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HERSCHEL **SPIRE** CLRC		Author: **Allan Dowell and Steve Guest**	Issue: **1.0** Date:**2-March-2007**

SPIRE I-EGSE Set-up Procedure

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Approval:

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Distribution

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                               Bernard Collaudin
                               Benoit Gobillot

ESA   Carsten Scharmberg

Host system	Windows 2000 SP2
Word Processor	Microsoft Word 2000 SR1
File	

Document Change Record

Date	Index	Affected Pages	Changes
2-March-2007	Issue 1.0		First version based on AVM test log at Astrium, Friedrichshafen and SPIRE-RAL-DOC-001630 SPIRE EGSE-ILT Startup Procedures Issue 1.0.

Contents

1   Scope of Document

This document describes the procedures for the safe startup of the SPIRE I-EGSE and the DPU for the AVM testing (AD4) at Astrium, Friedrichshafen, Germany. The steps in Section 5 must be carried out in the order given for the I-EGSE to function correctly. See the section 4 for the prerequisite configuration. Notes of the steps taken on 21st February 2007 are in Appendix A.

2   Applicable Documents

	Title	Author	Reference	Date
AD 1	SPIRE On-Board Software User Manual	Sergio Molinari	SPIRE-IFS-PRJ-001391, Issue 2.1	16/12/2005
AD 2	DRCU Simulator User Manual	H-G Florén & Göran Olofsson	Issue 1.0 Draft 1.5 (?)	26/11/2003
AD 3	Email "Current IEGSE setup at Astrium@Friedrichshafen"	Erich Wiezorrek	N/A	12/02/2007
AD 4	AVM SPIRE UFT Procedure	S. Hamer (TERMA AS)	HP-2-ASED-TP-0142_1A AVM Issue1	22/02/2007

3   Constraints

3.1   Safety Issues

Standard Astrium Cleanroom and ESD Safety procedures must be observed when (de-/)connecting the DRCU Simulator PC to the SVM inside the Cleanroom.

4   Configuration

4.1   Properties

Certain configuration properties must be correctly configured before the system can be run. These properties should generally be entered into the **user.props** file, located in the **.hcss** subdirectory of the home directory (**$HOME**). These properties will then apply to all applications run at that machine. If in doubt, put properties in this file.

Properties can also be entered into a file in the same directory called ***<application-name>*.props***, for example **QLA.props**. These properties will apply to that application only, and will *override* the value in **user.props**. From the QLA, if "properties" is selected from the popup right-click menu, it will by default save changed properties to this file.

Historically, a file called **hcss.props** was also used and located in the same directory. The SPIRE team felt that this led to too much confusion, and this file is no longer used. When it *would* be useful is to specify a set of properties that are *shared* across multiple user accounts. For this to work, the path of this file has to be specified in the **HCSS_PROPS** environment variable. Any file name is possible, and multiple ones can be present, separated by colons. Note that this file has lower precedence than the ones described above.

4.2 Logging

The level at which the (Java) applications log messages can be configured by editing the file **userlogging.properties**, also located in the **.hcss** directory. The exact format of this file is defined by the Java logging mechanism. This is described in the java.util.logging package documentation, particularly the classes LogManager, ConsoleHandler, FileHandler.

4.3 Distribution of Tasks

The following section ("IEGSE Setup Procedure") documents procedures for a way of setting up tasks running over a number of machines. It is not the only way to configure it – there is quite some flexibility available. Here are some general guidelines for how to (and how not to) organise this distribution.

1. Where possible, avoid running non-SCOS tasks on a SCOS machine. The operating system and setup might not be compatible.
2. Make sure the **var.database.server** and **var.router.server** properties are pointing to the correct machine where the database and router are running respectively.
3. Run **tmingestion** on the same machine where the database exists. This is not compulsory, but recommended for performance reasons, given the criticality of this task. For similar reasons, try to avoid overloading this machine.
4. It simplifies the configuration if the router, EGSE Gateway, and the Pipe Gateway are run on the same machine. TCP/IP port connections are then localised in a single place.

