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SPIRE Database Management and CUS Configuration Control

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List of Acronyms

CUS	Common Uplink System
HCSS	Herschel Common Science System
CVS	Concurrent Versioning System

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1 Introduction

This document provides information on various topics related to database management, CUS usage and configuration control of the CUS and test control/ccs template definitions.

1.1 Intended Audience

The potential users of this document are those persons directly related with the SPIRE testing on its different scenarios (ILT, AVM, IST) which will be involved in the creation of the test setup.
The test setup is understood as the 'system' that allows the operation of the SPIRE instrument in real or semi-real time, the monitoring of its behaviour and the archiving of the instrument's telemetry.

1.2 Scope

This document is applicable to all test environments, i.e, ILT, AVM, IST, HSC ..

1.3 Assumptions

Despite all SPIRE test environments are run under Linux systems, no assumptions are made here as to the expertise in Linux environment of the person reading this procedure, i.e., you don't need to be a Linux guru to understand it. Nevertheless it would help if you know something about Linux.

1.4 Reference Documents

Ref#	Title	Reference	Issue Nb	Date
RD01	Database Administration Procedures	HSC-HERSCHEL-DOC-0833	0.4	07/11/06
RD02	HCSS Installation Instructions	HSC-HERSCHEL-DOC-0427	1.18	12/10/06

1.5 Applicable Documents

Ref #	Title	Author	Reference	Date

1.6 Document Change Record

Date	Issue Nb.	Affected Pages	Changes
12/02/07	Draft 0.1		Document Created
19/02/07	Issue 1.0		Introduced a section explaining the usage of the TestSetup.txt caltable.

2 Database Management

2.1 Database Creation

This section specifies how to create a versant database using the available versant and HCSS functionality.

2.1.1 System/Software Requirements

Operating system:

- The operating system requirements are mainly those imposed by the HCSS and Versant installation requirements, which can be found in RD01 and RD02
  - o http://www.rssd.esa.int/SD-general/Projects/Herschel/hscdt/releases/doc/Install.html
  - o http://www.rssd.esa.int/SD-general/Projects/Herschel/hscdt/releases/doc/versant/dba-procedures/index.html respectively
- On Linux systems the key parameters for database creation (and in general for all HCSS required operations) can be located in the *user.props* file located under ${USER_HOME}/.hcss directory
- On Windows systems the key parameters for database creation (and in general for all HCSS required operations) can be located in the *user.props* file located under %USER_PROFILE%/.hcss directory

The following must be installed on the system were the database is to be created:

Third parties software:

- Versant ODBMS (v7.0.1.1 or higher)
- Java Run Time Environment (v1.5.0 or higher)

Note: this is the current (13/02/07) setup on both the ILT setup at RAL and the IST setup machines.

SPIRE specific:

- SPIRE Build (#478 or higher) (or equivalent formal release). It is assumed that the SPIRE release contains the correspondent HCSS release. The SPIRE latest build can be retrieved @ http://www.rssd.esa.int/herschel_scripts/hscdt/ccInfo2Html.cgi?theProject=SPIRE&theDisplay=BUILD

Note: all given URL addresses above will prompt for a user name and password. Please ask Steve Guest or Sunil Sidher for this information.

2.1.2 Creating a database

The following steps specify how to create a new database and the expected results of each of the actions performed. The commands should be typed in a terminal of the database server's. For a full description on db management refer to RD01.

2.1.2.1 Allocating the physical space:

Command line: *db_admin -i db_name@db_server*

Expected Result:

```
02-Feb-07 09:43:42.852 LogInitialiser: Initialising using local log configuation file
/home/sg55/.hcss/userlogging.properties
02-Feb-07 09:43:42.942 Configuration: Build number is 1106
Initializing new database system...
[makedb] New database directory created: db_name@db_server
[profile.be] Updated profile.be for database: db_name@db_server
[createdb] New database created: db_name@db_server
[SchemaTool]
[indexing] Creating default indices.
02-Feb-07 09:43:50.200 DatabaseTools: Could not check for multi-user-mode, check is
disabled.
[DBI]
[initv]
Initializing database "db_name@db_server"
02-Feb-07 09:43:50.518 ReplicatingTransaction: Initializing normal Store:
db_name@db_server (main), shadowing disabled.
Initializing database using herschel.ccm.tools.BasicMissionInitializer
02-Feb-07 09:43:50.643 InstrumentModelRegistryImpl: Create new model registry for
instrument HIFI
02-Feb-07 09:43:50.738 InstrumentModelRegistryImpl: Create new model registry for
instrument PACS
```

```
02-Feb-07 09:43:50.739 InstrumentModelRegistryImpl: Create new model registry for
instrument SPIRE
02-Feb-07 09:43:50.906 ReplicatingTransaction: Initializing normal Store:
db_name@db_server (main), shadowing disabled.
Database system initialization finished, system id = 794.
Finished successfully.
```

