

Emtec Whitepaper Series

***Virtualization in Healthcare: A Better
Way to Secure Information and Reduce
Costs***



Executive Overview

The concept of virtualization has been rapidly gaining attention for several years. Driven by the need for IT departments to reduce costs, raise service levels, and insure information security and availability, virtualization has proven to be a significant part of any IT strategy. First used for software development, virtualization has proven itself to be ready and capable of handling the most demanding production scenarios. This paper will define virtualization, discuss its benefits and practical uses in healthcare and offer guidance in how to get started. It should provide the reader with the knowledge necessary to start a discussion, both internally as well as with potential partners, on how virtualization can help your organization become more nimble and efficient.

Virtualization Defined

Virtualization in the information technology world can mean many different things depending on which vendor you talk with. The concept, though it has been around the mainframe world for years, is just now gaining traction in the x86 and UNIX arenas.

In a nutshell, virtualization means doing more with less. In server virtualization, special software called a “hypervisor” allows the creation of multiple virtual servers on the same physical server. This is significant because now we can consolidate 8-10 previously physical servers down to one. By reducing the number of physical servers that have to be supported, we can greatly reduce the costs associated with having them while simplifying their management.

Desktop virtualization is the fastest growing sector in IT infrastructure today. The advent of the personal computer was a wonderful thing and reinvented the way that people used computing. However, these individual PC’s brought with them a heavy burden to manage, support and secure their data and use. In a virtualized desktop environment, solid state devices called “thin clients” replace PC’s in the workplace, and the user’s desktop actually runs as a virtual machine in the data center.

Storage virtualization means consolidating all the data storage spread across the enterprise into a “pool” of storage that can be better managed and more fully utilized. Again, this can be accomplished by deploying special software or new storage arrays that have virtualization built into them.

There are other areas that can be virtualized as well that we will discuss later on in this whitepaper. Through virtualization techniques and technologies available today, IT managers can now gain control of their expensive resources and more fully utilize them. In the healthcare industry, where quality of care is essential, and managing costs is paramount, virtualization can be the key to success.

The Benefits of Virtualization

Virtualization, like any other technology that has come along in the last 50 years, requires careful planning and design to implement correctly. But unlike some other information technologies that have come along, virtualization offers some clear and definable benefits for healthcare organizations.

- **Virtualization can really save money.** Depending on the type of virtualization you first deploy, you are probably not going to save much money on the initial purchase of equipment and software. However where you can realize a huge savings benefit is in having to provide less data center space, cooling, power, and maintenance contracts for the servers, desktops and storage arrays you currently have. If you can reduce the costs of operating your datacenter by 30-50%, that can be a significant savings.
- **Your data will be more secure.** Take the example of PC's spread across a medical facility campus. Every PC has a hard drive that is more than likely never backed up. Even if you are using enterprise applications that store their data in the data center, every individual user has their own data (word processing documents, spreadsheets, etc.) stored on their hard drive. For some of these users, the lose of that data would be a major problem. Additionally, that data is vulnerable to unauthorized access. Anyone with a thumb drive could copy off patient information and walk out the door. In a virtual desktop world, the entire user's data resides in the data center where it is secured and backed up.
- **A virtual environment is easier to manage.** Most virtualization software these days has excellent management tools built into it. From a "single pane of glass" or management console, an IT manager can understand what is going on and be alerted as to potential problems. Some virtualization software allows the manager to define resource and performance thresholds. The software automatically reallocates resources to meet changing requirements. Patch management and upgrades are also easier to implement because you only have to do it once and the change is made across all virtual machines. This is especially critical for desktops and servers since this type of maintenance is usually very labor intensive in a non-virtual enterprise (another cost-saving benefit).
- **Disaster recovery is simplified.** From a server standpoint, if there are fewer physical servers that have to be replicated at a DR site, the simpler and easier it will be to maintain and then activate that site in the case of an emergency. Virtualization software can be configured to constantly migrate data to the DR site and when an outage occurs automatically bring the DR site on line. In a traditional environment, you would have to completely duplicate your production systems and then implement expensive clustering and replication software. The cost of a virtualized DR site is significantly less than a traditional one. In a virtualized desktop

environment all the desktops actually exist in the data center and would be included in the systems that were part of a DR plan. In the case of an outage, they would still be secure and accessible by users, even from remote locations such as their homes. In a traditional environment, the task of replacing and rebuilding user's PC's would be monumental.

Practical Uses of Virtualization in Healthcare

As you can see from the previous section, the benefits of virtualization are significant. But what are the practical applications of this technology that truly pertain to enhancing the delivery of quality healthcare? There are many but following are some of the best.