4.4 Symbolic Links

The following aliases (symbolic links) were created on SCOS machine (HOSS2K4-2):

      hfiles   was linked to **/data/SPIRE/hfiles/AVM_UFT_1/**

      TMD   was linked to **/data/SPIRE/TMD/AVM_UFT_1/**

      data/ASCII   was linked to **/home/sops23e/SPIRE/conf_avm/data/ASCII/**

These symbolic links, **/home/sops23e/hfiles** and /**home/sops23e/TMD**, are the archive directories.

4.5 EGSE Server Settings

The following definitions were made in /home/sops23e/resources/MISCConfig:
    EGSE_EGW_SERVER 192.168.202.101   (i.e. the IP of HOS4-D)
    EGSE_EGW_SERVER_PORT 9876

4.6 SPIRE MIB

The SPIRE MIB (**SPIRE_IEGSE_MIB_2 2 G2_AVM_IST_16022007 tar.gz** and **MIB_22G2_Patch.tar.gz**) was unpacked as .dat files on the SCOS machine (HOSS2K4-2) to ⁄**home/sops23e/SPIRE/conf_avm/data/ASCII**.

Manual changes were made to the MIB to remove some Astrium information.

To import the MIB, first steps 1 to 5 of Section 5.3 were completed, next the **IMPORT** process was selected from the SCOS 2000 task launcher and the **Start** button clicked. The details output by the process can be viewed in the file **/home/sops23e/import.log**.

5   I-EGSE Set Up Procedure

5.1   I-EGSE Machine Set Up

Objective: To startup the I-EGSE computers

Initial Conditions: I-EGSE computers off and not running
Final Conditions: I-EGSE computers on and logged-in
Constraints:

Total Duration: 15 minutes

Step.	Action
1	Switch on and log in to the I-EGSE computers. Computer: HOS4-D (192.168.202.101) User: spire Password: tektronix Computer: HOSQLA4-1 (192.168.202.110) User: spire Password: tektronix Computer: HOSS2K4-2 User: sops23e Password: s2ks2k

2	Synchronise time

o Open a konsole on HOSQLA4-1 and HOSS2K4-2 by hitting the console icon.

o Log in as System Administrator on all 3 computers to synchronise the time to the CCS2 UTC server. Failure to synchronise the time leads to the CCS showing errors for late packets.

   su   (password = hwa2bpwFS)

o Kill any ntp jobs which are running

   ps -u root | grep ntp | awk '{print $1}' | xargs kill -9

o Perform an initial synchronization. (192.168.202.51 is the IP of the CCS time server.)

   ntpdate 192.168.202.51

o Modify the file **/etc/ntp.conf** and enter the following line into it:

   server 192.168.202.51

o Start the ntp daemon by entering

   xntpd

o Verify synchronisation with

   ntpq –p

(HOS4-D and HOSQLA4-2 have already been configured (by Nico Sonn (Astrium) so that they run the ntp update protocol automatically. HOSS2K4-2 and HOSSQLA4-2 are not used by SPIRE but synchronising their time might be useful for PACS. The status of the synchronisation can be checked with ntpq –p. On testing the synchronisation on 1/3/07, Nico Sonn found that HOSQLA4-1 time synchronisation failed since the time server could not be reached. This needs attention.)

