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Svom

About VOEvents

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SVOM

THE SVOM MISSION

Svom : a French-Chinese space mission dedicated to GRB studies

~~Launch likely in 2016~~
~~By an Italian rocket Vega from Kourou in French Guyana~~
~~Payload on a mini-satellite developed by Thales~~

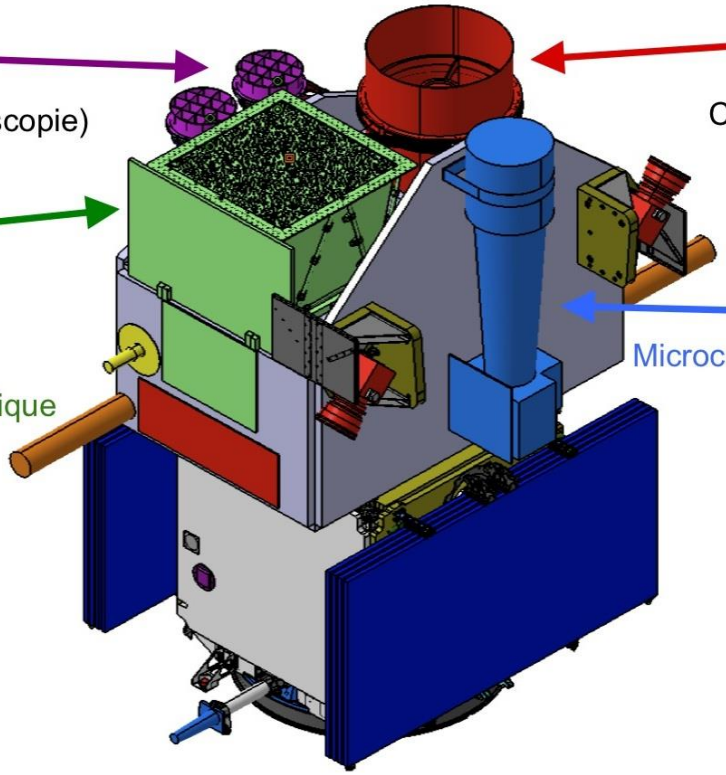
Launch likely by the end of 2021

By a *Long March* rocket from somewhere in China

Payload on a mini-satellite developed by
Shanghai Engineering Center for Microsatellites

Altitude of the orbit : 630 km, inclination of 30°
Duration of the mission 3 (+3) years

THE SVOM ON-BOARD INSTRUMENTS



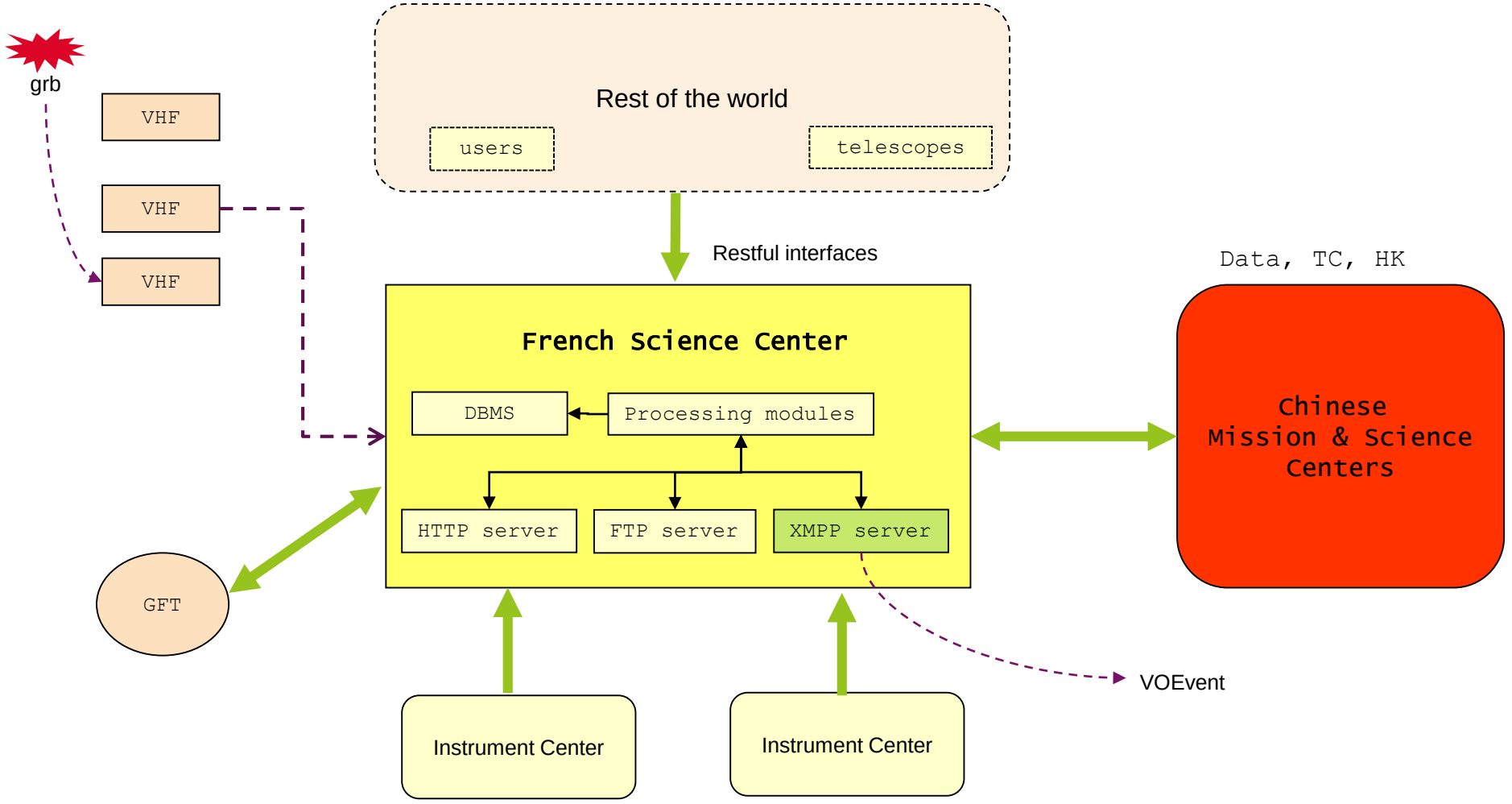
GRM
Gamma Ray Monitor
NaI-CsI (30 keV – 5 MeV spectroscopie)
FOV 2 sr

