



PADC

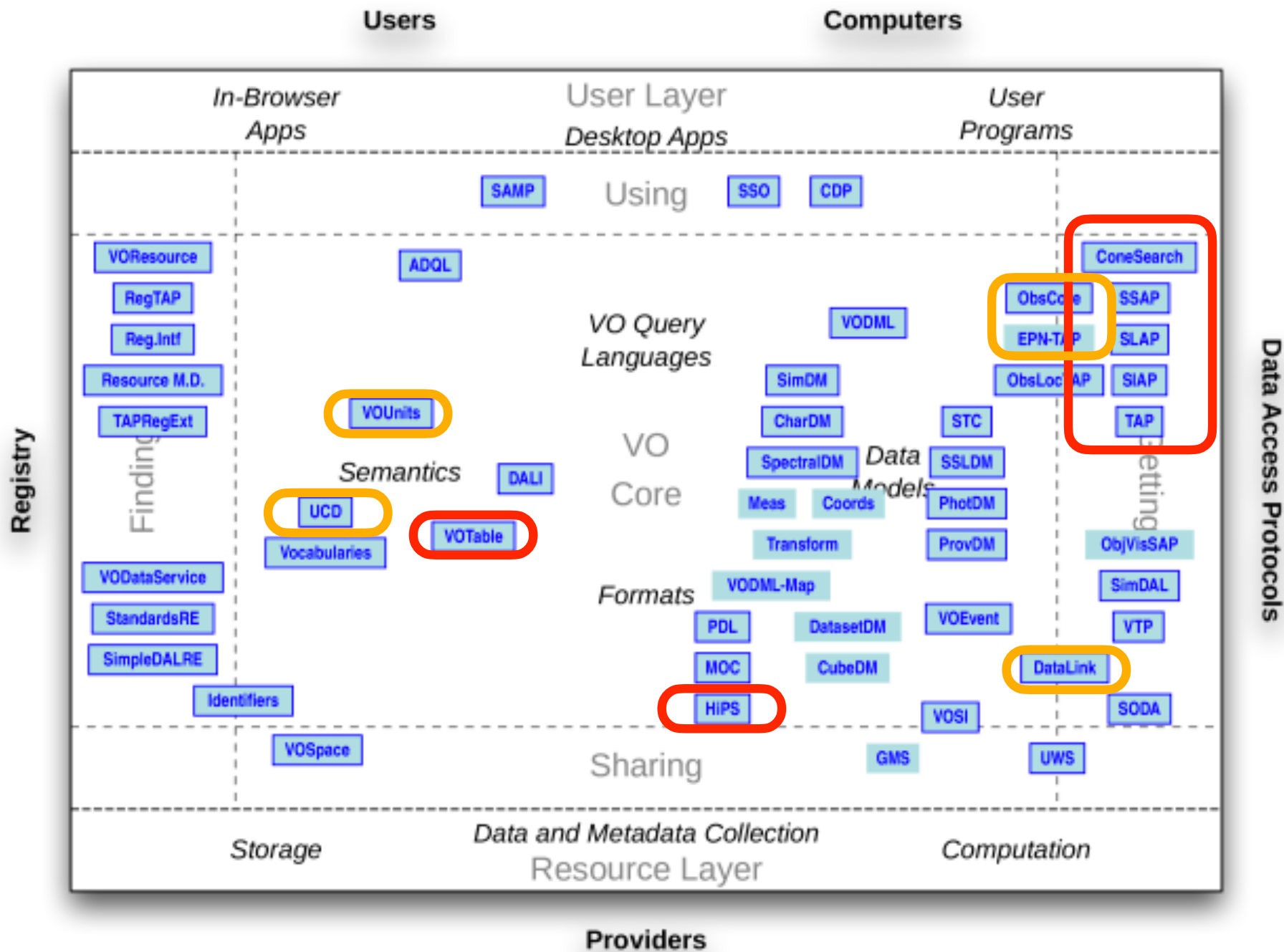
Web Validators

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IVOA Interop Meeting - VIRTUAL - 2022-04-29 - Operations IG

