**Heat Group – FAIS SQL Database**

**Alert monitor – L3MichaelDeputy**

**Import data**

select name from sysdatabases where name = 'learnsoftproductuser'

select name from sysdatabases where name = ' GLMdata22 '

select name from sysdatabases where name like '%archibus%'

[\\csentfile1\shared\Groups\ClinicalEng\Archibus\DB\_Backup\](file:///\\csentfile1\shared\Groups\ClinicalEng\Archibus\DB_Backup\)

-> shows what server DB is located on find

import data -

right click DB, tasks, import data

**Logins / Users / Security**

Logins – to server

Users – to DB (Must be associated with a Login)

Setting up a new login – expects windows authentication via AD

IF App can’t use AD account, must create a local account (example PDK)

Server based roles (provides security at the server level, not used much, better to limit access vs add it)

User Mapping (under Logins) – sets up user accounts tied to login by database

Database roles (under user) – provides security at the Database level

New Access request for new user: (Non-AD service account – security sends to us and we create)

1. Request goes to security
2. We check to see if a group exists, if not ask security to create a group and put user(s) in it
3. Add group as SQL login and create users for needed DBs

**Security request for service accounts:**

Facility - Alverno

Your relationship to users - Self

Forward to Supervisor

Select request change of Access for you

Select (on left-hand side)

No application access needed - ID only

In text box include the following:

Please create the following new accounts

E10NTSLEEPLAB-SQLS

E10NTSLEEPLAB-SQLA place this account in security group SSFHS\SQL Server Agent

Note - This will run the services on E10NTSLEEPLAB server. Please send me the passwords.

**SQL license Structure (cost: ?)**

1. By processor – most common
2. By User (CAL) – Only if requested
3. By Device (CAL) – rare

No special characters for passwords if vb\_programmers have access – VB programs could have issue with special character passwords.

**Backups**

Netbackup request for SQL:

which directories should be backed up:

E:\MSSQL\Backup

C:\MSSQL\_Script\_2k8

Which directories should be excluded?

\*.mdf – master data file

\*.ldf – log data file

DNS – Yes

Backup SQL DB

via GUI

1. Right-click db, select tasks, backup
2. Select Destination, Back up to: Disk, Click Add
3. click … button, select K drive, MSSQL, Backup, Restore, change name, run

via Script

BACKUP DATABASE [RMPro] TO DISK = N'K:\Mssql\Backup\Restore\RMPro\_preUpgrade-test.bak' WITH NOFORMAT, NOINIT, NAME = N'RMPro-Full Database Backup', SKIP, NOREWIND, NOUNLOAD, STATS = 10

GO

**Stored Procedures**

xp\_fixeddrives – shows drives & disk space on a given server

**Database properties page**

Options

Collation: rarely changed, leave as default, determines sort order

Recovery Model: We set to full for production, simple for test (no transaction log recovery)

Compatibility level: used when upgrading to a newer version. If issues may need to run in prior version mode.

Note – We always want to go to latest compatibility level when we can. We can do this when the DB is up and live.

Other options:

Automatic – False, True, False, True, False

Note\* - Never use Auto Shrink (fragments disks, screws up indexes)

Recovery – Checksum (Best option) or Torn\_Page\_Detection 🡪 both of these look for corrupt disk

State – Read-only mode 🡪

1. This is useful to migrate to another server and still let user see but not update DB.
2. Heat Reporting DB – makes it faster because it doesn’t have to worry about record locks

Restrict Access (single user mode) – Used sometime at DR at server level to make sure nobody else is doing anything

Server properties (memory) – Can control memory allocation. Useful when multiple SQL instances on one server based on each instances needs

**Troubleshooting:**

K drive is full – 1. run xp\_fixdrives, 2. run cleanupbackupfiles (SQL Server Agent, Jobs)

**Spotlight – Tool to monitor some of the SQL servers**

Max I/O Wait – ideally under 11.00 MS / no issues seen as long as under 100.00 MS

Page Life Expectancy – ideally above 5 minutes (How long page is available in memory, higher the number, better the performance)

Hit Rate – How often SQL finds the data in memory , higher the better

SQL 2000 – 1.59 max memory use limitation

Stolen Pages – stored procedures loaded into memory

blue – means informational message

If you ever see these errors on OAINTPMMSCA there is a process to fix these. It is documented in the wiki (<https://corewiki.ssfhs.org/wiki_database/index.php/PMM-SCA_Job_Failure_Recovery>)

