

Facilities Overviews: Themes

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Presentations

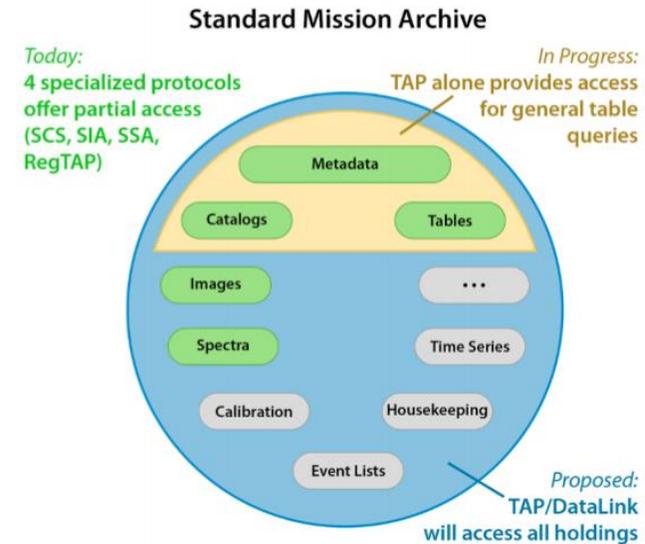
- May 2015: Sesto
 - CDS: Landais: Integrating VOServices into Vizier
 - CADC: Gaudet: An Integrated VO-Enabled Framework
- Oct 2015: Sydney
 - ChinaVO: Li: The Architecture and Maintenance of the China-VO System
- May 2016: Cape Town
 - GAVO: Demleitner: VO Protocols Implementation at GAVO
 - IRSA: Landry: VO Protocols Implementation at IRSA
- Oct 2016: Trieste
 - ESA/GAIA: Gonzalez:Administrating a heavily used TAP instance: Gaia Archive operations for DR1
 - SVO:Alacid:VO Operations at the Spanish Virtual Observatory
- May 2017: Shanghai
 - China-VO: Li: China-VO Operations Report
 - WFAU: Voutsinas: WFAU Operations Report
- Oct 2017: Santiago
 - ChiVO: Camilo Nunez and Mauricio Araya: ChiVO
 - NASA/HEASARC: McGlynn: Usage of the VO at the HEASARC
- May 2018: Victoria
 - CADC: Gaudet: A Second Look at VO Operations
 - ESA: Merin: ESASky Updates and Operations
 - ESA/GAIA: Salgado: GAIA Archive for Release 2
 - IRSA: Groom: IRSA Operations
- Nov 2018: College Park
- May 2019: Paris
 - PADC: Erard: VO Operations at the Observatoire de Paris
 - MAST: Dower: VO Operations at MAST

Institutions Presenting

- CDS
- CADC x 2
- China VO x 2
- GAVO
- IRSA x 2
- ESA/GAIA x 2
- SVO
- WFAU
- ChiVO
- HEASARC
- ESA/ESA Sky
- PADC
- MAST

Enabling a common interface

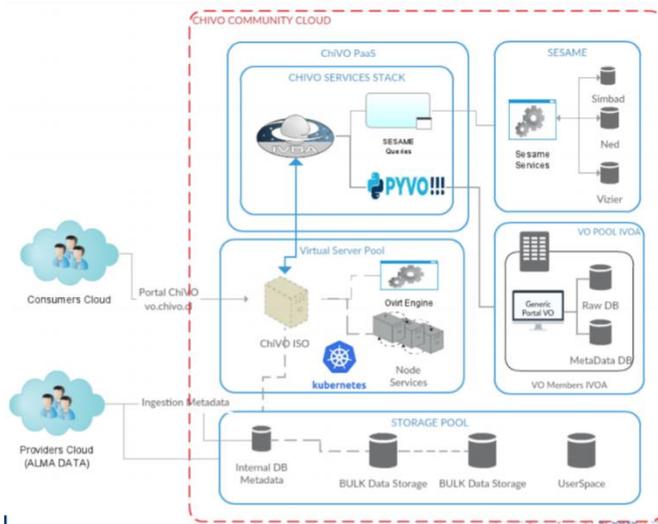
- Handling a legacy of diverse missions with different missions
- Providing a common interface across diverse archives