In The Big Picture



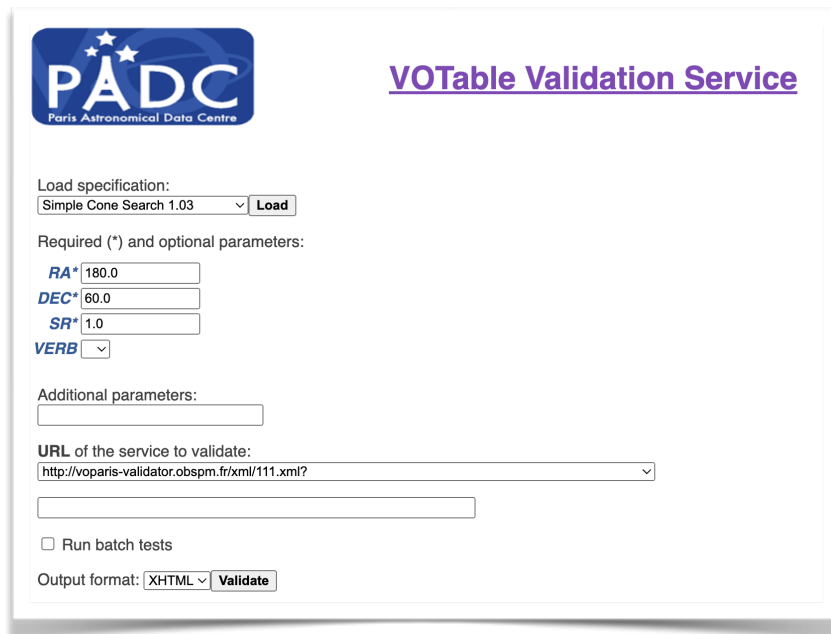
Web Validators in the IVOA

<https://wiki.ivoa.net/twiki/bin/view/IVOA/IvoaValidatorsSummary>

1. **Web** (vs Standalone) **Validator**: A tool that can be run interactively by a user at a web site
2. [Web] **Testing framework**: A *web* site that provides links to results of tests of a class of services.
3. **Web API**: An Application Programming Interface which provides test results in a programmatic way over the *web*.

PADC “Legacy” Validators

- <http://voparis-validator.obspm.fr/>
- **VOT** (1.0-1.4) **SCS** (1.03) **SIA** (1.0-2.0) **SSA** (1.0-1.1) **SLA** (2.0)
- Input: form or GET params, Output in HTML or XML
- Rules are public:
<http://voparis-validator.obspm.fr/json/>
- Updated for new versions and errata



