LEIBNIZ-INSTITUT FÜR ASTROPHYSIK POTSDAM

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GREGOR: SJCam Slitjaw Camera Server Manual

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1 Scope

This document describes the usage of the services provided by the *sjcam* software.

2 Overview

The *sjcam* `systemd` software services are used to

- read out the two slitjaw cameras of the company *prosilica*
- promote data to the client programs utilizing the *DCP* protocol
- promote data to a NFS share

3 Server computer

The server computer used to read out the *prosilica* cameras via the network connection is `gsjc.tt.iac.es`. To connect to it, use the `observer` user:

```
bash$> ssh observer@gsjc.tt.iac.es
bash$> _
```

It's hosting a standard CentOS7 Linux installation. All `gsjc` software is installed using the KIS-internal RPM repository, hence a crash recovery is possible quickly.

4 SJCam Services

4.1 gsjc Server

On the Slitjaw Camera Server (hostname is `gsjc`) the software to control the cameras is organized using `systemd` services. There are three services used to control the server processes, each one assigned to one camera and running independently of the others:

- one for sjcam1
- one for sjcam2
- one for a test camera used for development works at the KIS test laboratory in Freiburg

4.2 Files Mover Service

Also on the Slitjaw Camera Server, there are two additional `systemd` services, one for each sjcam. They copy over newly acquired images to the `instruments` nfs share shared by the `jane` server.

5 Installation

5.1 Prerequisites

`gsjc.tt.iac.es` shall use the in-house-standard rpm-based linux distribution (which currently is CentOS7) with disabled SELinux extensions and disabled local firewall. Please contact IT to set up an according computer, the setup procedure is documented (https://wiki.leibniz-kis.de/doku.php/edv/intern/gsjc.tt.iac.es).
Make sure that the server computer that should operate as `gsjc.tt.iac.es` does have two extra GBit NICs, one for each camera. These NICs need a special MTU size set to let the cameras operate. This MTU size needs to be set in the configuration files for the referring NICs. Additionally, the IPs of the NICs need to match the networks that the cameras are in. The cameras shall have a static IP address configured.
The current setup for for one of the two cameras currently installed is:

```
[root@gsjc observer]# cat /etc/sysconfig/network-scripts/ifcfg-em1
HWADDR=D0:94:66:93:95:8F
ETHTOOL_OPTS="autoneg on"
TYPE=Ethernet
PROXY_METHOD=none
BROWSER_ONLY=no
BOOTPROTO=none
IPADDR=192.168.1.1
PREFIX=24
DEFROUTE=yes
IPV4_FAILURE_FATAL=yes
IPV6INIT=no
NAME=em1
UUID=cca4cdb4-9a0a-418f-b98f-ed9aa46b28ef
ONBOOT=yes
MTU=8228
```

The current set of NICs is

```
[root@gsjc observer]# ifconfig
em1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 8228
        inet 192.168.1.1  netmask 255.255.255.0  broadcast 192.168.1.255
        ether d0:94:66:93:95:8f  txqueuelen 1000  (Ethernet)
        RX packets 21369900791  bytes 175617136281084 (159.7 TiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 11286714  bytes 722354428 (688.8 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
        device interrupt 17

em2: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 8228
        inet 192.168.2.1  netmask 255.255.255.0  broadcast 192.168.2.255
        inet6 fe80::d294:66ff:fe93:9590  prefixlen 64  scopeid 0x20<link>
        ether d0:94:66:93:95:90  txqueuelen 1000  (Ethernet)
        RX packets 21373678767  bytes 175648405993474 (159.7 TiB)
        RX errors 0  dropped 0  overruns 0  frame 0
```

```
        TX packets 11260014  bytes 720644038 (687.2 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
        device interrupt 18

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 1459  bytes 216433 (211.3 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 1459  bytes 216433 (211.3 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

p2p1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 161.72.22.177  netmask 255.255.255.0  broadcast 161.72.22.255
        inet6 fe80::2983:28b:381b:94c  prefixlen 64  scopeid 0x20<link>
        ether 34:80:0d:09:98:4c  txqueuelen 1000  (Ethernet)
        RX packets 2646537519  bytes 189389693055 (176.3 GiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 14648645029  bytes 22150343894741 (20.1 TiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
        device interrupt 54  memory 0xc7020000-c703ffff

p2p2: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        ether 34:80:0d:09:98:4d  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
        device interrupt 187  memory 0xc7000000-c701ffff
```

The two NICs of interest here are `em1` and `em2`.