5.2 Starting the EGSE Router, EGSE Gateway and Pipe Gateway

Objective: To startup the EGSE router and gateway

Initial Conditions: EGSE router, EGSE Gateway and Pipe Gateway not running
Final Conditions: EGSE router, EGSE Gateway and Pipe Gateway running
Constraints:

Total Duration: 2 minutes

Step.	Action

1	Start the EGSE router
	
	On the HOS4-D computer,
	
	• First start the router:
	
	   o Open a konsole by hitting the console icon
	
	   o Select "Rename session" option from the "Session" tab and rename the session to be "EGSE Router"
	
	   o Start the router from this konsole by typing
	
	      router R

2	Start the EGSE gateway
	
	   o Open another konsole by hitting the console icon
	
	   o Select "Rename session" option from the "Session" tab and rename the session to be "EGSE Gateway"
	
	   o Start the EGSE gateway from this konsole by typing
	
	      router S –scosapids 1280,1282
	
	(Note for information: scosapid 1280 contains critical HK, events and telecommmands, scosapid 1282 contains nominal HK. Other test set-ups would include 2038 for the CDMS (Simulator) but this is not useful for the testing at Friedrichshafen.)

3	Start the Pipe gateway
	
	   o Open another konsole by hitting the console icon
	
	   o Select "Rename session" option from the "Session" tab and rename the session to be "Pipe Gateway"
	
	   o Start the Pipe gateway from this konsole by typing
	
	      ~hcss/bin/pipeGW
	
	This is understood to be a temporary command, extracted from Appendix B. The "official" command is **router –P**. There may be differences between the contents of **~hcss/bin/pipeGW** and router -P but this has not been checked yet. The **~hcss/bin/pipeGW** command worked during the testing at Astrium, Friedrichshafen of 21st to 23rd February 2007.
	
	(Note for information: Reading this script, using the command, cat ~hcss/bin/pipeGW
	,gives the following details of IP addresses and port numbers:
	java herschel.egserouter.PipeGW 192.168.202.101 9877 server 9877 server 12345 2043 PipeGW 2043
	java herschel.egserouter.PipeGW 192.168.202.101 9877 server 9875 2043 PipeGW 2043 .)

5.3   Starting SCOS 2000

Objective: To startup SCOS 2000

Initial Conditions: EGSE Router, EGSE Gateway and Pipe Gateway running
Final Conditions: EGSE Router, EGSE Gateway and Pipe Gateway and SCOS 2000 running

Constraints:

Total Duration: 5 minutes

Step.	Action
1	Start SCOS 2000 On the HOS4-D computer, • Open a console window by clicking on the screen icon of the desktop environment • Start SCOS 2000 typing **s2.start** from the command line. The SCOS 2000 task launcher GUI should appear
2	• From the SCOS 2000 task launcher click on the **EGSEsrv** button. The mandatory EGSE server processes will become highlighted. • Start the highlighted processes by clicking on the **Start** button at the bottom left corner of the SCOS 2000 task launcher. Confirmation will be requested. The processes will take about a minute to start. A horizontal task appears at the top of the screen and an alarm will begin to sound – this is perfectly normal and not a cause for concern.
3	• Click on the **Alarm Tone Enabled** button on the horizontal task bar that appears at the top of the screen. Select the option to disable the alarm but only do this if you are confident that you do not want to monitor the alarms – the alarms will sound when housekeeping parameters go in and out of limits.
4	• Click on the **Users** button in the horizontal task bar and login as **User name**: Matt **Password**: Matt Select the **SOFT_001** role from the **Role** drop down menu. • Wait until the highlighted processes on the SCOS 2000 task launcher have green borders, indicating that SCOS 2000 server processes have started up correctly. *A scrolling Regis window appears at the bottom of the screen and displays various messages: red ones are alarms, yellow ones are warnings and green ones are for normal messages. All red alarms regarding the NCTRS connections can be ignored.*
5	• To monitor telemetry select the **MON1** process from the SCOS 2000 task launcher and click on the **Start** button. A Telemetry Desktop display appears on the second SCOS screen. • From the Telemetry Desktop display click on the **AND…** button and select the Alphanumeric Display of interest for the AVM test (e.g. **DPU AND OBS PARAMETERS, DCU Parameters, SCU Parameters, MCU Parameters**) SCOS is now ready to receive OBS TM packets and to display the DPU/OBS parameter values.