NAVO VO interface

Entering the VO requires implementing a wide variety of interconnected protocols

- Requires care in understanding dependencies and interrelationships of standards
- Versions of standards matter
- Dependencies on some protocols (e.g., registry) may be non-obvious
- Substantial barrier to entry that can be alleviated by reuse of existing code



ChiVO 2017

IVOA Standards

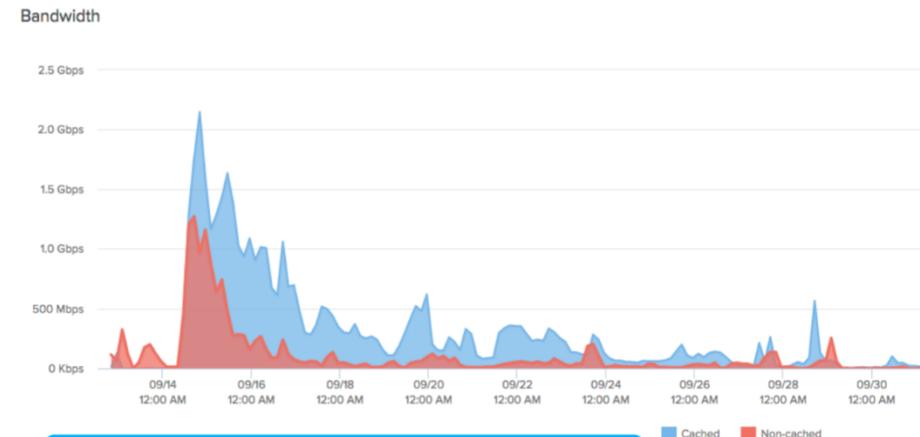
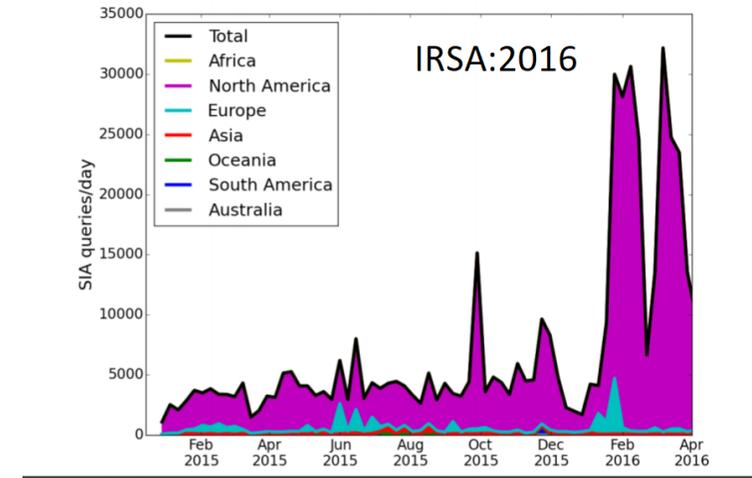
- ADQL 2.0
- CDP 1.0
- DALI 1.0
- DataLink 1.0
- ObsCore 1.0
- SIA 1.0
- SimpleDALRegExt 1.0
- SSO 1.01
- TAP 1.0
- TAPRegExt 1.0
- UWS 1.0
- VODataService 1.1
- VOResource 1.03
- VOSI 1.0
- VOspace 2.0
- VOTable 1.1, 1.2, 1.3
- RegistryInterfaces 1.0