**Claim format install (SQL 2008 – OAINTHHDB)**

Email comes with links

RDP into oaimfphc00 or oaimfphc01

Go to M:/install format/

Create a UNC path to \\oaimfphc00\m$

click on link and copy \*.MDB file to the install format folder using UNC path

Go back to RDP session -> run shortcuts based on DB list provided in the email

Run scripts if needed –

1. email needs to contain which DBs to run against
2. links to \*.sql scripts
3. values for parameters in the scripts
4. Open oainthhdb through management studio
5. click on \*.sql link in email, select open
6. select DB in dropdown above object explorer
7. change parameters as requested
8. execute against all DB’s requested

**SQL Profiler (Under Start, programs, SQL 2008 R2, Performance Tools folder)**

Sometimes get requested to do these from the vendor or we are asked a question where it is helpful to do it ourselves. Usually save it to a file for someone else, save to a table if we do it.

It is rare to do this

Handy report – Right-click on DB, Reports / disk usage

auto-growth is not ideal but we do it. We can adjust it if it’s happening too often

Don’t currently have an automated way to determine which DBs are autogrowing often

**Linked server relationships**

**NOTE: If this involves clarity DB follow up with Tim Landrum**

SQL has 4-part naming: [servername].[dbname].[owner/schema].[object]

SQL can’t find other servers without adding a linked server relationship

1. Need to create a new login on destination server and give access to the DBs they need to get to
2. Create the link under server objects / linked servers on DB you want to work from

**Restore a table**

You can’t directly restore just a table but you can restore the DB to a different name and then grab the table out of there.

select \* into “new table” – builds a copy of an existing table.

SQL test server: OAINTSQLTST1

Quest SQL Litespeed – If this is installed you can’t do the standard backup / restore – it will fail (see wiki for how to use litespeed)

Extended stored procedures – (external to DB code) usually only standard SQL ones there (dbo.xp.\* indicate Litespeed is installed

**Policy management** – similar to group policy for SQL, may see alerts as Dep test things out.

PM on SQL 2008, can be added to 2003, 2005 – located under Management, Policy Management, 3 parts:

Facets – what you are looking at

Conditions – what it should look like

Policies – what action you take

**Restore a DB to a different server**

Backup DB to the restore directory using copy only if 2005 or older

copy backup to new server

1. open source and dest server using start \\<servername>
2. copy source to dest
3. right-click database on new server and select restore
4. type in name of new DB
5. Confirm new DB is owned by SA < DB properties, Files page>
6. If you have identical login id on dest server you may get error when trying to map it to new DB if so run following command:

EXEC sp\_change\_users\_login ‘update\_one’, ’<user>’, ‘<user>’

Note: may need to “fix” ‘ marks in sql

Note2: If you have a number of logins with issues consider the following steps.

1. Delete the logins associated with this database from the test server, then export and import those users again from the prod system again.  Then all refreshes will have the correct SID.
2. The next time you fix the users, keep track of the users you fix with the script below. Then combine that into a script and run it each time.
3. If you need to copy login over:
4. Go to system databases, master, programmability, stored procedures on source Server
5. right-click execute dbo.sp\_help\_revlogin
6. NOTE: if revlogin is not there follow DB wiki instructions to create it.

\\oaintfile2\shared\Groups\Database\Utilities\Migrating SQL Logins

<https://corewiki.ssfhs.org/wiki_database/index.php/Migrate_SQL_Server_Logins>

1. click on messages
2. copy - DECLARE @pwd sysname to new query on dest server
3. also copy login you want to move into same query and execute

**SQL alerts –**

Backup Full with Recovery failed, Backup recovery initiated, Netbackup problems

Description: These alerts are specific to SQL 2000. It has to do with the full backup on SQL trying to take place and Netbackup has an issue and hasn’t released the file. In 2000, the backup always has the same name and so the new file can’t get created because the old one can’t be moved or deleted.

Action: Script has been modifed to self-correct. No action needed.

Backup Xlog failed – only care if happens every hour several times in a row.

SQL Express: We don’t support at all. Strongly preferred that they stay in supported version.

