IEGSE Setup
at
Friedrichshafen

Technical Note

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1. IEGSE Room Layout at Friedrichshafen

The three Herschel instrument teams share a single room (called IEGSE room in this document) close to the central checkout room. In the IEGSE room there are six tables, three on each side. On the left side (looking from the door) the IEGSEs for SPIRE (closer to the window) and PACS can be found. The right side of the rooms holds the HIFI IEGSE, the printer and some off-line work area.
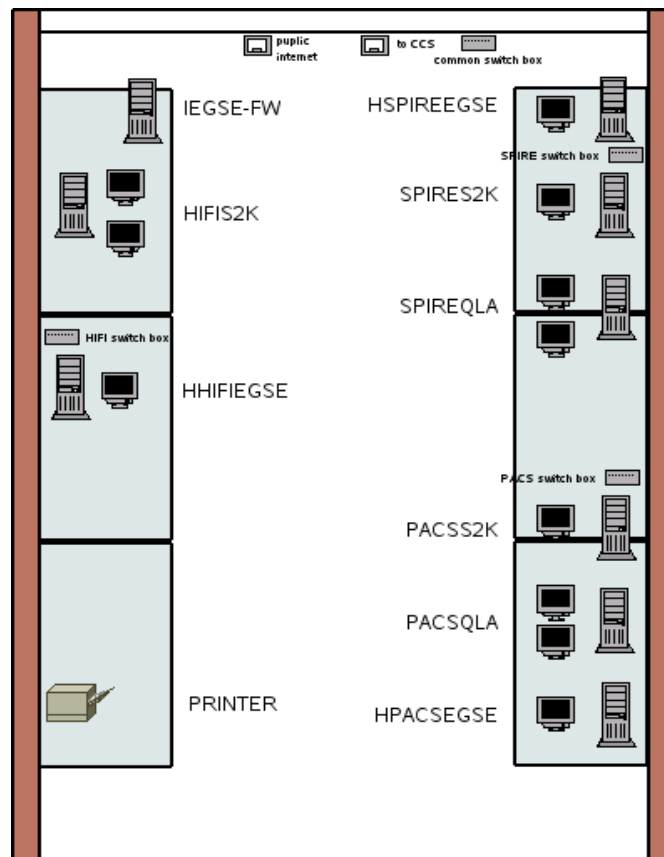

Illustration 1: IEGSE room layout

Below the window sill two network sockets are located. One is providing the connection to the CCS LAN, the other to the public internet.
Each IEGSE setup has its own network switch box to connect the single workstations to the IEGSE LAN segment. One common network switch box is below the window sill.
Close to window on the left side of the room there is a single PC to connect the internet to the IEGSE LAN segment providing both firewall and routing facilities.