ECLAIRs
CXG – caméra X/gamma
CdTe (4 – 120 keV imagerie)
FOV 2 sr
UTS – unité de traitement scientifique
détection temps-réel sursaut et localisation ~ 10'

VT
Visible Telescope
CCD (400-700-1000 nm)
localisation ~ 1"
FOV 21'x21'
M_R = 23

MXT
Microchannel X-ray Telescope
CCD (0,3 – 5 keV)
localisation ~ 20"
FOV 1°x1°

FSC MAIN INTERFACES & PROTOCOLS



THE REFERENCE DOCUMENTS

- VOEvent 2.0 is a IVOA Recommendation (11 July 2011)
- VOEventRegExt : *an XML Encoding Schema for Resource Metadata for Collections of Events* is a working Draft (13 May 2014)
  - VOEventStream
  - VOEventServer
  - VOEventAnnotator
- The IVOA documents are very helpful for the developers
- However some of them are not easy to interpret
- And it is not a piece of cake to master this bunch of standards

SVOM & THE VO

- Svom productions should comply with the VO standards

- Most of the Svom members have heard about the VO
- but almost none of them have consulted the IVOA web site

- I've been evangelizing people about VOEvents since 2005
- Usually I'm listened politely …

- It is a good idea to have the GCN messages also emitted under the VOEvent format

- However I was pretty disappointed to see that some physicists take VOEvents only as GCN XMLified

- They do not care about the new concepts in the VOEvent

WHAT ABOUT TRANSPORTATION ?

VOEvent is transport neutral, but deploying and operating a robust general-purpose network of interoperating brokers has always been a high-priority issue

VOEventServers for a stream are registered in the registry

The VOEventRegExt schema defines 3 derived vr:Interface types to be used with the **`voe:Subscription`** capability:

