

Demonstration of the VLBI Communications Center (VCC)

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1. Current method of communication

- Emails (IVS mail exploder)
 - Need human to extract information
 - Unknown if message reach target audience
 - Limited automation
- Data archiving system and web pages
 - Synchronization issues
 - No traceability
 - Limited automation (scanning data centers for new files)

2. VLBI Communications Center (VCC)

- Characteristics
 - Fully automated
 - Machine-to-machine data exchange
 - Near real-time two-way communication
 - Traceability of data/information exchange
 - Users need credentials for specific actions
- Components
 - Database
 - Web Service (API)
 - Message broker

3. VOC – Database

- Latest information
 - Sessions
 - Catalogs
 - SEFDs
 - Station availability
- Events
 - Submitted/retrieved files
 - Specific messages
- User credentials/access/roles
- Populated/query using Web Service (API)

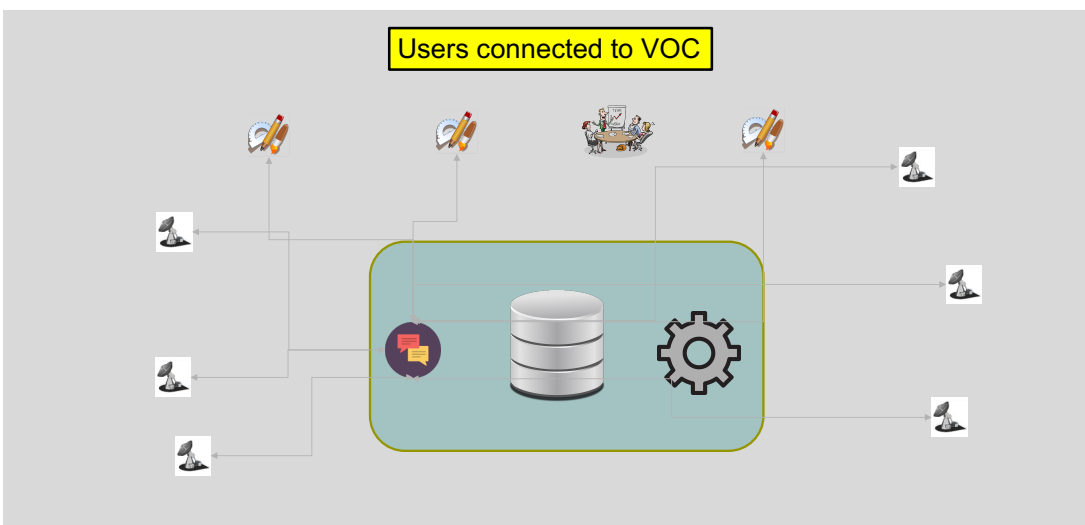
4. VCC Web Service

- REST API
- Data exchange using JSON structure messages
 - Users validated using Jason Web Token (JWT)
- Users can query and provide information
 - Some actions are limited to specific users
 - Using http get and post
 - Download and upload files (schedules, logs)
- Generate “signals” based on received information