2. Physical Network Layout

The single workstations of all three HERSCHEL instrument IEGSEs are connected to separate network switch boxes which are connected on their side via a common network switch box.
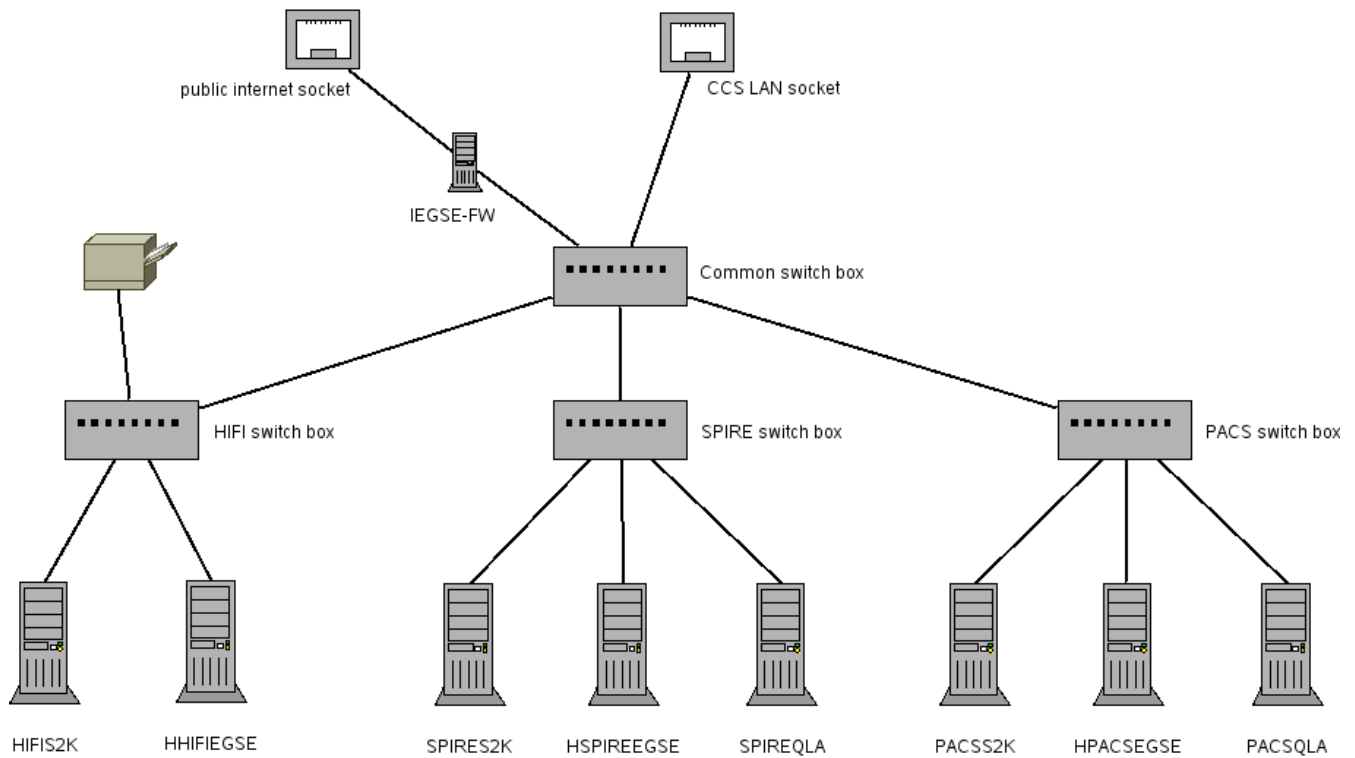
Illustration 2: Physical network layout

The public internet socket is the only connection to one of the network interfaces of the firewall PC. The other network interface is connected to the common network switch box providing access to the IEGSE LAN.

The CCS LAN wall socket is connected the common network switch box as well.

3. Logical Network Layout

The use the subnet with a subnet mask of 255.255.255.0.

The distribution of network packets within the IEGSE room is accomplished by four network switch boxes. All sockets of these switch boxes provide connections to the IEGSE LAN (192.168.202/24).
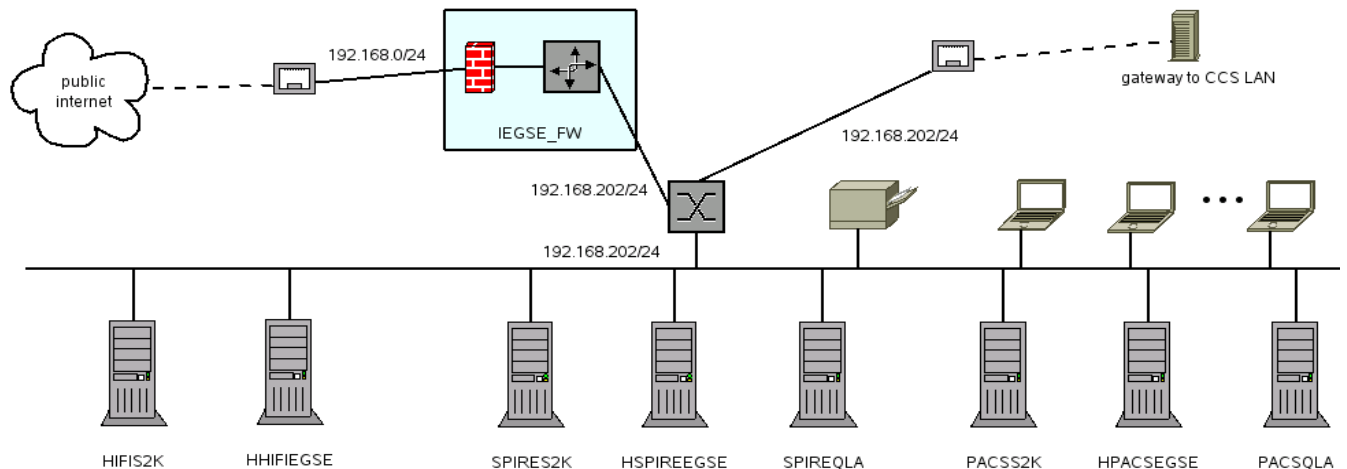
Illustration 3: Logical network layout

There are two gateways connecting the IEGSE LAN to
- CCS LAN
- public internet

The gateway for the CCS LAN is not visible from the IEGSE LAN. Only two communication paths between CCS and IEGSE LAN exist:
- PIPE protocol implemented by running a PIPE server on the IEGSE
- NTP protocol implemented by a time server on the CCS-IEGSE gateway

The gateway to the public internet is implemented by the firewall PC "IEGSE-FW". This PC is equipped with two network interfaces to separate physically the IEGSE LAN from the internet. A firewall blocks every connection request from the internet, only outbound connections are allowed. The firewall PC performs the necessary routing to the internet.

