Central Vermont Medical Center (CVMC), with 1,500 full and part-time employees, houses 200 physicians providing care from private practices as well as from CVMC’s 18 community-based medical group practices, a nursing home and rehabilitation facility. The organization is the primary health care provider for 66,000 people who live and work in central Vermont. It offers 24-hour emergency care, with a full spectrum of inpatient (licensed for 122 beds) and outpatient services.

The facility receives over 30,000 outpatient visits, and an equal number of Emergency department visits each year.

“With 20 full-time staff, the IT department has its hands full,” says Maureen McQuiggan, Director of IS. “Any challenge on the IT side can have serious repercussions on clinical work, and likewise improvements of IT can enable strong improvements on the clinical side. Ideally, IT should be a business enabler.”

**A landscape of aging desktops with high failure rates**

CVMC’s IT Department found that it had its hands full keeping up with an increasing inflow of trouble tickets. “Desktops used to be replaced on a regular basis,” said Pat Miner, Network Manager at CVMC. “But we had skipped a few cycles, and we were faced with 1500 aging desktops. Failure rates had been climbing steadily among desktops, laptops, and even tablets, reaching a point where four to five units needed replacing and rebuilding every week. And turnaround times from failure to complete rebuild and ghosting a new image could take several days.”

With 18 medical practices in and around the medical center – some several miles away – failed machines ended up taking an enormous percentage of IT’s resources. Each desktop failure wasn’t just about a rebuild.

Because the practices were only open during the day, it meant an engineer had to go on location to work on the machine during open hours. This meant rebuilds would take longer and cause disruption to the practices.
The fast-moving medical computing environment
In a medical facility like CVMC, one of the key challenges is the time it takes doctors, nurses and other clinicians to connect and reconnect to the electronic medical records (EMR) or other applications. With each clinical visit, the clinician needs to log on, and then log off at the end of the visit. Often a single visit will require several log-ons and log-offs because clinicians must log off for security reasons each time they leave the patient for medication or supplies.

“This challenge was compounded at our Medical Center because, during the last few years, we had hired a large number of hospitalists – staff who take care of patients and move from floor to floor between patients,” McQuiggan said. “These clinicians, in addition to nurses and other caregivers, are truly impacted by any delay in logging on and off the computers and the applications they use. To most of the Medical Center, IT existed to address problems, but we knew that with the right technology and infrastructure, we could actually become business enablers.”

“We were getting a number of complaints around the time it takes to connect and the length of time to replace failed devices,” continued Miner. “We knew that a virtual solution would enable staff to keep their connections active, allowing them to log on and log off running sessions easily and rapidly.”

Securing Internal Buy-in
Yet Miner and his team knew that virtual solutions required not only funding, but management buy-in supporting the time investment. Securing support depended on having a keen understanding of the current challenges before figuring out the solution, which would be a huge challenge in itself. Together, they calculated the time it took for each desktop refresh and documented the fact that the IT team was dealing with five or more machines failing each week.

“It was time for a storage refresh, and that fell within the regular budget. We were already working with EMC on storage and upgrading capacity on the existing CX4 which fell within normal budgetary planning. But creating the right environment for virtual desktops, doing the licensing at the system and application level, and making it all happen at a reasonable cost presented an entirely new challenge.”

Getting the Right Partner
CVMC chose Focus Technology Solutions to help build the new technology infrastructure. Focus had already worked with CVMC on the purchase and installation of the CX4 and Server Virtual Infrastructure. While internal IT staff worked with the Medical Group Practice Team to understand the needs that would make a difference on a daily basis, Focus considered a range of options that would provide the improvements McQuiggan and Miner had envisioned within a budget that this non-profit Medical Center could handle.
Technology Selection – EMC VSPEX with VMware’s End User Computing Shines
As an EMC and VMware partner, Focus understands the advantages of EMC’s VSPEX – a flexible infrastructure that allows IT to quickly deploy a virtualized infrastructure to consolidate servers and applications that help reduce capital and operations expenses. If ever there was an ideal scenario where VSPEX and EUC could help, this was it.

EMC VNX unified storage array, “which offered fast-cache capabilities that we needed, given 500 concurrent-use desktops,” said Miner. Then there was a choice about whether or not to use Cisco UCS blade enclosures, which were eventually chosen because they enabled higher density on blades than other choices.

“The great thing about VSPEX is that it can be built using our customer’s choice of technology from best-of-breed providers,” said Brad Maher, senior solutions architect / virtualization practice manager at Focus.

In the spring of 2012, we initially were thinking of embarking on a solution using HP blade enclosures and NetApp storage arrays, but we were too unfamiliar with them,” Miner stated. “The cohesive solution available in VSPEX architecture became a clear leader in our search. I had been skeptical of such a solution, but Focus did a good job proving it could work and that we could get the price to the point where we needed to be.”