5.2 Initial Installation

To install `sjcam` server software on a CentOS7 computer fulfilling the prerequisites from above, the following steps are neccessary:

1. Add the KIS yum repository, where the RPMs in the following steps are installed from:

   ```
   bash$> sudo yum install http://rpm.leibniz-kis.de/kis-testing/centos/7/\
   x86_64/kis-yumrepo-1.0-8.git.0.5c7cadb.el7.x86_64.rpm
   ```

2. Update the yum cache to get latest repository information about available packages and dependencies:

   ```
   bash$> sudo yum makecache
   ```

3. Install the `sjcam` RPM including all dependencies (which might take a while, because QT is installed, too):

```
bash$> sudo yum install sjcam
```

The default configuration should work out of the box, but if new cameras are installed, their `UniqueID`s will have to be re-configured.

5.3 Camera Initial Setup

If the current IP of a camera are unknown or a camera is replaced, the command `CLIpConfig` shall be used for configuration.
The help screen of this command is

```
[observer@gsjc ~]$ CLIpConfig -h
usage: CLIpConfig [-u <camera unique ID>|-l] [-g|-s] [-m|-i|-n|-w] <string>
-l      list all the cameras visible
-u      camera unique ID
-g      get configuration
-s      set configuration
-m      mode (DHCP,AUTOIP or FIXED)
-i      IP address
-n      Subnet mask
-w      Gateway
```

5.3.1 Setup a New Camera

To set a IP address for a new camera in the system - which of course has to be in the same subnet as the NIC that it is connected to(!) - the installer has to issue the following command as root user:

```
# obtain camera IDs
CLIpConfig -l
# set camera NIC mode to FIXED IPs
CLIpConfig -u <camera unique ID> -s -m FIXED
# set camera's subnet mask
CLIpConfig -u <camera unique ID> -s -n 255.255.255.0
# set camera's IP
CLIpConfig -u <camera unique ID> -s -i <new IP>
```

5.3.2 Find out a Cameras IP Address

If an IP was set already but is unknown but needed to set the gsjc server's NIC IP address correctly to an IP in the same subnet, open a terminal and issue the command as root user

```
tcpdump -n src port 3956 -i <NIC, eg em1>
```

In a second terminal, type as root user

```
CLIpConfig -l
```

6 Recovery

If the cameras do not work properly anymore by any means (usually known by the fact that the sjclient's camera windows are blacked out and a connection error is shown), do the following steps to recover:

- Powercycle the referring camera or both:
  - unplug the network cable
  - wait one minute
  - replug
- Reboot the machine `gsjc.tt.iac.es` or restart the referring camera service manually being logged in as root user:

```
# for gsjc1
systemctl restart gsjc1_Server.service
# for gsjc2
systemctl restart gsjc2_Server.service
```

- If the systems still don't connect, then the server probably crashed and left a stale connection on the DCP-Server on `gcs.tt.iac.es`. Connect to it using Teamviewer or go directly to the gcs computer and click on the status indicator for the referring camera (see figure 1). The DCP name follows the pattern `sjc<cam number>-<client computer hostname>`, e.g. `sjc1-fsg30`.

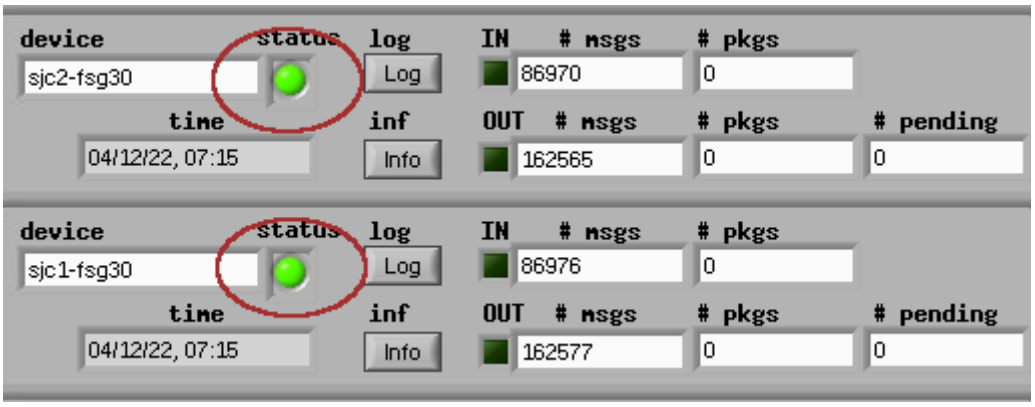

Figure 1: Example status indicators to click on for resetting connection

7 Remarks

The LaTeXsource for this document is available under KIS gitlab.