The screenshot shows the PADC VOTable Validation Service interface. It features the PADC logo (Paris Astronomical Data Centre) and the title "VOTable Validation Service". The "Load specification:" section has a dropdown menu set to "Simple Cone Search 1.03" and a "Load" button. Below this, "Required (*) and optional parameters:" are listed: RA* (180.0), DEC* (60.0), SR* (1.0), and VERB (a dropdown menu). The "Additional parameters:" section has an empty text input field. The "URL of the service to validate:" section has a dropdown menu showing "http://voparis-validator.obspm.fr/xml/111.xml?". At the bottom, there is a checkbox for "Run batch tests" and an "Output format:" section with a dropdown menu set to "XHTML" and a "Validate" button.

```
Array
(
    [VOTable version] => 1.0
    [required parameters] => Array
        (
            [RA] => 180.0
            [DEC] => 60.0
            [SR] => 1.0
        )
    [optional parameters] => Array
        (
            [VERB] => Array
                (
                    [0] =>
                    [1] => 1
                    [2] => 2
                    [3] => 3
                )
        )
    [RESOURCE] => Array
        (
            [xpath] => /vot:VOTABLE/vot:RESOURCE
            [then] => Array
                (
                    [no error] => Array
                        (
                            [xpath] => //vot:INFO[@name='Error'] | //vot:PARAM[@name='Error'] | //vot:INFO[value='ERROR']
                            [then] => Array
                                (
                                    [2.3] => Array
                                        (
                                            [xpath] => /vot:VOTABLE/vot:INFO[@name='Error'] | //vot:RESOURCE/vot:INFO[@name='Error'] |
                                            //vot:RESOURCE/vot:PARAM[@name='Error'] | //vot:VOTABLE/vot:DEFINITIONS/vot:PARAM[@name='Error']
                                            [error type] => error
                                            [name] => 2.3
                                            [documentation] => In the case of error, the service <strong>must</strong> respond with a
                                            VOTable that contains a single <code class="element">PARAM</code> element or a single <code class="element">INFO</code> element with <code
                                            class="attribute">name="Error"</code>, where the corresponding <code class="attribute">value</code> attribute should contain some
                                            explanation of the nature of the error. If a <code class="element">INFO</code> element is used, it must appear as a direct child of the
                                            root <code class="element">VOTABLE</code> element or the <code class="element">RESOURCE</code> element. If a <code
                                            class="element">PARAM</code> element is used, it must appear as a direct child of the <code class="element">RESOURCE</code> element or a
                                            <code class="element">DEFINITIONS</code> element below the root <code class="element">VOTABLE</code> element.
                                        )
                                    )
                                [else] => Array
                                    (
                                        [2.2.1] => Array
                                            (
                                                [xpath] => /vot:VOTABLE/vot:RESOURCE/vot:TABLE/vot:{@ucd='ID_MAIN'}
                                                [max] => 1
                                                [error type] => error
                                                [name] => 2.2.1
                                                [documentation] => Exactly one <code class="element">FIELD</code> <strong>must</strong> have
                                                <code class="attribute">ucd="ID_MAIN"</code>, with an array character type (fixed or variable length), representing an ID string for that
                                                record of the table.
                                            )
                                        )
                                    )
                                )
                            )
                        )
                    )
                )
            )
        )
    )
```

Legacy Validators: Recent Changes

- **VOTable**

- VOTable-1.3 Erratum 1 - COOSYS un-deprecation

- https://wiki.ivoa.net/twiki/bin/view/IVOA/VOTable-1_3-Err-1

- **SSA**

- SSA v1.1 Erratum 1: Base URL trailing separator clarification

- https://wiki.ivoa.net/twiki/bin/view/IVOA/SSA-1_1-Err-1

- **SIA** (for Datalink)

- RESOURCE with type="metadata" *always* allowed

- + at least 1 RESOURCE with type="results" is required



TAP Web Validator

<https://voparis-validation-reports.obspm.fr/validators/tap>

- Uses STILTS **taplint** by Mark Taylor [2021arXiv211208003T](https://arxiv.org/abs/2112.08003)
- New parser + new web validator with form
- Output in color HTML or JSON
- Supports most taplint options + timeout

Home ConeSearch SIA SSA TAP HIPS

TAP Validator

Service URL*

Stages (if none selected, the default list of stages will be run)

- TMV: Validate table metadata against XML schema
- TME: Check content of tables metadata from /tables
- TMS: Check content of tables metadata from TAP_SCHEMA
- TMC: Compare table metadata from /tables and TAP_SCHEMA
- UUC: Check column units and UCDs are legal
- CPV: Validate capabilities against XML schema
- CAP: Check TAP and TAPRegExt content of capabilities document
- AVV: Validate availability against XML schema
- QGE: Make ADQL queries in sync GET mode
- QPO: Make ADQL queries in sync POST mode
- QAS: Make ADQL queries in async mode
- UWS: Test asynchronous UWS/TAP behaviour
- MDQ: Check table query result columns against declared metadata
- OBS: Test implementation of ObsCore Data Model
- EPN: Test implementation of EPN-TAP tables
- UPL: Make queries with table uploads
- EXA: Check content of examples document