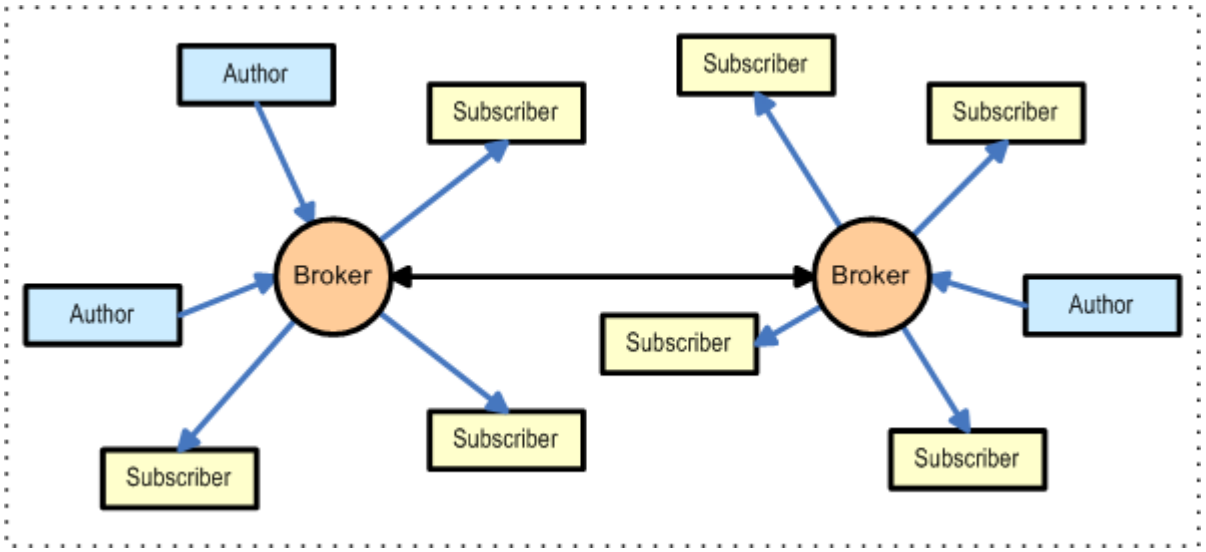
- **`voe:VTP`**
- **`voe:Jabber`**
- **`voe:RSS`**

VTP

This protocol is intentionally as simple as possible while still accomplishing the required task

`VOEvent Transport Protocol Version 1.1` IVOA Note 05 August 2009

This is an IVOA Note expressing suggestions



XMPP

This protocol can be defined as a VOEventServer interface in the registry

The `voe:Jabber` interface indicates that VOEvents are available from this server through a Jabber/XMPP interface.

The `<accessURL>` gives the endpoint for the Jabber server.

Extensible Messaging and Presence Protocol (XMPP) is a communications protocol for message-oriented middleware based on XML .The protocol was originally named Jabber.

Left behind in the middle of the war of the instant messaging systems.

Openfire server developments still in progress.

XMPP

XMPP, VTCP, Dakota ? Our choice is XMPP + PubSub :

- No need to reinvent the wheel
- Widely used on the internet
- Open source libraries, clients, servers available
- Provide all features necessary for Svom

We are required to control access to the alert messages

The *Publish-Subscribe* extension has the concept of *Affiliations* defining various privileges granted to the possible different user roles

Technical tools are available to implement any policy decided by the PIs

VTP vs XMPP

A comparison of VTP & XMPP

VTP	XMPP
Simple	Complex
Simplistic	Powerful
Developed from scratch	Mature technology born in 1998
Tiny community	Large community
No consensus	IETF standard
Used and working for VOEvent	No longer used for VOEvent
Specific clients needed	Bunch of standard clients available

XMPP

L'information est structurée autour de nœuds c'est-à-dire de thèmes d'intérêt.

Par exemple le *gcn, svom, catalina*, …

Les nœuds peuvent être organisés en arbre

Pour chaque nœud on définit des affiliations avec les rôles :

```
owner
publisher
member
none
banned
```

À chaque affiliation sont associés des privilèges

Naturellement tout est configurable en ligne

AFFILIATIONS AND THEIR PRIVILEGES

Access models : Open, Presence, Roster, Authorize, Whitelist

Affiliation	Subscribe	Retrieve items	Publish items	Delete single item	Purge node	Configure node	Delete node
Owner	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Publisher	Yes	Yes	Yes	Yes	Yes	No	No
Publish-Only	No	No	Yes	Yes	No	No	No
Member	Yes	Yes	No	No	No	No	No
None	Yes	No	No	No	No	No	No
Outcast	No	No	No	No	No	No	No

OUR XMMP TOOLBOX

We ~~have~~ had more than 10 client programs available to investigate our XMPP configuration, e.g. :

```
java fr.svom.xmpp.clients.Ping
java fr.svom.xmpp.clients.Hello
…
java fr.svom.xmpp.clients.VoEventReceiver

java fr.svom.xmpp.clients.NodeManager
java fr.svom.xmpp.clients.InfoQuery
```

