EXTENDING EUC COST LEADERSHIP WITH VMWARE HORIZON ON VxRAIL

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In recent years, more and more organizations have moved away from purely physical desktops to virtual desktop infrastructure (VDI). Breaking the link between access devices and the applications they are used with results in a number of benefits, such as cost efficiency and transparency of access, regardless of where the user is physically located. It also reflects the broad shift towards enterprise use of mobile and cloud-based applications.

A related recent development in the data center is converged infrastructure (CI). Instead of the traditional silo deployment approach to storage, compute, and network resources, all infrastructure elements are delivered and managed in a single environment, providing virtualized access to business services in an efficient manner. This is particularly suitable for cloud-based delivery models. However, since CI achieves lower costs through optimization of data center resources, it can be effective for all IT organizations, regardless of the way in which the services are managed or presented.

CI is often implemented as an appliance. Computing appliances have been used for many years for specific purposes, such as storage (SAN) or database applications.

The combination of CI and standardized appliances that can be rapidly integrated results in hyper-converged infrastructure (HCI). A new wave of HCI—appliances optimized for end-user computing (EUC)—is now entering the market. These appliances deliver comprehensive EUC capabilities in a single unit, reducing data center and operational costs.

VCE VxRail™ is the only appliance family on the market to deliver pre-tested VMware hyper-converged infrastructure.

How VxRail Can Help Your Company

Server virtualization and VDI attempt to address "infrastructure sprawl," with its high cost and operational difficulties (management of the physical devices and software licenses, for example).

However, VDI still requires management and is often complex to deploy. It can consist of large numbers of disparate components, all of which must be tracked, configured, integrated, and managed. VMware Horizon® provides great facilities to do this, but time and resources are still required each time the infrastructure or the deployment footprint changes. The agility of VDI can be called into question in high-scale or fast-changing environments. An estate of thousands of virtual servers on hundreds of physical servers can cause difficulty when ensuring proper business continuity, for example.

These problems can be easily overcome by deploying VMware Horizon on VxRail. Each VxRail appliance is specifically optimized to run VDI, giving unbeatable performance and no compatibility problems between hardware, hypervisor, and operating system layers. All elements are co-located, and disaster recovery can easily be designed into the system by pairing two appliances in different data centers. More importantly still, VxRail appliances are building blocks that be rapidly assembled and integrated to expand or adapt infrastructure capacity as requirements change.

Through the appliance approach, support becomes the responsibility of a single vendor, avoiding the common scenario when a problem cannot easily be attributed to a particular component in the stack and all vendors deny responsibility.

Not only is VxRail an elegant solution to these problems, it is also cost effective compared to traditional desktop and, perhaps more importantly, when compared to more conventional VDI deployments. It is quick to implement and deploy, so disruption is minimized and resources can be dedicated to other needs critical to the business.

Optimizing Infrastructure and Operational Costs with VxRail

Compared to traditional, distributed (non-VDI) desktop devices, the cost of VxRail is very low, but a more interesting comparison is between VxRail and conventional VDI.

The initial value proposition of deploying VMware Horizon on VxRail is that the only infrastructure you need purchase is an appliance, rather than multiple elements, potentially from different sources. This represents a relatively large CapEx outlay on a single item of infrastructure, but will deliver immediate capital cost savings (compared with buying all the servers, storage, and network switches separately) if deployed to support enough users. Further cost savings will be achieved through project implementation time and in future operations, so the payback time is often very short.

The project costs to get a VxRail deployed and operational are very low. A conventional VDI implementation entails configuring servers, storage, and network elements, requiring work from IT architects, managers, and administrators. VxRail contains all these elements in a single unit, so this effort (and the associated labor cost) is significantly reduced when the appliance is installed.

During any major IT project, users are disrupted, resulting in some loss of productivity. This is often difficult to quantify as a dollar value, as the users are affected to differing degrees and typically have different remuneration packages. In the examples presented below, these costs are shown as an estimated number of days of disruption and so not converted into monetary savings. However, they must be considered when planning projects and presenting options to stakeholders.

Once VxRail is in service, savings continue to accrue. At an assumed cost of $12K per rack per year, the reduced data center footprint of an HCI appliance translates directly into lower ongoing costs. There are savings in power consumption as well—the current drawn by the appliance is lower than for the equivalent infrastructure capacity in servers, storage, and networking, and there is an indirect power savings through lower cooling requirements too.

VxRail will be particularly helpful in situations where data center capacity is constrained. Switching from traditional infrastructure elements to HCI appliances allows more VDI users, more applications, and more services to be supported from the same data center capacity and, in some circumstances, avoids the need to invest in additional capacity.

Staff operational costs (system administration, management, and security) are also reduced with VxRail. Everything is managed through a single interface, and dealing with a single vendor reduces the number of staff hours coordinating support issues.

VxRail Costs and Example Configurations

The following practical examples show how different organizations might deploy infrastructure to support a workforce requirement using three different options: with physical desktops and laptops, with VMware Horizon running on traditional infrastructure (servers, storage, and so on), and with VMware Horizon running on VxRail. For each scenario, we present estimated costs and compare the equivalent implementations built by the customer using physical desktop or VDI.