The IP addresses and host names for the IEGSE workstations are fixed. Laptops shall use the DHCP protocol to get temporary IP addresses.

4. Network Details

4.1. IP Addresses, Host Names

There is no name server running for the IEGSE LAN. All the IP addresses and host names are specified by the local /etc/hosts file of the nodes.

IP address	host name	description
192.168.202.101	hhifiegse	HIFI data server, used by CCS to establish PIPE connection
192.168.202.102	hpacsegse	PACS data server, used by CCS to establish PIPE connection
192.168.202.103	hspireegse	SPIRE data server, used by CCS to establish PIPE connection
192.168.202.110	spireqla	SPIRE QLA machine
192.168.202.111	spires2k	SPIRE SCOS 2000 machine
192.168.202.120	hifis2k	HIFI SCOS 2000 machine
192.168.202.130	pacss2k	PACS SCOS 2000 machine
192.168.202.131	pacsqla	PACS QLA machine
192.168.202.140	iegse-fw	firewall PC
192.168.202.141	hp-printer	network printer (served by host iegse-fw)
192.168.202.200 ... 192.168.202.250	DHCP clients	IP address range used by the DHCP server

4.2. Services

Note: All these services are only announced on the IEGSE LAN segment. None of them will be offered on the public internet connection of the firewall PC.

4.2.1. NTP

An NTP server is running on host 192.168.202.51 (the gateway to the CCS LAN).
All IEGSE workstations are configured to be synchronized with this NTP time server. Laptops running a DHCP client shall be configured automatically.

4.2.2. Printing

A CUPS print server is running on the host IEGSE-FW, the firewall PC. It provides access to an "HP LaserJet 4050 TN" printer.
All IEGSE workstations are configured to use this CUPS server. The local print queue is called "printer". Laptops running a DHCP client shall be configured automatically.

4.2.3. Name Service, Routing

Although there is no name service for the IEGSE LAN hosts there is one for the public internet. Its IP address is 192.168.0.1. The router address to be used is 192.168.202.140.
All IEGSE workstations are configured accordingly. Laptops running a DHCP client shall be configured automatically.

4.2.4. DCHP Server

A DHCP server is running on the firewall PC "IEGSE_FW". It will serve IP addresses for its clients in the range 192.168.202.200 to 192.168.202.250.

4.3. Firewall

The firewall running on the host IEGSE_FW blocks **all** inbound connections from the public internet.

5. IEGSEs as seen by the CCS

The CCS will see three different IEGSEs specified by three different IP addresses. Each IEGSE will supply a TCP port as PIPE server.
- HHIFIEGSE: IP address 192.168.202.101, TCP port 9875 for the CCS PIPE client
- HPACSEGSE: IP address 192.168.202.102, TCP port 9875 for the CCS PIPE client
- HSPIREEGSE: IP address 192.168.202.103, TCP port 9875 for the CCS PIPE client

The PIPE server running on the IEGSEs is ready to:
- accept TM packets from the HERSCHEL instruments and from SCOEs
- accept TC packets for the IEGSE
- deliver IEGSE TM packets
- deliver keep-alive packets

Each PIPE server is independent form the others running on different IEGSEs.

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┌──────────┐                          ┌──────────────────────┐
│          │         TCP port 9875    │     HHIFIEGSE        │
│   CCS    │──────────────────────────│   192.168.202.101    │
│          │          │               └──────────────────────┘
└──────────┘          │
                      │               ┌──────────────────────┐
                      │  TCP port 9875 │     HPACSEGSE        │
                      ├──────────────── │   192.168.202.102    │
                      │               └──────────────────────┘
                      │
                      │               ┌──────────────────────┐
                      │  TCP port 9875 │     HSPIREEGSE       │
                      └──────────────── │   192.168.202.103    │
                                      └──────────────────────┘
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