

# Euro-VO Resources Validation Status

*Christophe Arviset, Costas Vrioni, Juan Gonzalez  
ESAC Science Data Centre,*

*IVOA interop, Victoria, Canada, 29/05/2018*

Issue/Revision: 1.0

Reference: VO Service Compliance Statistics

Status: Issued

ESA UNCLASSIFIED - Releasable to the Public




**Welcome to the new EURO-VO Full Harvestable VO Resource Registry.**



The new Euro-VO Registry offers you the following main functionalities:




**For astronomers and end users:**

Search the VO resources through the Simple Search Panel, the Advanced Search or through the expert ADQL Search Panel (click on the  icon ).




**For data publishers:**

Host your resources with EuroVO, create and update your own VO Resources via a password-protected interface, check their compliance with the associated IVOA standards (click on the  icon; requires an account: click  to join ).



**For VO Applications developers and for other IVOA Registries:**

Harvest the registry, retrieve individual resources, or search the registry through its programmatic [OAI-PMH](#), [RI1](#) and [RegTAP](#) interfaces (click on the  icon to find more information).

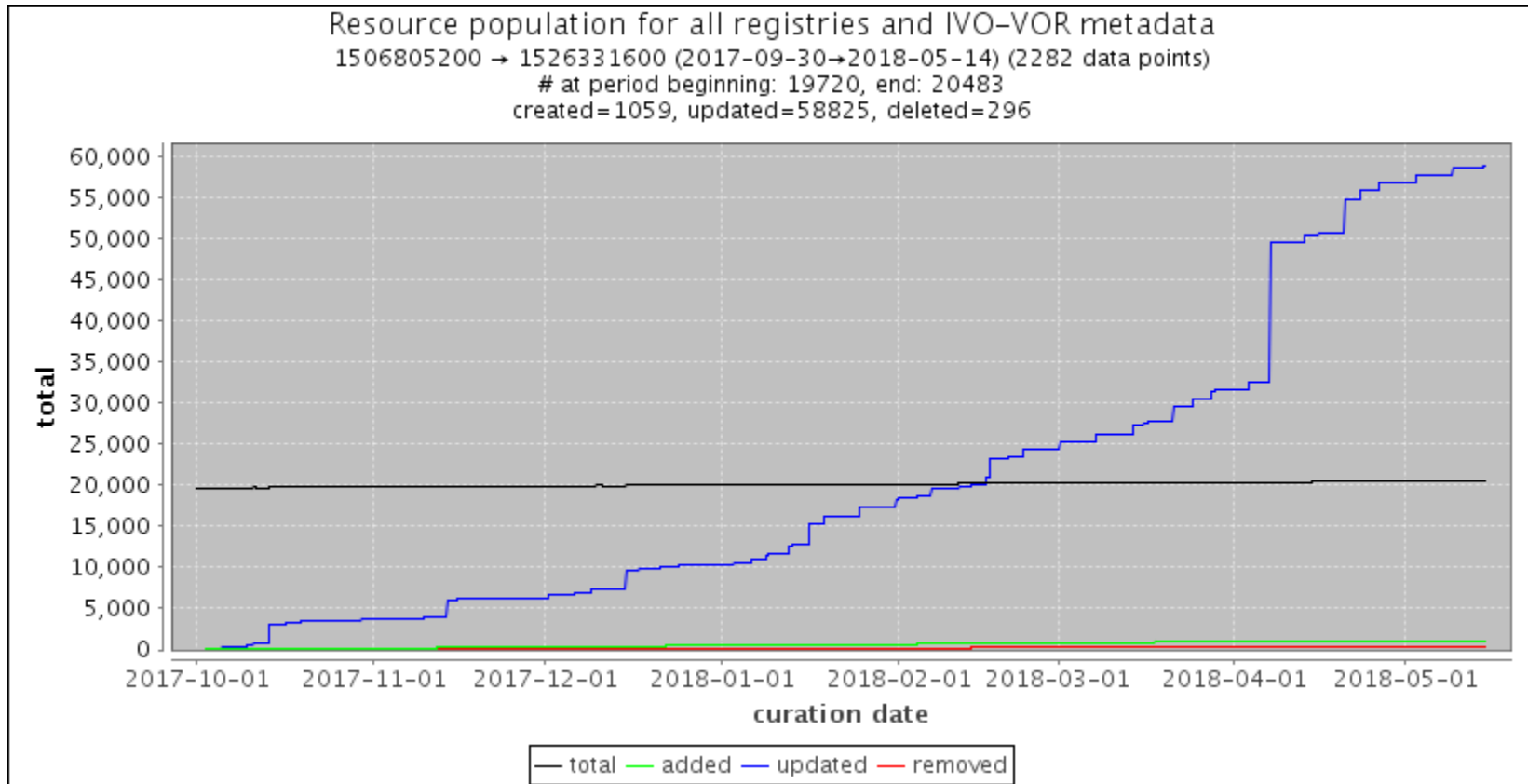


If you have any question regarding the EURO-VO Registry, please send an email to:

[esavo.registry@sciops.esa.int](mailto:esavo.registry@sciops.esa.int).



# VOResources evolution



Many updates the last months...



# Compliance mappings



- **Compliant** (no requirement fails)

- A++** no criterion fails
- A+** no requirement, warning or recommendation fails
- A** no requirement or warning fails, but at least one recommendation fails
- B** no requirement fails, but at least one warning fails

- **partially compliant** (some (but not all) requirements fail)

- C** at least one (1) req fails, but at least one (1) req equally succeeds
- C-** at least two (2) reqs fail, but at least one (1) req equally succeeds
- C--** at least three (3) reqs fail, but at least one (1) req equally succeeds

- **not compliant** (all requirements fail)

- D** all reqs fail but some other criterion (of lesser importance) succeeds
- E** no criterion succeeds

## Actions taken since last interop:

- 1. Update the Standard:** Simple Cone Search version 1.03 Proposed Erratum 1 accepted: [http://wiki.ivoa.net/twiki/bin/view/IVOA/SCS-1\\_03-Err-1](http://wiki.ivoa.net/twiki/bin/view/IVOA/SCS-1_03-Err-1)

Val. Code: **2.3b**

Appears: **17264 times**

Type: REQUIREMENT

Description: *"In the case of error, the service MUST respond with a VOTable that contains a single PARAM element or a single INFO element with name='Error', where [a] corresponding value attribute [should be present]..."*

URL: <http://www.ivoa.net/documents/latest/ConeSearch.html>

- 2. Improve the validator:**

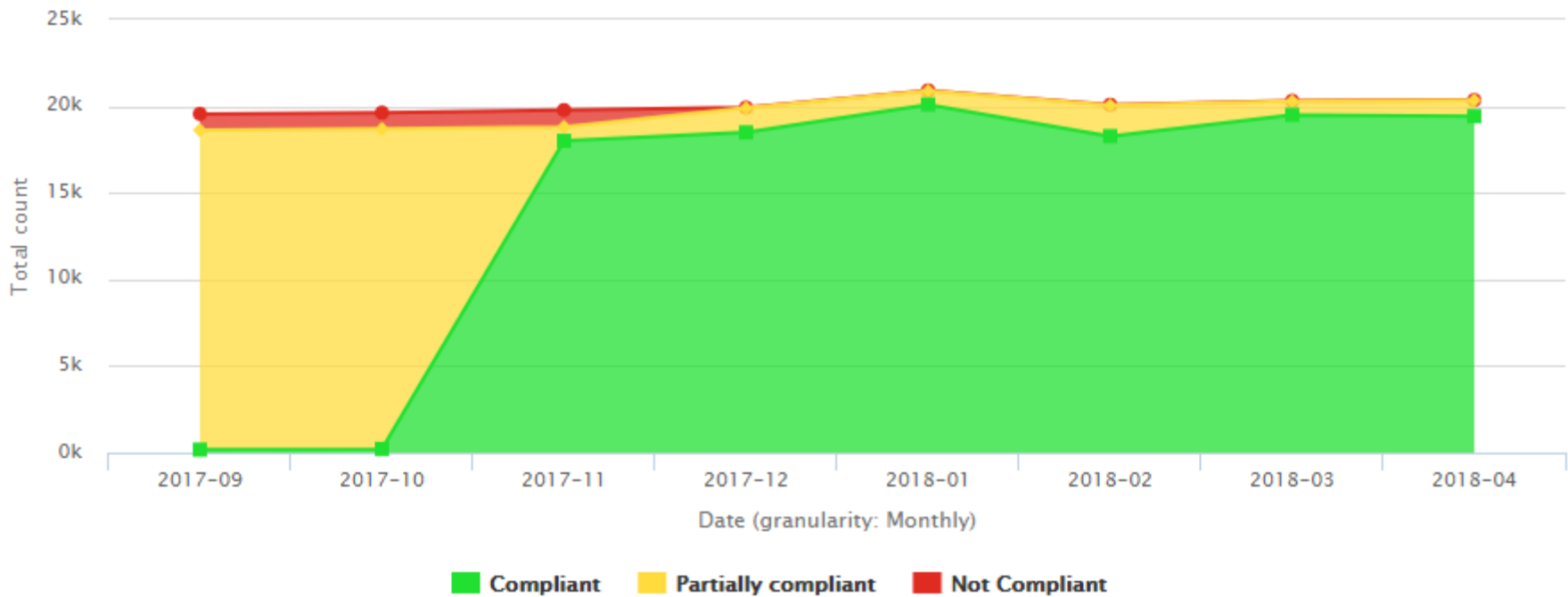
- a. Increase the connection timeout on validator.
- b. Increase response size limits (ViZieR response >25MB..)
- c. Solve the HTTPS issues (connection to NASA/GSFC HEASARC).

- 3. Improve the services:** Sending reports and info to the services contact persons.