The baseline is physical desktops, and the savings are stated in relation to that. In each case, we assume that all data center software is purchased through an Enterprise Licensing Agreement (ELA).

The following basic data is used as input to the calculations:

• Monthly cost of data center space is $1K/rack.

• Cost of power is $0.10/kWh.

• Annual salary for support engineers is $75K, working 1,920 hours per year with a 25 percent overhead for benefits and other costs.

• Annual salary for supervisory staff and technical architects is $120K, working 1,920 hours per year with a 25 percent overhead for benefits and other costs.

Cost calculations depend on the following factors, which are stated for each example:

• Number of users

• **Workforce fluctuation** – Percentage change in the number of users over the course of a year. This will be high for a seasonal business and low for a business which is steady state, with new project load evenly distributed throughout the year.

• **Staff churn** – Number of employees joining and leaving on an annualized basis

• **Concurrency** – Number of staff working at any one time

• **User mix** – Percentages of mobile users, office-based task workers, and office-based knowledge workers

The method used to perform the cost calculations is too complex to document here, but is explained in the VMware End-User Computing Business Case Calculator.

Example 1 – Pharmaceutical Warehouse Working 24x7

In this example, orders are taken mainly online and dispatched from a small number of large warehouses in the central U.S. There are three shifts, with about two-thirds of users working during the overlap at the changeovers, so a concurrency figure of 65 percent is assumed.

A total of 5,000 users perform order fulfilment tasks on the order system. Supervisors and managers have access to this system too, but perform the bulk of their work on another system, to which summary retail data is replicated (so only the 5,000 shift workers are considered in the model).

Business is steady throughout the year and there is only a 5 percent increase in user numbers during holiday periods, to cover staff absences during this time. Staff churn is assumed to be 10 percent, which is fairly typical for the sector.

As Table 1 shows, the initial capital cost of deploying VMware Horizon on VxRail is around 25 percent less than that of using physical desktops and there is a 51 percent project cost saving over deploying VMware Horizon on traditional infrastructure. Deployment and implementation takes less than half the time of 'conventional' Horizon VDI, with correspondingly fewer working days of disruption to the users.

	PHYSICAL DESKTOPS AND LAPTOPS	ON-PREMISES HORIZON	ON-PREMISES HORIZON ON VxRAIL
User devices	$877,832	$197,311	$197,311
User software	$262,500	$446,250	$446,250
Data center infrastructure		$167,417	$154,096
Data center software		$306,250	$306,250
Data center space / facilities		$24,000	$12,000
Power and cooling	$151,200	$30,191	$24,159
Labor costs (management / security / admin)	$2,691,650	$807,495	$628,052
Service provider costs			
Project costs	$56,882	$83,188	$41,077
Total CapEx	$2,975,700	$2,143,259	$2,224,013
Annual CapEx + Service provider costs	$1,140,332	$1,141,228	$1,115,907
Annual OpEx	$2,842,850	$837,686	$652,210
Total per year	$3,983,182	$1,978,914	$1,768,117
Cost per user per month	$63	$31	$28
Savings	Baseline	50%	56%
Time to completion (weeks)	53	40	17
Lost user productivity (days)	2,875	863	406

Table 1: Example 1 Cost Comparison

Example 2 – Large Legal Firm

This company operates out of several offices, but in a geographically limited area in the Northeast of the United States. There are 3,000 users, 20 percent of whom work remotely. Workload is predictable and so workforce numbers remain constant throughout the year. Staff churn is a very low 5 percent. There is no shift working, and there are some periods when all staff are working, so the concurrency figure is 100 percent. All members of staff are highly skilled, whether they are professional or administrative. Support functions such as facilities management are all outsourced, so there are no users performing only routine tasks.

This company can reduce costs by opting for VMware Horizon running on either self-built infrastructure (34 percent savings) or on VxRail (42 percent savings) compared with physical desktops and laptops. As in the previous scenario, the time to implementation and days of user disruption with VMware Horizon on VxRail are less than half of those incurred when deploying conventional Horizon VDI.

	PHYSICAL DESKTOPS AND LAPTOPS	ON-PREMISES HORIZON	ON-PREMISES HORIZON ON VxRAIL
User devices	$672,659	$238,950	$238,950
User software	$150,000	$255,000	$255,000
Data center infrastructure		$186,151	$141,691
Data center software		$300,000	$300,000
Data center space / facilities		$24,000	$12,000
Power and cooling	$77,760	$28,146	$19,058
Labor costs (management / security / admin)	$1,655,273	$659,180	$512,695
Project costs	$43,742	$62,754	$33,661
Total CapEx	$2,102,550	$2,050,560	$1,444,950
Annual CapEx	$822,659	$1,004,101	$947,641
Annual OpEx	$1,733,033	$687,326	$531,753
Total per year	$2,555,692	$1,691,427	$1,479,393
Cost per user per month	$71	$47	$41
Savings	Baseline	34%	42%
Time to completion (weeks)	45	31	14
Lost user productivity (days)	1,575	473	229

Table 2: Example 2 Cost Comparison

Example 3 – Automobile Manufacturing Plant

In this example, the EUC system is required to support 10,000 employees, half of whom are assembly line workers using just a few applications, 30 percent are engineering staff, and 20 percent are mobile. The plant works three shifts, but the majority of staff are on normal, daytime hours—hence the concurrency rate is 80 percent. While staff numbers are constant for the assembly line, the less predictable nature of engineering projects causes an overall fluctuation in total staff numbers of 5 percent through the year. The engineering and mobile jobs are skilled and highly paid, but the company is located in a prosperous region, so staff churn is around 10 percent.