5.4   Starting programs on the HCSS machine

Objective:	To start the following software: tmingestion, Packet Display, Quick Look Analysis (QLA) and CCSHandler on the HOSQLA4-1 computer.
Initial Conditions: **Final Conditions:**	EGSE Router, EGSE Gateway and Pipe Gateway and SCOS 2000 running
Constraints:	EGSE Router, EGSE Gateway and Pipe Gateway and SCOS 2000, tmingestion, Packet Display, Quick Look Analysis (QLA) and CCSHandler running
Total Duration:	5 minutes

Step.	Action

1	Start tmingestion
	
	On the HOSQLA4-1 computer,
	
	    o Open a konsole by hitting the console icon
	
	    o Select "Rename session" option from the "Session" tab and rename the session to be "tmingestion"
	
	    o Start the router from this konsole by typing
	
	            tmingestion |& tee tmingest_<date>.log
	
	(Note for information: this command pipes output from the tmingestion to the Konsole window and a log file).

2	Start PacketDisplay
	
	On the HOSQLA4-1 computer,
	
	    o Open a konsole by hitting the console icon
	
	    o Select "Rename session" option from the "Session" tab and rename the session to be "PacketDisplay"
	
	    o Start the router from this konsole by typing
	
	            PacketDisplay

3 (Optional)	Start the **qla**
	
	 On the HOSQLA4-1 computer,
	
	  o Open another konsole by hitting the console icon
	
	  o Select "Rename session" option from the "Session" tab and rename the session to be "Quick Look Analysis"
	
	  o Start the Quick Look Analysis from this konsole by typing
	
	   qla
	
	(Note for information: QLA is useful for investigating Packets received by the I-EGSE from the CCS but is not a crucial measure for the Warm Unit Functional Tests.
	Display using Packetviewer from the Process Selection drop down menu. Can use local database for historical packets and EGSE router for live packets on the source tab.
	Packet Dump is useful for HK data. (This is also selected from the Process Selection drop down menu).
	Parameterselector shows housekeeping data and science graphs e.g. bolometer temperature.)

4 (Must be done)	Start the ccshandler
	
	 On the HOSQLA4-1 computer,
	
	  o Open another konsole by hitting the console icon
	
	  o Select "Rename session" option from the "Session" tab and rename the session to be "Quick Look Analysis"
	
	  o Start the Quick Look Analysis from this konsole by typing
	
	   ccshandler -server

5.5   Attaching the DRCU Simulator to the AVM DPU

Objective: To attach the DRCU Simulator to the AVM DPU (in the cleanroom)

Initial Conditions: DRCU Simulator PC not running
Final Conditions: DRCU Simulator PC running

Constraints:

Total Duration: 20 minutes

Step.	Action
	Scope: This procedure is relevant to the EGSE set-up at Astrium, Friedrichshafen on 21.02.07. The set-up of the DRCU Simulator to the AVM DPU is described. ESD Safety: All relevant Astrium ESD Safety measures are to be taken when touching the DPU and it's cables to the Spacecraft and later DRCU Simulator. Set-up description - The AVM DPU is connected to the Spacecraft. (It has connectors labelled J1, J2, J3, J7, J8 and J9.) - J1 is connected to the Spacecraft power and is not touched (or changed in any way). - J2 and J3 are connected to the Spacecraft via Mil bus cables and are not touched (or changed in any way). - The spacecraft needs to be switched off. - The keyboard, mouse and monitor is attached to the DRCU Simulator PC whilst it is switched off. - The DRCU Simulator PC and it's monitor's power supply cables are grounded using a MITU 4000 Isolating Transformer to avoid grounding loops. - When confirmation is given by Astrium staff that the spacecraft is off, the following cables are altered. - Cables to J7, J8 and J9 on the AVM DPU are removed. - The connector J7 on the AVM DPU is connected to CH1 on the DRCU Simulator PC with the cable labelled CH1. - The connector J8 on the AVM DPU is connected to CH2 on the DRCU Simulator PC with the cable labelled CH2. - The connector J9 on the AVM DPU is connected to CH3 on the DRCU Simulator PC with the cable labelled CH3. - The DRCU Simulator PC is switched on. The user is administrator and there is no password. - The Spacecraft is switched on. Note: The DRCU Simulator PC is left on. To start the DRCU Simulator program running, the file transmit.exe on the desktop is run but only at the applicable step in Astrium test procedure HP-2-ASED-TP-0142 Issue 1.