# SCS Services Compliance – all registries



SCS compliance category distribution over time for all registries

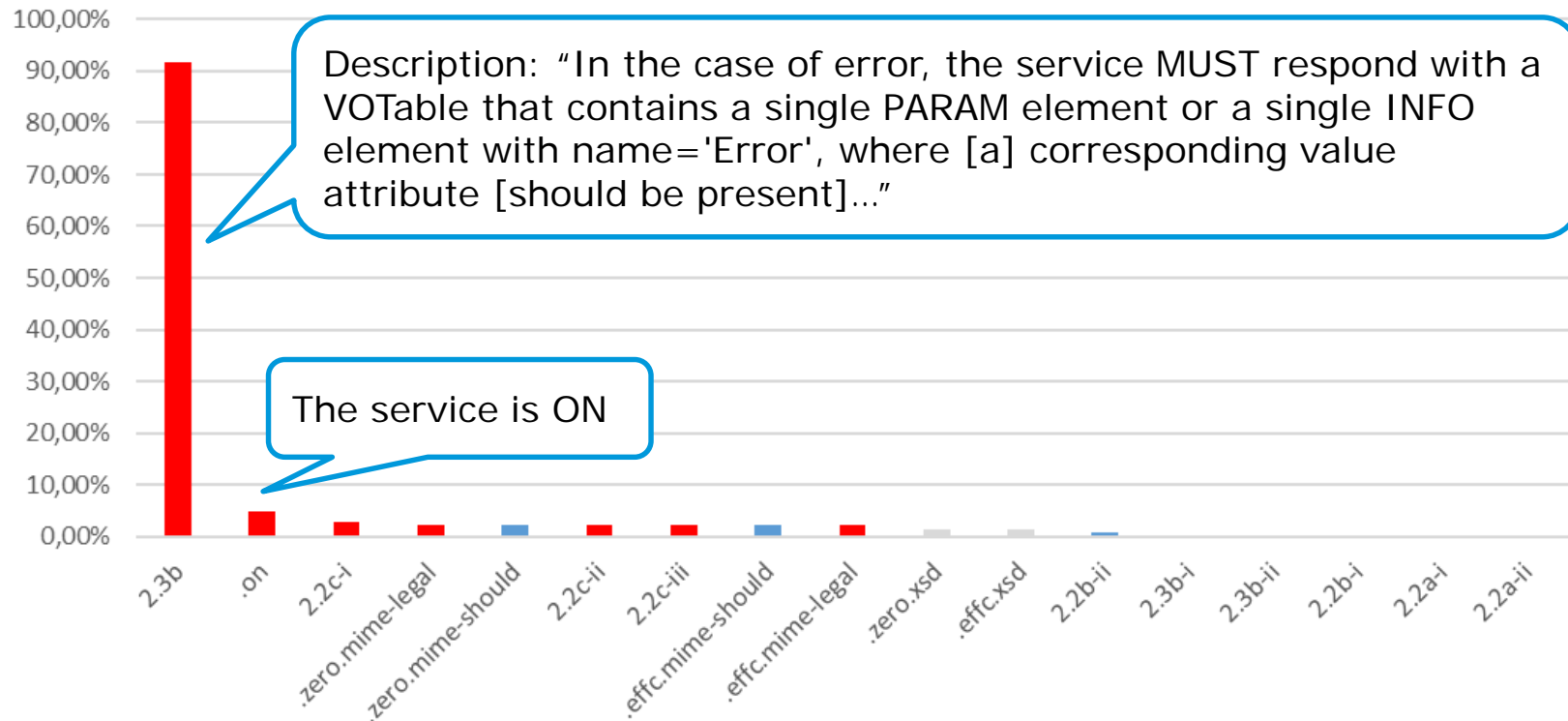


Huge improvement since previous interop...



# SCS Services Validation Analysis (prior to Santiago interoper)

## Validation criteria failed for SCS Services



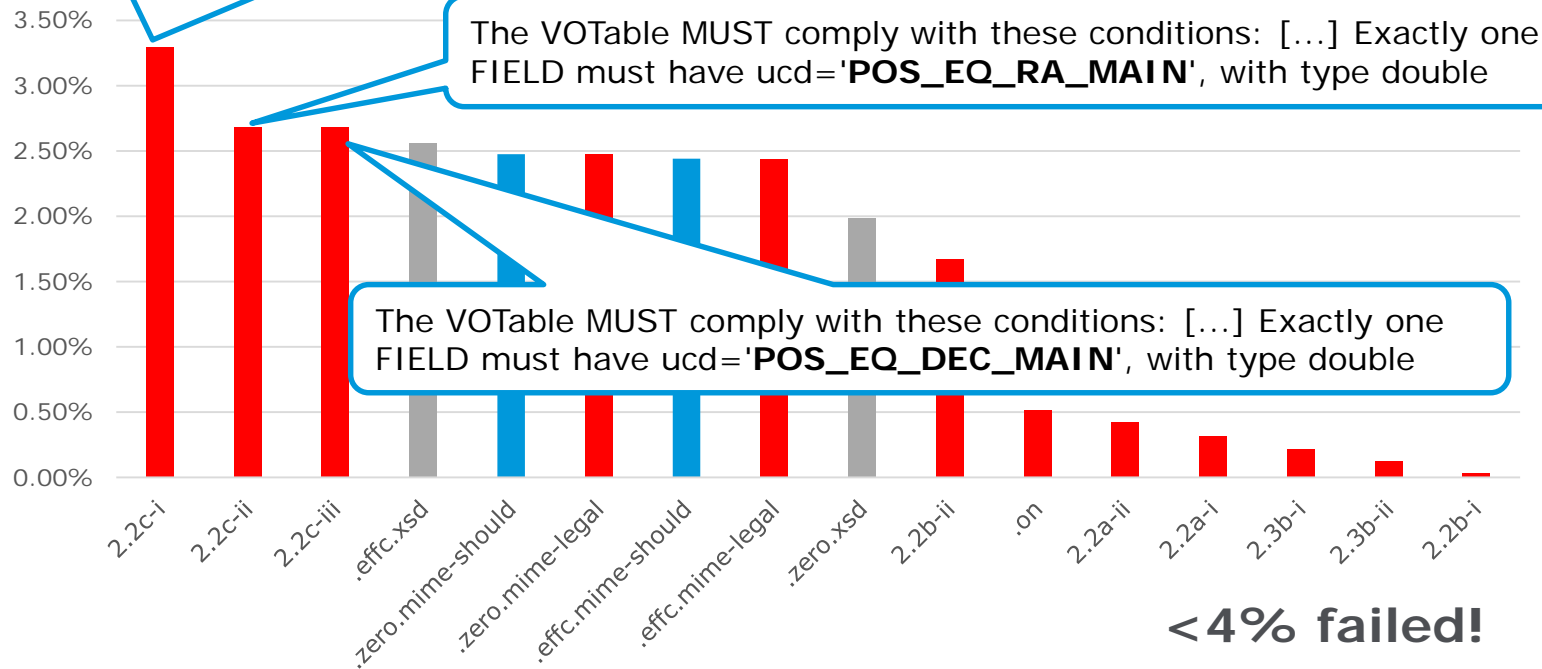
name	description
REQUIREMENT	Tests drawn from 'MUST' statements in the respective standard
WARNING	Tests drawn from strongly encouraged 'SHOULD' statements in the respective standard
RECOMMENDATION	Tests drawn from 'SHOULD' statements in the respective standard
EXTRA	Criteria not defined in the IVOA 'Service Validation' wiki

# SCS Services Validation Analysis



The VOTable MUST comply with these conditions: [...] Exactly one FIELD must have ucd='ID\_MAIN', with an array character type (fixed or variable length)

Validation criteria failed for SCS Services (May 2018)



Criterion Type	
name	description
<span style="color: red;">■</span> REQUIREMENT	Tests drawn from 'MUST' statements in the respective standard
<span style="color: yellow;">■</span> WARNING	Tests drawn from strongly encouraged 'SHOULD' statements in the respective standard
<span style="color: blue;">■</span> RECOMMENDATION	Tests drawn from 'SHOULD' statements in the respective standard
<span style="color: gray;">■</span> EXTRA	Criteria not defined in the IVOA 'Service Validation' wiki





# SCS Services Validation Analysis



val_code	criterion_type	description
2.2c-i	REQUIREMENT	The VOTable MUST comply with these conditions: [...] Exactly one FIELD must have ucd='ID_MAIN', with an array character type (fixed or variable length)
2.2c-ii	REQUIREMENT	The VOTable MUST comply with these conditions: [...] Exactly one FIELD must have ucd='POS_EQ_RA_MAIN', with type double
2.2c-iii	REQUIREMENT	The VOTable MUST comply with these conditions: [...] Exactly one FIELD must have ucd='POS_EQ_DEC_MAIN', with type double
.effc.xsd	EXTRA	The effective response is XSD-valid XML
.zero.mime-should	RECOMMENDATION	The MIME type of the zero response has the recommended value ('text/xml')
.zero.mime-legal	REQUIREMENT	The MIME type of the zero response has a legal value ('text/xml', 'text/xml;content=x-votable' or 'text/xml;votable')
.effc.mime-should	RECOMMENDATION	The MIME type of the effective response has the recommended value ('text/xml')
.effc.mime-legal	REQUIREMENT	The MIME type of the effective response has a legal value ('text/xml', 'text/xml;content=x-votable' or 'text/xml;votable')
.zero.xsd	EXTRA	The zero response is XSD-valid XML
2.2b-ii	REQUIREMENT	The effective response has to contain some data
.on	REQUIREMENT	The service is ON
2.2a-ii	REQUIREMENT	The service must respond with an XML document in the VOTable format [for the effective URL]
2.2a-i	REQUIREMENT	The service must respond with an XML document in the VOTable format [for the zero URL]
2.3b-i	REQUIREMENT	no INFO elements with @name='Error' should appear in the zero response
2.3b-ii	REQUIREMENT	no INFO elements with @name='Error' should appear in the effective response
2.2b-i	REQUIREMENT	The zero response contains no data



# SCS Services Validation Analysis



## Actions to be taken:

1. **Reconsider the Standard:** not needed
2. **Improve the validator:** not needed
3. **Improve the services:** Contact with the low Compliance Category services and report findings...

# SIA Services Validation Analysis



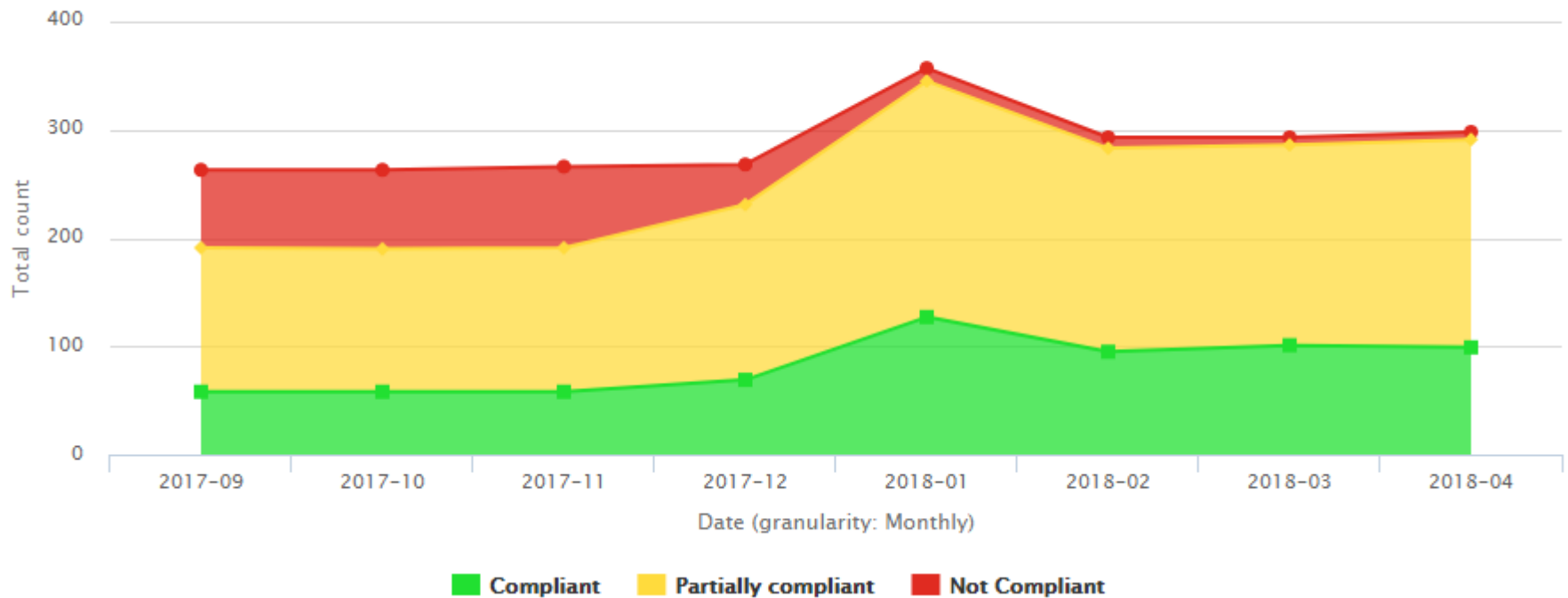
## Actions taken since last interop:

1. Reconsider the Standard: N/A
  
2. Improve the validator:
  - a. Increase the connection timeout on validator.
  - b. Improve the search algorithm for validation tests data.
  