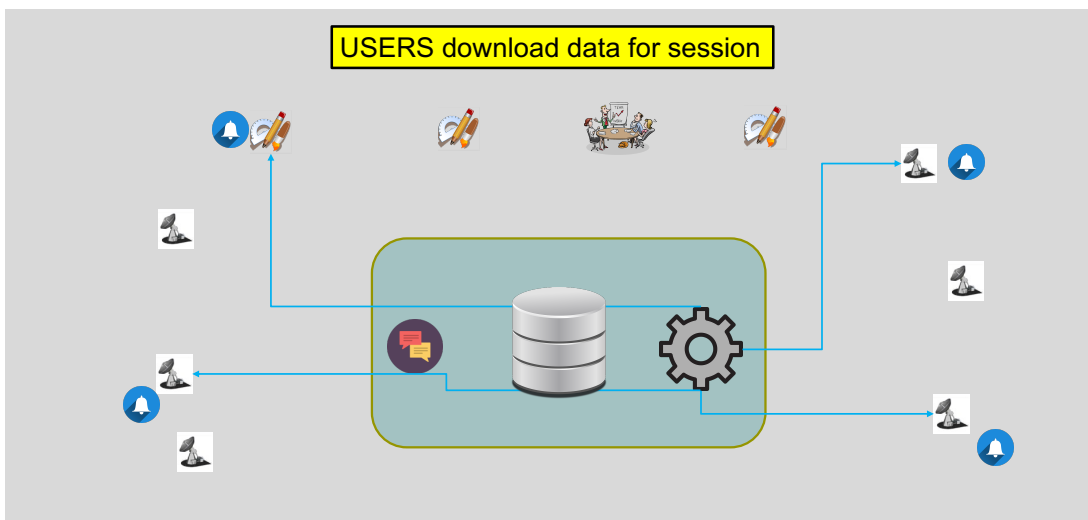
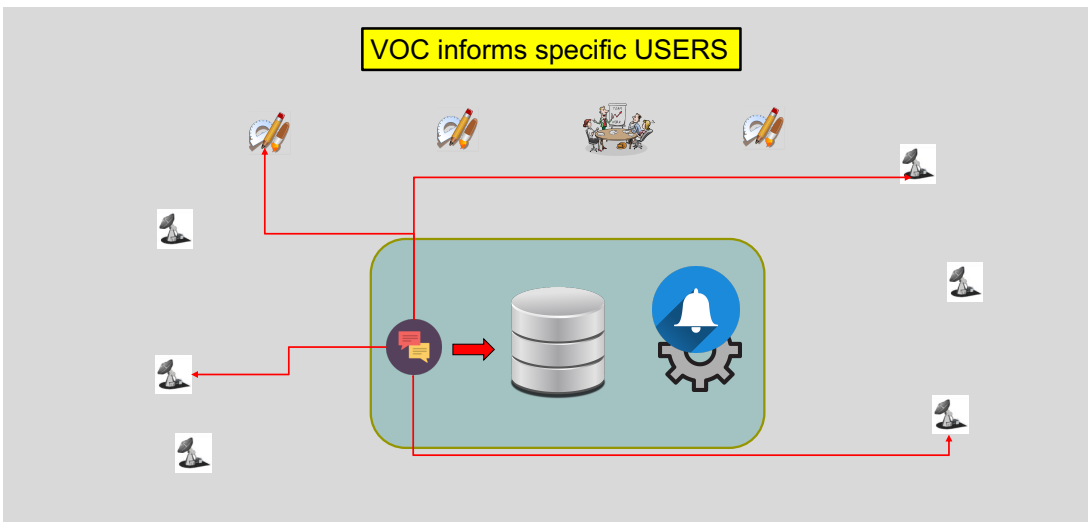
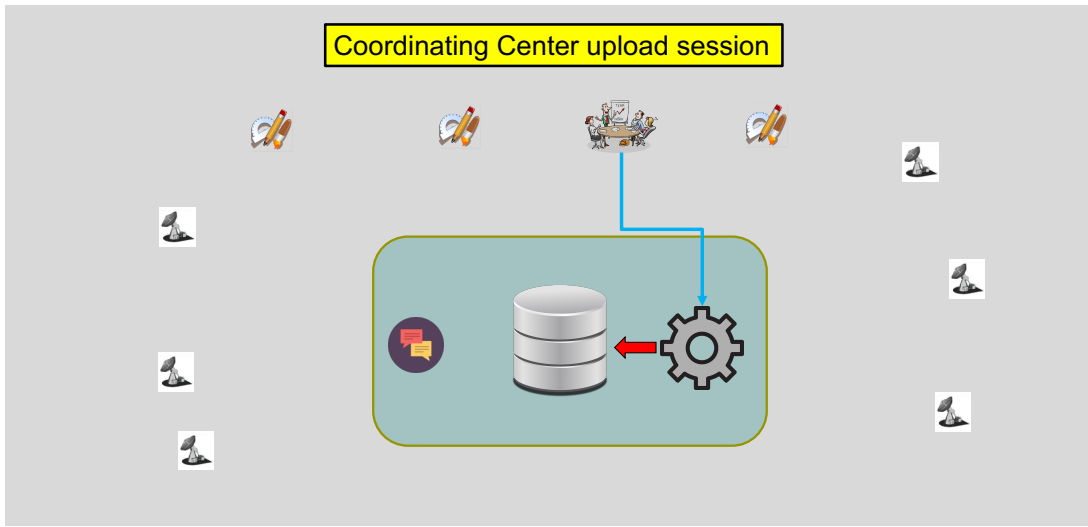
5. VCC Message broker

- Near real-time two-way communication system
- Messages generated by VCC (signals) or external users
- Dispatches messages using specific rules
 - Messages sent only to relevant users
- **Does not contact users**
 - Messages stored in the “inbox” of each user
- Users must connect to Message Broker
 - Retrieve information from “inbox”
 - Send messages to IVS world