2.1.2.2 Adding public access to the database:

Command line: *dbuser -add -P db_name@db_server*

Expected Result:

```
VERSANT Utility DBUSER Version 7.0.1.1
Copyright (c) 1989-2005 VERSANT Corporation
```

2.1.2.3 Telemetry Packet Objects index sorting by time:

Command line:
dbtool -index -create -btree herschel.versant.ccm.TmSourcePacketImpl _time db_name

Note: there is no error, the @ part on the db is not necessary

Expected Result:

```
VERSANT Utility DBTOOL Version 7.0.1.1
Copyright (c) 1989-2005 VERSANT Corporation

Creating btree index on herschel.versant.ccm.TmSourcePacketImpl._time...
```

2.1.2.4 Creating a new configuration for this database:

This step is required to associate all changes done to the contents of a database. The philosophy is that a new database will start with configuration config1 and if changes are then made to definitions on the database or calibration tables a new configuration will be required for those changes to have effect. See section 3.1.3 for more information on this.

Command line: *missetup -addconfig config1*

Expected Result:

```
02-Feb-07 09:58:32.639 LogInitialiser: Initialising using local log configuation file
/home/sg55/.hcss/userlogging.properties
02-Feb-07 09:58:32.687 Configuration: Build number is 1106
```

```
02-Feb-07 09:58:33.776 ReplicatingTransaction: Initializing normal Store:
db_name@db_server (main), shadowing disabled.
02-Feb-07 09:58:33.852 MissionSetup:
Using database "db_name@db_server"
02-Feb-07 09:58:33.947 MissionSetup: Mission configuration "config1" created in
database "db_name@db_server"
```

2.1.2.5 Ingesting the MIB into the database:

It is necessary to check the current settings for MIB ingestion before ingesting the MIB. The property which specifies the locations of the MIB files to ingest is ***hcss.mib.datadir*** . This can be found on the *user.props* file under ${USER_HOME}/.hcss. Make sure it is pointing to the directory you want.

Command line: *ingestmib -settings | grep 'mib'*

Expected Result:

```
02-Feb-07 10:04:33.179 LogInitialiser: Initialising using local log configuation file
/home/sg55/.hcss/userlogging.properties
02-Feb-07 10:04:33.224 Configuration: Build number is 1106
+hcss.mib.dumprawmib.stdout=false (Package default property, source:
herschel/mib/defns/mib.xml)
+hcss.mib.preparemib.outdir=. (Package default property, source:
herschel/mib/defns/mib.xml)
+hcss.binstruct.mib.source=ascii (Package default property, source:
herschel/binstruct/defns/binstruct.xml)
+hcss.mib.logfile=mibchecker.log (Application default property, source:
IngestMib.defaults)
+hcss.mib.readallcmds=true (Package default property, source:
herschel/mib/defns/mib.xml)
+hcss.binstruct.mib=/spires/hcssbld/spire/lib/hcss/data/binstruct/mib (Package default
property, source: herschel/binstruct/defns/binstruct.xml)
+hcss.mib.database=db_name@db_server (Application default property, source:
IngestMib.defaults)
+hcss.binstruct.mib.pal.database=database@server (Package default property, source:
herschel/binstruct/defns/binstruct.xml)
+hcss.binstruct.mib.pal.poolname=mibs (Package default property, source:
herschel/binstruct/defns/binstruct.xml)
+hcss.mib.preparemib.indir=. (Package default property, source:
herschel/mib/defns/mib.xml)
+hcss.mib.tabledefs=/spires/hcssbld/spire/lib/hcss/data/mib/defns/table-defns/
(Application default property, source: IngestMib.defaults)
+hcss.mib.datadir=/home/sg55/PFM5/MIB/ (User global property, source:
/home/sg55/.hcss/user.props)
+hcss.binstruct.mib.pal.tm_version_map=default (Package default property, source:
herschel/binstruct/defns/binstruct.xml)
```

```
+var.mib.datadir=/home/sg55/PFM5/MIB/ (User global property, source: /home/sg55/.hcss/user.props)
+hcss.mib.instrument=SPIRE (Application default property, source: IngestMib.defaults)
+hcss.mib.cus_file=cus.script (Application default property, source: IngestMib.defaults)
+hcss.mib.tc_command_list=/home/sg55/PFM5/MIB//auxil/tcmds (Package default property, source: herschel/mib/defns/mib.xml)
+hcss.mib.errorsonly=false (Application default property, source: IngestMib.defaults)
+hcss.mib.tc_command_durns=/spires/hcssbld/spire/lib/hcss/data/mib/example-mibs/example-1/auxil/tc-durns (Application default property, source: IngestMib.defaults)
```