3. Improve the services: Starting from resources on Euro-VO Registry

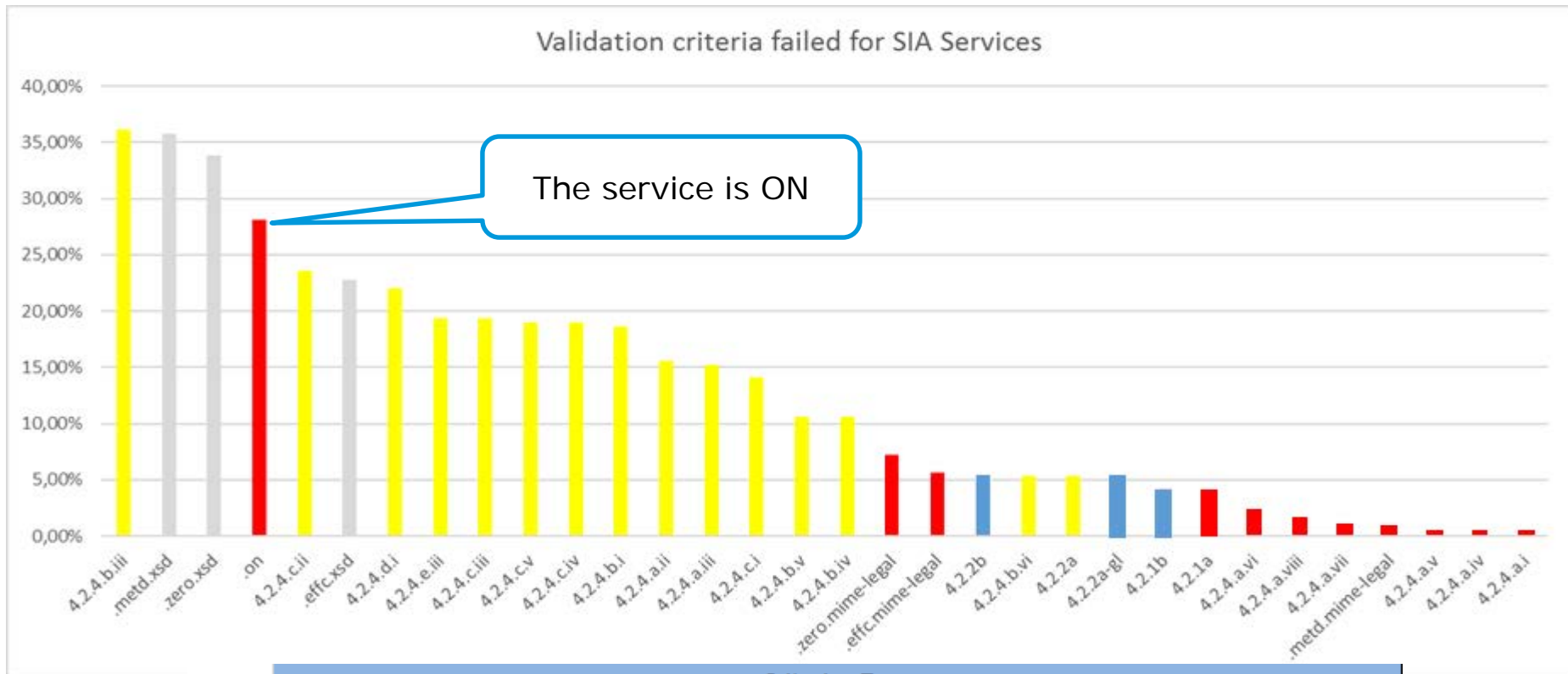
# SIA Services Compliance – all registries



SIA compliance category distribution over time for all registries



# SIA Services Validation Analysis (prior to Santiago interop)



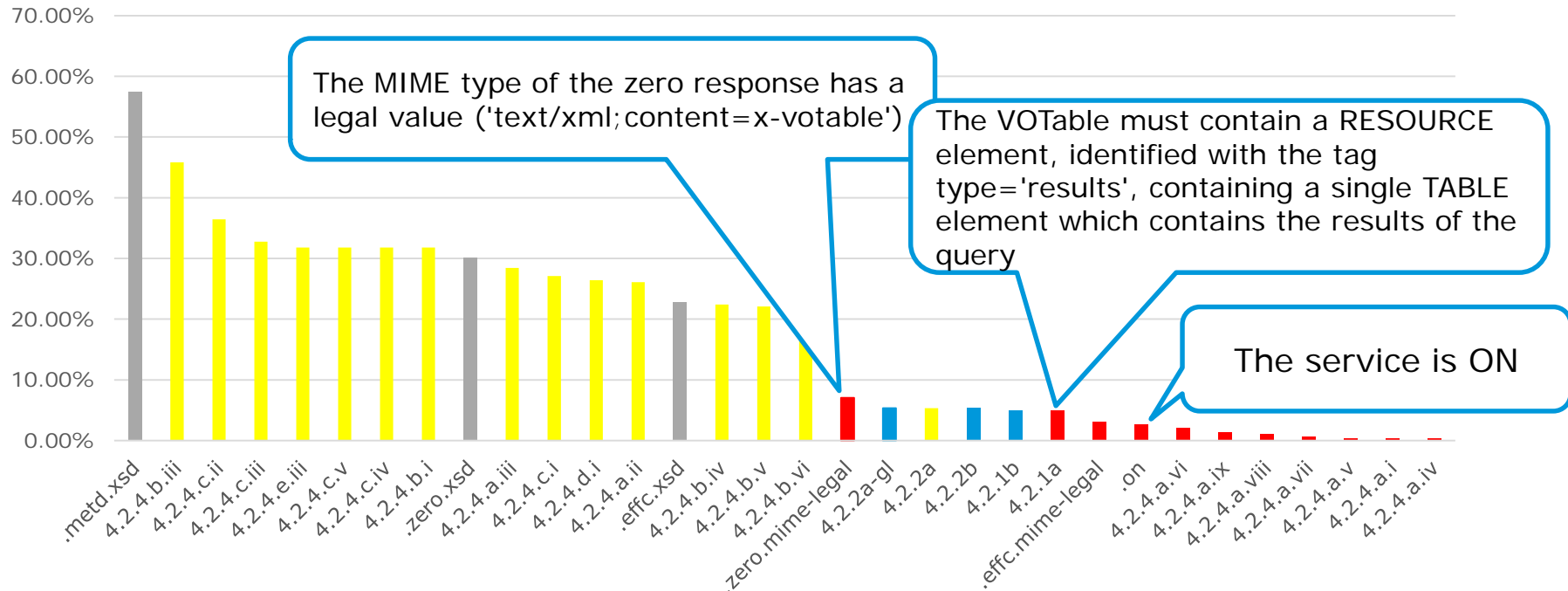
Criterion Type	
name	description
<span style="color: red;">■</span> REQUIREMENT	Tests drawn from 'MUST' statements in the respective standard
<span style="color: yellow;">■</span> WARNING	Tests drawn from strongly encouraged 'SHOULD' statements in the respective standard
<span style="color: blue;">■</span> RECOMMENDATION	Tests drawn from 'SHOULD' statements in the respective standard
<span style="color: gray;">■</span> EXTRA	Criteria not defined in the IVOA 'Service Validation' wiki



# SIA Services Validation Analysis



Validation criteria failed for SIA Services



Some of the services could not be tested due to no test data found.

Criterion Type	
name	description
<span style="color: red;">■</span> REQUIREMENT	Tests drawn from 'MUST' statements in the respective standard
<span style="color: yellow;">■</span> WARNING	Tests drawn from strongly encouraged 'SHOULD' statements in the respective standard
<span style="color: blue;">■</span> RECOMMENDATION	Tests drawn from 'SHOULD' statements in the respective standard
<span style="color: grey;">■</span> EXTRA	Criteria not defined in the IVOA 'Service Validation' wiki



# SIA Services Validation Analysis



VAL_CODE	CRITERION_TYPE	DESCRIPTION
.METD.XSD	EXTRA	The metadata response is XSD-valid XML
4.2.4.B.III	WARNING	Exactly one field should have ucd='VOX:WCS_CoordProjection', with datatype='char', and arraysize='*'
4.2.4.C.II	WARNING	Exactly one field should have ucd='VOX:BandPass_Unit', with datatype='char', and arraysize='*'
4.2.4.C.III	WARNING	Exactly one field should have ucd='VOX:BandPass_RefValue', with datatype='double'
4.2.4.E.III	WARNING	Exactly one field should have ucd='VOX:Image_FileSize', with datatype='int'
4.2.4.C.V	WARNING	Exactly one field should have ucd='VOX:BandPass_LoLimit', with datatype='double'
4.2.4.C.IV	WARNING	Exactly one field should have ucd='VOX:BandPass_HiLimit', with datatype='double'
4.2.4.B.I	WARNING	Exactly one field should have ucd='VOX:STC_CoordRefFrame', with datatype='char', and arraysize='*'
.ZERO.XSD	EXTRA	The zero response is XSD-valid XML
4.2.4.A.III	WARNING	Exactly one field should have ucd='VOX:Image_MJDateObs', with datatype='double'
4.2.4.C.I	WARNING	Exactly one field should have ucd='VOX:BandPass_ID', with datatype='char', and arraysize='*'
4.2.4.D.I	WARNING	Exactly one field should have ucd='VOX:Image_PixFlags', with datatype='char', and arraysize='*'
4.2.4.A.II	WARNING	Exactly one field should have ucd='INST_ID', with datatype='char', and arraysize='*'
.EFFC.XSD	EXTRA	The effective response is XSD-valid XML
4.2.4.B.IV	WARNING	Exactly one field should have ucd='VOX:WCS_CoordRefPixel', with datatype='double', and arraysize='*'
4.2.4.B.V	WARNING	Exactly one field should have ucd='VOX:WCS_CoordRefValue', with datatype='double', and arraysize='*'
4.2.4.B.VI	WARNING	Exactly one field should have ucd='VOX:WCS_CDMMatrix', with datatype='double', and arraysize='*'
.ZERO.MIME-LEGAL	REQUIREMENT	The MIME type of the zero response has a legal value ('text/xml;content=x-votable')

...

URL: <http://www.ivoa.net/documents/latest/SIA.html>



# SIA Services Validation Analysis



## Actions to be taken:

1. **Improve the standard:** erratum for all the 4.2.4.\* warnings ?
2. **Improve the validator:**
  - a. Improve the search algorithm for validation test data.
3. **Improve the services:** Contact with the low Compliance Category services and report findings.