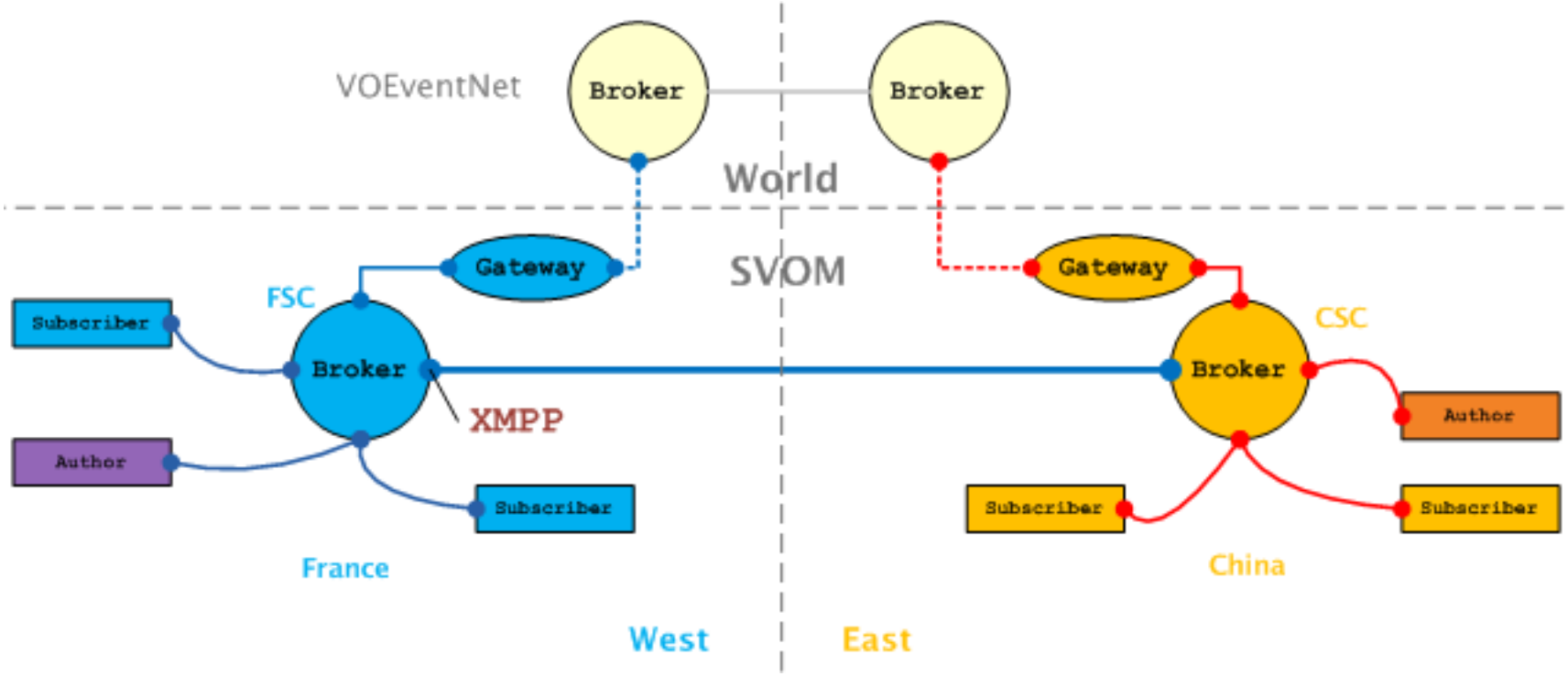
and we ~~have~~ had a couple of add-ons plugged in the server :

