

VOEvent notices format & content

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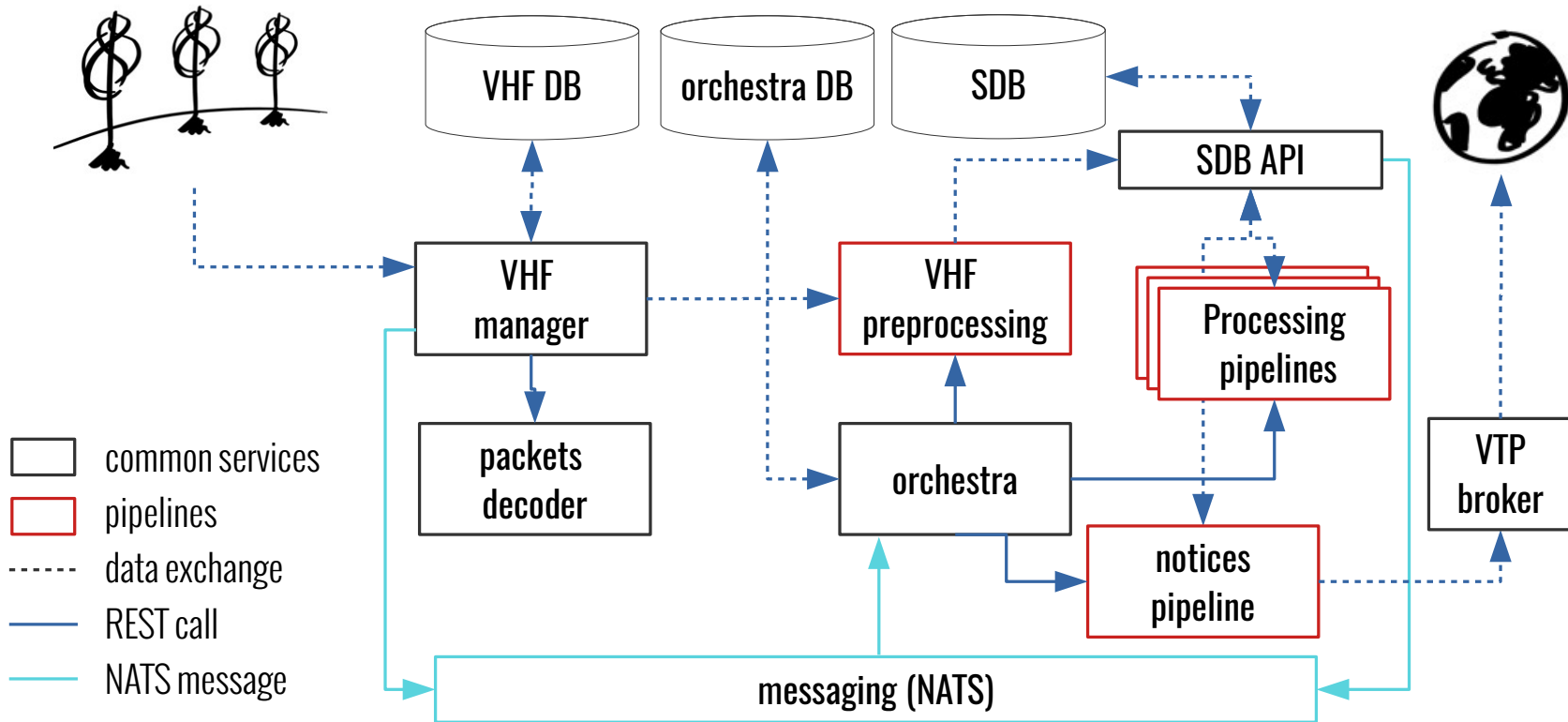