# SSA Services Validation Analysis



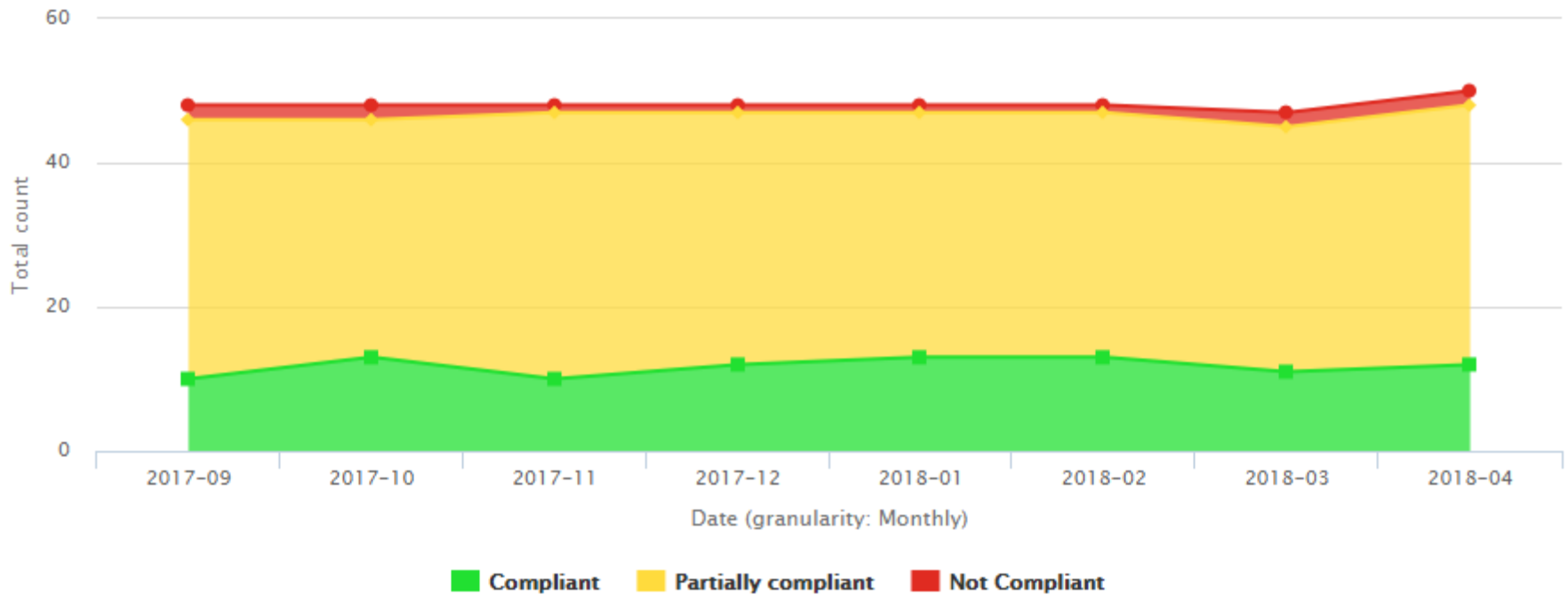
## Actions taken since last interop :

1. Reconsider the Standard: N/A
  
2. Improve the validator:
  - a. Increase the connection timeout on validator.
  
3. Improve the services: some improvement but not significant (for many REC the failure rate was decreased from 45% to <40%)

# SSAP Services Compliance – all registries



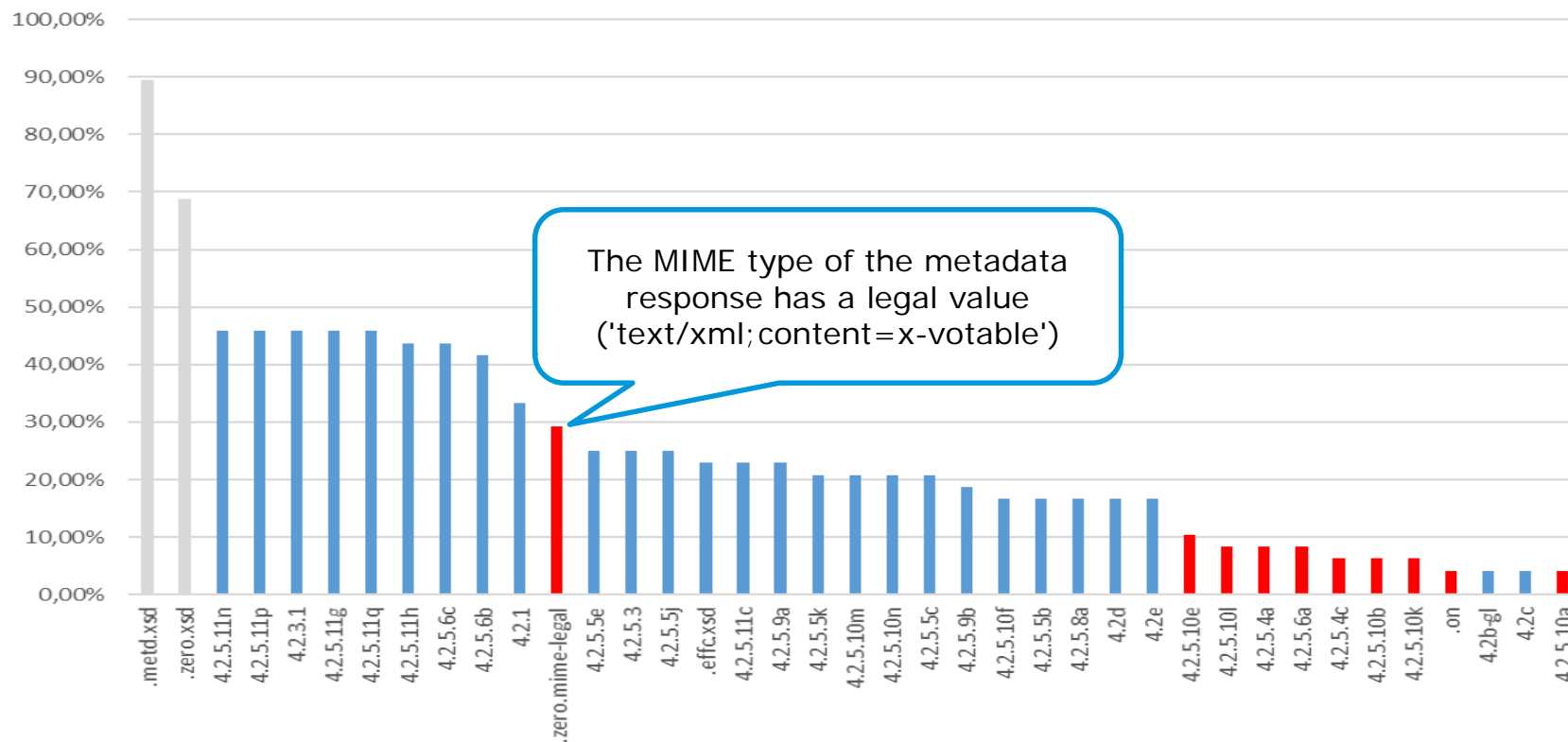
## SSA compliance category distribution over time for all registries



# SSA Services Validation Analysis (prior to Santiago interop)



Validation criteria failed for SSA Services



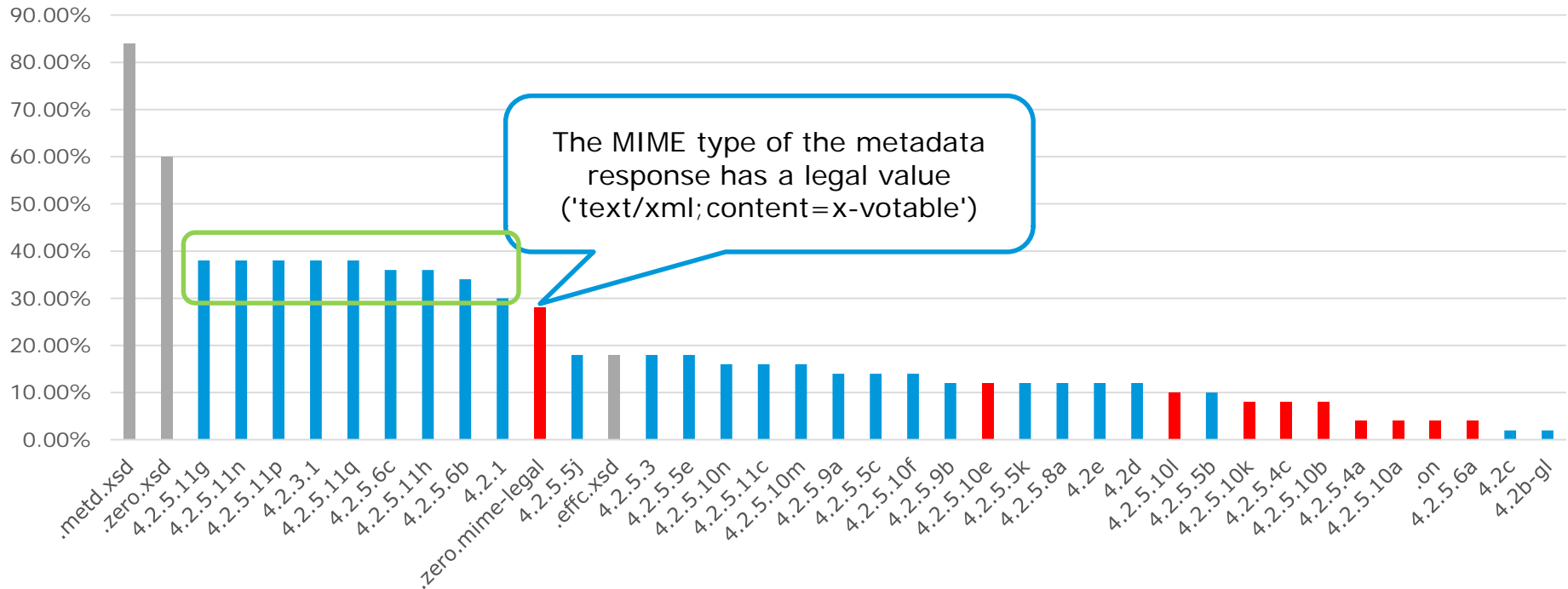
	name	description
<span style="color: red;">■</span>	REQUIREMENT	Tests drawn from 'MUST' statements in the respective standard
<span style="color: yellow;">■</span>	WARNING	Tests drawn from strongly encouraged 'SHOULD' statements in the respective standard
<span style="color: blue;">■</span>	RECOMMENDATION	Tests drawn from 'SHOULD' statements in the respective standard
<span style="color: gray;">■</span>	EXTRA	Criteria not defined in the IVOA 'Service Validation' wiki



# SSA Services Validation Analysis



Validation criteria failed for SSA Services



Criterion Type	
name	description
<span style="color: red;">■</span> REQUIREMENT	Tests drawn from 'MUST' statements in the respective standard
<span style="color: yellow;">■</span> WARNING	Tests drawn from strongly encouraged 'SHOULD' statements in the respective standard
<span style="color: blue;">■</span> RECOMMENDATION	Tests drawn from 'SHOULD' statements in the respective standard
<span style="color: gray;">■</span> EXTRA	Criteria not defined in the IVOA 'Service Validation' wiki