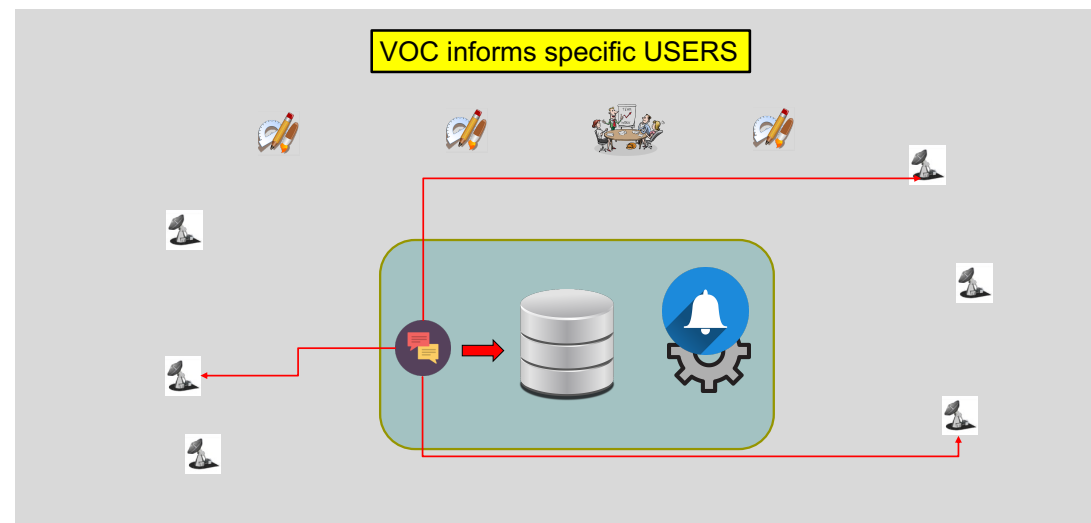
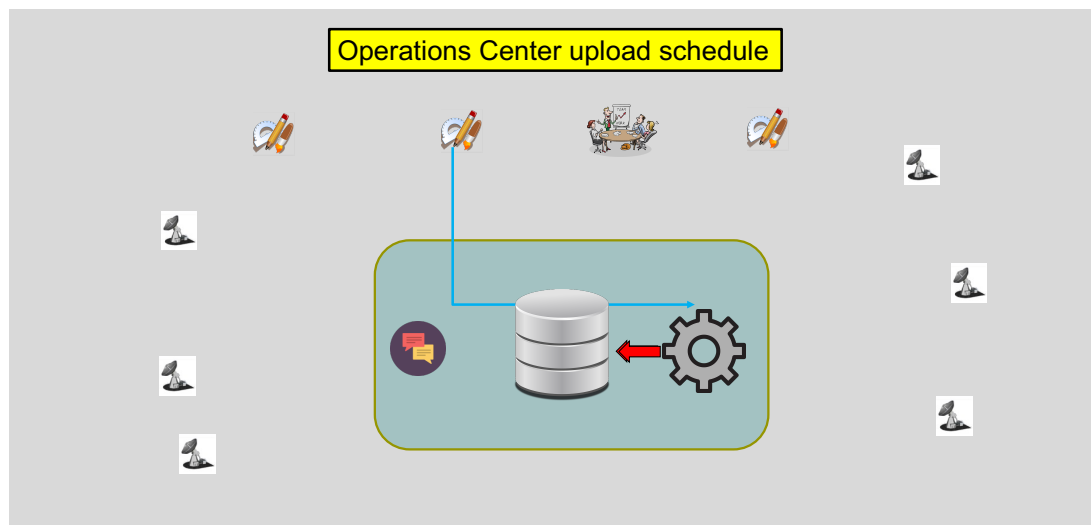
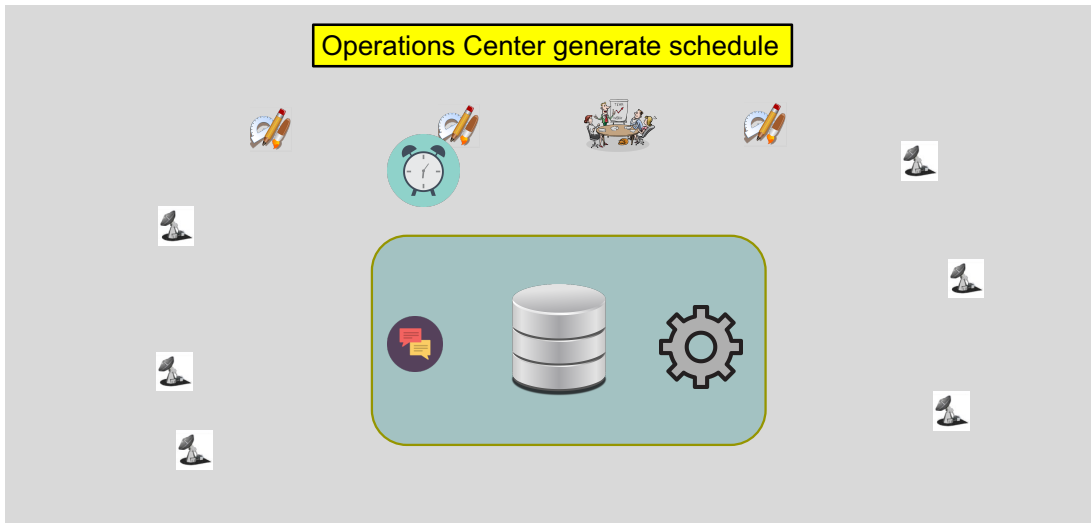
6. VCC – Updating session