Command line: ***ingestmib MIB_LABEL (where MIB_LABEL is a user specified label)***

Expected Result: (only the last lines of the output are copied here as it is too long)

If there is an error:

```
There was one or more serious problems in the semantics of the imported MIB files. Check the file mibchecker.log for details.
Exception in thread "main" herschel.mib.utils.ValidationProblemsFoundMibException: One or more serious semantical validation problems encountered.
        at herschel.mib.api.MibFactory.createDefinitions(MibFactory.java:411)
        at herschel.mib.api.MibFactory.createDefinitions(MibFactory.java:93)
        at herschel.mib.tools.IngestMib.exec(IngestMib.java:65)
        at herschel.mib.tools.IngestMib.main(IngestMib.java:100)
```

This will indicate an error on the MIB files themselves and therefore nothing you can't do unless you have some insight onto MIB file correction. If this is not the case Sunil Sidher should be able to help you. A mibchecker.log file will have been created on the directory were the ingestmib tool has been run.

If everything went well:

```
MibFactory: There was one or more problems in the imported MIB files. These are not judged to be serious. Check the file mibchecker.log for details.
02-Feb-07 12:16:24.187 MibFactory: Semantical checks done.
02-Feb-07 12:16:28.120 IngestMib: MibDefinitions now added to database with label SPIRE_MIB_2.2.G1
02-Feb-07 12:16:28.127 IngestMib: Ingestion Completed Successfully.
```

Note: despite the reference to "…one or more problems…" this does not stop the MIB from being ingested and can be used normally.

2.1.2.6 Open the cusgui and load this MIB:

Command line:

1. ***cusgui&***
2. **When the gui appears hit tab labelled Mib then hit the load new mib from the drop down menu.**
3. **From the pop up window select the MIB labelled *MIB_LABEL***

Expected Result:

Ingested MIB commands appear on the MIB commands subwindow of the cusgui (on the bottom right)

2.1.2.7 Ingesting required calibration tables onto the database:

Command line: *./UploadCaltables.csh*

Note: the "./" (dot-slash) is important

Expected Result: (only contains the output of the first table loaded for reference)

```
Using database db_name
VERSANT Utility DBTOOL Version 7.0.1.1
Copyright (c) 1989-2005 VERSANT Corporation


Volume 0:
   Sysname "sysvol"    Size: 8387584K
   Pathname "/spired/versant/db/pfm5_test/system"
       Percentage of volume space free in sysvol : 99%
       Free space in vol sysvol : 8361344KB

   Percentage of free space in DB : 99%
   Total available free space in DB : 8361344KB

02-Feb-07 12:26:23.921 LogInitialiser: Initialising using local log configuation file
/home/sg55/.hcss/userlogging.properties
02-Feb-07 12:26:23.978 Configuration: Build number is 1106
02-Feb-07 12:26:24.962 ReplicatingTransaction: Initializing normal Store:
db_name@db_server (main), shadowing disabled.
02-Feb-07 12:26:26.057 Cus: Calibration table "Flash.txt" successfully uploaded from
"/home/sg55/PFM5/CUS/temp/Caltables/Flash.txt"…
…
```

one "successfully uploaded from …" message for each calibration table

2.1.2.8 *Ingesting the CUS definitions:*

It is assumed that a single file containing all latest CUS definitions (building blocks, procedures and modes) which should be named *CUS_Definitions.file* is available at CVS for download.
There are two ways to ingest the CUS definitions, through the cus gui or from command line

Using cusgui:

1. ***cusgui&***
2. Press the tab *Registry* labelled tab then *Import* and on the pop-up window selected the file that contains all the definitions that are to be uploaded.
3. Then commit the changes by pressing the *Registry* labelled tab, then *Commit* window and in the pop-up window insert a comment.

Command line: *./IngestCUSDefinitions.csh*

This shell script is part of the files located on the CVS repository and it executes a cus command to import the same file as specified on the previous step.

2.1.2.9 *Setting the initial obsid for this database:*

An initial obsid (previously selected based on already existing obsids for different dbs) should be assigned to the new database.