While the initial capital costs of deploying VMware Horizon on conventional infrastructure for this complex scenario are only slightly less than for physical desktops and laptops, deploying on VxRail delivers capital cost savings of nearly one-third. Operational costs for VMware Horizon are significantly lower, for both options, but the reductions in implementation time and user disruption when deployed on VxRail are again less than half of those incurred with conventional infrastructure.

	PHYSICAL DESKTOPS AND LAPTOPS	ON-PREMISES HORIZON	ON-PREMISES HORIZON ON VxRAIL
User devices	$2,051,908	$729,771	$729,771
User software	$525,000	$840,000	$840,000
Data center infrastructure		$592,662	$418,381
Data center software		$875,000	$875,000
Data center space / facilities		$60,000	$24,000
Power and cooling	$272,160	$93,456	$63,041
Labor costs (management / security / admin)	$5,793,457	$2,307,129	$1,794,434
Project costs	$87,541	$130,869	$58,380
Total CapEx	$6,406,995	$6,261,750	$4,306,275
Annual CapEx	$2,576,908	$3,097,433	$2,887,152
Annual OpEx	$6,065,617	$2,400,585	$1,857,475
Total per year	$8,642,525	$5,498,019	$4,744,627
Cost per user per month	$69	$44	$38
Savings	Baseline	36%	45%
Time to completion (weeks)	69	59	23
Lost user productivity (days)	5,750	1,725	813

Table 3: Example 3 Cost Comparison

Case Study – VxRail as a Technological Quantum Leap

In recent years, IT budgets have come under pressure. Organizations have had to use creative strategies to take advantage of unpredictable financial resources as they become available. Here the CIO of a telecoms enterprise describes the challenges she faced when insourcing a call center operation:

"In a commodity business like ours has become, the focus has shifted from expansion to consolidation. It seems like each year we have less to spend, and this has put the squeeze on implementing new technologies, even when we can demonstrate a long-term benefit. Our infrastructure teams' focus has been on 'keeping the show on the road,' while keeping a watching brief on the latest technical developments, so that when we do get some funding we can be ready with a suitable solution.

"When the business decided to bring first-line customer support back from India, we had to plan a solution that would be cost-effective, yet scalable; I didn't want the embarrassment of having to make major changes a couple of years after a big spend.

"Our desktop and server infrastructure was still very traditional, using a wide range of devices of various ages and power. We'd made a start on implementing VDI for IT Support functions, so already had some experience in that area. It would have been fairly straightforward to expand the VDI estate we'd built ourselves, which was performing well following early issues around capacity management. The big decision was whether to continue along that road or go to the next level and purchase appliances.

"We had to decide with a lot of uncertain data. The company in India providing customer support was using different technology and providing services to a number of European and North American customers, so we didn't have much to go on in the way of a capacity model. And as they were losing the business, they weren't inclined to put in a lot of effort to break out the resources used in our operation and help us translate that into requirements for our new systems. So we weren't sure of what we'd need by way of CPU and storage, never mind stuff like backup strategy. Whatever we built would have to be flexible enough to handle the initial load, whatever that turned out to be, and be expandable if requirements should change in the future.

"In the end, the decision made itself. The deadline for delivery was very tight, and the short time to implement VxRail was the thing that set it apart. Of course, that isn't the only thing it has going for it. The lower operational costs going forward make it ideal for a lean IT division such as the one we have here.

"Now that we have VxRail, we're using the definable QoS feature to help us decide where we need more resource. The Data Domain option, with its built-in dedupe, is something we might be interested in too, once we can see how much this will buy us."

Conclusion

For any customer planning to implement VDI for the first time, VxRail is the natural choice. Project costs and ongoing operational expenses are a fraction of traditional desktop and lower than a self-built and managed Horizon-based VDI. The simple and short implementations minimize disruption to business users and there is little to go wrong.

The same considerations apply to organizations upgrading existing systems. A like-for-like replacement of conventional VDI by VxRail simplifies the infrastructure and can be migrated easily.

Customers who already have a large investment in self-built VDI can benefit from the scalability of VxRail. Growing organizations can install a small appliance and add to capacity at low expense as requirements dictate. If requirements are fixed over time, VxRail capacity can be increased as older parts of the existing VDI come up for renewal.

VxRail is the future of VDI.

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