**OHP follow-up
meeting
Apr, 7th 2022**



FSC real-time alert processing

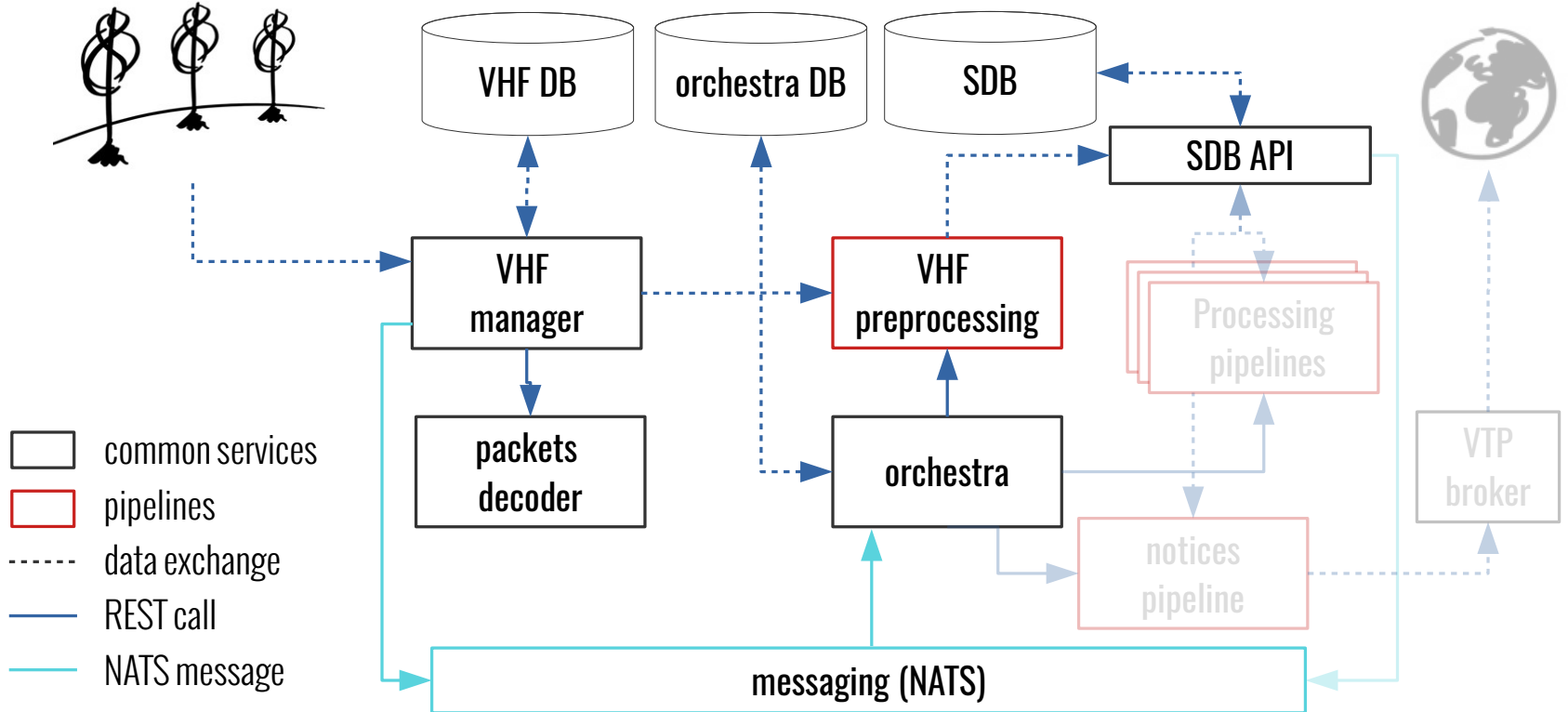
Overview of the complete VHF data flow:





FSC real-time alert processing

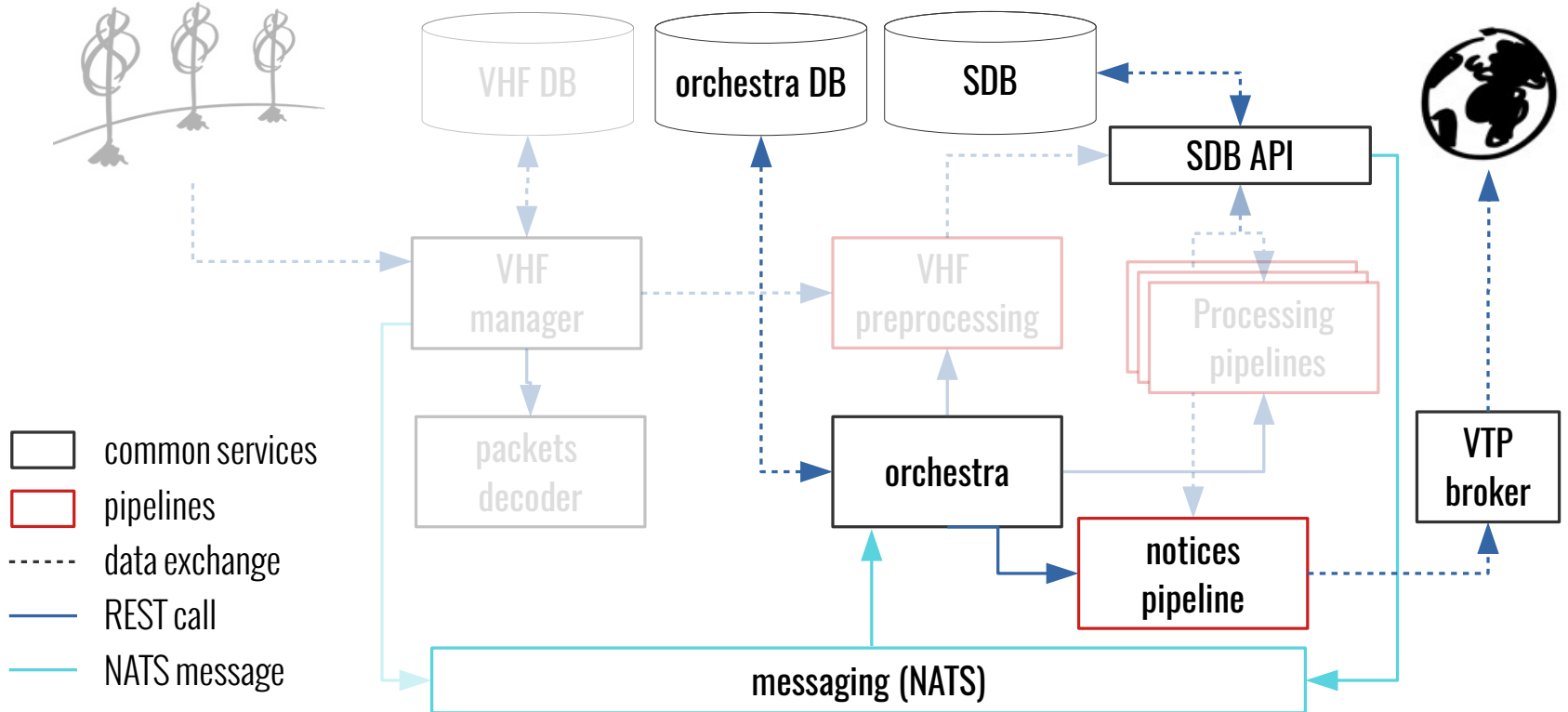
Focus on the preprocessing step :





FSC real-time alert processing

Focus on the notices generation step :

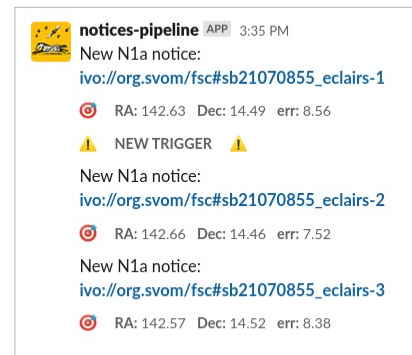




FSC notice pipeline

The notice pipeline is responsible of producing notices in VOEvent format

- Is triggered **by the orchestrator** when Q1 products are available in SDB
- Uses the BURST_ID to **retrieve data from the SDB** in FITS format. In the case of an ECLAIRs alert, uses TT_ECL, QPO_ECL and QCL_ECL
- Generates notice(s) in **VOEvent format**
- **Broadcasts notices** using VTP protocol on a Comet broker located within FSC
- Stores broadcasted notices **in a dedicated voeventdb**
- Sends a message on the **Slack channel #voevent-notices** when new notices are broadcasted





FSC notices broker

All notices broadcasted through the FSC broker are visible on the notices webUI
<https://fsc.svom.eu/notices/> (with access-control and permission handling)