Command line: *java SetObsId db_name@db_server start_obsid*

Note: the start_obsid should be given as the hexadecimal value of the start obsid without the '0x' indicator, i.e., if the initial obsid to set is 0x30012001 the command should look like: *java SetObsId db_name@db_server 30012001*

Expected Result:

```
02-Feb-07 12:40:26.714 LogInitialiser: Initialising using local log configuation file
/home/sg55/.hcss/userlogging.properties
02-Feb-07 12:40:26.763 Configuration: Build number is 1106
02-Feb-07 12:40:27.522 ReplicatingTransaction: Initializing normal Store:
db_name@db_server (main), shadowing disabled.
02-Feb-07 12:40:27.637 IdRegistryCommitThread: Creating new IdRegistry entry
idreg_Observation
```

2.1.2.10 *Associating ALL of the previous (MIB + CUS definitions) by creating and instrument model on this configuration:*

Command line: *cus -createinsmodel config1*

Expected Result:

```
02-Feb-07 12:54:31.063 LogInitialiser: Initialising using local log configuation file
/home/sg55/.hcss/userlogging.properties
02-Feb-07 12:54:31.115 Configuration: Build number is 1106
02-Feb-07 12:54:31.968 ReplicatingTransaction: Initializing normal Store:
db_name@db_server (main), shadowing disabled.
02-Feb-07 12:54:32.096 MissionImpl: Using configuration "config1"
```

2.1.2.11 Checking the currently available instrument models in the database:

The following step assumes that an instrument model defined by the property *var.model* located on the user.props file is defined.

Command line: *missetup -listmodels*

Expected Result:

```
02-Feb-07 09:59:12.860 LogInitialiser: Initialising using local log configuation file
/home/sg55/.hcss/userlogging.properties
02-Feb-07 09:59:12.907 Configuration: Build number is 1106
02-Feb-07 09:59:13.883 ReplicatingTransaction: Initializing normal Store:
db_name@db_server (main), shadowing disabled.
02-Feb-07 09:59:13.957 MissionSetup:
Using database "db_name@db_server"
02-Feb-07 09:59:13.968 MissionSetup:
Instrument models :-
SPIRE PFM5
PACS WHOCARES
HIFI WHOCARES
```

2.1.3 Creating a new configuration on an existing database

The following steps specify how to create a new configuration on an already existing database

1. If ccshandler (IST) or testcontrolserver (ILT) applications are running, stop them, by pressing Ctrl-C on the correspondent terminal. If not go to step 2.
2. In order to know which configuration number to create, hit the up arrow in order to get the latest missetup command with the correspondent confign **or** edit the *user.props* file located under ${USER_HOME}/.hcss and look for hcss.ccm.mission.config property. Then on a terminal type: *missetup –addconfig config**n*** *(*where n the correspondent incremental number). Wait for completion, then go to step 3.
3. On a terminal type: *cus –createinsmodel config**n***
4. On the user.props file located under ${USER_HOME}/.hcss update the hcss.ccm.mission.config property to the newly create configuration *config**n***
5. Restart ccshandler (IST) or testcontrolserver (ILT) applications.

2.2 Database Deletion

The following steps describe how to delete and existing database.

Note: This action should only be performed if you REALLY know what you are doing.

2.2.1 Stopping database transactions

Command line: *stopdb –s db_name@db_server*

Expected Result:

```
VERSANT Utility STOPDB Version 7.0.1.1
Copyright (c) 1989-2005 VERSANT Corporation
```

2.2.2 Removing the database

Command line: *removedb –rmdir db_name@db_server*

Note: you will be prompted whether you want to go ahead

Expected Result:

```
Version 7.0.1.1
Copyright (c) 1989-2005 VERSANT Corporation

Are you sure you want to remove the database "db_name@db_server" (y/n) ? : y
```

2.3 Database backup and restore process

The following steps describe how to backup and existing database and restore it afterwards

2.3.1 Backing up an existing database

1. **Command line: *stopdb –s db_name@db_server***

   Expected Result:

   ```
   VERSANT Utility STOPDB Version 7.0.1.1
   Copyright (c) 1989-2005 VERSANT Corporation
   ```

2. **Command line: *dbinfo -1 dbname@db_server***

   Expected Result:

   ```
   VERSANT Utility DBINFO Version 7.0.1.1
   ```

```
Copyright (c) 1989-2005 VERSANT Corporation

Database is in DBA-only and single connection mode ...
```

