Packaging VO applications for Debian

Status and outlook

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Content

- Introduction in Debian Astro
- VO specific requirements
- VO Packages
- Outlook

Debian Astro

- The Debian Astro Pure Blend
  - Completely integrated into Debian (*Pure*)
  - Currently 282 binary packages, 17 sections
    - Base libraries (cfitsio, wcslib, erfa)
    - Python 2/3 (astropy and affiliated packages)
    - Legacy (ESO-MIDAS, Tcl/Tk, GDL)
    - Radio astronomy (casacore)
    - Java + VO
  - Handle citations, ASCL entries, Web page
- The Team
  - Mailing list: 160 subscribers
  - Git repository write access: 42 (15 uploaders)

Advantages for Packaging: User

- Simple, consistent installation and upgrade procedure
  - `apt install saods9`
  - `apt update ; apt upgrade`
- Dependency management
- Full integration into the system
  - Ready to go after installation: usually no configuration required
  - Shell integration (Tab completion)
  - Desktop integration (menus, data types, icons)
  - Manual pages
  - Integration with other packages of the system

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Advantages for Packaging: Technical

- Testing:
  - install tests on 22 platforms (10 official, 12 inofficial)
  - regular CI tests (on each depedency change)
  - repeated “inofficial” install tests (Reproducible builds)
  - people doing research with software metrics
  - bug tracker is already there
- Coupled to distribution development
- Dependencies are recognized
  - automated “transitions” (recompilations) when ABI breaks
  - prevent from silent removal of dependencies
- Automatic migration to Ubuntu

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Advantages for Packaging: Social

- Broaden user base: specialists, but also for outreach
- Self-magnification: a strong Debian Astro Pure Blend will attract more people to contribute
- Others may contribute: bugfixes etc.
- Debian is “bazaar” style: everyone can follow, everyone can contribute, development is transparent
- Packages get some attention even if “orphaned”
  - Non-maintainer uploads (NMU)
  - QA team
  - package adoption
  - even upstream may be taken over

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Packaging Rules, “Policy”

- Social Contract + Debian Free Software Guidelines: strict rules
- Debian policy
  - completely build from source
  - no convenience copies of code; re-use existing libraries
  - recursive packaging (package dependencies first, ...)
  - file system standard
  - package names, ...
- Specific policies (Python, Java, Tcl/Tk, Science)
- Portability (10 official architectures)
  - 32 vs. 64 bit
  - byte order
- Team maintenance

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Debian as a Reference Platform

- Almost standard linux
- High quality standards
- Clear, consistent structure: comprehensive Debian policy, specific policies for different fields: Python, Java, Tcl/Tk, Science
- Lots of tools for packaging + package checks
- Solutions can easily be taken over for others (Fedora etc.)

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Packaging VO Related Software

- Concentrate on client apps
- Python: astropy.vo, pyvo, astroquery, pymoc
- Applications: Montage (?), SAOImage DS9
- Current effort: Java, applications
- Common problems
  - Recursive jar-in-a-jar
  - Sources not always available
  - Licensing glitches: non-free, undocumented
  - Outdated libraries
  - Kudos to Florian Rothmaier here!

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Java Dependencies in VO Software

- Healpix, eag-healpix (Nikolai Kuropatkin)
- xmlrpc (Debian has version 3)
- nom.tam.fits (Tom McGlynn, Richard van Nieuwenhoven)
- Java Expressions Library (Konstantin L. Metlov)
- adql (Grégory Mantelet)
- jsamp (Mark Taylor)
- CDS
  - Moc (Pierre Fernique, version 4.6 / 4.7)
  - Savot (André Schaaff, 4.0)
- ivoafits
  - Author: Samuel Carliles
  - Undocumented license, "IVOA Public License Version 1.0"?
  - Not packaged yet

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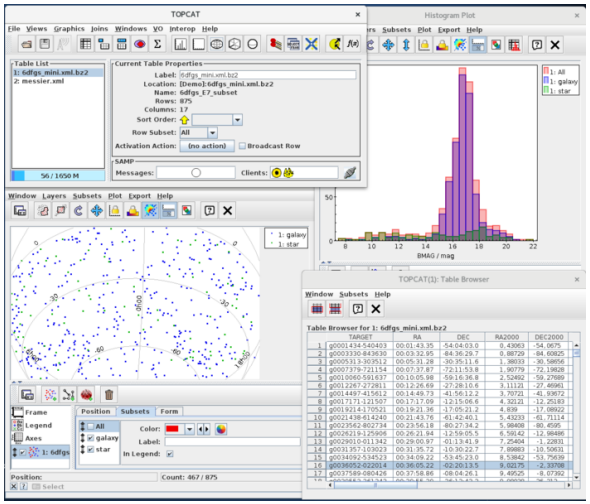
Packaging SkyView