CADC: Sesto

Usage is highly variable

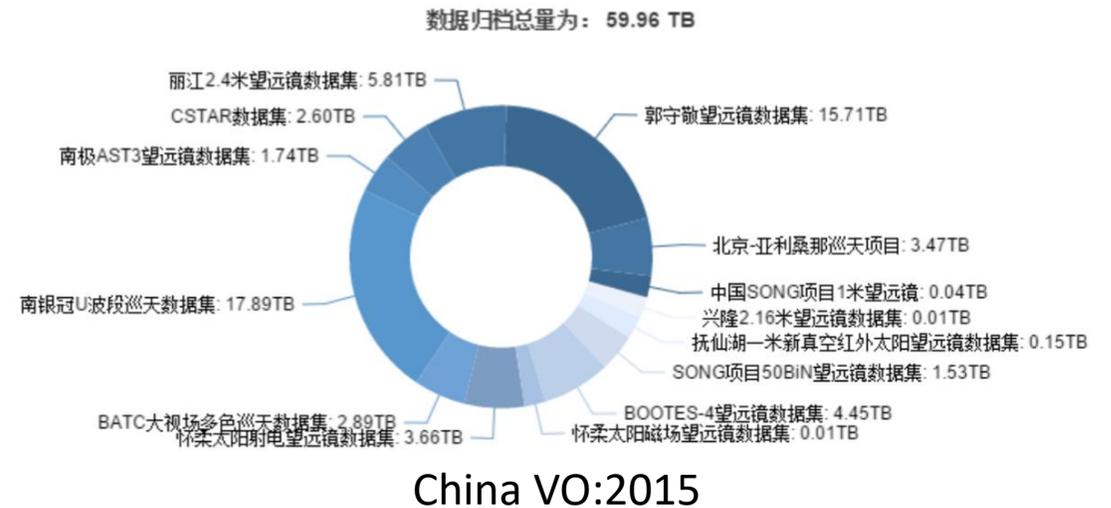
- Need to size to anticipated peaks
- Data releases
- External events which drive interest
- Mirrors to support distribution of broadly popular data

Simple Image Access Traffic



Lots of Data

- ...and growing TB -> PB and not too long PB -> EB
- Frequent use of cloud and cloud architectures but so far these are not in commercial cloud



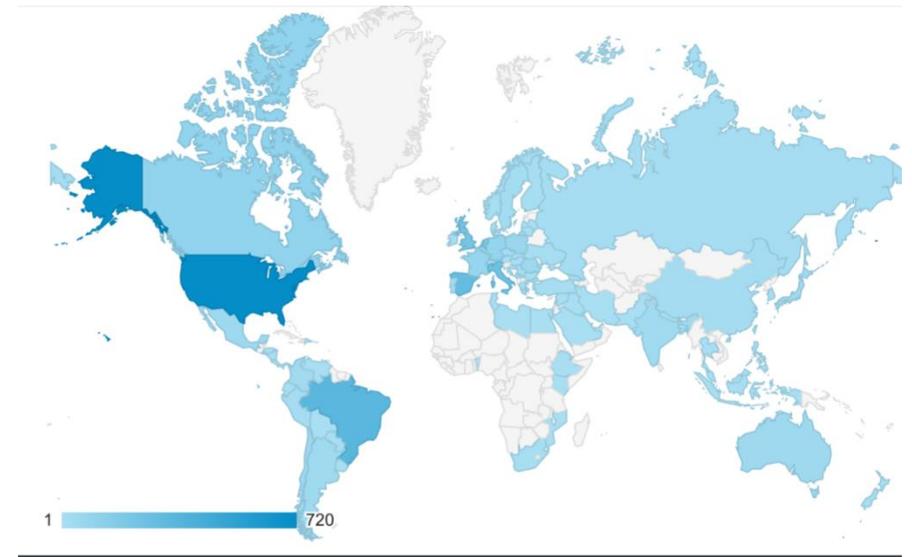
Achievement

- Storage capacity:
 - 1500TB
- Calculate ability:
 - 702T+472 cores
- Network bandwidth:
 - 155Mbps-300Mbps
 - 10Gbps/1Gbps
- Users: 18684 +
- Nodes: 7
- Virtual Machine Instances: 500+
- Supported Telescope: 4
- Archived Dataset: 24
- Mirror Dataset: 9
- Astronomy Software Environment: 4

