in a converged infrastructure solution.

**Implementing Best-In-Class Technology Solutions**

Due to the incredible pressures to deploy EHR systems and achieve meaningful use in the shortest possible time, the healthcare industry is looking for more than just hardware components that it then has to spend months integrating. Successful transformation of the healthcare industry can be enabled by electronic health records – but only if they can be deployed quickly, cost-effectively and reliably; on proven, industry-leading and fully integrated infrastructure platforms.

Healthcare providers must transform their IT infrastructures in a phased approach to meet rising challenges in compliance, care, costs, and administration. This transformation must support data security across a range of environments in the modern care continuum and provide dependable data access across a wide range of devices. It must support modern IT management applications to reduce IT OPEX. And it must grow and expand easily without disruption to data availability and compute performance.

IT professionals in healthcare recognize the immense value of a pre-integrated, pre-tested, pre-validated next generation converged infrastructure that meets the most exacting IT requirements and standards.

**Predictable & Scalable**

Healthcare organizations are at different phases in their IT transformation and have different compute, storage, and virtualization requirements. Vblock platforms are available in several sizes, each of which has the capacity to grow and scale based on individual needs.
Vblock platforms are predictable and scalable, accommodating an ecosystem of applications coexisting on one platform. As data center needs grow to meet healthcare organizations needs, Vblock platforms are easily scalable while maintaining reliable performance, security, and compliance.

Industry leading virtualization technology ensures that workloads running on physical hosts are distributed to cluster members with available CPU and memory resources. Vblock platforms are comprised of architectures that are pre-tested, fully integrated, and scalable, with:

- Repeatable units of construction based on matched performance, operational characteristics, and discrete requirements of power, space, and cooling
- Repeatable design patterns that facilitate rapid deployment, integration, and scalability
- An architecture that can be scaled for the highest efficiencies in virtualization and workload re-platforming
- An extensible management and orchestration model based on industry-standard tools, APIs, and methods
- A design that contains, manages, and mitigates failure scenarios in hardware and software environments
- Faster deployment times facilitated by a 3-day delivery process and quicker integrations than traditional IT deployments

**Flexible & Responsive**

EHR systems need to be comprehensive and flexible. EHR vendors are seeking to validate their solutions on robust, flexible, and scalable infrastructure platforms to cater to the needs of their customers as well as service providers. Industry professionals, from CIOs to CFOs, and IT directors to caregivers, all realize the importance of their mission-critical EHR applications running on flexible and responsive infrastructure platforms.

Large, standalone hospitals are no longer the primary healthcare delivery setting, healthcare information technology must respond quickly to changing locations and communication platforms. An effective healthcare transformation must support a wide range of applications at all levels and components of healthcare delivery and patient care – medical, clinical, research, benefits, reimbursement billing, financial, and administrative. The ability to plan, develop, deploy, and manage complex healthcare applications requires a converged infrastructure platform that provides flexibility and responsiveness.

Vblock platforms are able to meet spikes in network traffic and other unpredictable demands using technologies like storage tiering, data caching, and network QoS. Implemented with self-curing architecture, Vblock platforms accommodate unplanned events such as data spikes, server crashes, and physical component failure. VMware High Availability restarts failed servers and Fault Tolerance provides zero downtime, zero data loss, and continuous availability for healthcare, administrative, operations and IT applications – without the cost and complexity of traditional hardware or software clustering solutions. VMware vMotion enables IT to move mission-critical workloads without downtime.

**Cost-Effective**

The healthcare industry wants to deploy EHR on a robust but cost-effective infrastructure. They are already aware of the explosive growth of IT spending in healthcare on software to hardware, and they require infrastructure options that enable them to achieve meaningful use quickly but without wasting resources on underutilized hardware.