5.6   Starting the CDMS Simulator

Not Applicable.

5.7   Detaching the DRCU Simulator from the AVM DPU

Objective: To detach the DRCU Simulator from the AVM DPU (in the cleanroom)

Initial Conditions: DRCU Simulator PC running
Final Conditions: DRCU Simulator PC not running

Constraints: The tests are over or the DRCU Simulator is no longer required to be attached to the SVM.

Total Duration: 20 minutes

Step.	Action

	Scope:
	This procedure is relevant to the EGSE set-up at Astrium, Friedrichshafen on 23.02.07. The disconnection of the DRCU Simulator PC and its harnesses from the AVM DPU is described.
	
	ESD Safety:
	
	All relevant Astrium ESD Safety measures are to be taken when touching the DPU and it's cables to the Spacecraft or DRCU Simulator.
	
	Set-up description
	• The AVM DPU was left connected to the DRCU via connectors labelled J7, J8 and J9 and cables labelled CH1, CH2 and CH3.
	• J1 is connected to the Spacecraft power and is not touched (or changed in any way). J2 and J3 are connected to the Spacecraft via Mil bus cables and are not touched (or changed in any way).
	• The spacecraft needs to be switched off.
	• The DRCU Simulator PC and it's monitor's power supply cables are grounded using a MITU 4000 Isolating Transformer.
	• When confirmation is given that the spacecraft is off,
	    o Shutdown the DRCU Simulator PC,
	    o switch off the Monitor,
	    o switch off the transformer.
	• Remove the power supply cables to the DRCU Simulator PC, Monitor and MITU 4000 Isolating Transformer.
	• Disconnect the 3 cables from the DRCU Simulator PC to J7, J8 and J9 on the AVM DPU.
	• If appropriate, re-connect the cables between the AVM DPU and the Spacecraft as per the set-up procedure prior to 21.02.2007.
	• Pack the DRCU PC, Monitor, Harnesses and peripherals into it's transportation case in appropriate cleanroom bagging materials. (Lumalloy for the PC and Monitor). Or leave on a table in the cleanroom with a Lumalloy cover if repeating the tests soon.

Appendix A: I-EGSE Preparation

These notes describe the steps made on 21st February 2007 to restore the avm_test database taken from RAL to Astrium, Friedrichshafen. Details are also given for the MIB importation and how qla and Java problems were fixed.

On hosqla4-1: (user: spire password tektronics)
Restored database avm_test
Already contains 198681 packets
Changed database in user.props to avm_test
set hcsss.mission.config to wu_int_config
set var.model to AVM
HCSS build = #1111; SPIRE build = #478
db_admin –n avm_test@hosqla4-1
missetup –listconfig
Used dos2unix to convert qla.py
Moved qla.py in /home/spire to qla_save.py
Corrected errors on qla.py in .hcss
        error in scroll command
        import library
Set up router and model properties in hcss.props
Edited jwish and jtclsh scripts to get past Java version errors

Put MIB files from Sunil Sidher at home/spire/MIB_FOR_INGESTION/
Files are:SPIRE_IEGSE_MIB_2.2.G2_AVM_IST_16022007.tar.gz
        and MIB_22G2_Patch.tar.gz
These two files copied to hoss2k4-2.