SVOM VOEvent Notices TABLE ALADIN CREATOR FSC henri.louvin@cea.fr

Utilities ↻

Basic Filters ▾

Date

Cone

Pattern

Role
 observation
 test
 utility

Stream
 Svom
 LIGO-Virgo
 FSC Broker

All Filters ▾

AUTHORED ↕	IVORN ↕	ROLE	RA	DEC	ERR	TIME	
2022-04-04T11:54:31	ivo://org.svom/fsc#sb22040449_eclairs-1	observation	50.45	10.00	0.05	2022-04-04T11:54:30	<input type="button" value="↩"/> <input type="button" value="🔍"/> <input type="button" value="📄"/>
2022-04-04T11:54:31	ivo://org.svom/fsc#sb22040449_eclairs-2	observation	50.45	10.00	0.05	2022-04-04T11:54:30	<input type="button" value="↩"/> <input type="button" value="🔍"/> <input type="button" value="📄"/>
2022-04-03T20:45:17	ivo://org.svom/fsc#sb22040386_eclairs-6	observation	191.50	89.18	0.00	2022-04-03T20:45:16	<input type="button" value="↩"/> <input type="button" value="🔍"/> <input type="button" value="📄"/>
2022-04-03T20:44:19	ivo://org.svom/fsc#sb22040386_eclairs-5	observation	191.60	89.18	0.00	2022-04-03T20:44:18	<input type="button" value="↩"/> <input type="button" value="🔍"/> <input type="button" value="📄"/>
2022-04-03T20:42:43	ivo://org.svom/fsc#sb22040386_eclairs-4	observation	191.03	89.17	0.05	2022-04-03T20:42:42	<input type="button" value="↩"/> <input type="button" value="🔍"/> <input type="button" value="📄"/>
2022-04-03T20:42:43	ivo://org.svom/fsc#sb22040386_eclairs-1	observation	191.03	89.17	0.05	2022-04-03T20:42:42	<input type="button" value="↩"/> <input type="button" value="🔍"/> <input type="button" value="📄"/>
2022-04-03T20:42:43	ivo://org.svom/fsc#sb22040386_eclairs-2	observation	191.03	89.17	0.05	2022-04-03T20:42:42	<input type="button" value="↩"/> <input type="button" value="🔍"/> <input type="button" value="📄"/>
2022-04-03T20:42:43	ivo://org.svom/fsc#sb22040386_eclairs-3	observation	191.03	89.17	0.05	2022-04-03T20:42:42	<input type="button" value="↩"/> <input type="button" value="🔍"/> <input type="button" value="📄"/>
2022-04-02T03:54:43	ivo://org.svom/fsc#sb22040216_eclairs-4	observation	30.69	-61.38	0.05	2022-04-02T03:54:42	<input type="button" value="↩"/> <input type="button" value="🔍"/> <input type="button" value="📄"/>
2022-04-02T03:54:43	ivo://org.svom	observation	30.69	-61.38	0.05	2022-04-02T03:54:42	<input type="button" value="↩"/> <input type="button" value="🔍"/> <input type="button" value="📄"/>



Subscribe to the FSC broker

The FSC broker can be reached from anywhere in the world and is up and running 24/7 at

voevent.svom.eu:8099

Usage example using comet:

```
twistd -n comet --local-ivo=ivo://myivo \  
--receive --remote=voevent.svom.eu \  
--print-event
```



Svom VOE Notices and Circulars

Level 1 notices elaborated from alert messages of burst candidates localized by ECLAIRs (N1e) or GRM (N1g)

OUTPUT	N1e
Content	T0, position, flux, confidence level
Sender	FSC
Customers	CSC, GFTs, GWAC, GCN/VOE, FWGs
OUTPUT	N1g
Content	T0, raw position, confidence level, crude spectrum in trigger time window
Sender	FSC
Customers	CSC, GWAC, GCN/VOE



Svom VOE Notices and Circulars

N2f notices elaborated from alert messages and data issued by ground observations (GFTs and GWAC)

INPUT	Alert message level 2f / Internet	Alert data level 2f / Internet	Alert message level 2f / Internet	Alert data level 2f / Internet	Alert message level 2f / Internet	Alert data level 2f / Internet
From	F-GFT center		C-GFT center		GWAC center	
OUTPUT	N2f	Web site updated	N2f	Web site updated	N2f	Web site updated
Content	Afterglow coordinates, photometric redshift, magnitude	Image (png format)	Afterglow coordinate, photometric redshift, magnitude	Image (png format)	Prompt counterpart or afterglow coordinates, magnitude	Image (png format)
Sender	FSC		CSC		CSC	
Customers	CSC, GCN/VOE, FWGs	CSC	FSC, GCN/VOE, FWGs	FSC	FSC, GCN/VOE, FWGs	FSC



Svom VOE Notices and Circulars

N2e notices elaborated from level 2 data issued by ECLAIRs

INPUT	Alert data level 2e (light curves) / VHF	Alert data level 2e (descriptor) / VHF	Alert data level 2e (recurrent) / VHF
OUTPUT	N2e ECLAIRs	N2e ECLAIRs	Internal use only
Content	Background-subtracted best-resolution light curves in large energy bands, duration (T90), peak flux, hardness ratios, crude classification	Refined CXG position	Best positions found by ECLAIRs on-board process every 20 sec
Sender	FSC		
Customers	CSC, GFTs, GWAC, GCN/VOE, FWGs		CSC, GFTs, GWAC



