VMWARE PARTNER VLSS ENABLES NASSAU BOCES TO VIRTUALIZE THEIR PEOPLESOFT ENVIRONMENT

INDUSTRY
EDUCATION

LOCATION
NEW YORK

KEY CHALLENGES
- Eliminate legacy architecture
- Migrate to a standardized VMware environment

SOLUTION
VMware UNIX to Virtual Linux Migration Service, delivered by VLSS

BUSINESS BENEFITS
- Eliminated new hardware costs and ongoing maintenance
- Easily provision new environments
- Increased agility and improved utilization
- Improved backups and disaster recovery
- Improved lifecycle management metrics

Reducing CapEx and Accelerating Provisioning Time

With over 2,500 employees, Nassau Board of Cooperative Educational Services (BOCES) provides shared educational and support services to 56 school districts in Nassau County, New York, making it the largest BOCES in the state. Founded in 1967, Nassau BOCES provides students of all ages and abilities access to innovative and cost-effective educational services.

Much of the Nassau BOCES infrastructure is hosted on VMware® at the project's onset; the group utilized an extensive Virtual Desktop Infrastructure (VDI) supported by a VMware administration team. The organization continues to make IT investments in VMware, such as newer ESXi hosts, HPE Proliant blade servers, and Kaminario® solid state storage arrays, as well as active-active data centers. In addition, the web servers and Crystal Reports® (for PeopleSoft®) are running on Windows® on VMware.

The Challenge: Migrating from Aging AIX Environment

Nassau BOCES needed to eliminate the aging, proprietary IBM AIX® architecture and move to a more standardized environment that followed the same protocols and processes as the rest of the existing, robust VMware environment. This migration project was aligned with the VMware vSphere® UNIX to Virtual Linux Migration Service by VLSS. To that end, Nassau BOCES engaged VLSS to virtualize their PeopleSoft environment, which was running PeopleSoft 9.1 for Finance and Human Resources on physical IBM AIX hardware. The application stack (middleware and database) was logically separated on the same physical server.

The organization also had a test/disaster recovery (DR) environment for PeopleSoft running in a separate data center. Every evening, Nassau BOCES ran cold backups of the AIX production environment—application stack and database—and stored them in the DR AIX environment. To refresh the test environment, IT had a complex manual process in place that took about a day.

Since the AIX servers running PeopleSoft were old and needed to be upgraded, the timing was right to move to VMware. In addition, with virtual servers, the IT team could more easily provision new environments when needed. Finally, the backup and DR processes were cumbersome and did not provide the best data protection for the AIX servers and applications. However, Nassau BOCES used Unitrends® backup software to back up their VMware environments so virtualization solved this problem as well.

"A final point worthy of mention is that the migration was completely transparent to our end-users. They had no idea that the application, database, etc., was re-platformed from AIX to VMware. From their perspective, the migration was totally seamless, which was an ideal situation for us."

CLIFFORD STEINBERG
ASSISTANT DIRECTOR OF FINANCIAL AND
INFORMATION SYSTEMS
NASSAU BOCES

PEOPLESOFT ENVIRONMENT
• PeopleSoft 9.1
• PeopleTools 8.53
• Oracle Databases 12.1.0.2

VMWARE FOOTPRINT
• vSphere v6.5
• VMware vCenter v6.5
• VMware vMotion
• vSphere High Availability

APPLICATIONS VIRTUALIZED
• PeopleSoft 9.1
• PeopleTools 8.53
• Oracle Databases 12.1.0.2
• Oracle Enterprise Linux 6.9

The Solution

A key VMware partner with a deep knowledge of the Oracle stack as well as running Oracle workloads on VMware, VLSS helped Nassau BOCES create a VMware environment that now runs PeopleSoft 9.1 and PeopleTools 8.53, with Oracle® Database 12.1.0.2 and Oracle Enterprise Linux 6.9 with Unbreakable Enterprise Kernel (UEK). The new application architecture consists of a Web Tier running Windows on VMware, an Application Tier separated into individual Linux® virtual machines (VMs), and a Database Tier, also separated into individual Linux VMs. In total, Nassau BOCES is running 18 VMs: six for production, four for DR, and eight for testing, split between finance and HR. Each production VM has eight vCPU/32 GB RAM with 100 percent reservation in place, running on a VMXNET3 network card, using PVSCSI SCSI Adapters, with multipathing provided by Kaminario.

