Astronomical Data Analysis Software and Systems IX
ASP Conference Series, Vol. 216, 2000
N. Manset, C. Veillet, and D. Crabtree, eds.

Subaru Telescope ARchive System (STARS), Current Status and Future Work

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Abstract. At the end of December 1998, Subaru Telescope had its FIRST LIGHT (FL) and started to produce a large amount of observational data around optical to near infrared wavelength. We developed a data archive system STARS (Subaru Telescope Archive System) for handling, storing, managing and serving these data, and current stored number of data files is about 50,000. This system is developed on the Supercomputer system in Subaru Telescope's Hilo base facility, getting all data from the summit via high speed network connection. The data searching GUI is based on WEB CGI and Javascript, and it can serve many types of important information about searched data such as FITS header information (HDI), ASCII Table Extension information (ATE), Quick-Look-Image (QLI) and observational log etc.

1. Current Status and System Configuration

From the FIRST LIGHT (FL) of Subaru telescope on the end of last December, we got observational frames with about 300 GB (50,000 files). All of them are stored and managed in STARS (Subaru Telescope ARchive System) which was developed in the super-computer system in Hilo base facility of Subaru telescope (Takata et al. 1998). From the observatory at the summit of Mauna Kea, Hawaii, all data were sent via fast fiber link between the summit and base facility, and registered into database for managing.

Figure 1 shows the system configuration of the system. We are using the following hardwares and softwares for developing this system.

1. Hardwares:
   - AP3000 with 96 Ultra-Sparc CPUs (Scalar Parallel Processor),
   - 1.2TB RAID-5 hard disk (GEN-5),
   - 150TB Tape Library (Sony Peta-Site),
   - ATM(OC-12) link with the Summit system (SOSS),
   - High Performance Fiber Connection in Subaru base facility at Hilo,
   - Many workstations for data analysis.
2. Softwares (For STARS core):
   - ORACLE 7.3.2.4 for DBMS,

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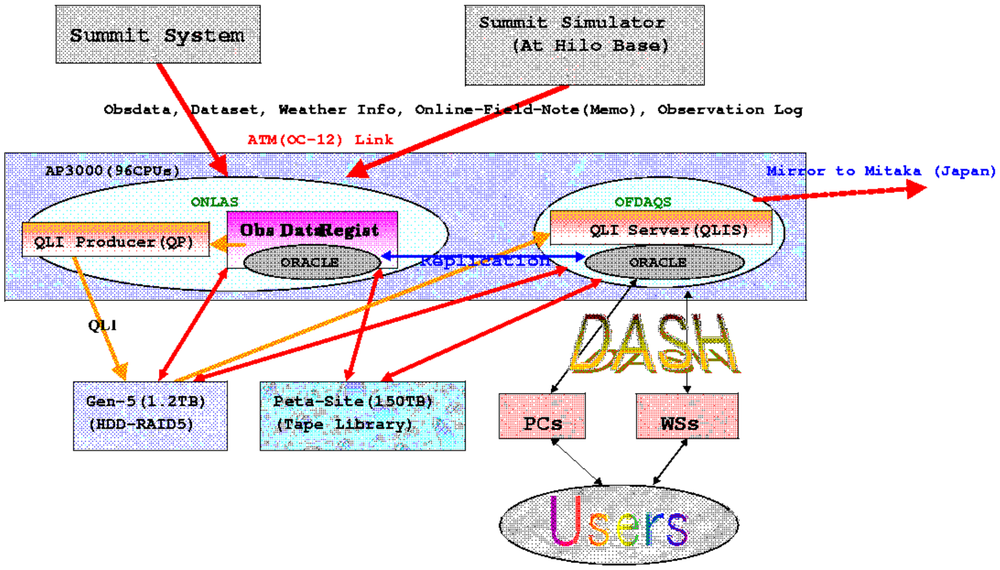

Figure 1. System Configuration of STARS.

- Web-Based GUI for data access (user check):
  1. CGI(Pro*C of ORACLE) + JavaScript for data search,
  2. Java Applet for Name-Resolver,
  3. Directory Manager for user verification using NIS+,
  4. Netscape Enterprise Server + JRun for http Server.
- Peta-Serve (Migration of data to tape library).

2. Support Tools

Our main goal is to develop the data handling system with effective science and engineering output. For this purpose, we consider two support tools, one for fast data browsing, and another is very close connection among STARS, data analysis system (DASH; Yagi et al. 2000) and telescope control system (SOSS; Kosugi et al. 1998).