3. **Command line:** ***vbackup -device devicename -backup db_name@db_server***

Expected Result:

```
VERSANT Utility VBACKUP Version 7.0.1.1
Copyright (c) 1989-2005 VERSANT Corporation


Backing up database `db_name@db_server' to device `devicename':

   0%             50%            100%
   |      |      |      |     |
   ....................................

Backup has completed successfully.
```

Note: this last message may take some time depending on the size of the database you are trying to backup

2.3.2 Restoring a database from a backup file

1. Create directory to hold the database volumes

Command line: ***makedb restoreddb_name@db_server***

Expected Result:

```
VERSANT Utility MAKEDB Version 7.0.1.1
Copyright (c) 1989-2005 VERSANT Corporation
```

2. Restoring the database

Command line: ***vbackup -device 'devicename' -restore restoreddb_name@db_server***

Expected Result:

```
VERSANT Utility VBACKUP Version 7.0.1.1
Copyright (c) 1989-2005 VERSANT Corporation

Restoring database `backedup_db@chichester' from device `temp.bck':

   0%             50%            100%
   |      |      |      |     |
   ....................................

Restore has completed successfully.

Would you like to do another level of restore
on database `backedup_db@chichester'? [ default = no ]
Cleaning up...
```

3 Configuration Control

3.1 Configuration Control Rationale

The rationale behind creating and maintaining a configuration control of the software used during the testing of the SPIRE instrument on any environment was/is to be able to know at some point in the future, which version of which script was used to produce a particular set of SPIRE telemetry data.

3.2 Configuration Control Approach

3.2.1 The CVS SPIRE repository structure

With this in mind, the SPIRE software used for different campaigns has been maintained on the ESA CVS repository: http://www.rssd.esa.int/herschel_scripts/cvsweb.cgi/?cvsroot=Herschel_CVS under the following directory: **develop/main/herschel/spire/instrument/**

Note: Access can be obtained to this repository by means of a user and password combination. You should contact Rob Zondag at ESA for this (rzondag@rssd.esa.int)

A tree structure based on a folder for each test campaign was created under the main directory so that changes to definitions could be tracked separately, as it can be seen in the figure below:

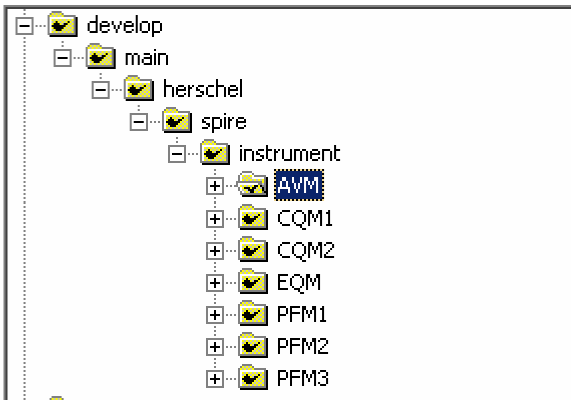

```
develop
  main
    herschel
      spire
        instrument
          AVM
          CQM1
          CQM2
          EQM
          PFM1
          PFM2
          PFM3
```

Figure 1. CVS SPIRE repository tree structure

For the ILT level campaigns each of these folders contains two subfolders: CUS and TestControl in which the CUS definitions and the TestControl scripts are located

respectively. For the IST (AVM) level campaigns each of these folders contains two subfolders: CUS and CCS in which the CUS definitions and the CCS templates are located respectively.
Experience has shown that keeping separate folders becomes difficult to maintain in the long term and the future approach is to have a single folder FM that will hold the latest versions of definitions. The configuration control should be tracked on this folder.

3.2.2 Versioning of CUS definitions

Note: this is not a cvs manual, only a guideline on how the versioning has to be done and therefore not every single step for using CVS will be explicated here. Useful information regarding CVS and WinCVS can be found on the links appearing below:

http://sourceforge.net/docman/display_doc.php?docid=766&group_id=1
And
http://www.thathost.com/wincvs-howto/