# SSA Services Validation Analysis



VAL_CODE	CRITERION_TYPE	DESCRIPTION
.METD.XSD	EXTRA	The metadata response is XSD-valid XML
.ZERO.XSD	EXTRA	The zero response is XSD-valid XML
4.2.5.11G	RECOMMENDATION	Char.SpectralAxis.Calibration   Type of coord calibration   REC
4.2.5.11N	RECOMMENDATION	Char.SpatialAxis.Accuracy.StatError   Astrometric statistical error   REC
4.2.5.11P	RECOMMENDATION	Char.SpatialAxis.Calibration   Type of coord calibration   REC
4.2.3.1	RECOMMENDATION	Query.Score   Degree of match to query params   REC
4.2.5.11Q	RECOMMENDATION	Char.SpatialAxis.Resolution   Spatial resolution of data   REC
4.2.5.6C	RECOMMENDATION	Curation.PublisherDID   Publisher's ID for the dataset   REC
4.2.5.11H	RECOMMENDATION	Char.SpectralAxis.Resolution   Spectral resolution FWHM   REC
4.2.5.6B	RECOMMENDATION	Curation.Reference   URL or Bibcode for documentation   REC
4.2.1	RECOMMENDATION	UTYPEs of standard fields are required for identification of interface elements and must be given
.ZERO.MIME-LEGAL	REQUIREMENT	The MIME type of the zero response has a legal value ('text/xml;content=x-votable')
4.2.5.5J	RECOMMENDATION	DataID.DataSource   Original source of data   REC
.EFFC.XSD	EXTRA	The effective response is XSD-valid XML
4.2.5.3	RECOMMENDATION	Access.Size   Estimated (not actual) dataset size   REC
4.2.5.5E	RECOMMENDATION	DataID.CreatorDID   Creator assigned dataset identifier   REC
4.2.5.10N	RECOMMENDATION	Char.SpectralAxis.Coverage.Bounds.Stop   Stop in spectral coordinate   REC
4.2.5.11C	RECOMMENDATION	Char.FluxAxis.Calibration   Type of flux calibration   REC
4.2.5.10M	RECOMMENDATION	Char.SpectralAxis.Coverage.Bounds.Start   Start in spectral coordinate   REC
4.2.5.9A	RECOMMENDATION	Char.FluxAxis.Ucd   ucd for flux   REC
4.2.5.5C	RECOMMENDATION	DataID.Collection   IVOA Identifier of collection (string)   REC
4.2.5.10F	RECOMMENDATION	Char.TimeAxis.Coverage.Bounds.Extent   Total elapsed exposure time   REC

URL: <http://www.ivoa.net/documents/SSA>



## Actions to be taken:

1. **Reconsider the Standard:** Are the many REC failures really important for the SSA services? They seem to fail for 35% of the services.. Suggest an erratum?
2. **Improve the validator:**
  - a. Increase the connection timeout on validator.
  - b. Improve the search algorithm for validation test data.
3. **Improve the services:** Contact with the low Compliance Category services and report findings.

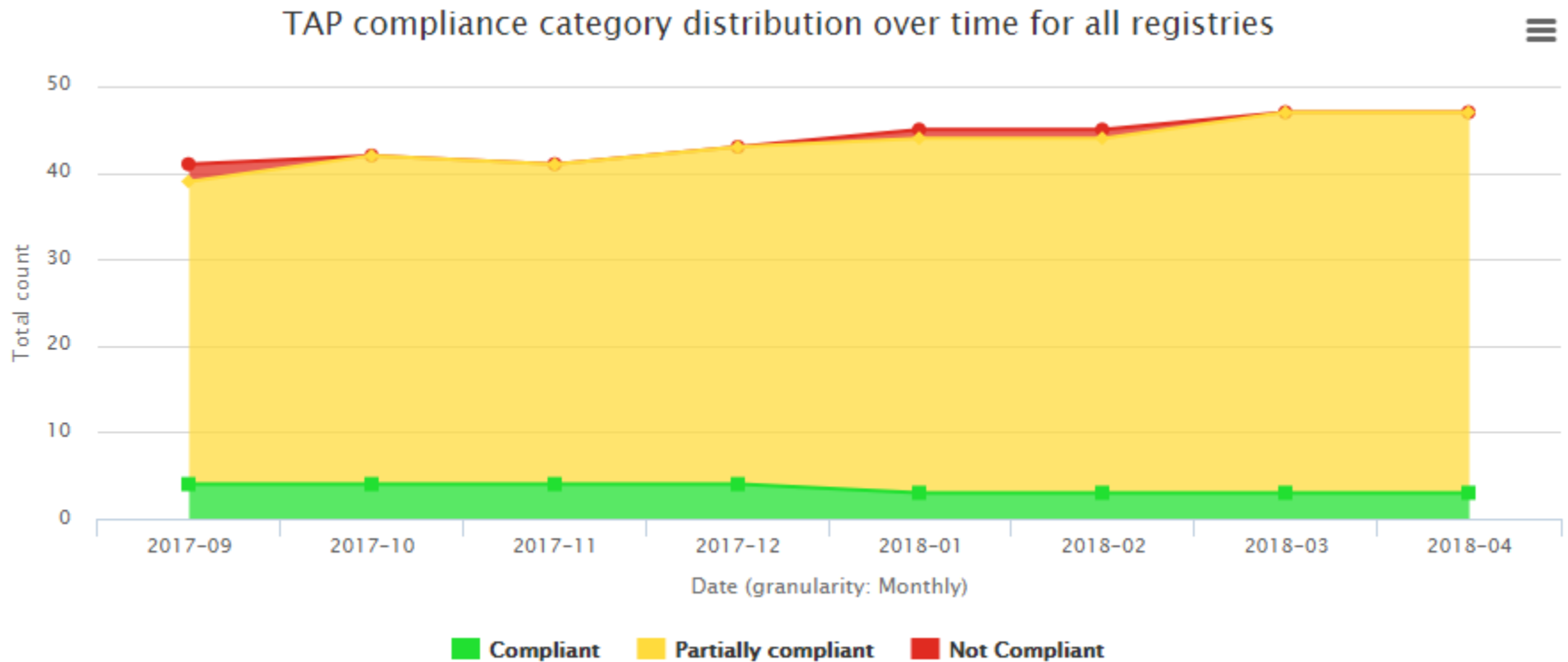
# TAP Services Validation Analysis



## Actions taken since last interop:

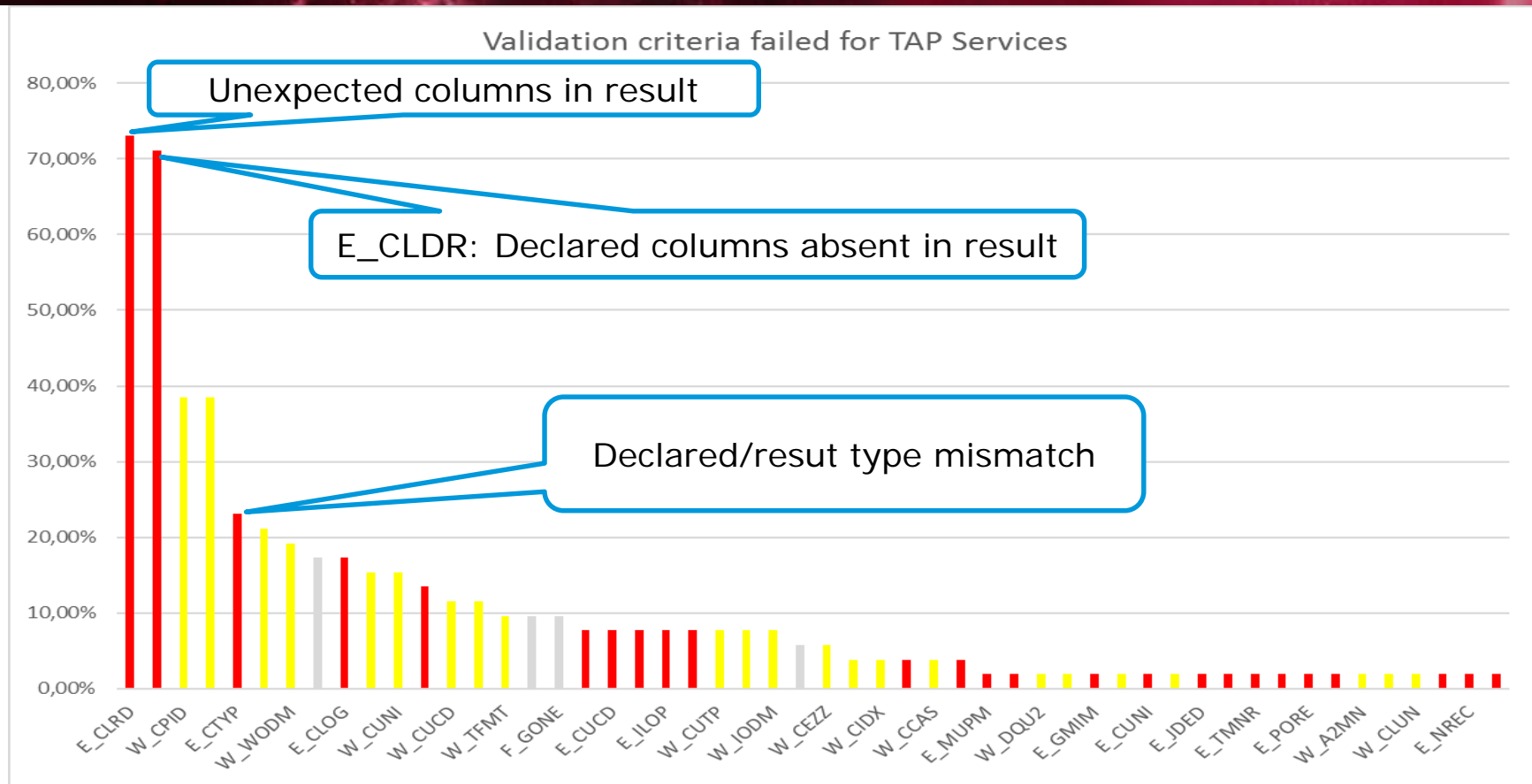
1. Reconsider the Standard: N/A
2. Improve the validator:
  - a. Update to the latest TAP 1.1 validator
3. Improve the services: nothing significant

