

Refreshing a Critical Epic Process Easily with Powerful API Tools

Customer profile



Company	University Health Systems
Industry	Healthcare
Country	United States
Website	uhsystem.com

Products

- [Dell Storage SC8000](#)
- [Dell PowerEdge R920 rack servers](#)

Technology challenge

University Health System needed to develop a new process for completing daily refreshes of its Red Hat Epic production environment in a new virtualized environment.

Solution

The organization used Dell Storage SC8000 API tools to design a new SUP refresh process and a Master Bash controller script that runs on a separate dedicated Red Hat virtual guest host.

University Health System is a growing healthcare organization with locations in Shreveport and Monroe, Louisiana. University Health offers 698 beds and 57 operating rooms, and sees more than 400,000 clinic visits and over 80,000 emergency department visits annually.

Approximately 3,500 health professionals use the organization's Epic Electronic Health Records (EHR) system each day. To reproduce issues that may occur in the production system for troubleshooting by the IT staff, an "IT playground" called SUP is updated with accurate production data. The goal is that the SUP system reflects the PROD (production) system as closely as possible, so accurate troubleshooting can occur without impacting production.

To ensure the SUP system closely reflects the PROD system, the organization's IT team routinely performs the SUP refresh process, a support system refresh process that copies current PROD system data and puts it into the SUP system, so that SUP data matches production data. "If nurses or doctors are having technical issues with our EHR, and they call for assistance, the help desk or other IT professionals can't do much if the patient records haven't been refreshed in our SUP system to accurately reflect what's seen in the production system," says Huey Hammontree, systems and programming manager, University Health System. Unfortunately, due to bandwidth constraints, IT only conducted SUP refresh a few times each week. "If someone was trying to troubleshoot, the best they could work with was data that was three days old," says Hammontree.

In response, the organization's leadership requested that the SUP refresh process take place every night. But doing that was challenging, because the organization had recently moved its Epic Caché environment

to a Red Hat virtualized environment running on VMware 5.5 and ESXi 5.5. "We needed to quickly come up with a new process to address how to do a periodic refresh from our Red Hat Epic virtual production environment to our new virtualized SUP environment," says Hammontree.

Because the virtualized environment is based on Dell PowerEdge R920 servers and a Dell SC8000 Controller, Hammontree decided to take advantage of the Dell Storage API set — specifically the Dell Storage Compcli API tool — to solve the problem. "When I started looking at the Compcli tool, I saw how powerful it was and I knew it could help," says Hammontree.

Using Dell Storage APIs to design a new SUP refresh process

Hammontree designed a new SUP refresh process using a Master Bash controller script that would run on a separate dedicated virtual guest host running Red Hat 6.5. All calls from the script are in the form of "SSH calls" to additional bash scripts, SSH calls to Powercli scripts on a supporting Windows virtual machine, or Compcli API calls to the Dell Storage API set.

The new Epic SUP Refresh flow, from the Master Bash script perspective, uses the following steps (note: "SSH call to powercli script" refers to the SSH call being to the "renew" server, which is a Windows Server):

1. SSH call to Powercli script to check current state of SUP VM.
2. SSH call to the Epic pre-copy bash script on the SUP server.
3. SSH call to instafreeze on the PRD server (Epic preconfigured script).
4. Direct call to Dell Storage Compcli API tool to refresh the SAN replay.
5. SSH call to PRD to Thawprd (Epic preconfigured script).



Dell Storage SC800

6. Direct call to Dell Storage Compcli to create a new Dell Storage SAN volume folder to hold the new volumes to be created from the refreshed replay for today's date.

7. Direct call to Dell Storage Compcli to create new volumes prd 1–8 from the refreshed replay from earlier.

8. Direct call to Dell Storage Compcli API tool to get a comma-delimited file showing the NAA numbers of all the newly created prd 1–8 LUNs. Will use this information later to give the new LUNs more meaningful "human-readable names" other than just NAA numbers.

9. VMware rescan of the LUNs, so the ESXi hosts in the VMware cluster pick up the newly mapped SAN LUNs.

10. SSH call to Powercli script to give the LUNs created above human-readable names.

11. SSH call to Epic bash script on SUP to unmount the volumes from the Red Hat OS perspective.

12. SSH call to Powercli script to unmount the original disks from the SUP VM that was documented at the beginning of the entire process.

13. SSH call to Powercli script to unmount the original LUNs from the VMware ESXi hosts that were documented at the beginning of the entire process.

14. VMware rescan of the LUNs, so the ESXi hosts in the VMware cluster pick up the newly mapped SAN LUNs.

15. SSH call to Powercli script to add the new disks to the SUP VM. Note: When removing the disks from the VM during scripting, it is important that the

Business Benefits

• Simplifies scripting through powerful API tools

University Health System was able to greatly simplify scripting when creating the new SUP refresh process. "My entire scripting process was simplified because of the Dell Storage Compcli API tool," says Hammontree. "That saved me from having to use a very manual process for everything. After I created new LUNs from the refreshed replays and placed them in a particular Dell Storage SC8000 folder for that day's refresh, I simply made a call to the Compcli API tool, which provided comma-delimited files of all the LUNs made in that particular Dell Storage folder I had just created. That made it much easier to map to the ESXi hosts in VMware."

Hammontree was also able to speed up the replay creation process by using the Compcli tool. "The Dell Storage Compcli API tool did the replays and creation/deletion of the LUNs, so I only had to orchestrate the API calls," says Hammontree.

• Refreshes patient data nightly

Because the SUP refresh process now takes place every night, the data is current, and support staff can resolve issues faster than before. "Before, if a nurse or doctor opened a help-desk ticket, the patient data might not have been updated in the SUP copy of the system yet because the SUP refresh only happened twice a week," says Hammontree. "Now, the SUP refresh process is completed in 50 minutes, every single night, so our support staff has the latest data whenever it's needed. As a result, they can resolve support tickets a lot faster."

• Provides flexible programming platform

The University Health System IT team took advantage of the flexibility of the Dell Storage platform, which provides API tools that enable administrators to control it from other management technologies in the environment. "Using the Dell Storage Compcli API tool was extremely helpful for our environment, because you can have the Compcli API toolset dump out information about the Dell Storage SC8000 SAN into comma-delimited files," says Hammontree. "It doesn't matter what programming language you're working in, as comma-delimited files are used universally."

Going forward, Hammontree plans to use Dell Storage API tools on additional projects. "I've only just scratched the surface of what this platform can do for us," he says.

process be done in reverse order.

16. SSH call to SUP Epic script to mount the Red Hat volumes from an OS perspective.

17. Direct call to Dell Storage Compcli API tool to remove SAN mappings for each of the old LUNs from VMware Cluster.

18. SSH call to SUP to do Runtasks.

19. SSH call to Powercli to get the post

state of the SUP VM and its disks and compare them to the original state. If they are the same disks, then the process failed. If not, the process was successful and you can send an email confirming it.

Hammontree has also created a separate tool that is now incorporated into the master bash script that performs SAN cleanup of previously used SUP luns that are no longer "in play" to help recoup valuable storage space.

For further information go to: Dell.com/Epic | Dell.com/customerstories

