

AstroCloud, a Whole Lifecycle Management Platform for Astronomical Data Based on Virtual Observatory and Cloud Computing

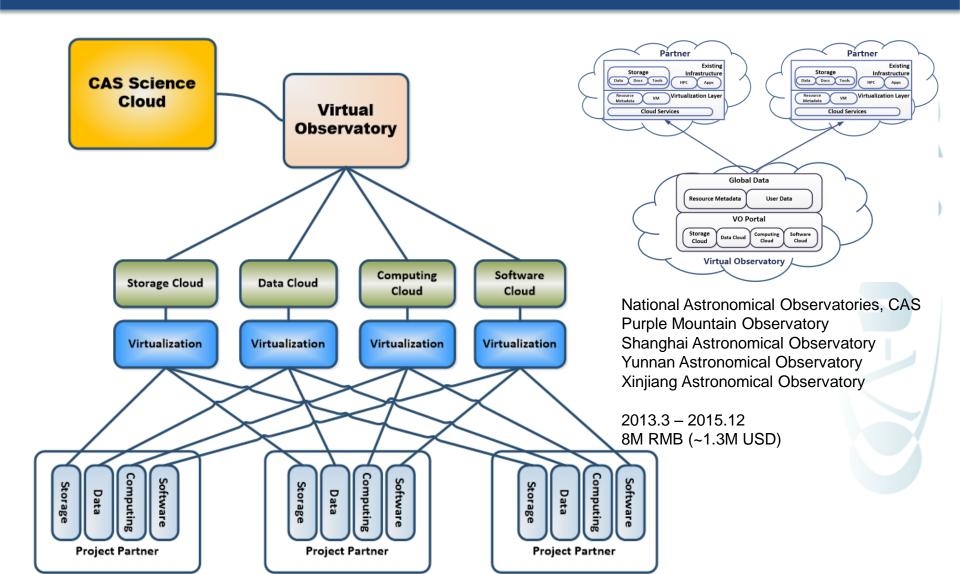
Chenzhou Cui

Chinese Virtual Observatory (China-VO)

National Astronomical Observatory of China

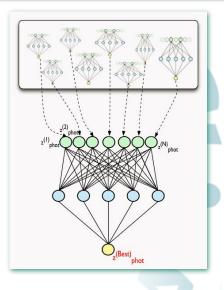
Ce Yu, Jian Xiao, Boliang He, Changhua Li, Dongwei Fan, Chuanjun Wang, Zhi Hong, Shanshan Li, Linying Mi, Wanghui Wan, Zihuang Cao, Jiawei Wang, Shucheng Yin, Yufeng Fan, Jianguo Wang, et al.

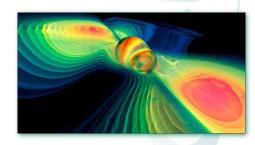
AstroCloud Project



AstroCloud Major Functions

- Telescope Open Access
 - 2.4m, 2.16m, radio telescopes, public telescopes
- Data Discovery and Access
 - Virtual Observatory
 - Seamless astronomy
- Data Mining and KDD
 - Cloud computing
 - Software and tools
- Data Visualization
 - Interactive
 - On-the-fly