# TAP Services Compliance – all registries





# TAP Services Validation Analysis (prior to Santiago interop)



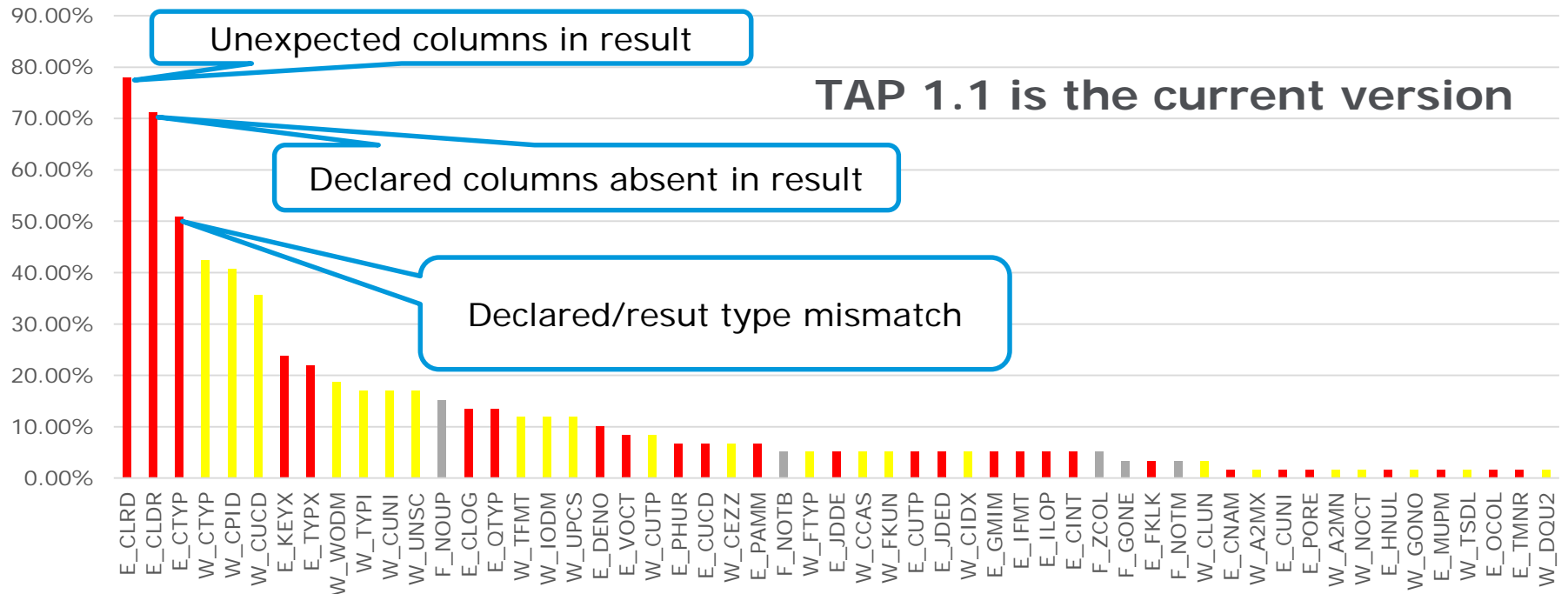
	name	description
<span style="color: red;">■</span>	REQUIREMENT	Tests drawn from 'MUST' statements in the respective standard
<span style="color: yellow;">■</span>	WARNING	Tests drawn from strongly encouraged 'SHOULD' statements in the respective standard
<span style="color: blue;">■</span>	RECOMMENDATION	Tests drawn from 'SHOULD' statements in the respective standard
<span style="color: grey;">■</span>	EXTRA	Criteria not defined in the IVOA 'Service Validation' wiki



# TAP Services Validation Analysis



Validation criteria failed for TAP Services



Criterion Type	
name	description
<span style="color: red;">■</span> REQUIREMENT	Tests drawn from 'MUST' statements in the respective standard
<span style="color: yellow;">■</span> WARNING	Tests drawn from strongly encouraged 'SHOULD' statements in the respective standard
<span style="color: blue;">■</span> RECOMMENDATION	Tests drawn from 'SHOULD' statements in the respective standard
<span style="color: gray;">■</span> EXTRA	Criteria not defined in the IVOA 'Service Validation' wiki



# TAP Services Validation Analysis



VAL_CODE	CRITERION_TYPE	DESCRIPTION
E_CLRD	REQUIREMENT	Unexpected columns in result
E_CLDR	REQUIREMENT	Declared columns absent in result
E_CTYP	REQUIREMENT	Declared/result type mismatch
W_CTYP	WARNING	Datatype mismatch
W_CPID	WARNING	Non-IdentifierURI dataModel
W_CUCD	WARNING	UCD mismatch
E_KEYX	REQUIREMENT	Unknown standard language feature key
E_TYPX	REQUIREMENT	ObsCore datatype incompatibility
W_WODM	WARNING	Incorrect ObsCore ID
W_TYPI	WARNING	ObsCore datatype mismatch
W_CUNI	WARNING	Unit mismatch
W_UNSC	WARNING	Foreign schema used in validation
F_NOUP	EXTRA	No upload methods listed
E_CLOG	REQUIREMENT	Non-boolean value
E_QTYP	REQUIREMENT	Query/result column type mismatch
W_TFMT	WARNING	Non-ISO-8601 result
W_IODM	WARNING	Incorrect ObsCore ID
W_UPCS	WARNING	Custom upload method
E_DENO	REQUIREMENT	Non-404 response for deleted job
E_VOCT	REQUIREMENT	Bad Content-Type for VOTable


URL: <http://www.ivoa.net/documents/TAP/>

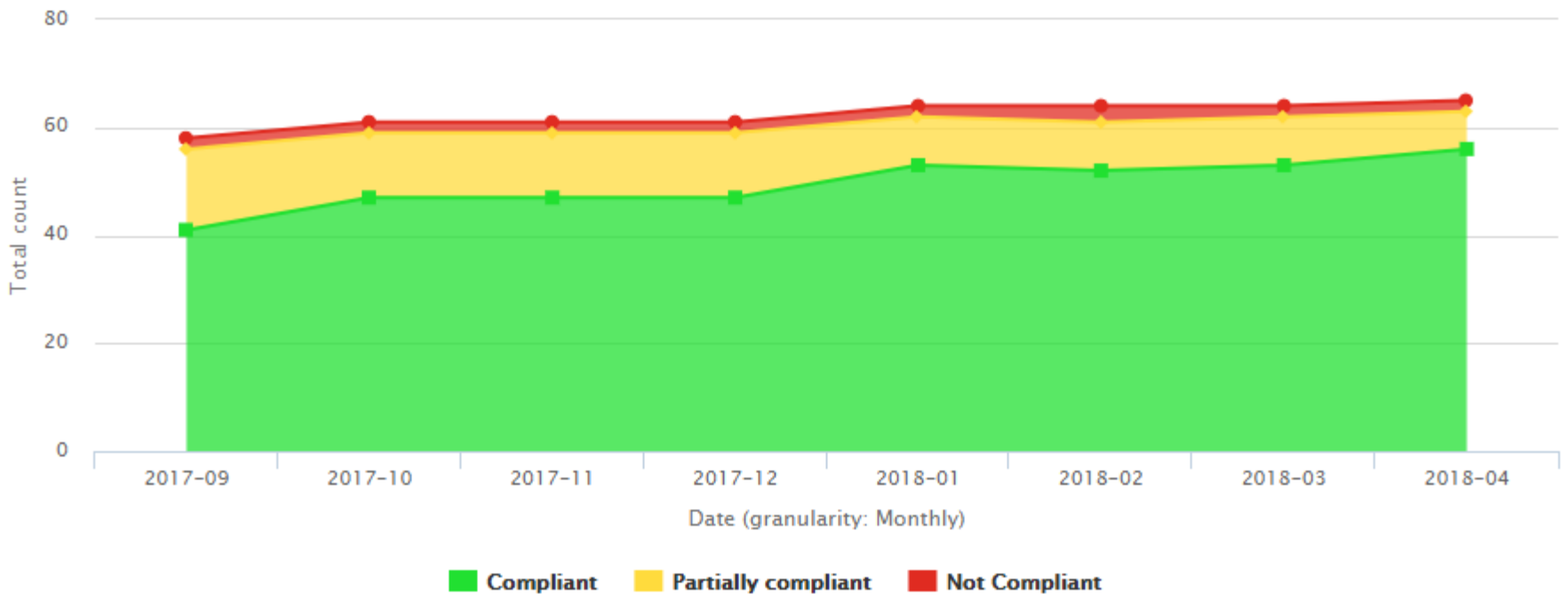
## Actions to be taken:

- 1. Reconsider the Standard:** suggest an erratum?
  - a. E-CLRD: Unexpected columns in result
  - b. E\_CLDR: Declared columns absent in result
  - c. E\_CTYP: Declared/result type mismatch  
failing for ~70% of the TAP services
  