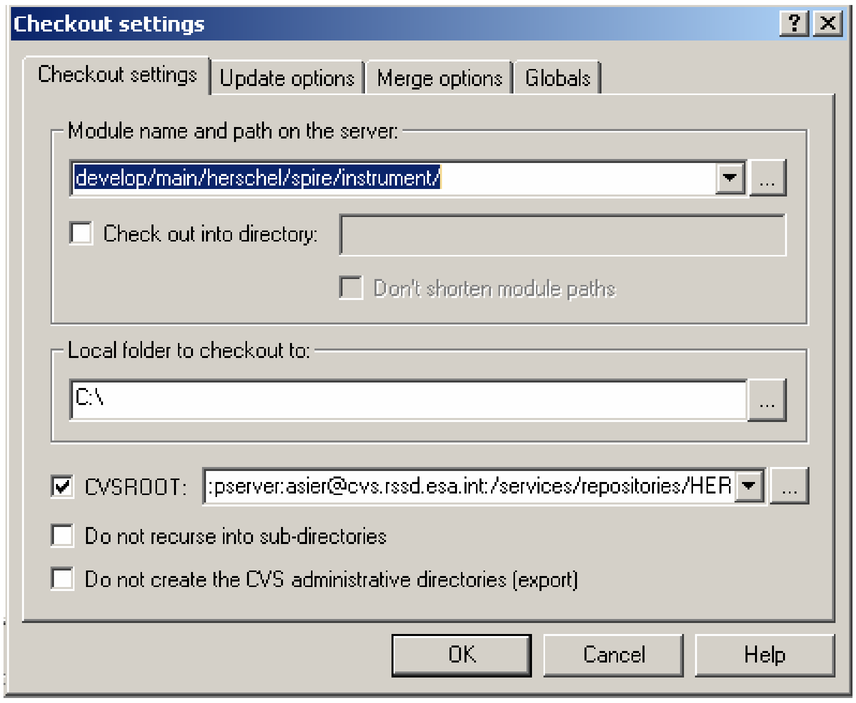
Note: script refers to both CUS definitions and testcontrol /ccs templates

3.2.2.1 Creating a local repository

Creating a local repository of definitions (if there isn't one already) should be the first step towards having a way of tracking changes on scripts. The only assumption on this is that you can download things onto the server you want to create the repository in, i.e., and internet connection should be enough. This local repository will have the same structure than the CVS repository.

Using WinCVS:

On a windows server creating a local repository can easily be done using WinCVS. From the WinCVS gui hit the *Remote* labeled tab and then select *Checkout module* … The pop up window will look like the figure below:


Checkout settings

Module name and path on the server: develop/main/herschel/spire/instrument/

[ ] Check out into directory:

[ ] Don't shorten module paths

Local folder to checkout to: C:\

[✓] CVSROOT: :pserver:asier@cvs.rssd.esa.int:/services/repositories/HER

[ ] Do not recurse into sub-directories

[ ] Do not create the CVS administrative directories (export)

Figure 2. Checking out a module from WinCVS

Using Linux CVS:

On a linux server cvs comman line provides the same functionality as in windows. Just type in (from the location in which you want to create the repository):
cvs checkout modulename

Note: In both cases (Window/ Linux) it is assumed that the user has specified a CVSROOT environment variable. An example of it can be seen on Figure2. On a Linux system this environment variable is usually specified on the .cshrc file located in ${USER_HOME}

See http://www.thathost.com/wincvs-howto/#gettingnew

3.2.2.2 Checking in scripts onto CVS

Prior to the start of a new campaign the definitions that have been verified to be correct using a dummy database on an alternative test setup have to be configured on CVS.
If the definitions did not exist they will have to be added to the repository, if they existed they are updated in the correspondent folder in the CVS repository.

Using WinCVS:

On a windows server updating definitions can easily be done using WinCVS. If the defs did not exist from the WinCVS gui select all new defs then hit the add symbol located on the button bar. After the defs are added hit the commit button in order to make changes effective.

If the defs existed, after having made changes only the commit step is required. When committing changes you will be prompted for comments that will be added to your definitions.
This process may require the creation of a new folder on the CVS repository, a new folder is just as every other file on CVS so the same process of 'creation' is applicable for it.

Using Linux CVS:

Two commands will be required:

1. *cvs add new_def*
2. *cvs commits updated_def*

If the definitions existed step 1 will not be needed.

See http://www.thathost.com/wincvs-howto/#commit

3.2.2.3 *Assigning a 'tag' to the versions*

The previous step will automatically assign initial (or new) versions to those definitions. Once they are checked in, a tag must be assigned to these versions so that each definition has a unique version number + TAG. The way to tag these versions shall comply with the following specification:

TAG NAME = *LABEL_CONFIGN*

Where LABEL = a label assigned to the definitions representative of the test for which these definitions are used, e.g., for the AVM tests *LABEL = AVM_TEST*

And *CONFIGN* = the latest configuration corresponding to these definitions
So the full tag would for example look like:

AVM_TEST_CONFIG6

See: http://www.thathost.com/wincvs-howto/#tag

3.2.2.4 *Configuration control after the test is started*

Because there is the possibility that things (scripts) can change when they start being used for one reason or another, some approach must be taken to the configuration control of these changes.
The HCSS provides a good enough mechanism for this.
Every definition or calibration table that is ingested onto a database gets automatically assigned a version (1). Therefore, if our script had an original cvs version of let's say 1.2 on the repository, when it gets ingested onto the db, its full version becomes 1.2.1.