Svom VOE Notices and Circulars

N2g,j notices elaborated from alert data provided by GRM and from ECLGRM ground analyses (joint ECLAIRs/GRM detection)

INPUT	GRM alert data level 2g (light curves) / VHF	ECLAIRs and GRM alert data level 2e and 2g (light curves) / VHF
From	PDCU	ECLGRM VHF analysis
OUTPUT	N2g GRM	N2j ECLGRM
Content	Background-subtracted best-resolution light curves in large energy bands, duration (T90), peak flux, hardness ratios, crude classification	Joint hardness ratios, update of crude classification
Sender	FSC	
Customers	CSC, GFTs, GWAC, GCN/VOE, FWGs	



Svom VOE Notices and Circulars

N2m elaborated from alert message and data issued by MXT

INPUT	Alert message level 2m / VHF	Alert data level 2m / VHF
OUTPUT	N2m	N2m and Web site updated
Content	MXT position	Refined MXT position, preliminary flux
Sender	FSC	
Customers	CSC, GFTs, GWAC, GCN/VOE, FWGs	



Svom VOE Notices and Circulars

N2v elaborated from alert data issued by VT

INPUT	Alert data level 2v (attitude chart) / VHF	Alert data level 2v (finding charts) / VHF
OUTPUT	Internal use only	N2v
Content	Astrometry parameters	VT position, preliminary photometry
Sender	-	FSC
Customers	FSC for data processing used for refining the astrometry for MXT (N2m) and VT (N2v)	CSC, GFTs, GWAC, GCN/VOE, FWGs



Svom VOE Notices and Circulars

Level 3 notices following ECLAIRs burst candidates (with associated N1e notice)

OUTPUT	N3e, N3g, N3j, N3m, N3v	N3e, N3g, N3j
Content	Final results for each instrument for a validated trigger, or cancellation of previous alerts in case of false trigger	
Sender	IS from FSC/CSC	
Customers	GFTs, GWAC, GCN/VOE, FWGs	

Level 3 notices following GRM burst candidates (with associated N1g notice)

OUTPUT	N3g, N3f	N3g
Content	Final parameters derived from GRM/GWAC	Cancellation of previous alerts in case of false trigger
Sender	CSC + GWAC center	
Customers	FSC, GWAC, GCN/VOE, FWGs	



Svom VOE Notices and Circulars

Which notices should be broadcasted to the worldwide community ?

- Which notices should be broadcasted to the worldwide community ?
 - The FSC broker could be either open to anyone or only to a list of known customers
 - If only a subset of Svom notices should be public, those will be sent to a public broker (VO-GCN, 4pisky, ...)
- What about circulars and reports ?
 - They are human readable as opposed to the VOEvent format
 - They have to be sent **interactively** and not automatically
 - They will be distributed through GCN which is managed by NASA, so all Chinese circulars will go through FSC



Svom VOE Notices and Circulars

What now ?

- The **notices pipeline** will become the responsibility of T.Roland under my supervision
- Workplan for the following months by decreasing order of priority :
 - Implementation of the new definitions of **N1* notices**
 - Definition and implementaiton of **N2m notices** (MXT position broadcast)
 - Definition and implementaiton of **N2v and N2e,g,j notices** (VT position, ECL,GRM, ECLGRM data)
 - Start discussion on **N3*** notices (the corresponding products/information is under development)



Svom VOE Notice format – N1e example

```
<?xml version='1.0' encoding='UTF-8'?>
<voe:VOEvent xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:voe="http://www.ivoa.net/xml/VOEvent/v2.0"
xsi:schemaLocation="http://www.ivoa.net/xml/VOEvent/v2.0
http://www.ivoa.net/xml/VOEvent/VOEvent-v2.0.xsd" version="2.0"
role="observation" ivorn="ivo://org.svom/fsc#sb22040449_eclairs-1">
  <Who>
    <AuthorIVORN>ivo://org.svom/FSC</AuthorIVORN>
    <Author>
      <shortName>Svom-FSC</shortName>
      <contactName>Henri Louvin</contactName>
      <contactEmail>henri.louvin@cea.fr</contactEmail>
    </Author>
    <Date>2022-04-04T11:54:31</Date>
  </Who>
  <What>
```