- 2. Improve the validator:** N/A
  
- 3. Improve the services:**
  - a. Update to the latest RegTAP

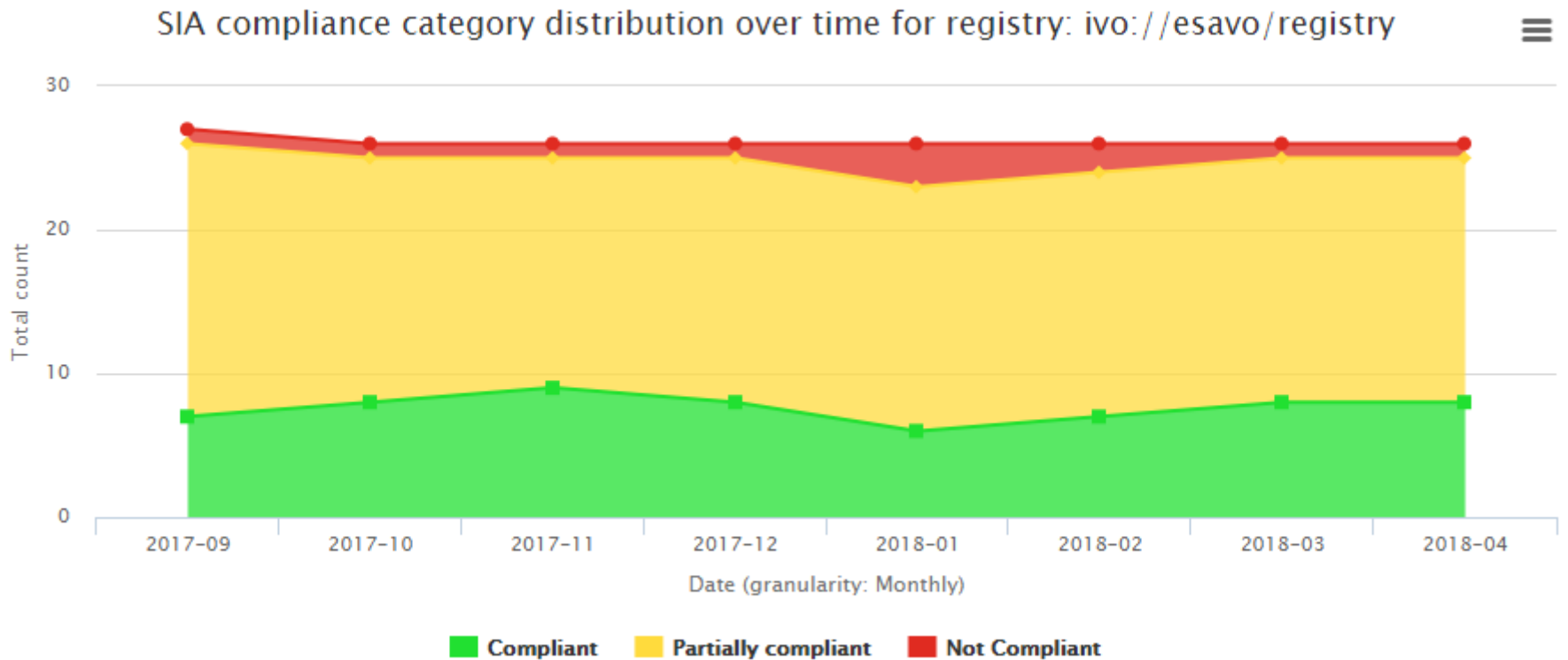
# BACKUP SLIDES

# SCS Services Compliance - Euro-VO Registry esa

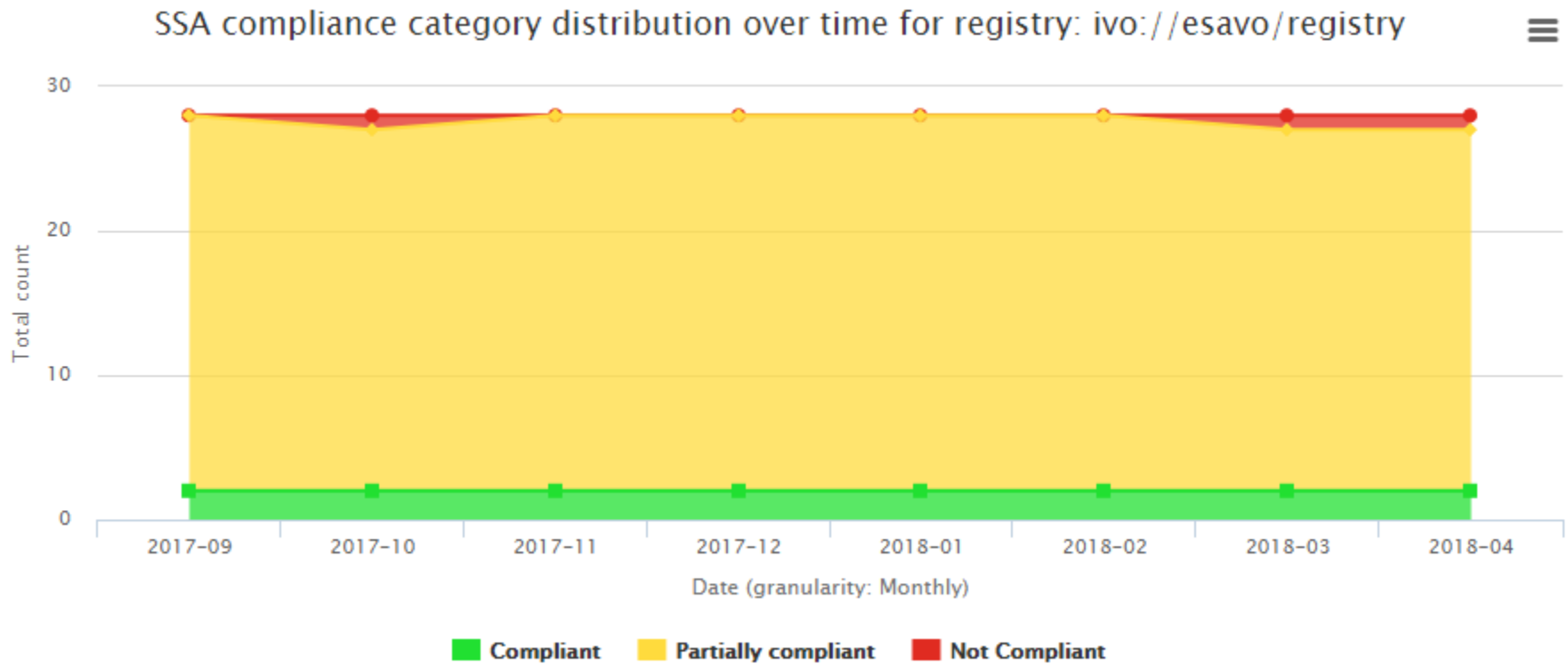
SCS compliance category distribution over time for registry: ivo://esavo/registry 



# SIAP Services Compliance – Euro-VO Registry

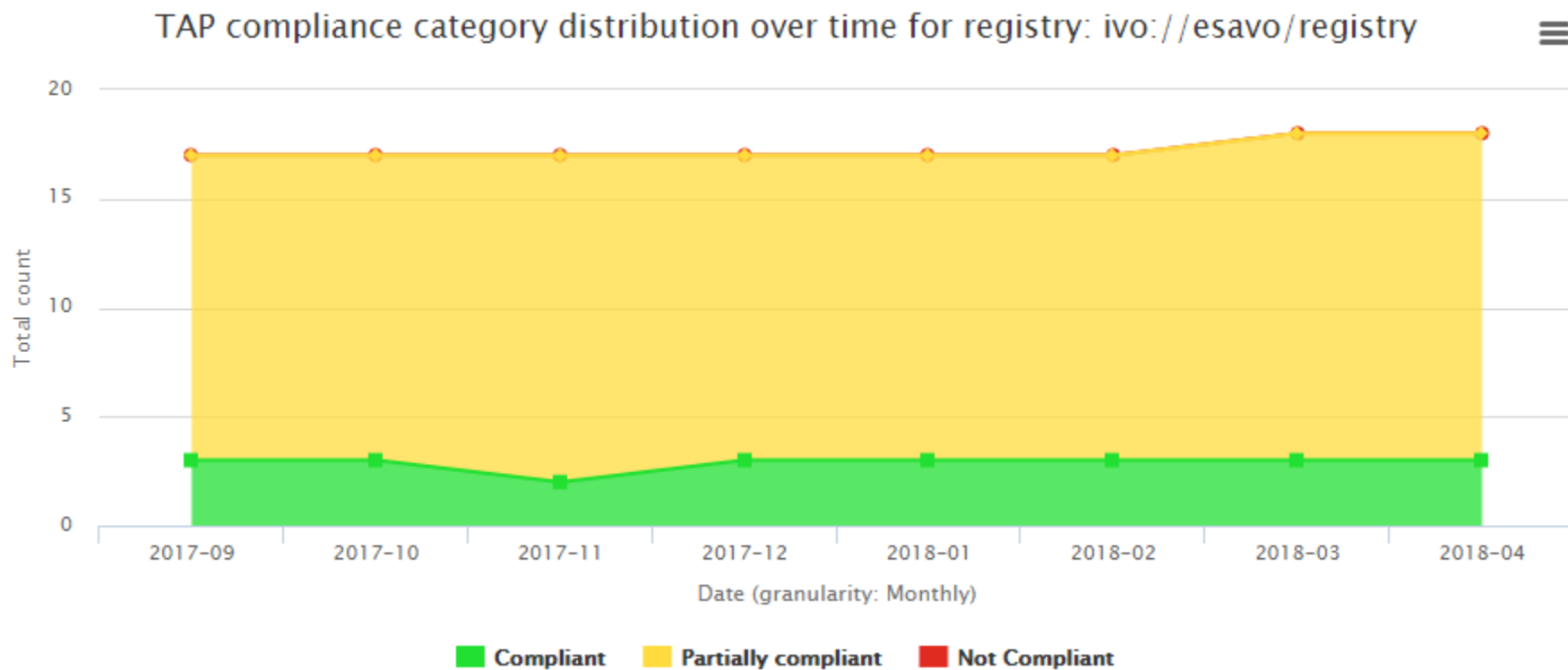


# SSAP Services Compliance – Euro-VO Registry





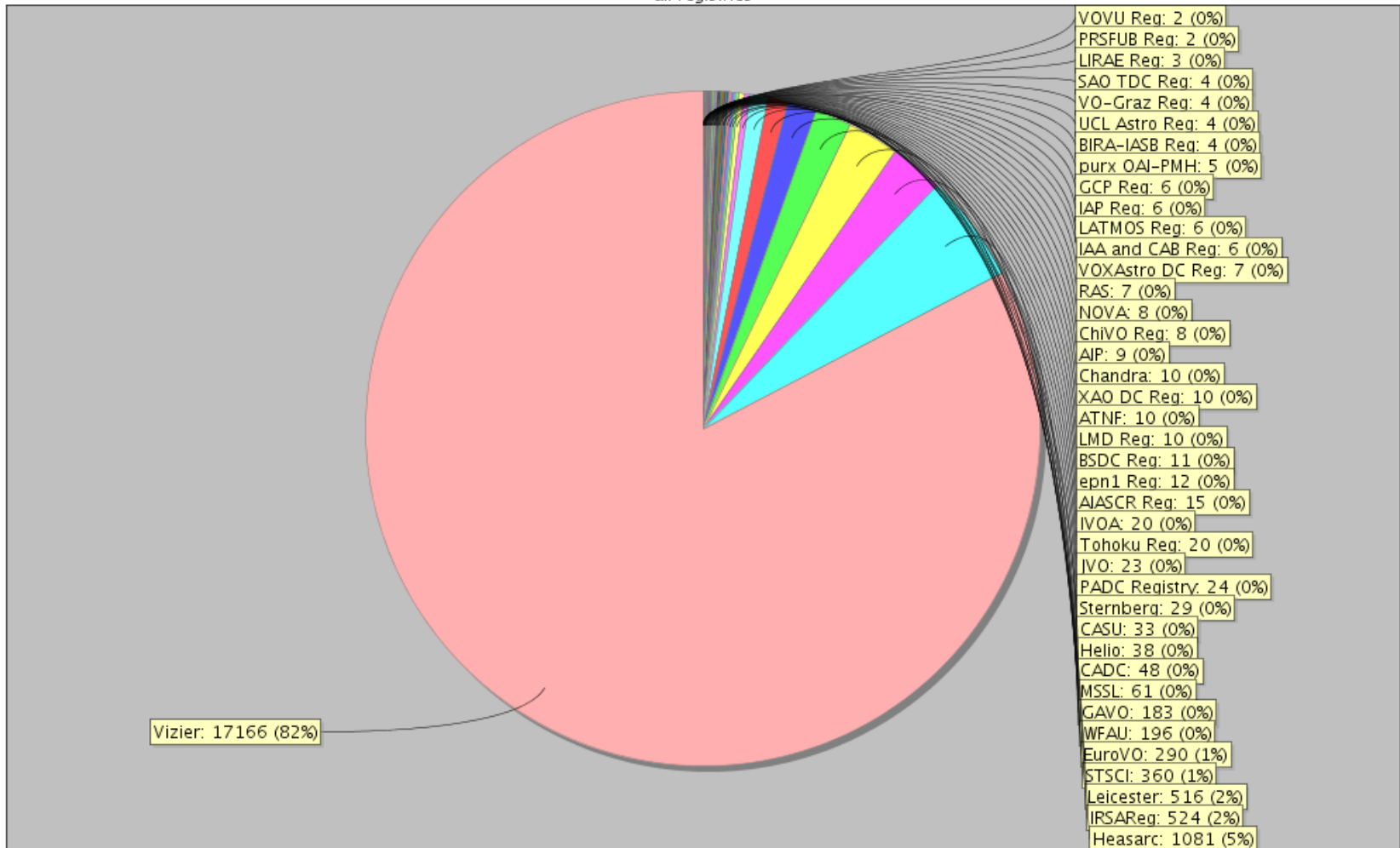
# TAP Services Compliance – Euro-VO Registry



