ESASky

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Issue/Revision: 1.0

Reference: ESA Sky

Status: Issued

ESASky concept

- **Goal**: to facilitate data discovery and archival science for ALL users
  - Multi-wavelength
  - Project agnostic
  - Exploration

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- Interface to all astronomy archives

- First release this week at the IVOA interop in Stellenbosch!!

ESASky data contents roadmap

Prototype (summer 2014)

- **All-sky HiPS mosaics:**
  - XMM-Newton (CDS)
  - HST (CDS)
  - Planck (CDS)
  - Herschel-SPIRE (ESA)
- **Science ready data (imaging):**
  - XMM-Newton
  - HST (core)
  - Herschel-SPIRE
- **Catalogs:**
  - 3XMM-DR4
  - XMM Slew
  - XMM OM

First Release (May 2016)

- **All-sky HiPS mosaics:**
  - EXOSAT (ESA)
  - INTEGRAL (ESA)
  - XMM-Newton (ESA)
  - HST (ESA)
  - ISO (ESA)
  - AKARI (ESA)
  - Herschel (ESA)
  - Planck (ESA)
  - JAXA/SUZAKU
- **Science ready data (imaging):**
  - INTEGRAL?
  - XMM-Newton
  - HST
  - ISOCAM
  - Herschel
  - JAXA/SUZAKU
- **Catalogs:**
  - 3XMM-DR5
  - XMM Slew
  - XMM OM
  - Hubble Source catalog
  - Hipparcos
  - AKARI catalogs
  - Planck catalogs

Second release (fall of 2016)

- **All-sky HiPS mosaics**
- **Science ready data (imaging and spectra):**
  - EXOSAT
  - INTEGRAL
  - XMM-Newton
  - IUE
  - HST
  - ISOCAM
  - Herschel
- **Catalogs:**
  - 3XMM-DR6
  - XMM Slew
  - XMM OM
  - Hubble Source catalog
  - Hipparcos
  - Gaia
  - AKARI catalogs
  - Herschel Point Source Catalogs
  - Planck catalogs

Aim: continuous integration, testing and releasing

ESASky feature roadmap

Prototype (summer 2014)

- Web interface
- All-sky HiPS mosaics from CDS
- Detailed footprints (imaging)
- Multi-target functionality

First Release (May 2016)

- Scientific validation of footprints and ESA all-sky HiPS by ESA
- Download management
- Multi-target summary table
- Interoperability with VO tools
- Documentation
- Helpdesk Support
- Hardware scaling requirements
- Refactoring of prototype into robust and stable application

Second release (fall 2016)

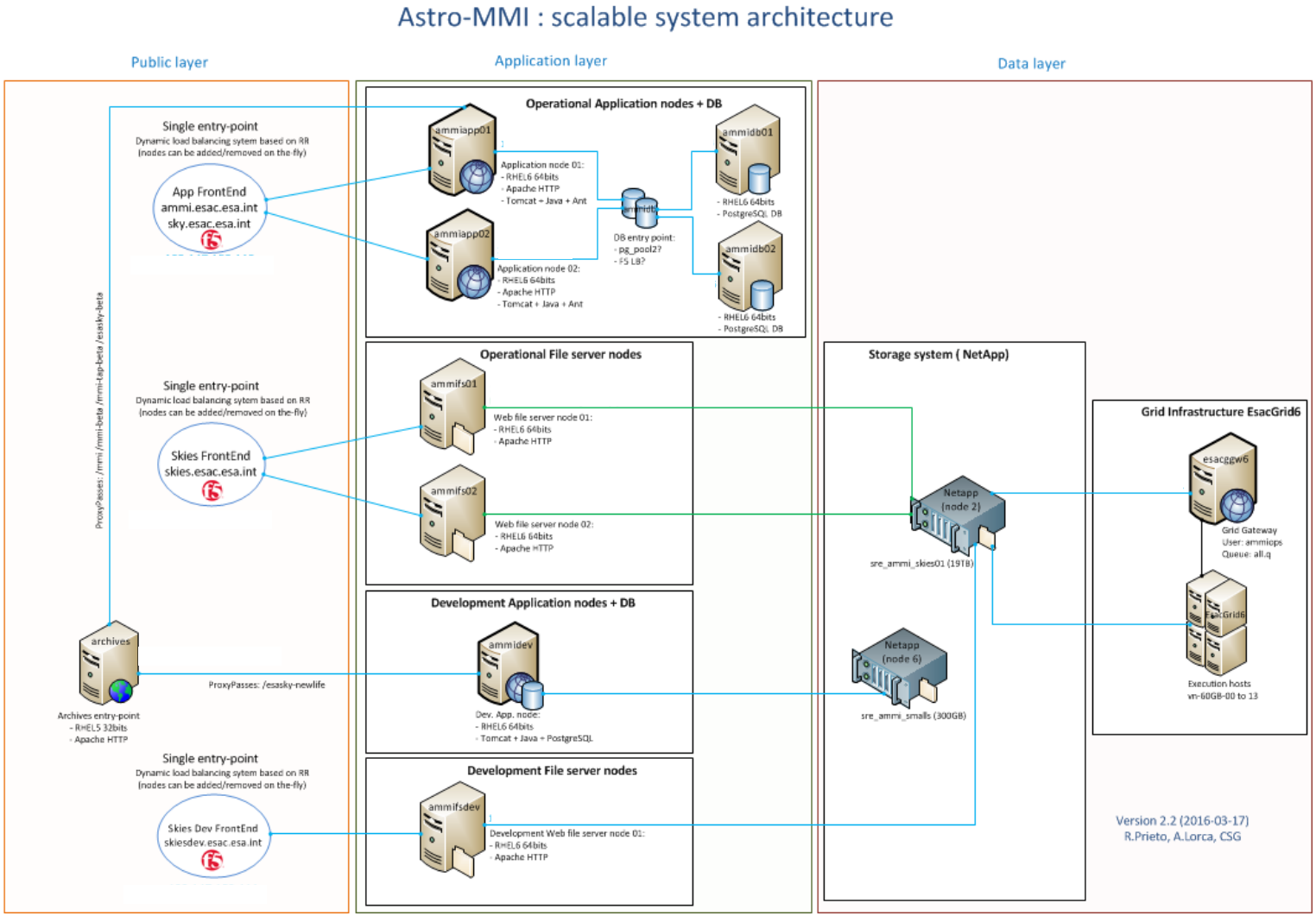
- Link to Vizier/Simbad
- Generation of detailed footprints (spectra)
- Imaging and spectroscopic data
- Online visualization of data