- ***Virtualize as many servers as possible.*** The cost and management benefits of virtualizing servers can be huge. These costs can be easily quantified and tracked. Many of the large clinical application vendors are actively supporting virtualization or are in the process of certifying their applications for it. The benefit of having virtualized servers when a catastrophic event occurs cannot be understated. Disaster recovery is drastically simplified from both a backup and recovery standpoint. Additionally, the cost savings of a virtual DR environment can be huge.
- ***Virtualization of desktops.*** As previously discussed, virtualized desktops can better secure data and decrease operating costs. But another benefit is increased productivity of caregivers. Doctors and nurses are constantly on the go, moving from patient to patient and floor to floor. To access the software applications they need they have to log in and log out of PC's wherever they are. In a recent study of nurses' working patterns, it was found that on an average shift, a nurse could log in and out of a PC up to 60 times, resulting in the loss of an hour's productivity. In some cases, caregivers simply will not log in or out, with everyone using the same access. This is a real problem for administrators who have to certify compliance with HIPPA regulations for the security of patient information. The solution is the use of virtual desktops running on thin client devices using a "smart card." A smart card looks like a credit card but contains specific information about the user including their "log-in, log-out" information. The user simply inserts their smart card into the thin client and their own personalized desktop appears on the screen. When they are ready to move on they extract their smart card and the screen goes blank. They walk down the hall to another thin client, insert their smart card and their desktop reappears exactly as they left it. This can not only save tremendous time but also secures access to patient data to only those who are authorized. Emtec, in conjunction with Flo Healthcare, has integrated a wireless, thin client with a mobile, rolling workstation. This allows the caregiver to physically move the thin client device anywhere

they need to including into the patient's room. Studies show that recording vital signs and other information into the patient record at bedside provides more timely and accurate information and helps eliminate medical errors.

- **Virtualize enterprise storage.** Every IT environment, including healthcare, has many “silos” of information. Historically, as new software applications have been added, the supporting hardware and storage has been purchased for this application at the same time. The result is many different storage devices of varying types and sizes spread across the organization. The idea behind storage virtualization is to bring all of these disparate devices together into a common “pool” of storage. This would allow storage to be more efficiently managed, storage resources to be better utilized, and as more storage is required, add only what is needed when it is needed. Most hospitals today are rapidly adding imaging capabilities with PACTS systems as well as other document types. These systems provide rapid access to information that caregivers need. But they also tend to grow rapidly and have to be able to scale upward. By virtualizing storage, IT managers can better monitor the status of data and anticipate when they will need more storage space. The consolidation of storage also simplifies and reduces the cost of disaster recovery and really enhances the security of data.

How to get started

Since the concept of virtualization is somewhat new and very different from the IT strategies of the past, knowing where to start can be daunting. But like any other business project, following a structured approach will yield success. Emtec, as a computer systems integrator, has been in the IT and virtualization business for a long time. Following is a list of “best practices” we have compiled to help our customers start thinking and planning their move to virtualization.

1. **Analyze your current environment.** It is difficult to know what to do if you do not know where you are today. Many organizations continue to run servers even though the applications on them are not used. This is an easy cost to eliminate. The only way to truly understand how to start eliminating and consolidating your IT infrastructure is to do an analysis of your infrastructure. Emtec has a number of tools that we use to gather information about work loads, network traffic, disk usage and other statistics. Engineers then take a look at your current environment and make suggestions as to ways to trim it. This also provides a baseline for evaluating changes and comparing cost savings.
2. **Develop a clear understanding of future infrastructure needs.** Developing a good plan for virtualizing and consolidating your environment means not only looking at where you are today, but where you think you will be 3-5 years down the road. One of the great benefits of virtualization is that because you have the ability to easily move

- applications to different servers and data to a “pool” of storage, you can expect infrastructure to be better utilized and to last longer. So as you add new servers or storage you want to be sure that they have the ability to scale up easily as needs change.
3. ***Engage a partner to help you get started.*** Although virtualization is now a mature IT strategy, it is still changing rapidly. If you are new to virtualization, there is a learning curve that you must address. For this reason, it is most efficient to engage with a partner who has the experience and expertise to help you not only design a strategy but to implement it as well. By using this approach, you will dramatically speed up the time it takes to implement as well as avoid any errors in the configuration and architecture of your new systems. It is also the most efficient way to make sure your staff is properly trained with the information they need to move forward.

Conclusion

Virtualization is today a mainstream IT strategy. It is being deployed in every industry and has tremendous potential in the healthcare business, where reducing cost is always an issue. The additional benefits of added security, easier management and better disaster recovery can also be significant. The best way to get started is to engage with a knowledgeable partner. This can save time, money and insure a successful implementation.

About Emtec

Emtec is a computer systems integrator offering a number of solutions and services targeted at helping our customers understand and implement virtualization. We have partnered with many of the leading IT infrastructure vendors to offer best-of-breed technology and practices. We are assisting our customers as they move towards more efficient computing environments. Please contact us if we can help your organization meet these challenges and opportunities.

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