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Sean Graham, Network Architect, Kettering Health Network

Kettering Health Network Achieves Optimal Performance of EpicCare EMR with F5 Solution

When **Kettering Health Network** implemented an electronic medical records (EMR) system from Epic Systems, it needed to ensure high uptime for the environment that clinicians depend on to provide patient care. Kettering chose F5® BIG-IP® Application Delivery Controllers to manage traffic to its EpicCare EMR servers, which it found to be easier to manage and customize than Cisco Systems devices.

With F5, Kettering provides clinicians with high-performance access to EpicCare, regardless of their location within Kettering facilities. Kettering’s network and application administrators are also more productive because the solution eliminates manual reconfiguration, making the EpicCare environment easy to manage and maintain.

Business Challenges

Kettering Health Network is a nonprofit healthcare network based in Dayton, Ohio. It comprises seven major medical centers and hospitals, with more than 60 state-of-the-art healthcare facilities, and a college of medicine. Four Kettering facilities have received 100 Top Hospitals recognitions by Thomson Reuters. More than 8,000 employees, 1,200 physicians, and 1,000 volunteers provide compassionate care to Kettering patients throughout the Dayton area.

Kettering relied on IDX Carecast healthcare software from GE for electronic records management. All facilities in the Kettering network accessed Carecast through one of four application servers at its main data center. Kettering’s Information Services (IS) department managed user traffic to Carecast by giving each facility a unique domain name, and routing each user request based on the source address of the user’s facility.

Overview

Industry

Healthcare

Challenges

- Reduce time spent administering healthcare software system
- Improve the user experience
- Implement EpicCare EMR with high availability

Applications Supported

- Epic Systems EpicCare
- Microsoft Exchange Server
- Microsoft Lync

Solution

- BIG-IP® Local Traffic Manager™
- F5 Professional Services

Benefits

- Streamlined network and application administration and management
- Strong support from established vendor and professional services
- High uptime for clinicians using EpicCare EMR
- Enhanced user experience

For instance, if a user was identified as coming from Sycamore Hospital, the request was directed to the server designated for Sycamore Hospital. In the event of a server outage or scheduled maintenance, however, a network administrator manually changed the domain name assigned to the facility so user requests could be routed to a different server. "We had to help clinicians by phone through the rebooting and reconnecting procedures," says Sean Graham, Network Architect at Kettering. "It was a highly manual process that required some hand holding."

Kettering wanted to reduce the time the IS department spent manually shifting users to available servers, provide higher uptime for clinicians, and provide an electronic records management system that would support the finest patient care. So, when the Carecast license came up for renewal in 2010, Kettering enlisted the help of an outside consulting firm to assess its environment and decide whether to renew with GE or implement new software from another vendor.

Upon the firm's recommendation, Kettering chose to implement EpicCare electronic medical records (EMR) software from Epic Systems. For optimal performance, the consulting firm also recommended an Enterprise Cache Protocol (ECP) architecture for Kettering's EpicCare EMR environment. ECP is a technology from InterSystems that makes network traffic between application servers and databases in a distributed environment more efficient, bringing higher scalability to the network to support more users and provide higher performance.

Solution

To guarantee high uptime for clinicians accessing EpicCare from workstations throughout Kettering medical facilities, the ECP deployment required Application Delivery Controllers (ADCs) to efficiently manage traffic to EpicCare servers. Kettering conducted an evaluation of ADCs, testing the EpicCare EMR app with devices from

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Cisco Systems and F5. In test results, the department found BIG-IP Local Traffic Manager (LTM) to be superior to Cisco ACE devices in a number of ways. Most significant was the ease of management that the F5 solution offered through a web-based interface rather than command line controls, and superior auditing and logging capabilities.

Kettering deployed a redundant pair of BIG-IP LTM devices in its main data center. The devices, which connect to a pair of Cisco routers through 20-gigabit EtherChannel connections, manage traffic to eight EpicCare EMR application servers. "We mirror each EpicCare session that's created so when we take a server down for maintenance, for example, all existing clinician connections stay active," explains Graham. Kettering installed a third BIG-IP LTM device at its disaster recovery location in a read-only, standby mode. In the event of an outage, Kettering propagates a DNS name change to redirect users to the disaster recovery site, where the BIG-IP device in turn directs users to the most available EpicCare EMR server.