Vblock platforms allow healthcare organizations to use converged architecture and virtualization to cost-effectively design, plan, and deploy applications. Planning is simplified with known quantities of power, and cooling per rack unit due to standardized components. Instead of ordering dedicated hardware, software, storage, and frequently upgrading networking capabilities, the healthcare data center manager can simply create virtual machines based on an elastic pool of resources. The converged nature of the infrastructure saves by combining high-speed network and storage connections. The virtual infrastructure allows for higher efficiencies and densely consolidated environments that more fully utilize the compute resources available.
Administration of the virtual environment is more efficient due to simplified management systems. Vblock platforms provide numerous implementation and deployment of new programs that bring ongoing savings to the organizations.

- Pre-integration provides significantly faster deployment and shorter time to value.
- Design, order, and installation occur in a matter of weeks, compared with several months for a traditional IT approach.
- Highly optimized designs maximize energy efficiency and provide ongoing cost savings.
- A single user interface reduces IT resource requirements.
- An integrated IT infrastructure reduces training and operating expenses compared to traditional systems using discrete pieces of equipment.
- VCE’s single point of contact for integrated customer support reduces IT costs for IT specialists.

Vblock platforms provide a streamlined, financially and operationally efficient system.

Optimized Storage

EHR’s imaging data is growing exponentially due to technological advances and increased retention. For example the 2,000-bed medical center at Universitaire Ziekenhuizen, (Leuven, Belgium) had 512GB of storage in 2000, but has 512TB today – a ten-fold increase in ten years. A successful IT solution must maximize storage capabilities and provide policy-based strategies that improve backup and recovery performance, and provide accurate and timely data access.

Vblock platforms have advanced high-level data protection and replication features that optimize enterprise SAN technology with speed, capacity, and efficiency – without compromising performance. Fully Automated Storage Tiering (FAST) moves data across storage tiers, getting information to the right place at the right time by pooling storage resources and defining policies and applying it to specific applications. This provides health IT administrators with end-to-end visibility and control of their virtual data center storage resources and usage for large healthcare data requirements.

Business Continuity & Disaster Recovery

Today’s healthcare organizations must operate around the clock. Vblock platforms provide a virtualized data center tailored to healthcare providers’ needs for continuous performance. Vblock platforms allow the seamless migration between data centers with zero application downtime and very limited application performance degradation (~5%). With Vblock platforms, healthcare organizations can change data center management and provisioning without violating SLAs.

- **Data center maintenance without downtime** – Application on a server or data center infrastructure requiring maintenance can be migrated offsite without downtime.
- **Disaster avoidance** – Data centers in the path of natural threats (like hurricanes) can be proactively migrated mission critical applications to another data center.
- **Data center migration or consolidation** – Healthcare organizations can migrate applications from one data center to another without business downtime as part of a data center migration or consolidation effort.
- **Data center expansion** – Migrate virtual machines to a secondary center as part of a data center expansion to address power, cooling and space constraints in the health care providers primary data center
- **Workload balancing across multiple sites** – Migrate virtual machines between data centers to provide compute power for data centers closer to the organizations or load balance across multiple sites. Healthcare organizations with Enterprises or multiple sites can also conserve power and reduce energy
cost by dynamically consolidating virtual machines in fewer data centers (automated by VMware Dynamic Power Management, or DPM) another feature of the green data center of the future.

Simple to Manage

Healthcare providers need the simplicity of a streamlined management application that offers a single pane of glass that integrates with higher-level applications and business intelligence management systems. Operational efficiencies are improved by using workflow-level commands, thereby minimizing the need for discrete hardware specialization.

Vblock platforms include Unified Infrastructure Management (UIM) and complementary IT Network Monitoring Solutions (NMS) to provide the orchestration and visibility required for easy configuration and operation of the Vblock platform. UIM provides simplified Vblock platform management for a healthcare environment by combining provisioning with configuration, change, and compliance management. A single UIM instance can manage multiple Vblock platforms, and it provides an API that easily integrates with existing enterprise management platforms, allowing operators to manage the Vblock platform installation as a single entity. It integrates with enterprise management platforms and consolidates views from all Vblock platform components, including network, compute, and storage. UIM also supports policy-based management for IT security and ensures compliance by using service profiles.