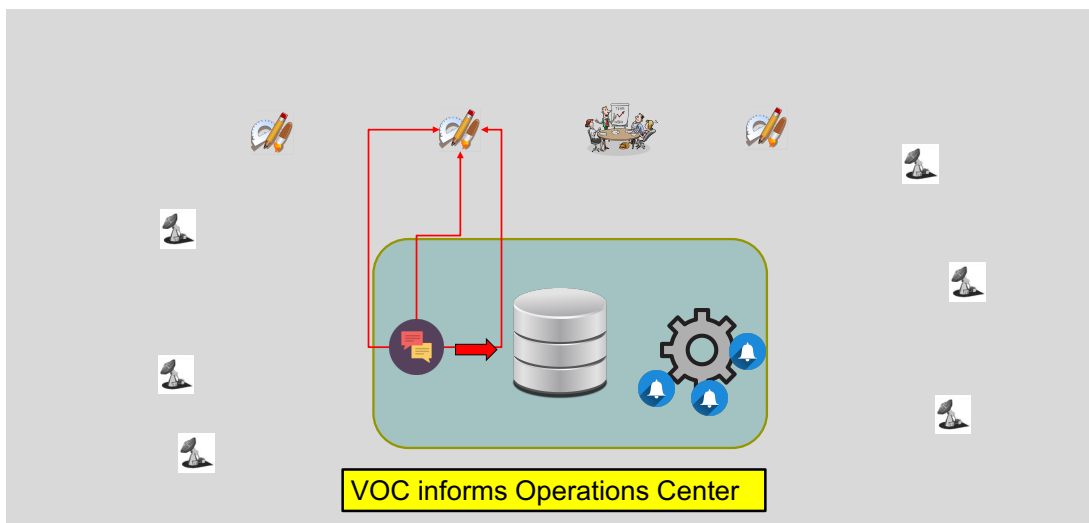
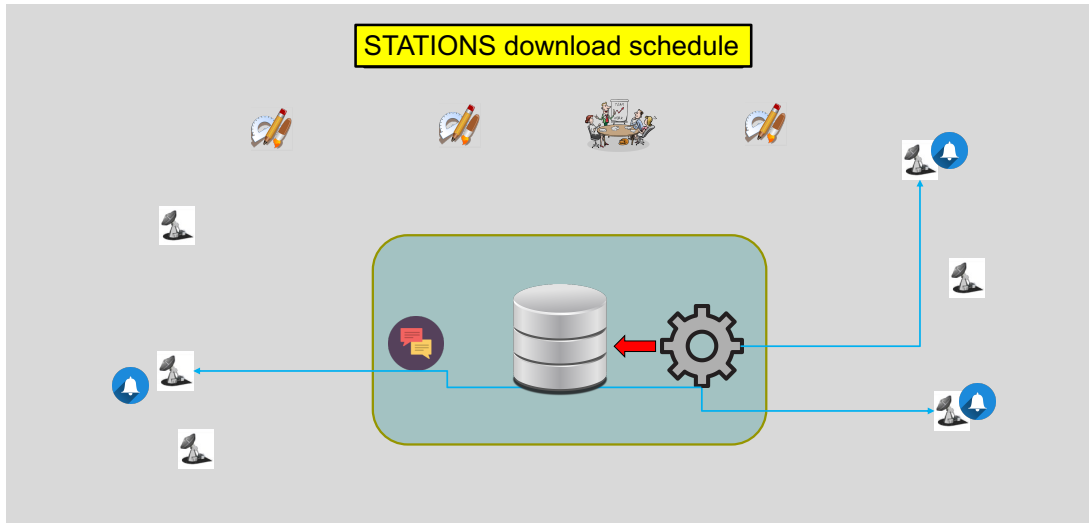
6. VCC – Updating a session