No cost if DB is added to existing cluster. $10,000 if needs own instance

SQL Support Contract:

Switching from per processor to per core

Our contract expires in June 2014

1 processor = 4 cores for default conversion

16 cores limit for standard SQL 2012

Enterprise – no more cal licenses on new ones

Mobility and SA available on Standard and Enterprise -> This means we can start doing SQL on VMs!

Deployment planning (consulting days dedicated to SQL planning)

Activity monitor: server level view of server stats within management studio (button on the far right)

**New DB request**

Build all new databases DBs on server: OAINTDBVS9\SQL10

1. Right-click Databases, select New Database
2. change owner to sa
3. confirm owner is sa
4. <only if requested> Create new SQL server login using name of DB + User, example DB Test, Login TestUser
5. Strong PW with no special characters, uncheck enforce password expiration
6. Change to SQL Server authentication
7. Grant this login db\_owner rights to DB
8. backup DB to to K:\mssql\backup\prod\<DatabaseName> so the trans log backups run correctly
9. Send server name, db name, and User ID and pw to requestor
10. Enter PW in NPM

**New access request**

Don’t give to individual. Have security create a group and add them to it. Then add group to SQL.

Disk busy on H backup drive – probably due to Backup job running late. Nothing to worry about.

to check things, go to job activity monitor, right-click and view history, scroll down in the detail window to see duration.

View / change a SQL jobs log

1. SQL Server Agent, Jobs, right-click job you want to look at
2. select steps, edit, shows location of file if being created, can also change it

change SQL jobs schedule

1. see one above
2. select schedules, edit, change as needed, do quick change.

**Retire SQL DB Server**

1.  Defect the server from the SQL Server Agent (right-click, select ‘Multi Server Administration’ select defect)

2.  Remove from CMS

3.  Delete instance out of CMDB

4. Delete AD SQL accounts

**Add DB to CMDB**

<https://corewiki.ssfhs.org/wiki_database/index.php/Add_a_Microsoft_SQL_server_to_automatic_CMDB_updating>

**Load a spreadsheet,** GLMdata22 – 2005 SQL7

1. confirm test or prod
2. move spreadsheet to desktop
3. right-click DB, tasks, import data, to load the spreadsheet in
4. change data source to excel
5. browse to spreadsheet, hit next
6. Copy data from one or more tables (default)
7. Select all sources
8. rename destination with date stamp, next
9. Run immdiately (default),next, confirmation hit finish

Script examples

This script finds data that is null in one field , matches on another field in another table and then inserts value back to original table.

**Delete example:**

delete FROM [HEATProd].[dbo].[HEATCAI]

where LoginID = 'sjxv1'

**Update example:**

begin tran

update [HEATProd].[dbo].[HEATCAI]

set CustID='sjxv1'

where LoginID = 'sjxv1'

commit

begin tran < - put this in front of sql command you want to try

if command runs successful use following command

commit <- highlight and run this only

if command is not successful use following command

rollback <- highlight and run this only

update DocTrk set RecDat = (select cpldat from PatCht

where CreDat >= '2005-01-01 00:00:00.000' and CreDat <= '2009-12-31 23:59:59.000'and DocTrk.DocSys = PatCht.DocSys ) where DocTrk.RecDat is Null

--rollback

Netbackup Restore request:

Heat self service:

<http://oaintheatss1:8180/HeatWebUI/hss/HSS.html>

Call Type: Backup-restore

Description: File restore request

Server name:

Full File Pathname: (see below)

here is a script to run against the msdb database to find the file you need restored:  select physical\_device\_name from backupmediafamily where physical\_device\_name like ('%\_Accounts\_Test\_full\_20120722\_23%')

Original location

most recent (if there is only one file)

**Netbackup problem messages…**

If you see these over and over. Go look at the SQL logs. If you see a message about file being used by another process you can verify by using process monitor (portable app) on the server. Netbackup process is (bpbkar32). If this is the case contact NBU guys via email if test, log if live.

**SSIS job setup: (currently have packages on oaintdb4)**

Note: DTS was cluster aware SSIS is not

Connect to integration services using connect button, type in server name.