From then on any changes made to this script must be **ONLY** tracked at the database through the incremental versions automatically assigned by the db whenever a change is done to this script and then committed.
The reason that this versioning should only be tracked this way is that experience says that trying to maintain a versioning system using new versions checked in and out every time a change is made can become highly unstable (i.e. a nightmare) on a system that uses hundreds of different definitions.

When the tests are finished all latest versions of scripts residing on the database will be checked in on the CVS repository and this will assign them a new version (1.3 following the previous example). A tag should also be assigned to these new versions following the guidelines given in assigning a ‘tag’ to the versions.

Since the introduction of the mission configuration concept a set of scripts + calibration tables ingested at one point on a database must be assigned a correspondent configuration. When creating a new configuration this effectively creates a ‘snapshot’ of the database at that particular moment that freezes those versions and therefore any ‘new’ changes performed to scripts since the config was created require a new configuration.
In this scenario the concept of automatic versioning by the database still holds as different versions of scripts will correspond to different configurations.

3.2.2.5 Configuration Control of Test Control/CCS scripts:

Unlike with the CUS scripts which have an automatic ‘tracking system’ provided by the database, the test control (or ccs templates) scripts cannot be tracked the same way and a different approach is required for these definitions.
In this case the control must be done explicitly, i.e. any changes performed to test control scripts or ccs templates must be committed to the general repository every time a change is done in order to be tracked properly. The only ‘effective’ way of doing this is :

On ILT:

The ‘local test procedures’ folder from which the test control scripts are executed at run time must become the ‘local repository’, i.e., this folder must be linked directly to the local CVS repository folder by creating a symbolic link.
For example if the folder where ‘local test procedures’ resides in the ILT setup at RAL is:

Lincoln: /home/sops23e/SCOS2.3eP5/tcl/TC

This folder should be linked through a symbolic link to the correspondent

/develop/main/herschel/spire/instrument/PFM3/TestControl/ for example

On IST:

The ‘ccs templates’ has to be directly the ‘local repository’,i.e., check out the correspondent module from CVS and the use the CCS directory under this tree structure to create (or update) the templates. For example at Friedrischaffen:

The folder */develop/main/herschel/spire/instrument/FM/CCS/* should be checked out onto the database server HOS4-D and the used for tracking changes.

FOR BOTH:

Any changes done to a test control script or ccs template should be done following the specification given in 3.2.2.2

3.3 Structure and dependencies of the CUS definitions

This section has been written to give an overview on the way the changes have been implemented on the latest CUS definitions and calibration tables. These can be found in:

/develop/main/herschel/spire/instrument/FM/CUS on the repository

The main change is the introduction of a calibration table that is used generally for several purposes. The name of this calibration table is *TestSetup.txt* . This table is very important as is used by different CUS definitions in order to decide on which commands to produce.The latest version of this table is showed below.

```
# Table Name    : TestSetup.txt
# Version       : $Revision$
# Update Date   : $Date$
# Purpose       : Used generally for uplink parameter setting
# Applicability : Applicable for all test environments
# Comments      :
#
#   Keys:
#        configuration ---> (used as an informative of the current configuration)
#        -------------
#                 The last row on this table will have 'current' as the value of the configuraiton
#                 and it will be a copy of the penultimate row.
#
#                 Possible values of configuration are 'config1,config2,...confign where n is an
incremental indicator
#
#        env --->(used to specify the environment in which the test is taking place )
#        ---
#                 This key is used by the Proc_SetBBID/Proc_SetOBSID procedures to set (or
not) the test facility ids
#
#                 Possible values of 'setup' key are: (According to Herschel Ground Segment to
Instruments ICD)
#        ICD FIRST-FSC-DOC-0200 Issue 2 Rev 3 18/11/04
#
#                 moc = manual commanding of the instruments during in-flight operations
#        ilt = scheduled operations (test using TOPE scripts) during instrument level tests
#       hsc = scheduled operations (real observations using mission timeline)
#                       of the instruments during in-flight operations
#       ist = scheduled operations (test using CCS templates) during system level tests
#       par = scheduled operations (test using CCS templates) during multiple instrument
system level tests
#
#       test_type --->(used to set the MODE parameter ONLY when test is not ft)
#       ---------
#               This key is used by the instrument procedures to set (or not) the MODE
parameter
#
#               Possible values of 'test_type' are: ft,pr
#               ft = functional tests
#               pr = performance test (EVERYTHING THAT IS NOT AN FT CAN BE
CONSIDERED AS PR)
#
#       instrument --->(used for calibration table selection of SMEC and CREC configuration
procedures)
#       ----------
#               This key is used by the instrument procedures to set the correspondent
parameter for different 'instruments'
#
#               Possible values of 'instrument' are : prime,redudant
#
#       condition --->(used mainly for proper SMEC encoder level setup)
#       ---------
#               This key is used by the instrument procedures (mainly SMEC related)
#               to set the correspondent parameter for different instrument condition
(warm/cool/cold)
#
#               Possible values of 'condition' are : warm,cool,cold
#               warm ( T_mechanism > 100K )
#       cool ( 100K < T_mechanism < 10K )
#       cold ( T_mechanism < 10K )
#
#       dbg_level --->(used for switching the behaviour of debug statements inside the cus
scripts)
#       --------
#               This key is used by CUS scripts generally
#
#               Possible values of 'dbg_level' are:
#               dbg_level = 0 (means debug statements will NOT be printed to std output)
#               dbg_level = 1 (means debug statements will BE printed to std output)
#
string          string  string          string          string          int
configuration   env     test_type       instrument      condition       dbg_level
current         ist     ft              prime           cold            1
```