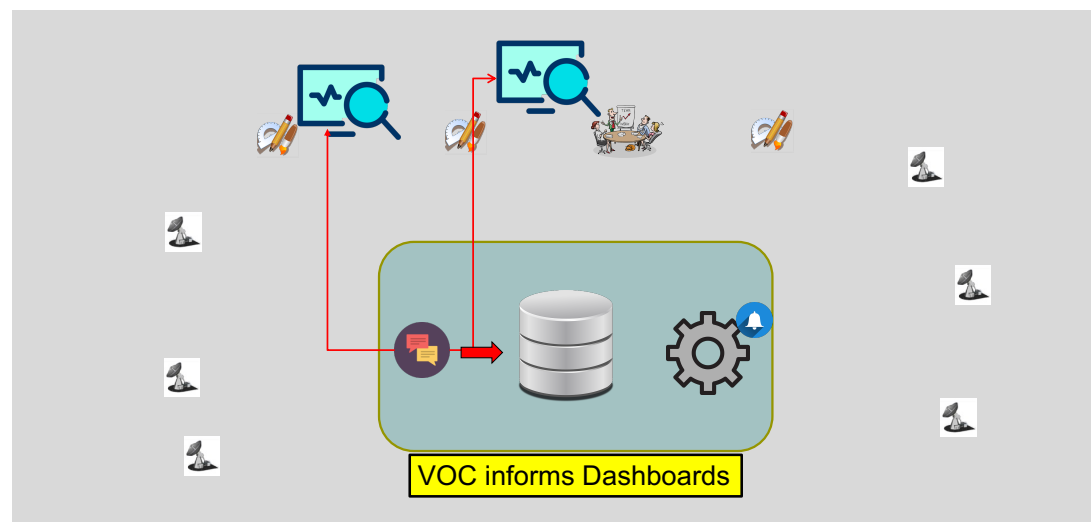
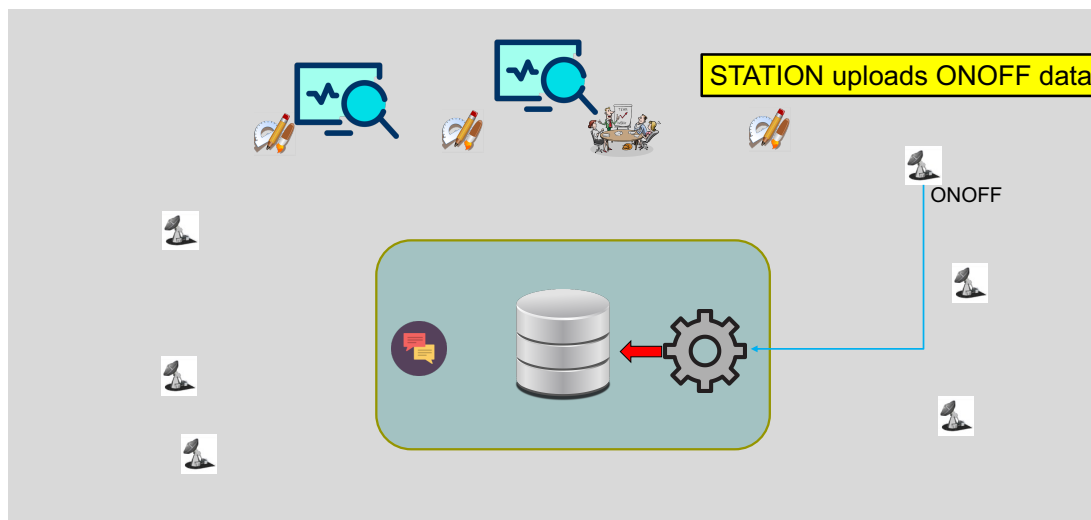
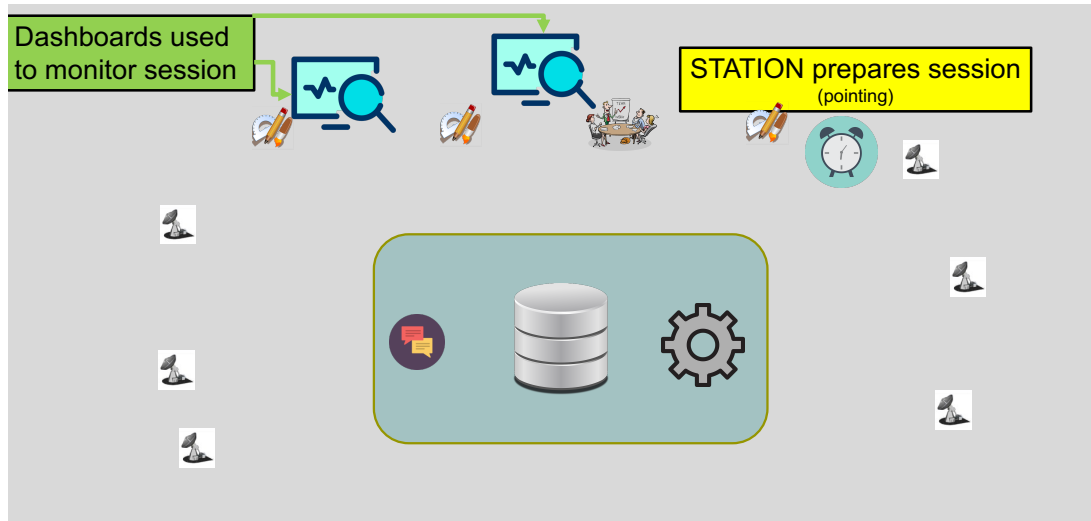
7. VCC – Uploading schedule