Under stored packages, MSDB, create a new folder for your packages.

right-click new folder and select Import Package.

change package location to File System

put in package path, hit ok

go back to server, right click jobs and select new job

add name, change owner to sa

change category – uncategorized usually

add description

go to steps, select new

add step name, change type to ‘SQL Server Integration Services Package’

type in server name (where package is located)

select package to run, hit ok ok

refresh jobs folder, test run package

schedule package if needed

JCAPSTest – oaintdbvs9\sql9

SSIS jobs – run on oaintdb4

**Install 2nd instance**

**Create index**

1. go to table they want index on
2. if data is unique select unique text box
3. Clustered Index – Database is reordered based on Indexed field. (Can only have 1 Index per table) Name format: CI\_<tablename>\_<field>
4. Non-Clustered Index – creates pointer table based on Index, Name format: NCI\_<tablename>\_<field>

**Making server a target fails.**

most likely one fo two things,

1. the MSXENCRYPTION channel has not been set to '0' and rebooted
2. the BHANTEXPERDB-sqla account is not in the SQL Server Agent group.
3. If both of those are set then I need to see the error message.

**SA account info**

1. don’t give to vendors on consolidated SQL DBs
2. we do not allow the use of the sa account for client or application conenctions.

**Locked pages in memory**

1. locked pages in memory yes on all physical machines (it conflicts with the balloon drive in vmware)it keeps SQL from getting swapped to pagefile (and running much slower)
2. Advanced windowing extensions, it the method that 32-SQL uses to access greater than 4 GB of RAM. it is accessed on the properties page of the database server on the memory tab

**SQL 2012 notes**

Transaction log full – backup DB, change to simple recovery, empties log, switch back. >>cinfo, or willie usually the cause, very rare 1x per quarter, epremis during index maint (dbcc runs on Friday night) – data loss possible, giving additional disk space is best way to go.

Backup Compression (New with 2008) (6-8) – started using it to replace litespeed, all 2008 R2 has it, storage team doesn’t like it.

Data file compression – clarity DB only one using it right now.

Differential Backups?  Copy-only Backups. >>> Do this if copying a prod DB

Synchronized recovery of multiple DB’s – Do we have this scenario? (7-25) >>> don’t have this yet.

Contained Users (2012) (User Access only at DB Level) (9-20)

User Defined Server Roles (2012) (10-10)

SQL Server Audit / Extended Events (12-12) – C2 Audit mode? >>> only available in enteprise mode before 2012

Why don’t we use the Operator setup? >>> could find uses for this

Fill Factor and pad index (16-19) >>> resources keep us from doing much with this.

SQL Server Profiler / Extended Events Profiler (17-3) >>> Use it sometimes if requested by vendor, investigating deadlocks

Tuning Advisor (17-21) >>> more on the development end of things, we don’t use

Data Collector (18-16) / Management Data Warehouse >>> this on the install notes as don’t use for now

Dedicated Admin connection >>> Dep has used once every

Dynamic Management Views (DMV) -

**Migrate DB to a new server**

1. backup DB
2. put old DB in read-only / restricted User mode
3. copy backup to new server
4. restore DB to new server
5. verify Logins are ok

**Check version of SQL:**

SELECT SERVERPROPERTY('ProductVersion') AS ProductVersion, SERVERPROPERTY ('ProductLevel') AS ProductLevel, SERVERPROPERTY('Edition') AS Edition, SERVERPROPERTY('EngineEdition') AS EngineEdition;

**SQL Sizing / Space**

F:\ 50 GB Data

G:\ 15 GB Xlog

K:\ 25 GB  Backup

xlog file should be 25% of datafile as rule of thumb

**Report Server Failed - OAINTHEMMDB**

<https://corewiki.ssfhs.org/wiki_database/index.php/OAINTHEMMDB_Report_Server_Refresh_Failures>

**DB Performance Issues (Possible solutions)**

* Disable / Drop indexes and rebuild them
* Disable Triggers
* SQL Trace via activity monitor – right click process you want to trace

Test DBs should be setup in simple recovery mode

backup-full has 6 steps is older job doesn’t work as well as new one.

ignore backup full alerts on sqlmsx CMS servers

ignore failed xlog backups unless several in a row

sql maintence failed ignore – usually caused by deadlocks

ignore PMM test

ignore RMDW ETL load

Spotlight – days since last backup – problem if on a different day than Saturday.

policy management ignore

Prod SQL DB restore

* + - 1. Do a backup
      2. setup the restore and hit the script button.
      3. log into the DB server and verify you have the files you need.
      4. if you need to go back before 9 PM the prior day you will probably need to submit a restore request. See note above.