- "SkyView-in-a-jar", base of the SkyView web page
- Author: Tom McGlynn
- Copyright (public domain) needed to be clarified
- No version number in jar name – no automated update check

Packaging TOPCAT and STILTS

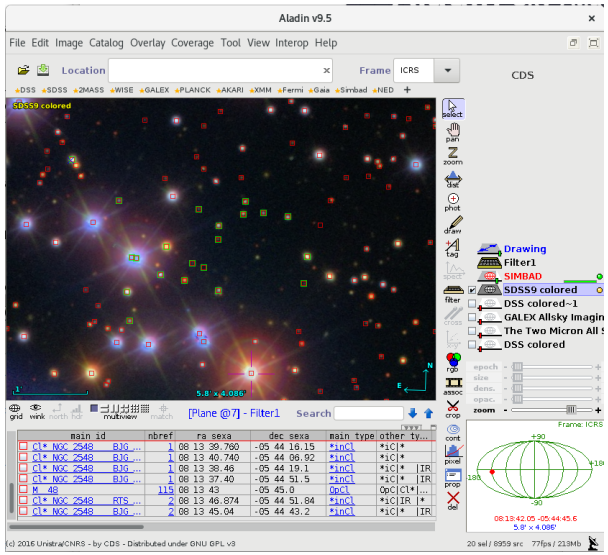


- Desktop integration (TOPCAT: actions, icon etc.)
- Shell integration (STILTS: man, completion etc.)
- Jython integration (JyStilts)

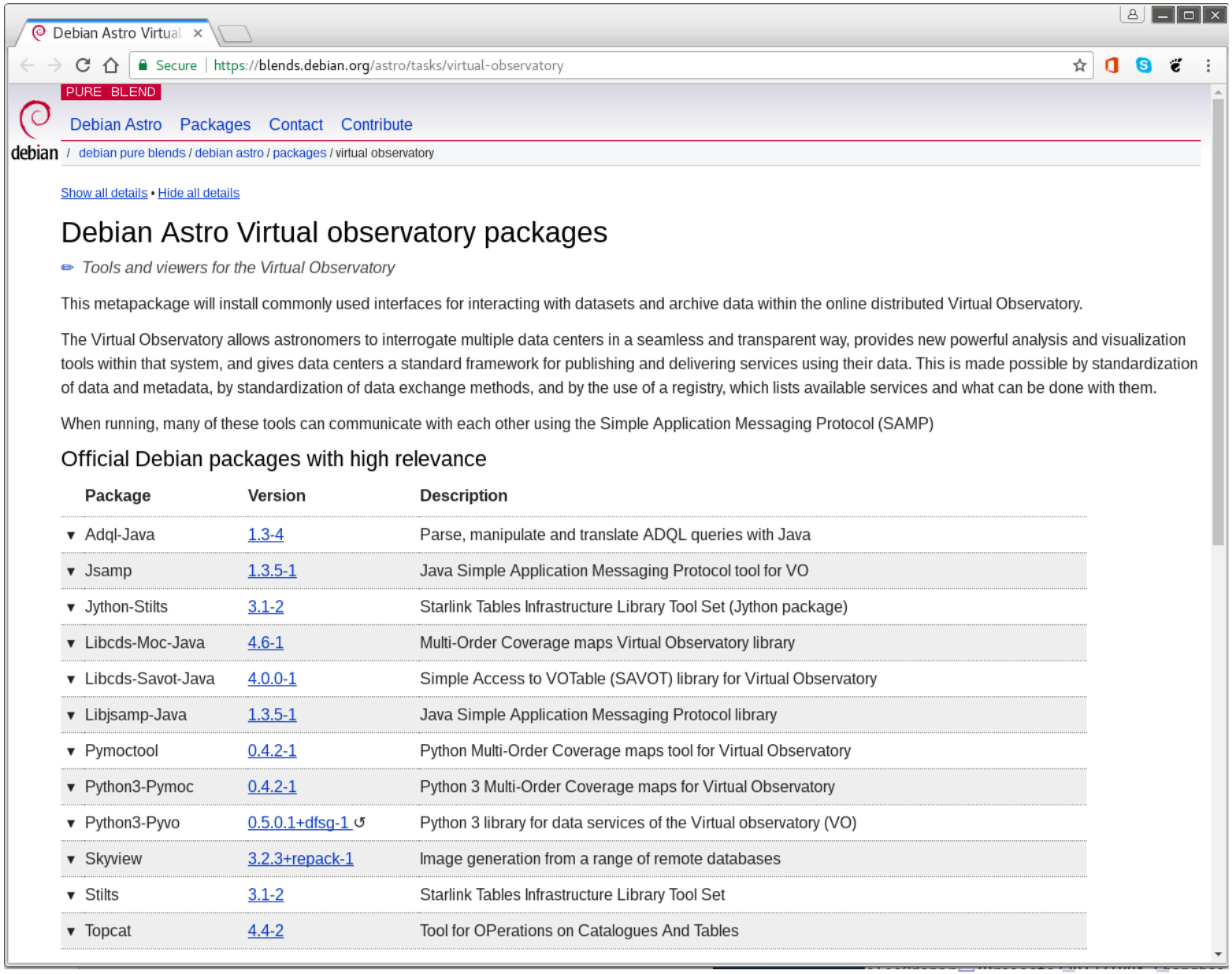
- Requires most of Starjava (total 13 source packages!)
- Some things removed:
  - HTM pixelization (licensing issue)
  - Data structures HDS, HDX, NDX. GBIN, Mirage, (CDF)
  - Protocols: Astrogrid, SRB, PLASTIC
  - Image display via SOG, Diva, JSky, ivoafits
- Excellent cooperation with upstream author (Mark Taylor)