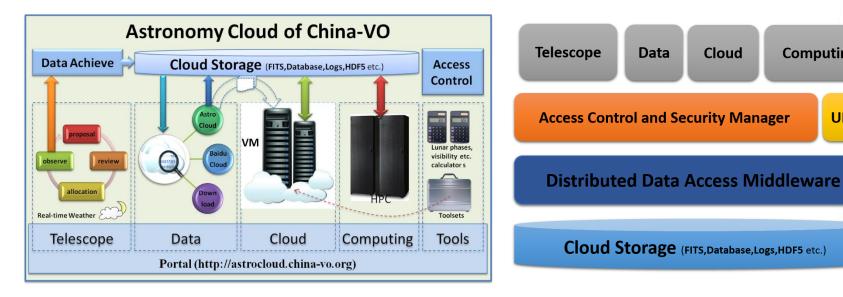


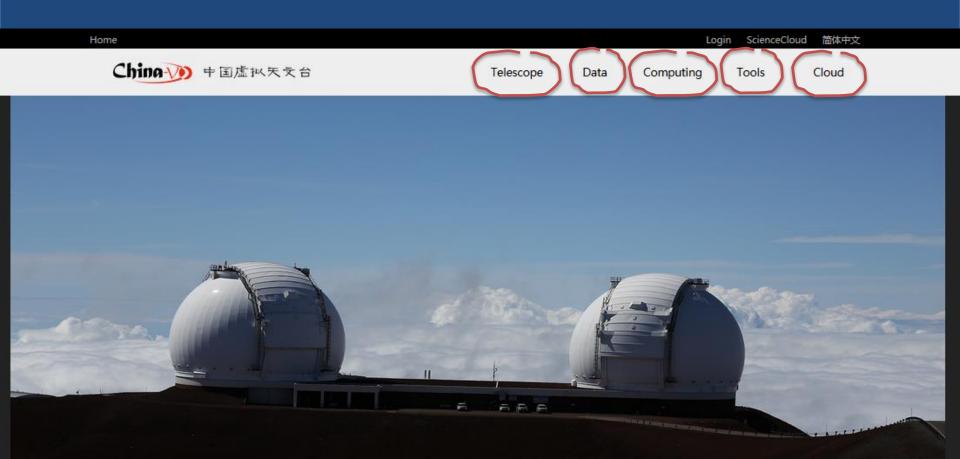
AstroCloud Architecture

Computing

UMT

The ultimate goal of this project is to provide a comprehensive end-to-end astronomy research environment where several independent systems seamlessly collaborate to support the full lifecycle of the modern observational astronomy based on big data, from proposal submission, to data archiving, data release, and to in-situ data analysis and processing.





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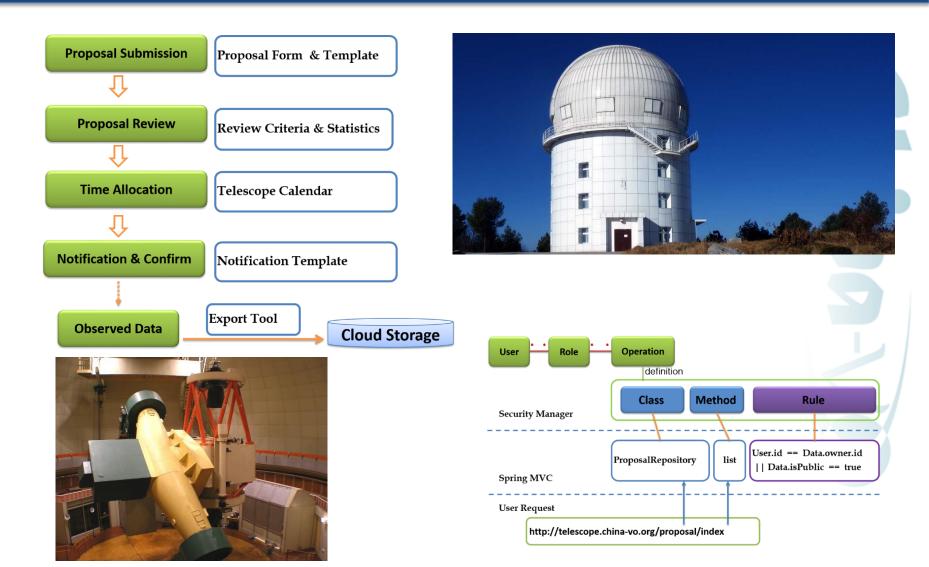
2.4米望远镜时间申请指南

热点新闻

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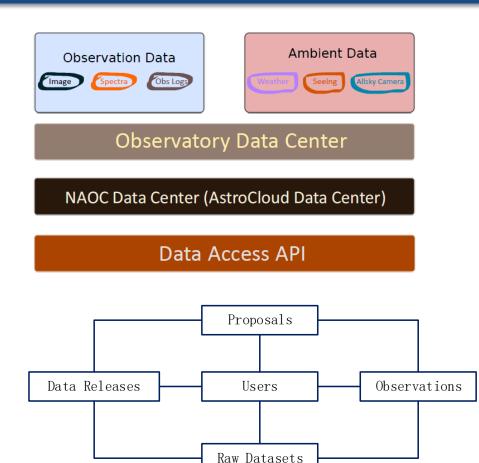
Proposal Submission and Management

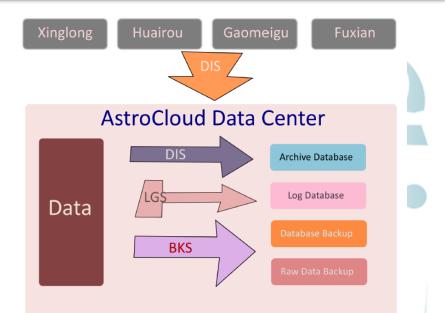


YNAO 2.4m Proposal Management

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Data archiving and quality control

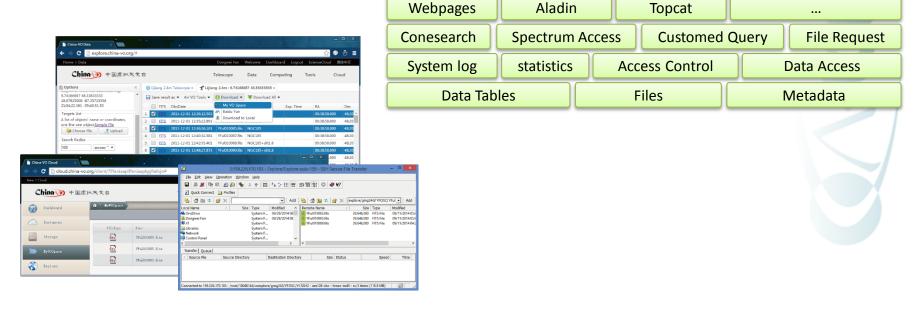




- data transfer
- data ingestion
- metadata management
- backup and security

Date exploration and interoperability

 Data channel connects the observation proposals, data, virtual machines and software. According to the unique ID system, data can be collected by PI's proposals, or by the search interfaces. Searche results can be easily saved to cloud storages, including the storage with virtual machines, or several commercial platforms like Dropbox. VOTable formatted searching result could be sent to kinds of VO software.