On hoss2k4-2: (user: sops23e password: s2ks2k)
Edited MISCconfig to set gateway hosting port (9876) (the connection is through Router S from the SCOS hoss2k4-2 to hos4-d).
Manual changes to the MIB (following Sunil Sidher's instructions) removing Astrium parts.

Imported MIB – files transferred from Sunil's email of 21.02.07 to hoss2k4-2. Manual changes made as stated earlier. Several .dat files created in ASCII/ folder
Can read Import.log for details.
Select IMPORT and run (START)

On hosqla4-1: (user: spire password tektronics)
The original user configuration of the CCSHandler did not show enough details of TC/TM. The following information (in blue) is the contents of the file "userlogging.properties" saved in the ".hcss" sub-directory of the home directory. Unfortunately there was not enough time on (23.02.2007) to adjust this to show just the useful details and it generates junk in the window along with useful TC requests.

$Id: logging.props,v 1.3 2003/11/27 10:47:16 sguest Exp $

# set the Handlers to be loaded on the root logger - a white-space separated list
handlers = java.util.logging.FileHandler java.util.logging.ConsoleHandler

# set the Level of the ConsoleHandler
java.util.logging.ConsoleHandler.level = FINE

# set the Level of the FileHandler
java.util.logging.FileHandler.level = FINE

set the pattern for creating log files
#java.util.logging.FileHandler.pattern = %h/qla.log

```
# append to the file each time a log message is sent, rather than overwriting.
java.util.logging.FileHandler.append = false

# formatting class
java.util.logging.FileHandler.formatter = herschel.share.log.api.StandardFormatter
java.util.logging.ConsoleHandler.formatter = herschel.share.log.api.StandardFormatter

# set the Level for the root Logger
.level = FINE

# set the level for the "herschel.qla" Logger
herschel.spire.qla.level = FINE
herschel.tmingest.common.BlockExecutionStore = NONE

# Shut up the Java 5 graphics libraries
javax.swing.level = INFO
java.awt.level = INFO
sun.awt.im.InputContext.level = INFO
```

Appendix B: Useful Background I-EGSE Information Email from Erich Wiezorrek at MPE

```
-----Original Message-----
From: Erich Wiezorrek [mailto:erw@mpe.mpg.de]
Sent: 15 February 2007 13:29
To: Sidher, SD (Sunil); Aramburu, AA (Asier)
Cc: King, KJ (Ken); Luc Dubbeldam; Otto Bauer
Subject: Current IEGSE setup at Astrium@Friedrichshafen
```

Dear all,

   I want to report in a quick summary about my IEGSE installation at Astrium in Friedrichshafen.

All five IEGSE machines are build up and running in a separate office very close to the central checkout room. I had no key for this room nor for the central checkout room but it was promised that in future we will get at least one key card.

There was no installed telephone available (again it is promised to be changed) but we (finally) got a wireless phone.

In the IEGSE room public internet access is available. There is no problem accessing any site from Friedrichshafen. But up to now no IEGSE machine is visible from outside. So it is not possible to maintain the IEGSE machines from remote sites.
I found no time to install some measures (like SSH tunneling) to overcome this problem.

To use the public internet access there is a free network cable (coming from the network switch) which can be attached to a laptop which must access the network via DHCP.

All five IEGSE machines and the wall socket supplying the CCS connection are connected to the same network switch. All IEGSE machines are configured to use the IS-LAN only not the public internet.

For the IP addresses of the IEGSE machines I used the same as we had in
Ottobrunn. Those two machines coming from Alenia@Torino had modified IP
addresses but I reset them. I have to admit that I didn't check all
"/etc/hosts"
files if they contain valid addresses. I have no idea if there is a name
service running at the CCS site.
Note: It was difficult to get information about the network layout. I
discovered for example only 15 minutes before I had to leave that the NTP
server is on different IP address than the one we used at Ottobrunn.

I followed the "IEGSE-setup.note" (which is attached to this email) to
setup the CCS connection via the PIPE gateway and the internal IEGSE
routing (see attached file). We only got the TM packets delivered only to a
single SCOS station. I had no time to follow this up.

