

Migrating Healthcare Databases

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Agenda

- Why Migrate?
- Plan
- Test
- Update Plan
- Execute
- Clean Up
- Example Migration Scenario

Why Migrate Healthcare Databases?

- Upgrading Hardware
- Upgrading Operating System
- Upgrading SQL Server Version
- Upgrading Application
- Changing Software Vendor

Migrating Quickly

- Clinical systems now critical to patient care and treatment
- Paperless systems
 - No going back to paper chart
- ARRA will bring even more EHR's

Plan the Migration

- Document steps
- Include users, application experts, technical resources, and vendor

Test the Migration

- Test in Lab first if available
- Test on Production environment
 - Take timings to predict outage to users
- Perform a ‘mock’ migration
- Allow users to test ‘mock’ environment
- Allow enough time for testing the ‘mock’ environment

Update Plan

- Testing finds issues
- Address Issues
- Update plan
- Re-test

Execute

- Done off-hours to minimize effects on users
- Subset of users test system prior to 'live'
- Conduct Post-mortem to address issues and learnings for next time

Clean Up

- Remove and scrub patient data from old servers
- Free up unused storage
- Re-use or recycle old servers
- Reclaim software licenses if possible
- Disable old urls

Sample Migration Scenario

- Migrate from old server cluster:
 - Microsoft Windows 2000 Enterprise
 - Microsoft SQL Server 2000
- To new server cluster
 - Microsoft Windows 2003 Enterprise
 - Microsoft SQL Server 2005

Plan for Example Scenario

- Build new Microsoft Windows 2003 server cluster
- Install Microsoft SQL Server 2005
- Build new application server in order to test the database

Plan for Example Scenario

- Use Microsoft SQL Server Backup to create full backup of old data at point in time
- Use Microsoft Robocopy to copy backup files to new server (from Resource Kit)
- Restore backup using Microsoft SQL Server restore – leave database in ‘Loading’ state

Plan for Example Scenario

- Use Microsoft SQL Server Backup to create Differential backup of old data at point in time
- Use Microsoft Robocopy to copy backup files to new server
- Restore backup using Microsoft SQL Server restore – completes the backup
- Allow users to test from new application server

Perform Test of Scenario

- Build all servers
- Look at your full backup jobs for current timings
- SQL Server Agent/Job History
 - BACKUP DATABASE successfully processed 16427858 pages in 3959.042 seconds
 - $3959 \text{ sec}/60 = 66 \text{ minutes}$

Perform Test of Scenario

- Run Microsoft Robocopy test
 - Pipe output to file to have a hardcopy record of testing
 - Robocopy X: Y: test.bak >c:\rcopy.txt
 - Bytes : 28.927 g
 - Times : 0:43:07
- If times are too long for outage may need another solution
 - Robocopy is multi-threaded so split file above into 3 and it will take 1/3 the time
 - In this case 15 minutes

Perform Test of Scenario

- Use Microsoft SQL Server to Restore the full backup
 - Find timings from Job History
 - RESTORE DATABASE successfully processed 16427858 pages in 2057.073 seconds
 - $2057 \text{ sec}/60 = 34 \text{ minutes}$
 - Restore times are shorter than backup times because of new hardware

Perform Test of Scenario

- Overall time for backup, copy, restore
 - Backup 66
 - Copy 15
 - Restore 34
- Add them = 115 minutes ~ 2 hours
- Start this process about 5 hours prior to scheduled downtime

Perform Test of Scenario

- Check timings for differential backup, copy, restore for 5 hours
- This becomes actual outage time of only about 5 minutes
 - Backup 2
 - Copy 1
 - Restore 1
- After restore, run Microsoft SQL Server stored procedure to get complete row counts of each database
 - sp_spaceused “table”

Automating the Process

- Create scripts and test them ahead of time to:
 - Run Full and Differential Backups
 - Perform Robocopy's
 - Run Full and Differential Restores
 - Comparing Row Counts
- Speeds up and ensures quality of work

Conclusion

- Future will bring:
 - Larger databases
 - More time-critical systems
- Migrating/Converting databases quickly and accurately will be ever more important