Mode* Normal

Format* HTML

Time-out (secs)* 60

Max tested tables

List of tables to test

Launch Validator Stop Validator

Tests based on taplint version 3.4-4+ by Mark Taylor. Command used:
/usr/bin/java -jar stilts.jar taplint format=text "http://voparis-tap-astro.obspm.fr/__system__/tap/run/tap"

Validator ended. 00:26

```
tapvalidator: This is tapvalidator version 2.0
tapvalidator: Called with URL: https://voparis-validation-backend.obspm.fr/val/tapvalidator?serviceURL=http%3A%2F%2Fvoparis-tap-astro.obspm.fr/__system__/tap/run/tap
tapvalidator: Launching taplint for URL: http://voparis-tap-astro.obspm.fr/__system__/tap/run/tap
tapvalidator: Command line: /usr/bin/java -jar stilts.jar taplint format=text "http://voparis-tap-astro.obspm.fr/__system__/tap/run/tap"
tapvalidator: Hostname: voparis-validation-backend Dir: /var/www/html/django/java
tapvalidator: Timeouts: global: 60 line: 60

This is STILTS taplint, 3.4-4+/4166b3c69 (2022-04-14)
Timestamp: 2022-04-26 10:28:30 UTC
Static report types: ERROR(172), WARNING(77), INFO(31), SUMMARY(13), FAILURE(25)
Section TMV: Validate table metadata against XML schema
I-TMV-VURL-1 Validating http://voparis-tap-astro.obspm.fr/tap/tables as tableset (http://www.ivoa.net/xml/VODataService/v1.1)
S-TMV-VALI-1 SAX report: warnings 0, errors 0, fatal 0
Section TME: Check content of tables metadata from /tables
I-TME-CURL-1 Reading capability metadata from http://voparis-tap-astro.obspm.fr/__system__/tap/run/tap/capabilities
I-TME-TURL-1 Reading table metadata from http://voparis-tap-astro.obspm.fr/tap/tables
S-TME-SUMM-1 Schemas: 10, Tables: 23, Columns: 1096, Foreign Keys: 6
S-TME-FLGS-1 Standard column flags: indexed: 46, primary: 14, nullable: 1056
S-TME-FLGO-1 Other column flags: none
Section TMS: Check content of tables metadata from TAP_SCHEMA
I-TMS-TAPV-1 Validating for TAP version V1.1
I-TMS-QSUB-1 Submitting query: SELECT COUNT(*) AS nr FROM TAP_SCHEMA.schemas
I-TMS-QGET-1 Query GET URL: http://voparis-tap-astro.obspm.fr/tap/sync?LANG=ADQL&QUERY=SELECT+COUNT%28*%29+AS+nr+FROM+TAP_SCHEMA
I-TMS-QSUB-2 Submitting query: SELECT COUNT(*) AS nr FROM TAP_SCHEMA.tables
```

Autoscroll to bottom Print Report



HiPS Web Validator

<https://voparis-validation-reports.obspm.fr/validators/hips>

- Uses **Hipslint** from Pierre Fernique, CDS
<http://aladin.u-strasbg.fr/hips/>
- Re-uses generic parser written for taplint
- Supports 2 Hipslint modes + timeout
- Output in HTML or JSON