Secure & Compliant

Healthcare providers are charged with safeguarding the nation’s health. They need a platform that offers ample assurance of security and compliance with government regulations, such as SOX and PCI. A converged IT infrastructure for healthcare providers must offer centralized data analysis and protected storage, authorized user access to resources, and audited systems that comply with all regulations concerning the security of our nation’s healthcare providers.

Vblock platforms enable healthcare organizations to meet security and compliance requirements by efficiently and effectively operating and managing the tight integration of compute, network, and server environments.

Data security and access control capabilities can be enforced system-wide with RSA solutions that meet industry standards like SOX and PCI, while supporting standard features like malware detection systems, vulnerability detection, disposal logs, and patch compliance. This ensures the confidentiality, integrity, and availability of the environment at every layer using technologies like identity management and access control, encryption and key management, firewalls, malware protection, and intrusion prevention.

• Security Information and Event Management (SIEM) provides centralized storage and analysis of logs of network logs and events.
• Data Loss Prevention (DLP) identifies, monitors, and protects data in use (e.g. endpoint actions), data in motion (e.g. network actions), and data at rest (e.g. data storage) through deep content inspection, contextual security analysis of transaction (attributes of originator, data object, medium, timing, recipient/destination, and so on) within a centralized management framework.
• Strong, two-factor, adaptive authentication provides robust authentication.

VCE Seamless Support Experience

VCE provides customers and our partner organizations with a Seamless Support Experience that encompasses all aspects of integrated Vblock Platforms, dramatically simplifying the support process. Our industry-leading and unique support experience is founded on state-of-the-art support and collaboration technologies, expertly trained people in all aspects of the Vblock solution, and proven processes that proactively identify and rapidly resolve problems.
Conclusion

A convergence of business, government, and humanitarian interests strongly urge healthcare providers to computerize records on a converged IT platform that allows standardization and sharing, efficiency, and cost reduction across many facets of modern healthcare. Electronic Health Records (EHR) and other standards like Electronic Medical Records (EMR), Personal Health Records (PHR), and Payer-based Health Records (PBHR) hold the promise of allowing healthcare providers to better manage clinical knowledge and administrative processes for better patient outcomes and more efficient, cost-effective business solutions. Vblock™ Infrastructure Platforms provide a state-of-the-art converged IT infrastructure to take advantage of these advances in healthcare IT. Healthcare providers that move now to adopt these advances will be best positioned to meet the rising challenges in providing quality healthcare:

- Improving Operational Efficiency & Reducing Costs
- Preventing Fraud & Mistakes
- Complying with the HITECH Act
- Managing Governance, Risk Management & Compliance
- Improving Clinical Treatments & Outcomes
- Business & Administrative Solutions

Healthcare IT is changing dramatically, causing impact across all parts of the organization – clinical, research, administrative, and executive. Government is increasingly mandating or promoting modern IT upgrades to improve efficiencies and reduce costs, as healthcare becomes an increasingly large portion of our nation’s budget. VCE’s Vblock platforms allow healthcare providers to take advantage of advances in healthcare IT to meet these challenges with validated, end-to-end IT solutions that ensure cost-effective security, performance, and expandability.

Next Steps

To learn more about this and other solutions, contact a VCE representative or visit www.VCE.com.
ABOUT VCE

VCE, the Virtual Computing Environment Company formed by Cisco and EMC with investments from VMware and Intel, accelerates the adoption of converged infrastructure and cloud-based computing models that dramatically reduce the cost of IT while improving time to market for our customers. VCE, through the Vblock solution, delivers the industry's first completely integrated IT offering with end-to-end vendor accountability. VCE's prepackaged solutions are available through an extensive partner network, and cover horizontal applications, vertical industry offerings, and application development environments, allowing customers to focus on business innovation instead of integrating, validating and managing IT infrastructure. For more information, go to www.vce.com.

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