In addition, it made a great deal of difference to CVMC that the solution came with provisioning of blades that they had gotten with their Cisco UCS blade server chassis.

“If there’s a single most important reason we went with a VSPEX EUC solution, it’s that we get a cohesive infrastructure, easily supportable with the stability to provision clients quickly,” said McQuiggan.

Dealing with Constraints – Internal and External
In addition to resource constraints, CVMC faced data center limitations in capacity, energy, cooling, cabling, and racks. Focus helped create a concept for expansion and implemented a new enclosure in a second data center to ensure redundancy.

In a more unusual set of circumstances, Focus needed to understand that CVMC’s new solution had to comply with the Centers for Medicare & Medicaid Services Meaningful Use regulations. Meaningful Use includes objectives that are specific to eligible organizations and individuals, and which must be adhered to in three stages. For hospitals, Meaningful Use Stage 1 lays out 24 objectives, 19 Core Measures and 5 Menu set items which must be met to qualify for Federal incentive payment, and which must be in process by 2012. The incentive payment is based on the Medicare and Medicaid EHR (electronic health records) Incentive Programs, which incentivizes the adoption, implementation, upgrade, and Meaningful Use of
certified EHR technology. In other words, lack of compliance could take away a significant source of funding from CVMC.

Even though Stage 2 Meaningful Use requirements are set to begin no earlier than 2014, it was critical that the technology solution would help CVMC meet both Stage 1 and Stage 2 Meaningful Use requirements, so incentive payments could continue into the future; which will prepare them for Stage 3 in 2017.

**An aggressive timeline**
In laying out a timeline and plan, Focus and the CVMC IT team needed to identify which practice to deploy first. Planning this phase required joint conversations with the VP in charge of group practices as well as interviews with different practices. Focus helped to narrow down the choices and land on Montpelier Family Integrated Health Center, which houses roughly 30 clinical personnel about five miles away from the main Medical Center.

All of this planning took place during the early part of 2012. By late summer 2012 all medical personnel in the Montpelier Family Integrated Health Center were using virtual desktops.

**Phased Approach:**
With a goal of replacing 1500 desktops, the rollout needed to happen department by department. This had to move in concert with Meaningful Use testing, which would happen at the hospital first and then with individual practices.

“Our staff had to partner with clinicians to understand their processes and make the comprehensive EUC solution work,” said McQuiggan. “We sent team-members into our Montpelier practice to understand the flow of that practice, and communicated with Focus the whole time, giving them more information as we garnered it ourselves.”

“It was very interesting to see our technical group run with this and really understand what physicians and clinicians need and how IS can help,” McQuiggan continued. “One of the ancillary benefits of this whole process is that the IT department became much more knowledgeable about the Medical Center’s business as it relates to clinicians and patients. This allowed them to come up with and implement new ideas to facilitate the transition and maximize success factors.”

The IT Team rebuilt its classroom with virtual desktops, and held numerous training classes with curricula it developed specifically for the Medical Center’s clinical staff. This enabled clinical staff to rapidly understand how the new system would work and how to access key applications sitting on the EUC. These applications included Meditech (EMR for hospital) and eClinicalWorks (practice management software for the individual practices), in addition to clinical applications, such as Picis, an emergency department information system.
Success stretches far beyond the original challenges
The CVMC team started out by searching for a solution which would help avoid the constant churn of failed machines while minimizing log-on and log-off hassles for clinicians. However, the benefits of the VSPEX solution that Focus implemented have stretched far beyond the original scope.

- With all data kept at the data center, security is much higher.
- For Meaningful Use compliance, CVMC is positioned for complex passwords, data-at-rest, and all data secure and compliant with HIPPPAA regulations.
- Hospitalists can walk up to any device at any time and access information. Because they travel through the Medical Center continuously, they deal with numerous interruptions and emergent situations. The new technology enables them to quickly exit and return from the desktop they saved, not only improving efficiency but improving care by making it easier to remember what they were doing before any given interruption.
- CVMC is poised to meet meaningful use Stage 2, which will save enormous time and resources in the coming years.

“Yet what might have made the greatest difference in our lives,” said both McQuiggan and Miner, “is that IT was recently recognized as one of the most collaborative departments in the hospital. Our work and our people have grown from being associated with chronic problems and difficulties to being seen as a business enabling operation. And, many efficiencies and benefits are yet to come.”

Looking ahead
What’s next: McQuiggan notes that the EUC solution will allow CVMC to give virtual desktops to a large partner organization so its employees can connect to the system. This will be a huge time savings, allowing the partner to create and download reports without taxing the CVMC staff.

More importantly, the IT organization has gotten much closer to CVMC’s core business, giving McQuiggan and her superiors the assurance that IT will continue to be an enabling force for business progress long into the future.