**Reclaim space from large xlog (transaction log)**

<http://msdn.microsoft.com/en-us/library/ms190757(v=sql.105).aspx>

1. DB properties
2. Point to **Tasks**, point to **Shrink**, and then click **Files**.
3. Select the file type and file name.
4. Optionally, select the **Release unused space** check box.

**Friday night cluster reboots**

9:00 PM – OAINTDBCL3, OAINTDBCL4, OAINTDBCL7, OAINTDBCL8, OAINTDBCL9, OAINTDBCL10, OAINTVCC02, OAILXIRON1,

10:00 PM – OAINTEPCLARC1, OAINTEPCLARC2

**OAINTDBCL3, OAINTDBCL4**

1. Remote Desktop into OAINTDBCL3
2. Start programs, admin tools, Cluster Administrator
3. Click on groups
4. Right-click server and select move group
5. Bounce OAINTDBCL3
6. Remote Desktop into OAINTDBCL3
7. Move all 3 servers back to CL3
8. Bounce OAINTDBCL4

**OAINTDBCL7, OAINTDBCL8**

1. Remote Desktop into OAINTDBCL7
2. Start programs, admin tools, Cluster Administrator
3. Click on groups
4. Right-click server and move all virtual servers to cluster 8
5. Bounce OAINTDBCL7
6. Remote Desktop into OAINTDBCL7
7. Move all servers to CL7
8. Bounce OAINTDBCL8
9. Remote Desktop into OAINTDBCL8
10. Start ping of OAILXIRON1
11. Run c:\rebootsvc\reboot\_oailxiron1.bat
12. Watch for OAILXIRON1 to come back up, if not open critical log with security team.

Note:  sometimes servers (CL7 and CL8 haven’t come back up, cold boot from iLo if necessary)

**OAINTDBCL9, OAINTDBCL10, OAINTVCC02, OAILXIRON1**

1. On my laptop Start, Admin tools, failover cluster manager
2. Right click failover cluster manager select manage cluster
3. Move all servers to CL10
4. Bounce OAINTDBCL9
5. Move all servers to CL9
6. Bounce OAINTDBCL10
7. Bounce OAINTVCC02
8. Bounce oaintepboe1, 3, & 4

**OAINTEPCLARC1, OAINTEPCLARC2**

1. On my laptop Start, Admin tools, failover cluster manager
2. Right click failover cluster manager select manage cluster
3. Move all servers to CLARC2 (where ever Clarity Prod is <<< only move prod 1x)
4. Bounce OAINTCLARC1
5. Move all servers to CLARC1
6. Bounce OAINTCLARC2
7. Move ClarityTest and OAINTEPCLARCDts back to OAINTEPCLARC2

**tempdb fills up**

* + - 1. check for runaway process
      2. In SQL spotlight, look at SQL activity
      3. select locks tab
      4. find SID for locks on tempdb
      5. Go back to sessions tab and find SPID
      6. Find out if you can kill that SPID

**Shrink TempDB Data file without a SQL restart (check with DEP!)**

DBCC FREEPROCCACHE  
GO  
DBCC DROPCLEANBUFFERS  
go  
DBCC FREESYSTEMCACHE ('ALL')  
GO  
DBCC FREESESSIONCACHE  
GO  
DBCC SHRINKFILE (TEMPDEV,1024)  
GO

**Heat Locks up**

* + - 1. Go into spotlight
      2. SQL activity, blocking, get SPID
      3. Find SPID on Sessions tab, if report identify and kill process

**Change DB owner**

EXEC sp\_changedbowner 'ssfhs\x15'

**PDK DB info:**

Server: OAINTDBVS8\SQL8

There are 3 databases:  AIS; Dynamics; AIS\_T (test)

**Modify / update existing stored procedure**

1. Right-click and select modify

2. make changes

3. test syntax

4. execute

**Performance issues**

* + - 1. Update statistics – make sure maint jobs are running correctly
      2. Rebuild Indexes – make sure maint jobs are running correctly
      3. Use perfmon to check page life expectancy (anything over 300 is good) – also available in SQL spotlight
      4. Look for blocking
      5. Look for processes
      6. See diagram below