China VO:2017

Our services are broadly used

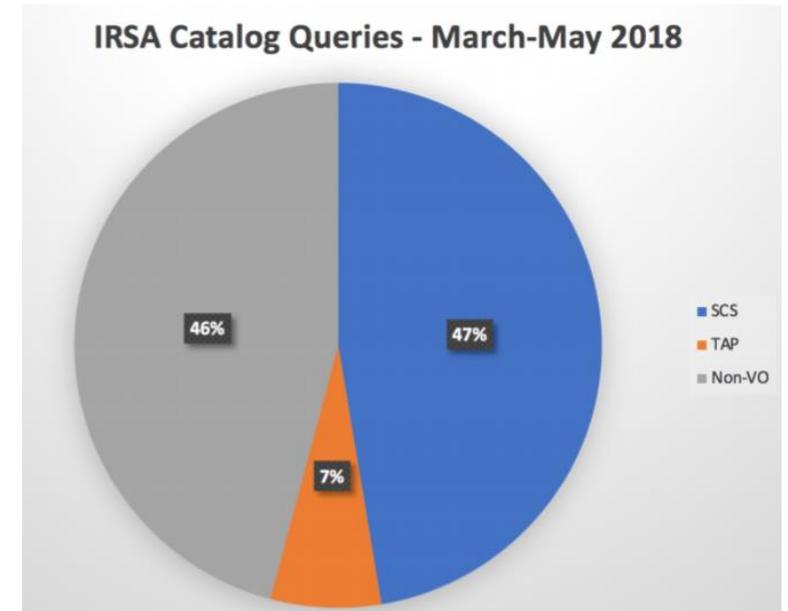
- Services are used worldwide
- Archives use data at other archives
- Many services are used not only by professional astronomers but also by public.
- Archives support one another (e.g., by sharing HiPS)



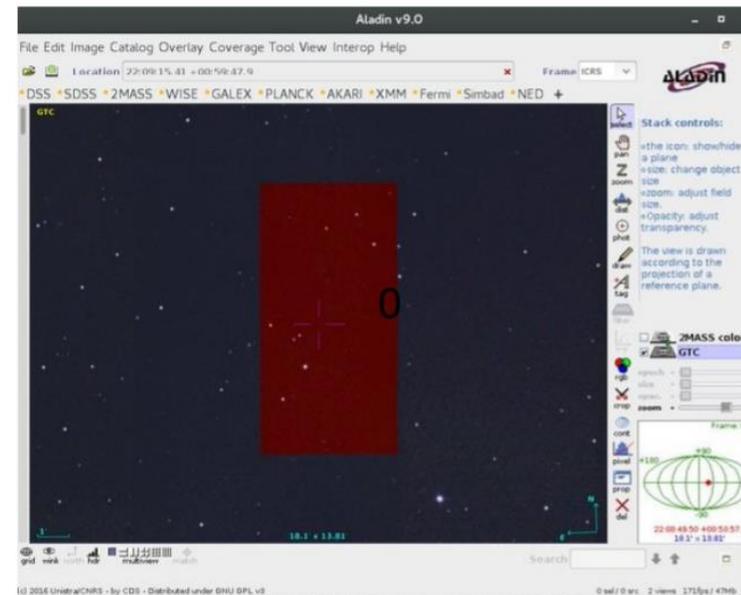
ESASky Usage

Archives evolve

- Implementations of protocols are prioritized to meet perceived needs.
- VO support needs to be balanced against legacy interfaces
- New standards are implemented as their utility becomes apparent.



HIPS (GTC)



HiPS at SVO

Closing thoughts

- Lots of different approaches taken in these talks addressing different aspects of how VO can support science usage of our archives: what standards are used, how do we maintain it, usage, volumes,... These different approaches can be very enlightening and have helped me to reconsider how I use the VO.
- Variability and size of VO data usage can be intimidating, but we need to plan for it.
- Some archives build on VO protocols as fundamental, others add VO interfaces to existing frameworks. This is not 1-1 with whether they had legacy data.
- Institutional adoption of VO is complex requiring understanding of myriad standards:
 - Can probably do better in making it easier for institutions to join VO. Libraries like DaCHS, CDS HIPS and MOC libraries and CADC codes should be promoted.
 - Do we need secondary documentation beyond standards for implementors given that on entry a user needs to understand 10 or more that interrelate in non-obvious ways (VO Table, UCDS, DMs, Registry,).