Only the machines coming from SPIRE have the latest JAVA and Versant
releases installed.

Please don't hesitate to ask for more if there are any open points. The
whole next week I will go on leave.

Regards,
   Erich

Contents of attachments from AD3: routing-setup.pdf and IEGSE-setup.note follow:
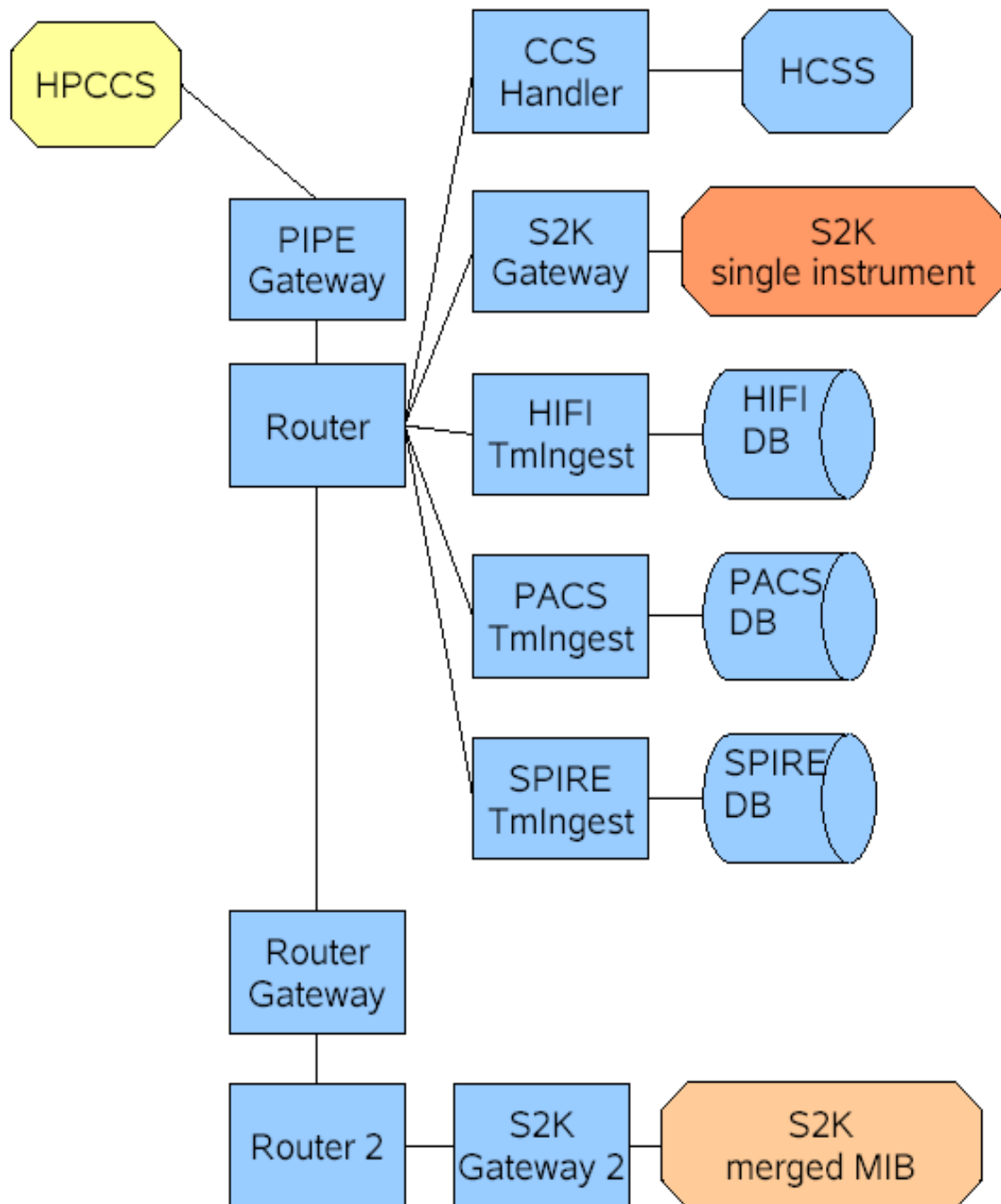
Legend:
- HPCSS
- HOS4-D (database server)
- HOSQLA4-1 (primary S2K host, configured for prime)
- HOSQLA4-2 (backup S2K host, merged MIB)