Cloud Computing and VMs

- Based on CloudStack, we set up the cloud computing environment for AstroCloud. It consists of five distributed nodes across the mainland of China.
- Based on GlusterFS, we built a scalable cloud storage system. Each user has a private space, which can be shared among different virtual machines and desktop systems.

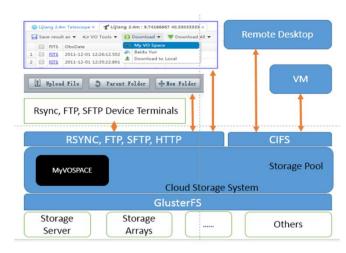


Fig. 4.1 the framework of MyVOSpace, cloud storage system and the relation with other components, techonology.

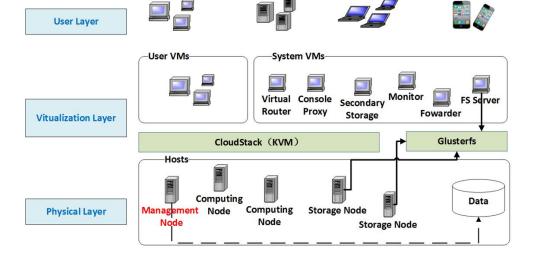
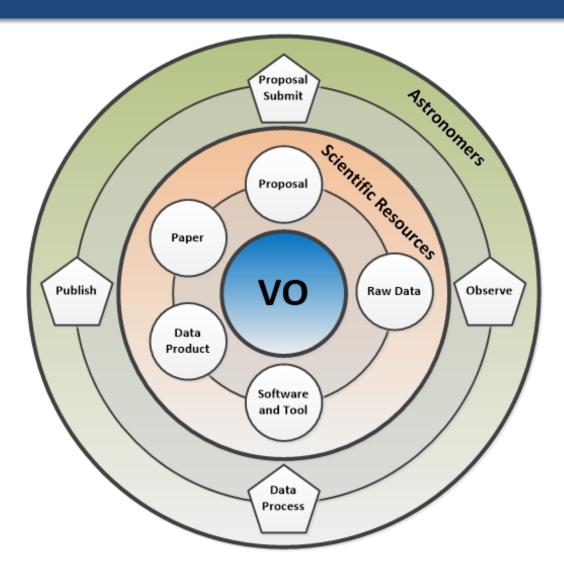


Fig. 2.1 The Architecture of Cloud Computing Environments for AstroCloud

Whole lifecycle management



Timeline

- Project approved
 2013.3
- Alpha version and commissioning
 - 2014.5.15
- Beta version
 - early of 2015
- Operation
 - by the end of 2015



Current Status

- Registered users: 171 (by 2014.10.08)
- Cloud nodes: 3
 - Beijing, Kunming, Urumqi
- VM stances: 41
- Proposal management client: 1
 - YNAO 2.4 telescope
 - NAOC 2.16 telescope
 - Xinjiang 25m radio telescope
- Datasets collected in China: 7
 - LAMOST、BATC、CSTAR、SCUSS、AST3、Bootes-4、2m4
- User contributed photographs: 41



IVOA Recommendations Involved

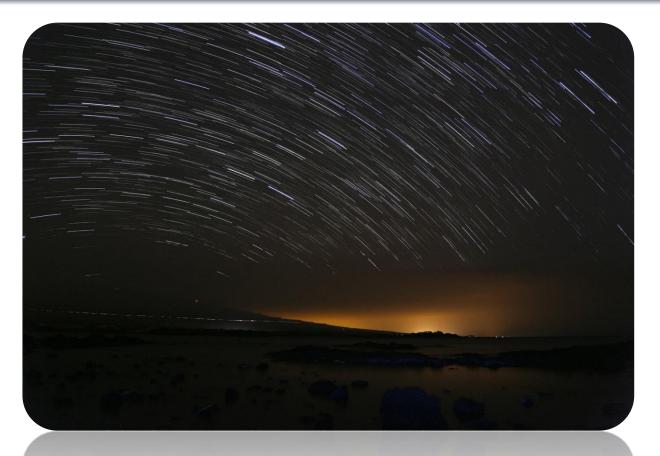
- Metadata
 - UCD
 - VORegistry
 - VOResource
- Data access protocals
 - ConeSearch, SSA
 - TAP, SIAP
- SAMP, WebSAMP
- VOSpace

AstroCloud: prospects

- An information and data management system for Chinese telescopes
 - Astronomical Resource Planning platform
- A gateway for astronomical data
- A data mining and scientific discovery environment for astronomical research
- A test bed for VO technologies

VO, from "virtual" to "physical" Special thanks to directors of the 5 observatories, CAS

Thank You!



http://astrocloud.china-vo.org