In the old AIX environment, Nassau BOCES used Zabbix® to monitor the up/down status of servers. However, with this project, VLSS provided richer performance metrics for both the old and new environments.

To accomplish this, VLSS first attempted to integrate PeopleSoft Performance Monitor (PPM) into Zabbix, but was unsuccessful. While PPM has APIs available for such an integration, there is no documentation available. Instead, Nassau BOCES implemented transactional metrics from the database into Zabbix along with standard operating system (OS) and database checks.

VLSS ultimately built a framework to bring data from the PeopleSoft database into Zabbix, put metrics in place for the old system, and compared those metrics to the new environment metrics. This provides the PeopleSoft team with more monitoring metrics to alert them to problems, so they can now proactively address performance issues before a user picks up the phone to report any issue. This also provided a way to measure whether the transition from the AIX environment to vSphere would impact the user experience.

Reaping the Benefits of Virtualization

Nassau BOCES was able to enjoy a multitude of rewards for forging ahead with their infrastructure future-proofing efforts:

• **Eliminated New Hardware Costs and Ongoing Maintenance**
  From a cost perspective, it made sense to consolidate Nassau BOCES' entire infrastructure onto a VMware virtualized infrastructure, especially since the AIX servers running PeopleSoft were aging and needed to be upgraded. So, in addition to eliminating the costs associated with new hardware, moving PeopleSoft to a VMware environment also eliminated the need and costs associated with AIX hardware maintenance and software support.

• **Easily Provision New Environments**
  From the Nassau BOCES team perspective, moving to VMware has provided greater flexibility as well as more powerful options. Previously, the application environments were limited to physical hosts and competed for resources; for example, the test environment ran on the same server as the disaster recovery environment. With the migration to VMware, the IT team was able to isolate those environments and increase utilization of the underlying hardware. To support provisioning efforts, VLSS developed templates to allow rapid and standardized provisioning of new environments.

vmware®

PLATFORM

- ESXi servers: HP ProLiant BL460c Gen9, 256 GB RAM, 16 cores + hyperthreading

- Network: 4 NICs per host, 10 GbE

- SAN: Kaminario

- Monitoring software: Zabbix

PARTNER
- VLSS

Today, the BOCES PeopleSoft team is no longer restricted by a limited number of AIX servers. To support the new environment, the team now has a test environment, DR environment, production environment, and an environment to support the PeopleSoft 9.2 upgrade project—all without having to restore and juggle environments. This meant that for the first time, the IT team has the capacity to provision multiple environments for testing the PeopleSoft migration while simultaneously preparing and provisioning for an upgrade.

The migration also provided Nassau BOCES with the flexibility to manage separate upgrade paths. Previously, the entire PeopleSoft application was stuck in lock-step. However, by migrating to VMware, the team is now able to separate the HR and Finance modules into separate upgrade streams that better address each department's business needs. Now, they have separate environments for the application, so upgrades to the application, database, and/or operating system can proceed independently.

- **Increased Agility and Improved Utilization**
  During performance testing on the new PeopleSoft environment, the CPU utilization was spiking to 100 percent on the virtual machines, a scenario that would have taken months to resolve in the old environment. With VMware in place, it was a simple matter of increasing the number of vCPUs from four to eight in the VMs and restarting the servers.

  Additionally, virtualization has allowed the team to become much more agile. There was a desire to investigate PeopleSoft Interaction functionality for BOCES. Becuase of the change to a virtualized platform, the Interaction Hub environment was provisioned in an hour versus the weeks/months it took in the old environment.

- **Improved Backups and Disaster Recovery**
  Nassau BOCES also realized improvements with backups and DR. Previously, file restoration and nightly database backups were a time-consuming process. Now, the VMware infrastructure is protected by Unitrends, allowing the team to perform more regular snapshots.

  The organization has also improved its DR Service Level Agreements (SLAs) and can restore an entire system/server in a short timeframe. Previously when hardware failed, the restores were done from tape. With the migration, Unitrends now integrates with VMware snapshots and allows for restores that improve Recovery Time Objectives (RTOs). Running on VMware and Kaminario solid-state storage improved backups, restores, and database refreshes by 50 percent.