# VOResources per Registry (w/Vizier)



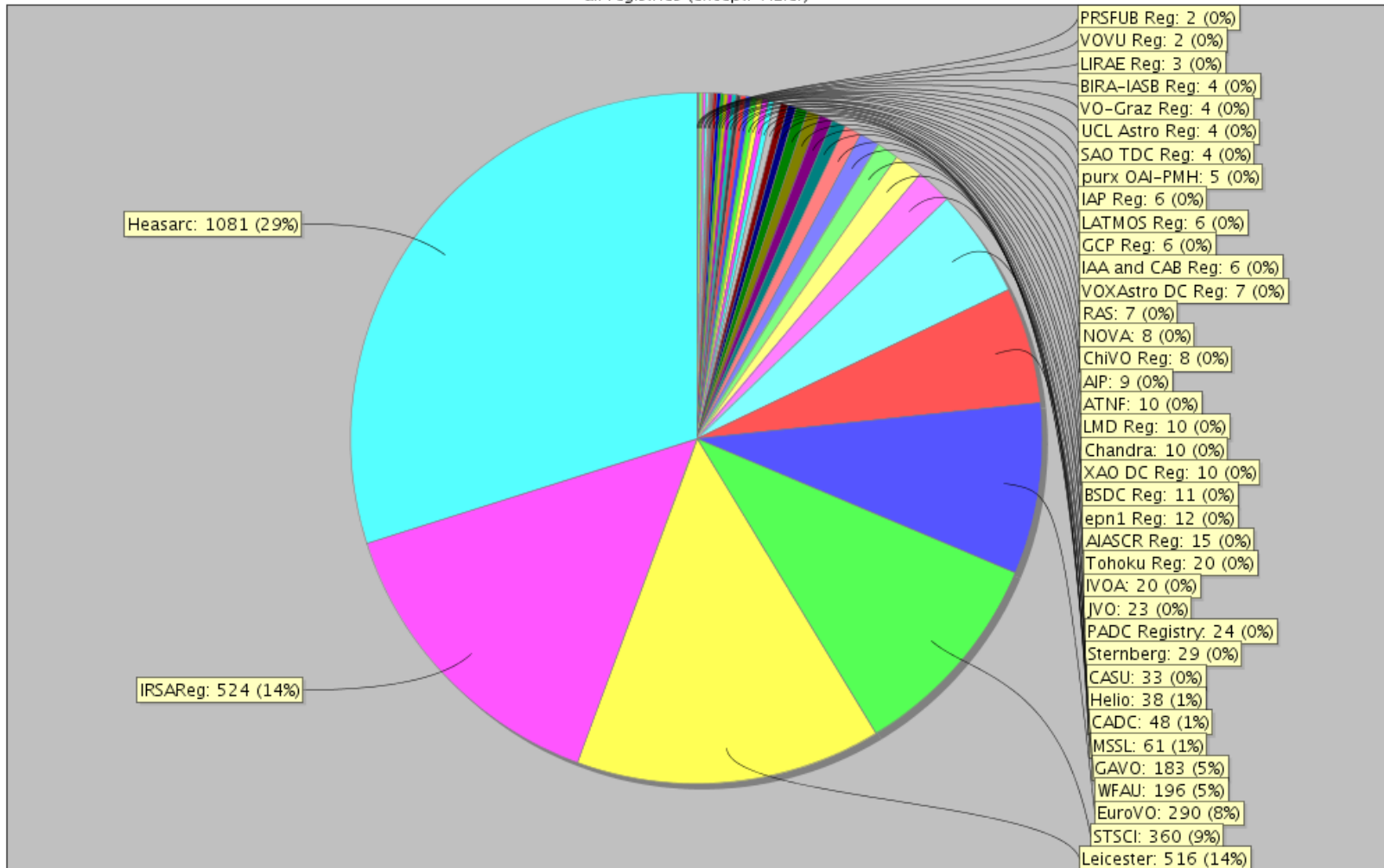
Resource population by registry (IVO-VOR metadata)  
 Data as of 2018-05-15 16:19:13 \* 20781 records from 41 registries in total  
 all registries



# VOResources per Registry (w/o Vizier)



Resource population by registry (IVO-VOR metadata)  
Data as of 2018-05-15 16:21:55 \* 3615 records from 40 registries in total  
all registries (except: Vizier)



# each service access URL is validated against a vector of pass/fail criteria



```
SELECT criterion_type, description FROM vo_curation.validation_criterion WHERE cap_type='cs:ConeSearch';
```

-----  
REQUIREMENT | The service is ON

REQUIREMENT | The zero response is well-formed XML

EXTRA | The zero response is XSD-valid XML

REQUIREMENT | The MIME type of the zero response has a legal value ('text/xml', 'text/xml;content=x-votable' RECOMMENDATION | The MIME type of the zero response has the recommended value ('text/xml')

WARNING | The MIME type of the zero response is not the optional value ('text/xml;content=x-votable')

RECOMMENDATION | The MIME type of the zero response is not the strongly discouraged value ('text/xml;votable')

REQUIREMENT | The effective response is well-formed XML

EXTRA | The effective response is XSD-valid XML

REQUIREMENT | The MIME type of the effective response has a legal value ('text/xml', 'text/xml;content=x-votable' RECOMMENDATION | The MIME type of the effective response has the recommended value ('text/xml')

WARNING | The MIME type of the effective response is not the optional value ('text/xml;content=x-votable')

RECOMMENDATION | The MIME type of the effective response is not the strongly discouraged value ('text/xml;votable')

REQUIREMENT | The service must respond with an XML document in the VOTable format [for the zero URL]

REQUIREMENT | The service must respond with an XML document in the VOTable format [for the effective URL]

REQUIREMENT | The zero response contains no data

REQUIREMENT | The effective response has to contain some data

REQUIREMENT | The VOTable MUST comply with these conditions: [...] Exactly one FIELD must have ucd='ID\_MAIN', REQUIREMENT | The VOTable MUST comply with these conditions: [...] Exactly one FIELD must have ucd='POS\_EQ\_RA\_MAIN', REQUIREMENT | The VOTable MUST comply with these conditions: [...] Exactly one FIELD must have ucd='POS\_EQ\_DEC\_MAIN', REQUIREMENT | no INFO elements with @name='Error' should appear in the zero response

REQUIREMENT | no INFO elements with @name='Error' should appear in the effective response

REQUIREMENT | In the case of error, the service MUST respond with a VOTable that contains a single PARAM (23 rows)

Service Type

▲ Access URL

Validate Now

sia:SimpleImageAccess

http://friendlyvo.herokuapp.com/query/sia?

Validated on: 13:04:40 19/10/2016

Duration in ms: 2452

Cap Type: sia:SimpleImageAccess

Compliance: C--


[Validations](#) [Traces](#)

Val Code	Val Type	Val Result	Description	valURL	▲ valException	valDetail
4.2.1a	REQUIREMENT	Pass	The VOTable must contain a RESOURCE element, identified with the tag type='results', containing a single TABLE element which contains the results of the query	http://friendlyvo.herokuapp.com/query/si...		
4.2.1b	recommendation	Pass	If multiple resources are present it is recommended that the query results be returned in the first resource element	http://friendlyvo.herokuapp.com/query/si...		
4.2.2a	WARNING	Failed	The RESOURCE element should contain an INFO with name='QUERY_STATUS'	http://friendlyvo.herokuapp.com/query/si...		The expression: '\$0>=1' supplied with the derived values: [0] evaluated to false
4.2.2a-gl	recommendation	Failed	The RESOURCE element should contain [gloss: 'an'-'>'one] INFO with name='QUERY_STATUS'	http://friendlyvo.herokuapp.com/query/si...		The expression: '\$0==1' supplied with the derived values: [0] evaluated to false
4.2.2b	recommendation	Failed	Its value attribute should set to 'OK'	http://friendlyvo.herokuapp.com/query/si...		The expression: '\$0=='OK' supplied with the derived values: [] evaluated to false
4.2.4.a.i	REQUIREMENT	Pass	Exactly one field must have ucd='VOX:Image_Title', with datatype='char', and arraysize='*'	http://friendlyvo.herokuapp.com/query/si...		
4.2.4.a.ii	WARNING	Failed	Exactly one field should have ucd='INST_ID', with datatype='char', and arraysize='*'	http://friendlyvo.herokuapp.com/query/si...		The expression: '\$0==1' supplied with the derived values: [0] evaluated to false
4.2.4.a.iii	WARNING	Failed	Exactly one field should have ucd='VOX:Image_MJDateObs', with datatype='double'	http://friendlyvo.herokuapp.com/query/si...		The expression: '\$0==1' supplied with the derived values: [0] evaluated to false
4.2.4.a.iv	REQUIREMENT	Pass	Exactly one field must have ucd='POS_EQ_RA_MAIN', with datatype='double'	http://friendlyvo.herokuapp.com/query/si...		
4.2.4.a.ix	REQUIREMENT	Pass	Exactly one field must have ucd='VOX:Image_Format', with datatype='char', and arraysize='*'	http://friendlyvo.herokuapp.com/query/si...		
4.2.4.a.v	REQUIREMENT	Pass	Exactly one field must have ucd='POS_EQ_DEC_MAIN', with datatype='double'	http://friendlyvo.herokuapp.com/query/si...		
4.2.4.a.vi	REQUIREMENT	Failed	Exactly one field must have ucd='VOX:Image_Naxes', with datatype='int'	http://friendlyvo.herokuapp.com/query/si...		The expression: '\$0==1' supplied with the derived values: [0] evaluated to false
4.2.4.a.vii	REQUIREMENT	Failed	Exactly one field must have ucd='VOX:Image_Naxis', with datatype='int', and arraysize='*'	http://friendlyvo.herokuapp.com/query/si...		The expression: '\$0==1' supplied with the derived values: [0] evaluated to false
4.2.4.a.viii	REQUIREMENT	Failed	Exactly one field must have ucd='VOX:Image_Scale', with datatype='double', and arraysize='*'	http://friendlyvo.herokuapp.com/query/si...		The expression: '\$0==1' supplied with the derived values: [0] evaluated to false
4.2.4.b.i	WARNING	Failed	Exactly one field should have ucd='VOX:STC_CoordRefFrame', with datatype='char', and arraysize='*'	http://friendlyvo.herokuapp.com/query/si...		The expression: '\$0==1' supplied with the derived values: [0] evaluated to false
4.2.4.b.iii	WARNING	Failed	Exactly one field should have ucd='VOX:WCS_CoordProjection', with datatype='char', and arraysize='*'	http://friendlyvo.herokuapp.com/query/si...		The expression: '\$0==1' supplied with the derived values: [0] evaluated to false

# Compliance category concept



# Compliance Category



Compliance Category			
compliance	numeric_equiv	reportorder	description
A++	8	1	no criterion fails
A+	7	2	no requirement, warning or recommendation fails
A	6	3	no requirement or warning fails, but at least one recommendation fails
B	5	4	no requirement fails, but at least one warning fails
C	4	5	at least one (1) requirement fails, but at least one (1) requirement equally succeeds
C-	3	6	at least two (2) requirements fails, but at least one (1) requirement equally succeeds
C--	2	7	at least three (3) requirements fails, but at least one (1) requirement equally succeeds
D	1	8	all requirements fail but some other criterion (of lesser importance) succeeds
E	0	9	no criterion succeeds

# Criterion Type



Criterion Type	
name	description
REQUIREMENT	Tests drawn from 'MUST' statements in the respective standard
WARNING	Tests drawn from strongly encouraged 'SHOULD' statements in the respective standard
RECOMMENDATION	Tests drawn from 'SHOULD' statements in the respective standard
EXTRA	Criteria not defined in the IVOA 'Service Validation' wiki



# Capability Type



Capability Type		
name	description	documenturl
cs:ConeSearch	Simple Cone Search	<a href="http://www.ivoa.net/documents/latest/ConeSearch.html">http://www.ivoa.net/documents/latest/ConeSearch.html</a>
sia:SimpleImageAccess	Simple Image Access Specificatio	<a href="http://www.ivoa.net/documents/latest/SIA.html">http://www.ivoa.net/documents/latest/SIA.html</a>
ssa:SimpleSpectralAccess	Simple Spectral Access Protocol	<a href="http://www.ivoa.net/documents/SSA/">http://www.ivoa.net/documents/SSA/</a>
slap:SimpleLineAccess	Simple Line Access Protocol	<a href="http://www.ivoa.net/documents/SLAP/">http://www.ivoa.net/documents/SLAP/</a>
tr:TableAccess	Table Access Protocol	<a href="http://www.ivoa.net/documents/TAP/">http://www.ivoa.net/documents/TAP/</a>