Third release (2017)

- Sample manipulation
- Time-series
- Observation planning
- State-fullness
- Massive data visualization
- Link to publications?
- Mobile app?

Aim: continuous integration, testing and releasing

ESASky Operational Architecture



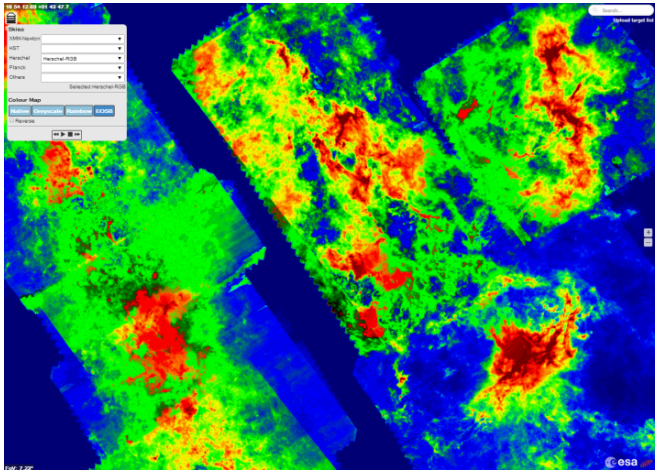
ESASky version 1.0 Demo

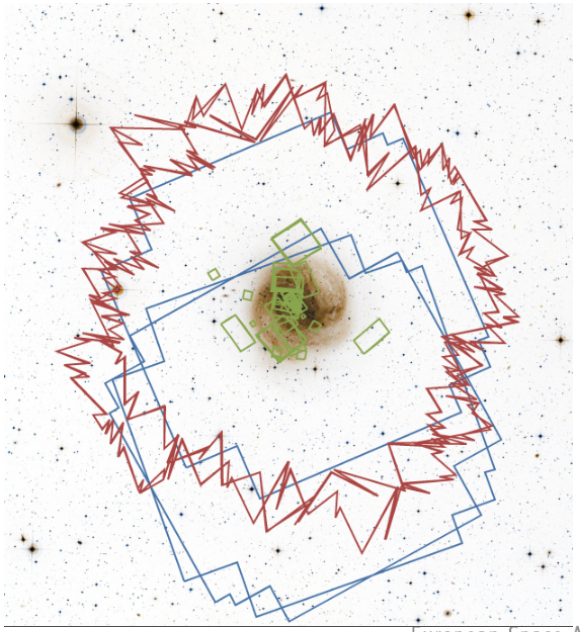
Demo

https://youtu.be/eAfHq7s5MBQ

ESASky v1.0 - Backend Data Generation

- HiPS: Hierarchical Progressive Survey
  - HEALPix sky tessellation
  - Number of levels depend on pixel angular resolution
    - Planck (low) 3 levels
    - Herschel(medium) 7 levels
    - HST(high) 14 levels
- Footprints
  - HST: Provided by project
  - Herschel: Footprint Finder (ST-ECF)
  - XMM: Instrumental + pointing





ESASky v1.0- Backend Data Access

- Apache HTTP Server
  - Serves HiPS requests
- Java Servlet container
  - Serves TAP & Target Resolver requests
- Database
  - PostgreSQL DB
  - Spherical data types library (PgSphere)
  - Footprints -> Spherical data types
- Usage of IVOA Protocols & Standards
  - TAP requests
  - ADQL translation to SQL + PgSphere
  - Storage of STC-S footprint information

ESASky v1.0 - Frontend

- Running on a Web Browser (HTML5/ CSS3)
- Google Web Toolkit
  - Aladin Lite wrapper (JSNI)
  - Data Visualization (Highcharts)
- Usage of IVOA Protocols
  - TAP accessing archive metadata
  - ADQL describing complex FoVs
- Astronomical services access
  - Target coordinates resolver
  - Angular size resolver

ESASky team

- Fabrizio Giordano (key person, full-time)
- María Henar Sarmiento (part-time, GUI)
- Elena Racero (part-time, HiPS and footprints)
- Belén López Martí (full-time EXPRO, HiPS development)
- Pilar de Teodoro (part-time, DB)
- Sara Nieto (part-time, DB ingestion)
- Raúl Gutiérrez (part-time, backend)
- Juan González (part-time, DB optimization)

Try the ESASky yourself !

Thanks!

http://sky.esa.int

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http://www.cosmos.esa.int/web/esdc/esasky-help