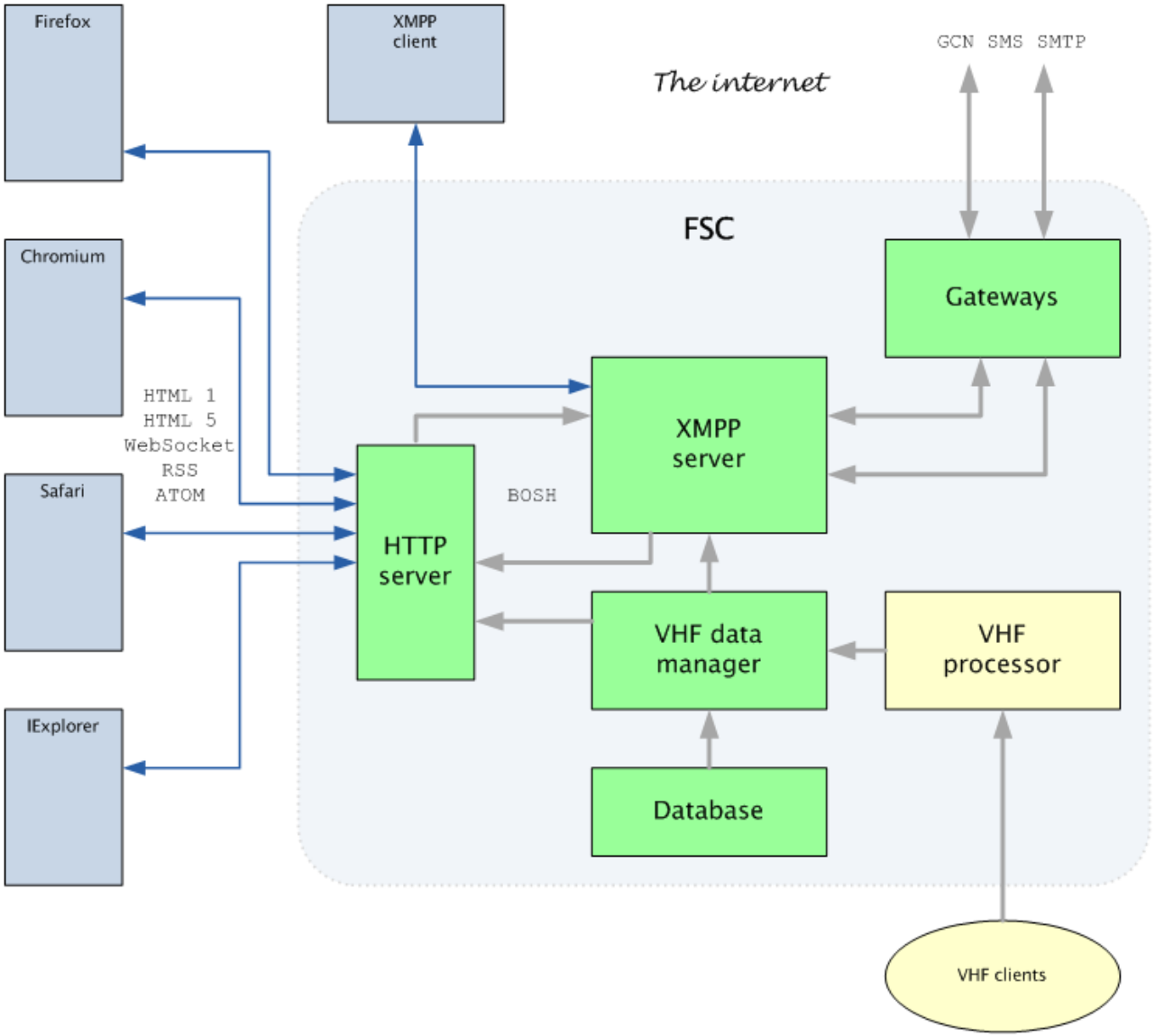
```
fr.svom.openburst.plugin.PubSubProbePlugin
fr.svom.openburst.plugin.NodeProbePlugin
```

SVOM MESSAGING ARCHITECTURE

France-China symmetry

Gateway between Svom and the rest of the world




Firefox
XMPP client
The internet
GCN SMS SMTP
FSC
Chromium
Gateways
HTML 1
HTML 5
WebSocket
RSS
ATOM
XMPP server
Safari
BOSH
HTTP server
VHF data manager
VHF processor
IExplorer
Database
VHF clients

IN THE SVOM FRAMEWORK

- Connection to VOEventNet proposed by november 2008
- Documents about content and distribution of VOEvents Svom delivered & reviewed a couple of times
- Test programs written, french-chinese trials carried out
- Back *en route* !

TESTS PREVIOUSLY IMPLEMENTED

From 2010 …

Documentation available at :

http://svomtest.svom.fr:8000/messaging/

Code and pages need to be refreshed

https://dsm-trac.cea.fr/SvomGround/browser/alert/messaging

Connection to servers, packet parsing, java programing

Receiving, sending events managed

TESTS PREVIOUSLY IMPLEMENTED

From 2010 …

Openfire server installed, configured and tested
http://www.igniterealtime.org/

Manage the XMPP protocol

It supports the pubsub messaging system
Test programs have been implemented:
http://svomtest.svom.fr:8000/messaging/pubsub.html

TESTS PREVIOUSLY IMPLEMENTED

Summer 2014 …

VTP : VOEvent Transport Protocol

Comet: a python implementation of VTP
http://comet.transientskp.org/
LOFAR transient key project

A java version has been implemented (code available in Irfu gitlab)
`fr.svom.xmpp.clients.VtpClient`

TODO LIST

For the scientists:

1. **Getting used with the VOEvent concepts**
2. Which streams for Svom ? Svom Ivorn specification ?
3. **`What`, `WhereWhen`, `How`, `Why`** for Svom instruments ?
4. How to manage France-China exchanges ?
5. How to present content to users ?

For the developers:

1. Getting used with the VOEvent XML schemas
2. Implementing a test bench & prototypes for Svom VOEvents
3. Implementing tools to access the registries