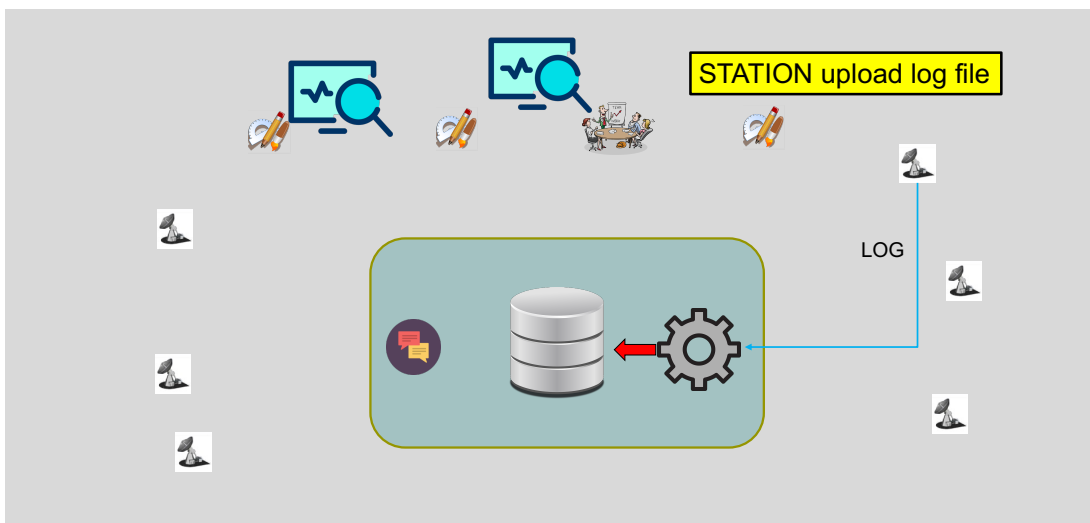
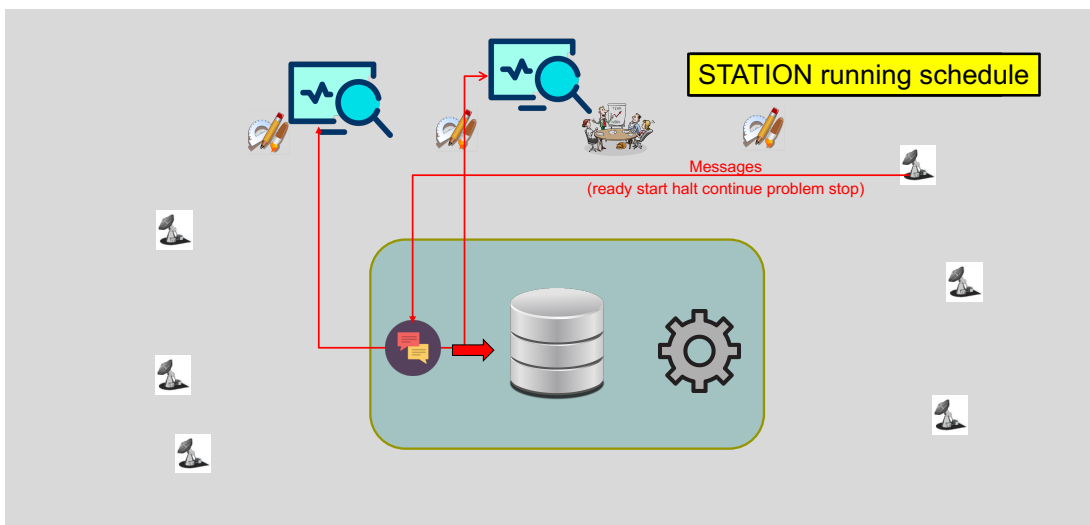
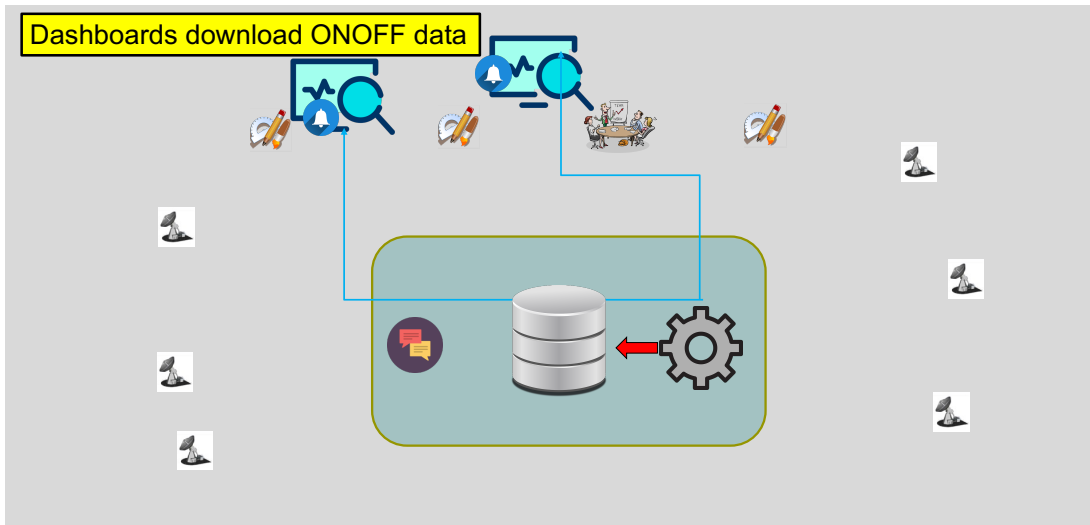
7. VCC – Uploading schedule (continue)