The main advantage of this table compared to previous implementation on CUS scripts is to make these definitions general enough so that they can be used on any scenario (ILT, IST) by updating ONLY this table and not the definitions themselves.

3.3.1 How this table is used by the different definitions:

The *TestSetup.txt* calibration table uses 5 keys to define:

1. The current configuration
2. The environment of the test
3. The type of test being done
4. The instrument being used
5. The instrument condition
6. The current debugging level for the definitions

3.3.2 Keys explained

configuration:

The *configuration* key should reflect the current configuration number as defined by the *hcss.ccm.mission.config* variable on the *user.props* file of the hcss installation. This is an informative key that tells of the configurations that have been used so far and which was the instrument configuration on each of them (by looking at the other keys for each config). A new row for each new configuration should be created and therefore the table updated with each new configuration.
A sensible way of doing this would be to create a shell script used for adding a new row on this table with the new config and uploading the updated table onto the database and then creating the new configuration. **This script is currently not available though.**
Possible values of configuration are 'config1,config2,...confign where n is an incremental indicator

env:

The *env* key is used to setup the correct null obsids and bbids depending on the current environment in which the test is being done.(ILT,IST,HSC…)

Possible values of 'setup' key are: (According to Herschel Ground Segment to Instruments ICD) ICD FIRST-FSC-DOC-0200 Issue 2 Rev 3 18/11/04
```
#
#               moc = manual commanding of the instruments during in-flight operations
#       ilt = scheduled operations (test using TOPE scripts) during instrument level tests
#       hsc = scheduled operations (real observations using mission timeline)
#                       of the instruments during in-flight operations
#       ist = scheduled operations (test using CCS templates) during system level tests
#       par = scheduled operations (test using CCS templates) during multiple instrument
system level tests
```

test_type:

The *test_type* key is used to set (or not) the MODE parameter when operating the instrument. This key has been introduced to avoid the problems of operating the instrument between non-nominal configurations during functional tests. During the functional tests, the MODE parameter is not set.

Possible values of 'test_type' are: ft,pr
ft = functional tests
pr = performance test (EVERYTHING THAT IS NOT AN FT CAN BE CONSIDERED AS PR)

instrument:

The *instrument* key is used by (currently) the SMEC switch on/initialisation and the CREC procedures to set the different parameters required for PRIME or REDUNDANT instrument operation.

Possible values of 'instrument' are: prime,redudant

condition:

The *condition* key is used by (currently) the SMEC switch on/initialisation to define different encoder and signal offsets for the different instrument temperatures.

Possible values of 'condition' are : warm,cool,cold
#   warm (T_mechanism > 100K)
#   cool (100K < T_mechanism < 10K)
#   cold (T_mechanism < 10K)

dbg_level:

And finally, the *dbg_level* key is used as a general debug level flag currently used by some procedures (not all). The recommendation is that usage should be extended to all at some point.

Possible values of 'dbg_level' are:
#   dbg_level = 0 (means debug statements will NOT be printed to std output)
#   dbg_level = 1 (means debug statements will BE printed to std output)