Searching and Viewing VOEvents

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VOEvent STAP Services

- Astronomical:
  - OGLE – gravitational microlensing events from eSTAR RSS feed ( )
  - GCN – gamma ray bursts from CalTech RSS feed ( )
  - SDSS – supernovae from CalTech RSS feed ( )
- Solar:
  - BATSE – packets generated from BATSE x-ray solar flare catalogue ()
  - LASCO – packets generated from LASCO coronal mass ejection catalogue ()
  - NOAA – packets generated from NOAA's GOES x-ray solar flare catalogue ()

VOEvent STAP Implementation

1. Acquire VOEvent packets
   - Astro events downloaded to MSSL
   - Solar events generated from catalogues
   - All packets made available as MSSL-based URLs[1]

2. Extract event data into database
   - XSLT used to generate text tables of each feed's VOEvents
   - Tables uploaded into one MySQL table per feed

3. Deploy VOEvent STAP services
   - AstroGrid STAP web service code refactored to include RA / Dec queries
   - One STAP web service deployed per feed
   - Each STAP service configured to perform start / stop time and start / stop time plus cone search queries on database

[1]Action taken after realizing that URLs pointing to eSTAR and CalTech packets were no longer valid after a few months.

Example Queries

Astro: start / stop time plus cone search

- GCN

http://msslxx.mssl.ucl.ac.uk:8080/stap-gcn/StapSearch?START=2007-01-09T00:00:00&END=2007-01-10T15:00:00&POS=0.0,-52.0&SIZE=1.0&service=astrogrid_stap

- SDSS

http://msslxx.mssl.ucl.ac.uk:8080/stap-sdss/StapSearch?START=2006-11-19T00:00:00&END=2006-11-20T15:00:00&service=astrogrid_stap&POS=0.0,-5.0&SIZE=10.0

- OGLE

http://msslxx.mssl.ucl.ac.uk:8080/stap-ogle/StapSearch?START=2006-09-17T00:00:00&END=2006-10-18T15:00:00&service=astrogrid_stap&POS=270.0,-28.0&SIZE=0.5

Solar: start / stop time

- BATSE

http://msslxx.mssl.ucl.ac.uk:8080/stap-batse/StapSearch?START=2000-05-25T00:00:00&END=2000-05-26T15:00:00&service=astrogrid_stap

- LASCO

http://msslxx.mssl.ucl.ac.uk:8080/stap-lasco/StapSearch?START=2005-12-05T00:00:00&END=2005-12-06T15:00:00&service=astrogrid_stap

- NOAA

http://msslxx.mssl.ucl.ac.uk:8080/stap-noaa/StapSearch?START=2005-12-30T00:00:00&END=2005-12-31T15:00:00&service=astrogrid_stap

STAP Results

Mandatory STAP fields:

- **ACCESS_URL**: URL of VOEvent packet
- **PROVIDER**: VOEvent broker name
- **TIME_START**: start time (or time instant) from `<WhereWhen>`
- **TIME_END**: stop time (or time instant) from `<WhereWhen>`
- **DATA_ID**: text description of VOEvent
- **INSTRUMENT_ID**: instrument or feed name
- **DESCRIPTION**: text describing event feed
- **DESCRIPTION_URL**: URL pointing to event provider's project or institution
- **FORMAT**: "VOEvent"

Note: "DATA_ID", "INSTRUMENT_ID" and "DESCRIPTION" all provide similar information in current VOEvent STAP services.

Optional STAP fields added:

- **IVORN**: ivorn attribute from `<VOEvent>` root
- **Concept**: event `<Concept>` element from `<Why>` ("flare", "GRB", etc.)
- **Name**: event type or event name from `<Name>` as child of `<Why>` or `<Inference>`
- **Contact details**: `<contactName>`, `<contactEmail>` of event's reporter from `<Who>`
- **Parameters**: comma-separated list of `<Param>` name, value, and unit attributes from `<What>`
- **References**: comma-separated list of `<Reference>` file URLs from `<What>`
- **RA and Dec**: for astro events, RA and dec from STC `<Position2D>` or `<Position3D>` in `<WhereWhen>`

STAP to SEAP?

Current STAP queries:

- Start time / stop time (astro or solar)
- Start time / stop time plus cone search (astro only)

Additional SEAP query suggestions:

- Cone search
- Event IVORN (requires coordinates & time to event IVORN resolver, similar to SIMBAD coordinates to object resolver)

Possible solar extensions:

- Active region number searches
- Cone search on heliosperical coordinates

Future Work

Further integration of VOEvent feeds with AstroGrid will be shaped by output of Tucson VOEvent workshop:

- Will a SEAP schema be developed to replace STAP for VOEvent web service queries?
- Will VOEvent brokers archive packets?
- Are VOEvent queries better suited to XQueries than SQL? (Does implementation matter?)

- **Tucson workshop demo:** VOEvent Explorer working with up-to-date events from eSTAR RSS feeds