2.1. QP and QLIS

"QP" is QLI Producer and "QLIS" is QLI Server. QLI is FITS data with 8-bit compressed and with/without BINTABLE extension for extracted spectra (Figure 2). It is made after original observational data come down to STARS system. QP is coded by FORTRAN90 with CFITSIO 2.0 and run once per day. For more details about QLI and QP, please refer the paper by Hamabe et al. (2000) in this proceedings. QLIS consists of server process and browser for quick data looking. They are coded mainly by Java2 and for GIF format support (for more fast access), PGPLOT 5.2 is used for GIF file making. The server reproduce images such as re-compress and extraction of spectra etc. by needs of users. These processes are run by Servlet under Netscape Enterprise

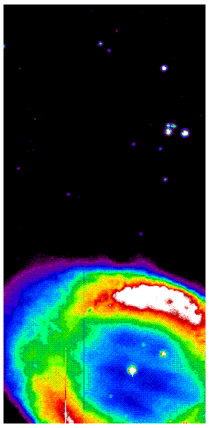

Figure 2. Sample of QLI for M57.

Server plus JRun environment. It is already running in STARS from November 1999. Details will be described by Taga et al. (1999).

By this tools, users can estimate the quality of searched data and decide which are useful for their purpose, much faster than browsing original data. (It takes about 5-times or more long.)

2.2. Linkage with DASH and SOSS

STARS must take a role as one of the keys for effective output provided by Subaru telescope, with close linkage with DASH (Subaru data analysis platform) and SOSS (Subaru Control System). STARS will get the following information fro SOSS and serves for DASH. Schematic connection between STARS and DASH is shown in Figure 3.

1. Dataset: Files describing how the "object" data is taken, and what files should be used for reducing the file.
    - It will be created based on abstract-command at the summit and transferred to STARS,
    - STARS will store and register the information about the dataset file and provide the interpreter of the contents of the dataset file interfacing with DASH,
    - DASH will collect necessary data which are ordered by the interpreter,
    - DASH will push them into the bottom of PRO*Cube and start reduction.
2. Observational Log: Files describing many types of data such as weather condition, telescope status etc. These files have the information with the interval of 0.1 second.
    - STARS will store and register the information about the log files and extract some information such as weather's and so on, and provide them to users. (Mainly used for "Seeing Improvement" work).

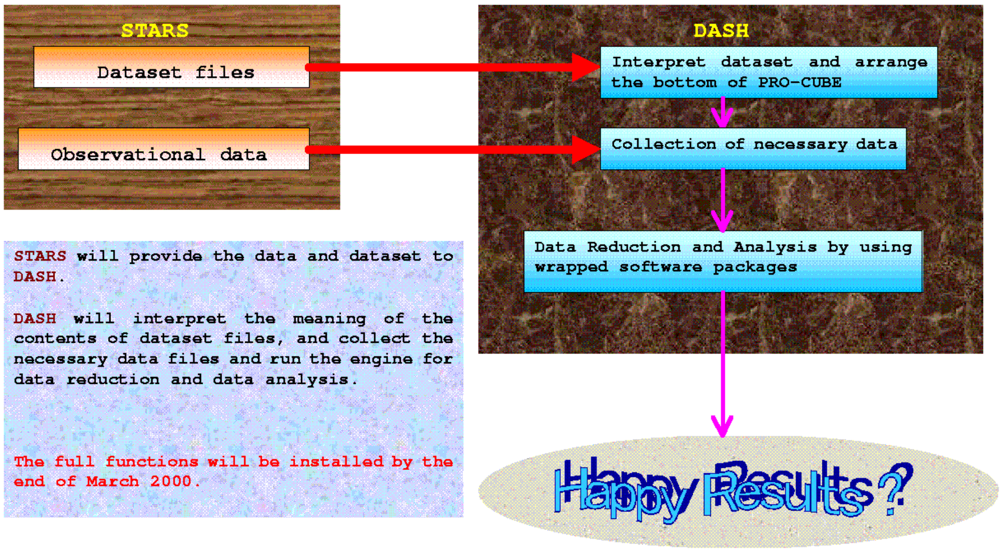

Figure 3. How to link STARS with DASH.

3. Future Work

In near future, we are planning to include the following functions into STARS:

1. Management of data after reduction and calibration:
   - It includes pipeline, especially for NIR and MIR data. (By this function, QLI for NIR and MIR data are also available);
   - It needs more closer linkage with SOSS.
2. Preparation for data release by close link with ADAC/NAOJ:
   - Data will be released at ADAC/NAOJ at Mitaka (Japan),
   - Proprietary term will be 1 and half year,
   - Replication of database files and reconstruction of database tables and data,
   - More functional updates of QP and QLIS (for example, mosaic display),
   - Links with environmental information (Cirrus, Seeing, Weather, Transparency etc.) to observational data. They are essential for archive users; users must know almost everything which observers know. (ideal)

References

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