With help from F5 Professional Services, Kettering created a custom tool using BIG-IP LTM to monitor the health and availability of its EpicCare servers by continually sending TCP queries to them. Kettering also uses F5 iRules®, a scripting language that gives administrators control over application traffic, to audit and log connection information. With a single iRule, Kettering gathers connection statistics (connection location, type of service connected to, and connection duration)

to determine the health of applications as well as servers.

Benefits

Using BIG-IP LTM, Kettering was able to optimize EpicCare EMR for high availability and performance, and it is able to manage and administer the new environment easily and efficiently. The organization has enjoyed strong support from F5 and is able to provide clinicians with the tools they need to deliver excellent patient care.

Eased management and administration of EpicCare

Kettering finds the F5 solution to be easier to manage and administer than other solutions—and this saves time for networking and application teams. "We save significant time by using the BIG-IP system web interface to do 99 percent of administrative tasks without ever using the command line," says Graham. "Other solutions we evaluated required at least 50 percent of the administrative work to be done through the command line and a third-party application, which was definitely more time consuming. With BIG-IP LTM, we can configure and control servers with a simple point and click of the mouse."

The graphical web interface also makes it easier for Graham to train his team. "With other solutions, I would have had to type up and walk my team through many command lines to train them. But with F5, I simply create and share screenshots of the interface to demonstrate how to manage devices." The BIG-IP system also allows Kettering's EpicCare app team to control servers without changing the BIG-IP LTM configuration. "The health monitor allows an administrator to place a server in or out of rotation by simply controlling the port through which it's communicating. It's automatic and doesn't require manipulation of the BIG-IP system configuration at all."

Using partitions with BIG-IP LTM also simplifies administrative tasks. Says Graham, "With BIG-IP LTM, we can give specific

administrators access rights to a particular partition that contains only the app they are responsible for monitoring. They can view statistics about connections and server availability, and when we start using BIG-IP LTM with other applications like Microsoft Lync and Microsoft Exchange, we can take advantage of partitions to maintain organization of configurations and user access rights to those resources as well.”

Confidence in reputable vendor

In reflecting on its decision, Kettering is relieved that it chose an F5 solution. “Had we chosen Cisco, we would have suffered a big time resource hit in light of the Cisco ACE end-of-life announcement. Replacing Cisco ACE products would have required six months of planning and migration, not to mention some financial loss due to investment in hardware we could no longer use,” says Graham.

Kettering also appreciated the support it received from F5 Professional Services during the implementation, and it continues to take advantage of ongoing support through the F5 DevCentral™ user community of more than 100,000 members. “F5 Professional Services was very helpful with our implementation, and DevCentral is a great resource to see how other users are doing things and to find best-practices code and configurations. The sheer number of people in the community demonstrates how widely used F5 solutions have become.”

Higher uptime and enhanced user experience

“Before F5, we spent a significant amount of time troubleshooting and providing phone support to clinicians, especially considering the manual reconfigurations we did,” says Graham. “With BIG-IP LTM, we’re dynamically managing traffic, moving users seamlessly among EpicCare servers without interruption, and providing high uptime and performance for clinicians.”

Customized health monitoring with BIG-IP LTM also helps Kettering ensure uptime because it alerts administrators to server issues before they become a problem. In addition, auditing and logging through iRules gives the Kettering IS department invaluable information it can use to continually refine and optimize its EpicCare EMR environment, enabling clinicians to provide the finest patient care.

Future Plans

Kettering also uses the BIG-IP system to intelligently manage traffic to other enterprise applications, including its VMware View virtual desktop infrastructure (VDI) and its human resources insurance enrollment system from Ultimate Software, which experiences very heavy traffic during the open enrollment period.

“Last year, the Ultimate server crashed multiple times. This year, we’ve applied the BIG-IP LTM devices to manage traffic and ensure uptime,” says Graham. BIG-IP LTM intelligently directs traffic to the most available and best-performing servers, and it also offloads resource-intensive tasks such as SSL encryption from Kettering application servers to the F5 environment.

Given these benefits, Kettering plans to extend the F5 solution to other environments—for instance, its Microsoft Exchange Server, Microsoft Lync, and other web application environments. “We invested in a BIG-IP system configuration that would support our EpicCare environment as well as other enterprise apps,” says Graham.

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