Hospital Saves $1.3 Million on Hardware

🏢 Healthcare   👥 Employee +4,000

📍 Netherlands   🏭 Hospital

The Challenge

A large hospital (over 4,000 employees and volunteers) selected and planned to completely move to a new Electronic Patient Records (EPR) application. For the desired flexibility of the workplaces and the safety of sensitive patient records, a virtual desktop infrastructure (VDI) was chosen. The hospital sets high standards on the performance of its systems and therefore chooses solutions from established market leaders, including Citrix Virtual Apps and Desktops, VMware (for the hypervisor), and HPE servers.

Selecting the best possible hardware and software infrastructure was critical to getting the optimal ROI of the broad functionality offered. Furthermore, to gain end-user acceptance, the end-user experience of the new environment needed to be as good (or better) compared to the 'old' environment.

The Solution

Both the EPR vendor and the hospital wanted to ensure that the best option for the best price was selected and agreed to benchmark three infrastructure scenarios. One is based on recommended best practices, and the other two are based on alternative scenarios. Two more scenarios were tested as baselines. The hospital invited Login VSI, the industry standard and authority for VDI performance testing, to perform the tests.

In total 5 different hardware configurations/hardware scenarios were tested:

1. **Alternative 1:** XenDesktop and EPR on 1 system, focusing on core speed. A popular configuration that is quite common in VDI environments.

2. **Alternative 2:** XenDesktop and EPR on 1 system, focusing on core count. This scenario is tested to see how this alternative approach would work out in practice.

3. **Best Practice:** XenDesktop and EPR on 2 different systems, focusing on core speed. In this scenario, the EPR-application is installed in a separate Citrix XenApp environment, which

is connected to the XenDesktop environment where the users would log in. This option asks for double hardware but promises the highest performance because of the distribution of the tasks between the two systems. The XenApp servers with EPR had high-speed cores.

4. **Fat Client:** with the EPR locally installed, these tests served as the baseline.

5. **Current Hardware:** XenDesktop running on the current hardware of the hospital. This was done to determine how much the hospital would gain with the new hardware.

Together with the hospital, a representative custom workload was created based on four actions that a hospital employee would conduct with the EPR: starting the EPR, logging on to it, opening patient information, and viewing bed occupancy. The duration of each action is measured in milliseconds. The load generation product Login VSI was used to generate the needed user loads. The Login Enterprise platform allowed to collect and visualize the different measurements.

The Result

Most measurements were quite similar, but the two scenarios with low-speed CPUs, 'Current Hardware' and 'Alternative 2 (core count)', had the lowest scores. This showed that hardware emphasizing many cores and threads is not adequate. For VDI purposes, it's more effective to focus on the core speed of the processors used. The 'Best Practices' scenario with the two environments on two separate servers was the fastest option as expected, even 6% faster than the 'Fat Client' scenario. The 'Alternative 1 (core speed)' scenario came out second and tested only marginally slower. The difference with the 'Fat Client' measurements was also practically negligible. We also saw that this solution delivered the best results compared to the 'Current Hardware', justifying the investment in the new server environment.

The costs of the three considered hardware scenarios varied strongly.

Considered hardware scenarios	Cost of hardware infrastructure	Cost difference with Alternative 1	Login VSI performance test results
Alternative 1: 1 system, focus on core speed	$1,000,000		Close to the fastest
Alternative 2: 1 system, focus on core count	$1,180,000	$180,000	The slowest
Best Practices: 2 systems, focus on core speed	$2,300,000	$1,300,000	The fastest

The 'Best Practices' scenario is due to the extra complexity of two separate server systems and is more expensive to install and maintain. These extra costs will make the cost difference even bigger (but were not considered in the calculations above). The scenario 'Alternative 2 (core count)' was 18% more expensive than 'Alternative 1 (core speed)' and slower; thus, this scenario was not considered. Based on these test results, the 'Best Practices' scenario offers the overall best performance and deserves the label 'Best Product.' But with the associated costs taken into account, it becomes clear that the scenario 'Alternative 1 (core speed)' deserves the label 'Best Buy' with excellent performance for a fantastic price. The hospital chose this cost-effective solution.

The Conclusion

This project demonstrates the value of comparing different hardware options in your environment. In this case, testing with Login Enterprise saved this hospital $1.3 million compared to the original 'best practices' proposal, without loss of quality.

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