The screenshot shows the HiPS Validator web interface. At the top, there are navigation links: Home, ConeSearch SIA SSA, TAP, and HIPS. The main heading is "HiPS Validator". Below this, there are four input fields: "Service URL*" (http://voparis-srv-paris.obspm.fr/vo/planeto/hips/perl_hipslist.pl), "Mode*" (No tile - Short), "Time-out (secs)*" (60), and "Format*" (HTML). There are two buttons: "Launch Validator" and "Stop Validator". Below the buttons, there is a text area showing the command used: "/usr/bin/java -jar HipsLint4Renaud3.jar -notiletest "http://voparis-srv-paris.obspm.fr/vo/planeto/hips/perl_hipslist.pl"". The output area shows the following text:

```
Validator ended. 00:03
hipsvalidator: This is hipsvalidator version 1.0
hipsvalidator: Called with URL: https://voparis-validation-backend.obspm.fr/val/hipsvalidator?serviceURL=http%3A%2F%2Fvoparis-sr
hipsvalidator: Launching HipsLint for URL: http://voparis-srv-paris.obspm.fr/vo/planeto/hips/perl_hipslist.pl
hipsvalidator: Command line: /usr/bin/java -jar HipsLint4Renaud3.jar -notiletest "http://voparis-srv-paris.obspm.fr/vo/planeto/h
hipsvalidator: Hostname: voparis-validation-backend Dir: /var/www/html/django/java
hipsvalidator: Timeouts: global: 60 line: 60

INFO : Starting HipsLint 26/04/22 10:40:40 (based on Aladin v11.122)...
INFO : ===== CHECKING HiPSserver [http://voparis-srv-paris.obspm.fr/vo/planeto/hips/perl_hipslist.pl] =====
RUN  : ----- Checking HiPSList record [CDS/P/Ariel/Voyager] -----
INFO : Lint: "hips_release_date" [2019-05-21T07:19Z]
INFO : Lint: "hips_status" [public mirror unclonable]
INFO : Lint: HIPS mirror skipped [CDS/P/Ariel/Voyager]
RUN  : ----- Checking HiPSList record [CDS/P/Charon/NewHorizon-PIA19866] -----
INFO : Lint: "hips_release_date" [2019-05-21T07:05Z]
INFO : Lint: "hips_status" [public mirror unclonable]
INFO : Lint: HIPS mirror skipped [CDS/P/Charon/NewHorizon-PIA19866]
RUN  : ----- Checking HiPSList record [CDS/P/Dione/Cassini-PIA12577] -----
INFO : Lint: "hips_release_date" [2019-05-21T07:06Z]
INFO : Lint: "hips_status" [public mirror unclonable]
INFO : Lint: HIPS mirror skipped [CDS/P/Dione/Cassini-PIA12577]
RUN  : ----- Checking HiPSList record [CDS/P/Earth/BlueMarble] -----
INFO : Lint: "hips_release_date" [2019-05-21T06:51Z]
INFO : Lint: "hips_status" [public mirror unclonable]
```

At the bottom, there are two buttons: "Autoscroll to bottom" and "Print Report".

PADC Testing Framework

- **Design Principles**

- Tools for providers to be pro-active and self-aware of potential issues during the lifetime of their VO services

- **Validation Batches (daily)**

- Query a publishing registry for suitable services
- Validate services in parallel using **testQueries** when avail (max SR=0.1 deg to avoid timeouts)

- **Validation Database**

- Store results: services+errors...