Packaging CDS Aladin

- Done by Paul Sladen and me
- Main change: update to xmlrpc version 3
- Ready to upload (9.012 and “Beta” 9.504)
- Prototype not done (source not available yet)
- Licensing problem (2 files not converted to GPL yet)



VO webpage in Debian Astro



Debian Astro Virtual

Secure | https://blends.debian.org/astro/tasks/virtual-observatory

PURE BLEND

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Debian Astro Virtual observatory packages

Tools and viewers for the Virtual Observatory

This metapackage will install commonly used interfaces for interacting with datasets and archive data within the online distributed Virtual Observatory.

The Virtual Observatory allows astronomers to interrogate multiple data centers in a seamless and transparent way, provides new powerful analysis and visualization tools within that system, and gives data centers a standard framework for publishing and delivering services using their data. This is made possible by standardization of data and metadata, by standardization of data exchange methods, and by the use of a registry, which lists available services and what can be done with them.

When running, many of these tools can communicate with each other using the Simple Application Messaging Protocol (SAMP)

Official Debian packages with high relevance

Package	Version	Description
Adql-Java	1.3-4	Parse, manipulate and translate ADQL queries with Java
Jsamp	1.3.5-1	Java Simple Application Messaging Protocol tool for VO
Jython-Stilts	3.1-2	Starlink Tables Infrastructure Library Tool Set (Jython package)
Libcds-Moc-Java	4.6-1	Multi-Order Coverage maps Virtual Observatory library
Libcds-Savot-Java	4.0.0-1	Simple Access to VOTable (SAVOT) library for Virtual Observatory
Libjsamp-Java	1.3.5-1	Java Simple Application Messaging Protocol library
Pymoctool	0.4.2-1	Python Multi-Order Coverage maps tool for Virtual Observatory
Python3-Pymoc	0.4.2-1	Python 3 Multi-Order Coverage maps for Virtual Observatory
Python3-Pyvo	0.5.0.1+dfsg-1	Python 3 library for data services of the Virtual observatory (VO)
Skyview	3.2.3+repack-1	Image generation from a range of remote databases
Stilts	3.1-2	Starlink Tables Infrastructure Library Tool Set
Topcat	4.4-2	Tool for OPerations on Catalogues And Tables

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Outlook

- Finish and upload Aladin
- Extending TOPCAT/STILTS (CDF, ivoafits, ...)
- SPLAT (Starjava/TOPCAT as base)
- tapsh, uwclient, gavovotable
- Backports to Stretch etc.
- Sideports (Fedora)?
- More packages: Suggestions?

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