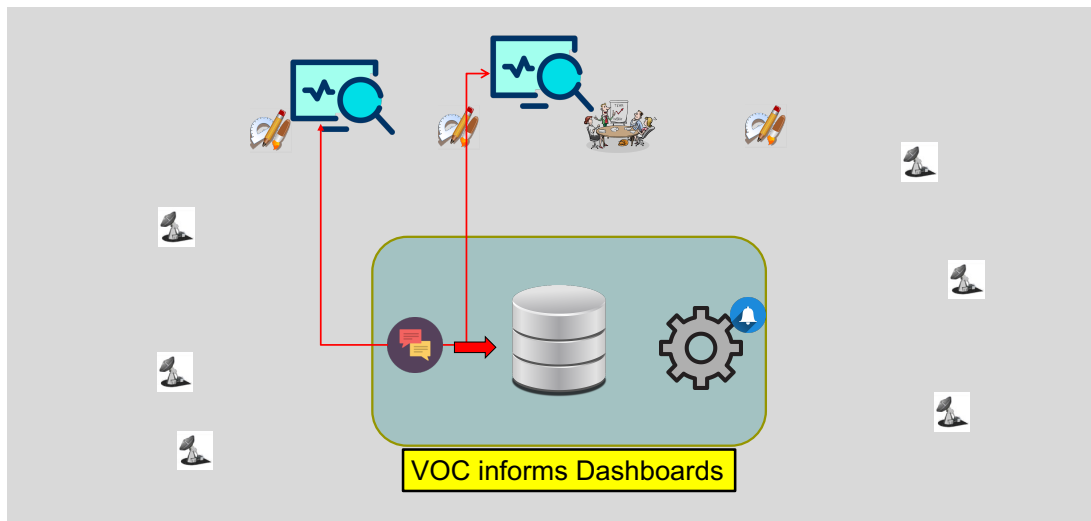
8. VCC – Observation



8. VCC – Observation (continue)



8. VCC – Observation (continue)



9. Installing VCC client software

- Users need key to access VCC
 - Send email to mario.Berube@nviinc.com uncluding
 - Public SSH key (oper for FS)
 - Your IVS component code.
 - Examples
 - Station: K2
 - Correlator: WASH
 - Operations Center: DACH
 - Analysis Center: NASA
 - Keys look like this
 - NS = ["K2", "61B9F50C-57F7-4D72-BC66-CFDA7C5DD709"]
 - AC = ["NASA", "0D50CF2C-AD4F-4B27-9068-01399562B5F7"]
 - OC = ["NASA", "214F7ADE-E8CF-40DE-96F3-1E6B5612FB1A"]
 - DB = ["----", "3CC16FC3-CBA0-4506-96D1-F5B2E9969F37"]
 - You will receive and encrypted config.txt file
- Install VCC python package
- It is recommended to create python virtual environment