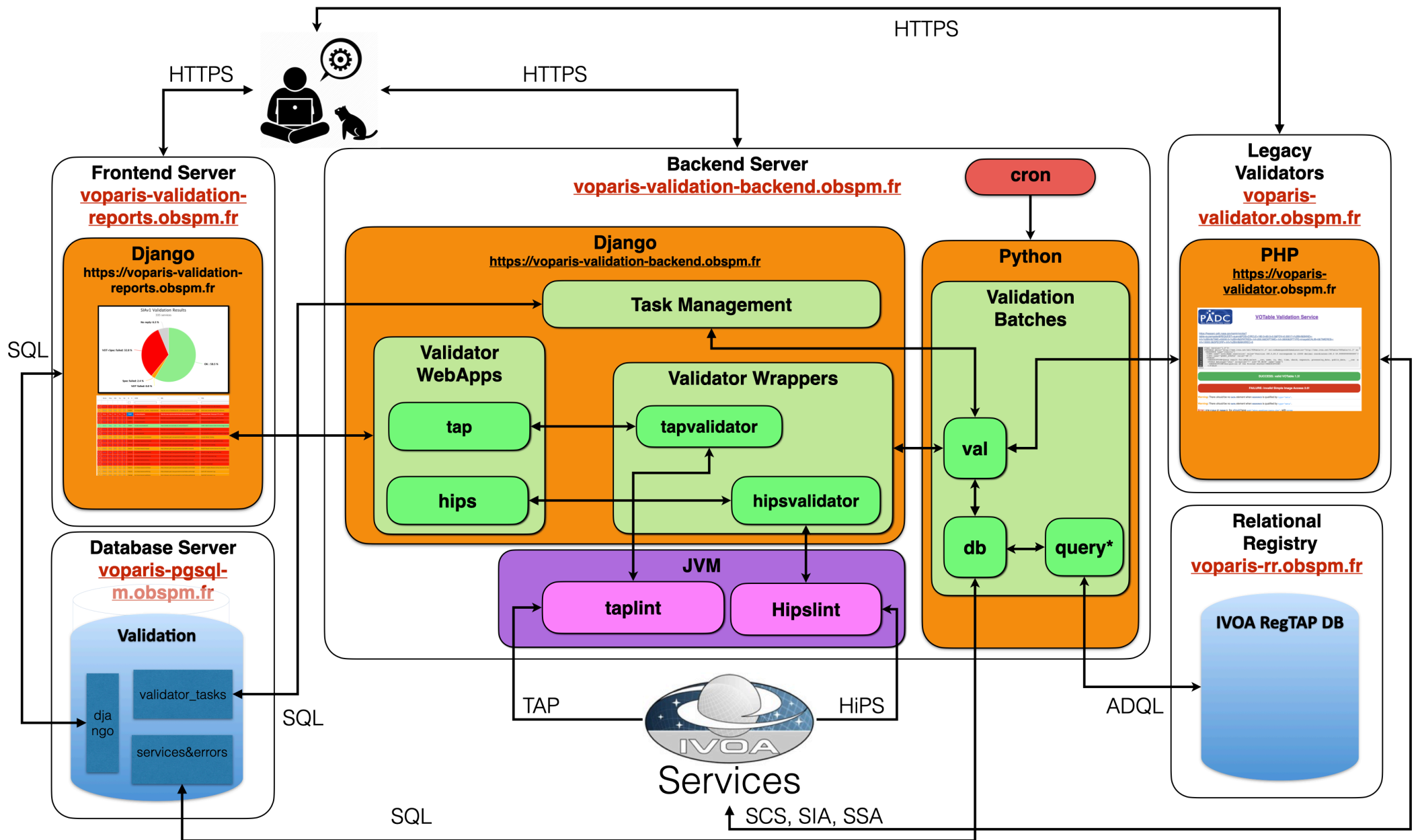
- **Web Frontend** <https://voparis-validation-reports.obspm.fr/>

- Explore the validation results (bookmark GET URLs)
- Generate Validation Reports

- **API** <https://voparis-validation-reports.obspm.fr/api/>

- Query the Validation Database programmatically

PADC Testing Framework Architecture (2022)





PADC Testing Framework: New Features

- **New table display for services and errors**

- links at beginning of row
- searchable columns
- row expansion

	Errors	Freq	Hist	Try	Val	id ↑↓	IVOID ↑↓
						...	<input type="text" value="gavo"/>
+	Errors	Freq	Hist	Try	Val	91584	ivo://aip.gavo.org/ravedr4/q/cone
+	Errors	Freq	Hist	Try	Val	91585	ivo://aip.gavo.org/tap

- **New standards added to daily batches**

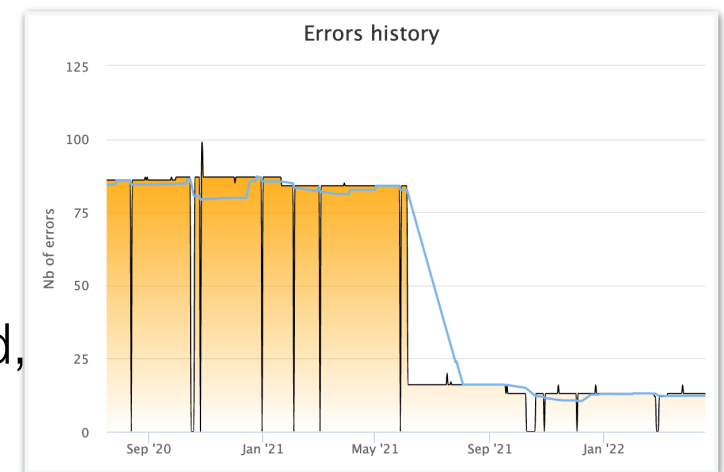
- SLAv2
- HiPS

- **standard_id selection**

- differentiate tap and tap#aux services

- **Errors history graphs**

- display compliance progression for a standard, or a (set of) service(s)