  Virtualizing the PeopleSoft environment with VMware also provides Nassau BOCES with more options when evaluating DR hot-sites off the island or off the grid.

- **Improved Lifecycle Management Metrics**
  VLSS also improved the Zabbix Dashboard, which only provided "up/down" information in the old environment. Now, the Nassau BOCES team gets information on additional metrics such as concurrent logins and CPU utilization, allowing the team to proactively address performance problems.

- **Other Key Benefits**
  ○ Continuous performance improvement: The Nassau BOCES team can now improve performance by easily adding additional CPU power when required.

○ More flexible and improved business processes: For example, the old PeopleSoft 9.1 system had specific certification requirements for operating systems and patches, but with VMware, BOCES can now select the best operating system that fit their needs and matches their skill set while meeting those certification requirements. VMware provides a solid basis for the application upgrades that Nassau BOCES is planning near term.

○ Improved reports/SQRs (Structured Query Reports) reports: After go-live, end-users have reported significant performance improvements from their day-to-day PeopleSoft activities and reports.

○ Improved technical support: The Nassau BOCES team had only two individuals trained on AIX and 10 individuals trained on VMware, providing improved support for the new infrastructure.

Project Challenges Overcome

Nassau BOCES is running PeopleSoft 9.1 and since it was an older version, VLSS discovered some challenges with the backup software when migrating to the supported Linux Operating System (OS). For example, the Unitrends agents were not certified to support Oracle Linux 6.9, but they did support snapshot backups. To leverage the snapshot backups, the database backups were written to separate disks on the production servers to get certified backups in place.

VLSS developed a close collaboration with the PeopleSoft team, who had operational questions about the AIX to VMware migration. For example, in the previous environment, the team backed up the AIX OS using mksysb and then transferred the cold backups to the DR AIX server. To get the team comfortable with VMware snapshots through Unitrends for the OS backups, VLSS replicated the company's AIX backup strategy onto VMware. The database/application backups are still transferred through secure copy to the DR Linux VM. While an active-active DR solution is still being finalized and will further improve DR performance, the production VMs are being protected using vSphere Replication between the data centers.

Since Nassau BOCES is an 8-to-5 organization, the organization is comfortable with cold backups and only required that the virtualization improve SLA performance. To measure this, VLSS implemented new metrics to measure performance in both the old and new environments. Users have stated the new system is noticeably faster.

Conclusion

With VLSS's guidance, Nassau BOCES was able to realize dramatic cost- and time-saving IT infrastructure innovation. Overall, the migration project was a subset of the VMware vSphere UNIX to Virtual Linux Migration Service, delivered by VLSS. Migrating Nassau BOCES' PeopleSoft environment to VMware also complemented their other IT modernization projects and provided many significant benefits, notably a seamless transition for all involved parties. Nassau BOCES Assistant Director of Financial and Information Systems Clifford Steinberg reports, "A final point worthy of mention is that the migration was completely transparent to our end-users. They had no idea that the application, database, etc., was re-platformed from AIX to VMware. From their perspective, the migration was totally seamless, which was an ideal situation for us."

About VLSS

VLSS was founded in 2005 as a group of consultants specializing in Oracle and VMware technologies. With accredited engineering expertise across the spectrum, VLSS has deep knowledge of the Oracle stack as well as running Oracle workloads on VMware. From engineered systems and hyperconverged infrastructure, all the way up to middleware and applications, the firm helps their customers successfully migrate to the cloud and take advantage of automation opportunities. Employing many industry-leading professionals, VLSS also enjoys being one of the four companies partnered with VMware to deliver their UNIX to virtual Linux (U2vL) service.

Want to Learn More?

With partners such as VLSS, an original member of the VMware vSphere Unix to Virtual Linux Migration Service Program delivering seamless migrations to customers, VMware virtualized infrastructure brings the benefits of reduced hardware and maintenance costs to organizations, as well as easier provisioning, increased agility, and improved utilization. To learn how your organization could benefit from VMware partners with infrastructure modernization efforts, visit http://www.vlss-llc.com/ and https://www.vmware.com/solutions/business-critical-apps/oracle-virtualization.html.

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