9. Installing VCC client software – FS

As “prog”

```
cd /usr2/st
python3 -m venv vcc
source vcc/bin/activate
pip install --upgrade pip (recommended)
pip install wheel (recommended)
pip install git+https://github.com/mario-berube/vcc.git
```

As “oper”

```
Extract and save config.txt from email
source /usr2/st/vcc/bin/activate
vcc-config {-o output } config.txt {id_rsa}
The default location is /usr2/control/vcc.ctl
The default id_rsa key is ~/.ssh/id_rsa
```

You may want to edit the vcc.ctl file to set some folders or commands.

Test it

```
vcc -V
```

It will provide the version of vcc package (1.3.0 at the moment)

```
vcc-test
```

It will connect to vcc and test the inbox for user and dashboard.

```
vcc-message “This is title” “This is text”
```

This is used to confirm the popup window is working.

```
dashboard ses_id
```

9. Installing VCC client software – non FS

You need privileges to run pip

Create directory and move to it (Linux or MacOS)

```
python3 -m venv vcc (some system python3 is python)
```

```
source vcc/bin/activate (Linux or MacOS)
```

```
pip install --upgrade pip (recommended)
```

```
pip install wheel (recommended)
```

```
pip install git+https://github.com/mario-berube/vcc.git
```

Extract and save config.txt from email

```
vcc-config {-o output } config.txt {id_rsa}
```

The default location is vcc.ctl in current

The default id_rsa key is ~/.ssh/id_rsa

You can move vcc.ctl in your home folder.

You may want to edit the vcc.ctl file to set some folders or commands.

Test it. (vcc.ctl must be in directory or home)

```
vcc -V
```

It will provide the version of vcc package (1.3.0 at the moment)

```
vcc-test
```

It will connect to vcc and test the inbox for user and dashboard.

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vcc-message "This is title" "This is text"
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This is used to confirm the popup window is working.

10. VCC software for Network Stations (vcc-ns)

The vcc client package has special software that can be run by stations only called vcc-ns.

vcc-ns action options

- The action key words are:
 - **start** : starts the application that will be monitoring the VCC for message and the log scanner that report to VCC. This action should be run in background (nohup vcc-ns start > /dev/null 2>&1 &)
 - **stop**: stop vcc-ns in background mode
 - **status**: report if vcc-ns is running
 - **fetch**: retrieve schedule file from VCC
 - vcc-ns fetch r11090 (will not overwrite existing file on FS)
 - vcc-ns fetch -o r11090 (will overwrite existing file on FS)
 - vcc-ns fetch -r r11090 (will rename the existing file on FS)
 - **drudg**: will run drudg for specific session
 - vcc-ns drudg r11090 (drug r11090.skd and create snp, prc files)
 - **onoff**: will extract onoff values from log and transfer to VCC
 - vcc-ns onoff /usr2/logs/station.log
 - **next**: will list the upcoming sessions for next 14 days.
 - vcc-ns next -d 7 (next 7 days)
 - **log**: will upload the log file of session to VCC
 - vcc-ns log r11090 (will upload /usr2/logs/r11090k2.log)

urgen

Send urgent message to IVS components.

downtime

Application to inform IVS that station could be down for maintenance or other reason.

ses-info

Application provide fmout-gps data, issues or downtime.

vcc-test

Test if vcc can be reach. If the vcc-ns is running, it will failed on the inbox test because only one user can access it.

11. VCC software for other IVS components

The vcc client package has some applications for providing input or query the database.

vcc (None|int|std)

List (popup window) upcoming sessions (all or intensives or 2H). Viewer can be used to start dashboard.

vcc -s schedule file

Upload the schedule file to VCC. Can only be executed by Operations Center.

master session|master-file

This application can only be used by the Coordinating Center (GSFC). It will update the master schedule using the master file or window interface.

downtime station

Update status of a station. Can only be executed by Operations Center.

inbox CC|OC|AC|CO (version 1.3.1)

Monitor the inbox of IVS component.

CC: Coordinating Center

OC: Operation Center

AC: Analysis Center

CO: Correlator

dashboard session

Use dashboard to monitor a specific session.