Web API

- A POST web service with input and output in JSON formats
- Retrieve validation results from daily tests *programmatically*
- Documentation:
=> <https://voparis-validation-reports.obsspm.fr/api/>
- Endpoint:
=> https://voparis-validation-reports.obsspm.fr/validation/api_v1
- Demo

DEMO

- **Testing Framework**

- Main features
- Get Errors Report for one Service
- Explore Errors and get Reports for several services

- **TAP and HiPS Web Validators**

- Basic Usage
- Usage from the Services page

- **Web API**

- Basic Usage

Web API - Example Python client

```
#!/usr/bin/python3
import json
import sys

import requests

NOVOT_PROTOCOLS = ["TAP"] # protocols for which vot_ok and spec_ok are meaningless
DISPLAY_ERRORS = True # display individual errors ?
IVOID_SUBSTRING = "ivo://org.gavo.dc/"
ENDPOINT = "https://voparis-validation-reports.obspm.fr/validation/api_v1" # new prod server

def display_errors(service):
    for error in service["errors"]:
        if error["type"] == "error":
            print("    {num}. Error {name} in section {section}: {msg}".format(**error))

if DISPLAY_ERRORS:
    action = "query_services_errors"
else:
    action = "query_services"

res = requests.post(ENDPOINT, json.dumps({
    "action": action,
    "mode": "ivoid_substring",
    "protocol": "all",
    "include_aux_services": "no",
    "ivoid_substring": IVOID_SUBSTRING}))

if res["status"] != "OK":
    sys.exit(res["msg"])

nb_spec_not_ok = 0
nb_vot_not_ok = 0
nb_tap_with_errors = 0
for row in res["services"]:
    if row["vot_ok"] != 'yes' and row["protocol"] not in NOVOT_PROTOCOLS:
        print("{protocol} VOTable failure: {title} at {url}".format(**row))
        nb_vot_not_ok += 1
    if row["spec_ok"] != 'yes' and row["protocol"] not in NOVOT_PROTOCOLS:
        print("{protocol} Spec failure: {title} at {url}".format(**row))
        nb_spec_not_ok += 1
    if row["nb_err"] != 0 and row["protocol"] in NOVOT_PROTOCOLS:
        print("{protocol} failure ({nb_err} errors): {title} at {url}".format(**row))
        nb_tap_with_errors += 1
        if DISPLAY_ERRORS:
            display_errors(row)

print(f"Services found: {len(res['services'])}")
#print("Validation date:", res['date_val_min'])
print(f"Bad VOT {nb_vot_not_ok} -- Bad Spec {nb_spec_not_ok} -- Bad TAP {nb_tap_with_errors}")
```

Summary

- PADC maintain several Web Validators, a Testing Framework and a Web API to access validation results from our daily tests of registered services.
- Validators need updates due to errata (ex COOSYS) and new usages
- Web validators **<https://voparis-validation-reports.obspm.fr/validators/home>**
 - VOT (1.0-1.4)
 - SCS (1.03)
 - SIA (1.0-2.0)
 - SSA (1.0-1.1)
 - SLA (2.0)
 - TAP (1.0-1.1) using taplint
 - HiPS (1.0-1.1) using Hipslint
- Testing Framework **<https://voparis-validation-reports.obspm.fr/>**
- API **<https://voparis-validation-reports.obspm.fr/api>**
- Message to Standard Authors: we can provide an extensible framework to host and run your validator
- Advice to Providers:
 - validate often during development
 - once your service is registered, regularly check validation results