There are 8 scripts available located in hos4-d:~hcss/bin to start the

```
Router
EGSEgateway (the link to SCOS 2000)
PipeGW (the link to the CCS)
CcsHandler (the link to HCSS/CUS)
Router2 (additional router for second SCOS machine)
EGSEgateway2 (additional gateway for second SCOS machine)
Routergateway (to link the two routers)
packetDistribution (start all seven scripts using different konsoles)
```

To use those scripts login as user "hcss" on host "hos4-d" using the secure
shell command:

```
ssh -X hcss@hos4-d
```

The password is "nordsee".

Router:
=======
The router is started with the

```
router
```

command. There are no options nor arguments.
The router will be running on the host hos4-d, port 9877.

EGSEgateway:
============
The EGSEgateway is started with the

```
egsegateway APIDS
```

command. It requires a single argument, the list of APIDs to be transferred
to SCOS 2000. The list is a comma separated list of single APID values or
APID ranges specified with a minus sign. For example, "1100-1200,2043"
would
request all APIDs between 1100 and 1200 and also the APID 2043.
The EGSEgateway will be running on the host hos4-d supplying port 9876
as service port to SCOS 2000.

PipeGW:
=======
The PIPE gateway is started with the

```
pipeGW
```

command. There are no options nor arguments.
The PipeGW will be running on the host hos4-d supplying port 12345 as
service
port to the CCS.

CcsHandler:
===========
The CcsHandler is started with the

```
     ccshandler [localOptions] -- [ccshandlerOptions]
```

command. The ccshandler options are those described in the
TestControl/CcsHandler user manual. In addition following "local" options
are
available:
```
     -d or --TMdelay: requires a single argument
                      Specifies the delay in msecs between the transmission
                   of two TM packets transmitted to the CCS.
                   Defaults to 50 msecs.
     -n or --nTMS:       requires a single argument
                   Specifies how often the TM packet SEQUENCE will be
                   transmitted to the CCS.
                   Defaults to 1.
     -w or --TMSwait: requires a single argument
                   Specifies the delay in msecs between two TM packet
                   SEQUENCES. This option is only relevant if nTMS > 1.
                   Defaults to 1000 msecs.
```
All "local" options are only relevant in the CcsHandler server mode.

```
Example:
     ccshandler -n 2 -- -server
     This will start the CcsHandler in server mode with sending each
     TM packet sequence twice.
```

Router2 (additional router for backup SCOS machine (with merged MIBS)):
=======
The router is started with the

```
     router2
```

command. There are no options nor arguments.
The router will be running on the host hos4-d, port 19877.

EGSEgateway (additional gateway for backup SCOS machine (with merged
MIBS)):
============
The EGSEgateway is started with the

```
     egsegateway2 APIDS
```

command. It requires a single argument, the list of APIDs to be transferred
to SCOS 2000. The list is a comma separated list of single APID values or
APID ranges specified with a minus sign. For example, "1100-1200,2043"
would
request all APIDs between 1100 and 1200 and also the APID 2043.
The EGSEgateway will be running on the host hos4-d supplying port 19876
as service port to SCOS 2000.

Routergateway:
==============

The router gatewaz to link the two routers is started with the command

```
     routergateway
```

```
packetDistribution:
===================
```

This script start all four above applications using four different konsole
windows. It might be used as convenient method to start all at once or as
example how to use them.