

Progress of computer and network replacement at Subaru Telescope

Junichi Noumaru¹⁾, Tom Winegar¹⁾, Eiji Kyono¹⁾, Hitomi Yamanoi²⁾ and Kiaina Schubert¹⁾

¹⁾ Subaru Telescope, National Astronomical Observatory of Japan
650 N.A'ohoku Pl., Hilo, HI 96720, U.S.A.

²⁾ Subaru Telescope Mitaka Office, National Astronomical Observatory of Japan
2-21-1 Osawa, Mitaka, Tokyo 181-8588, Japan



Introduction

Subaru Telescope has procured a core of computer and network system with a rental contract with a vendor since 1997, before the telescope came to an official completion. The "rental contract" is probably a unique contract prevailing among educational/research institutes of Japan. With a rental contract, a client does not rent a mere software or hardware, but receives "service" out of software and hardware that the vendor designs, installs, operates and maintains at the premises of the client. Software engineers or operators are dispatched from the vendor to the premises of the client and provide necessary support. Because the vendor takes the responsibility for design, order, installation, configuration, operation and maintenance, this is an ideal procurement for corporations that do not have enough work force for IT such as universities and many research institutes of Japan. We are now working on the procurement of new computer and network system that will be rolled out from March 2018. We will make a five-year rental contract with a vendor that will be selected through the bidding process set up by the Japanese government.

Our Challenge

Money matters

Like other facilities that are over ten years old or of which parent organization starts to invest in a new, big and costly project, Subaru Telescope is facing a serious reduction of operation budget. We are required to reduce significantly operation cost of the computer and network system. Generally the system procured under the rental contract works great because of the expertise of the contractor. And the rental contract saves payroll, money and manpower of staff who was forced to spend their time for the project that was affected by the downed computer and network. Nevertheless, we are required to reduce the cost more than what we can save by continuing the rental contract.

We still use rental contract but this will be the last

We will procure the new system with a rental contract because of the shortage of manpower, knowledge and skills for design through maintenance of the system all by ourselves.

Gear up

This procurement will be the last rental contract. By 2018, we will hire IT staff so that we can design the next system by ourselves and so that we can take at least a part of the responsibility including the operation and the maintenance.

Soft-landing

Under this procurement, the vendor is still responsible for operation and maintenance of the system for the first three years, but the vendor should transfer the responsibility, knowledge and skills to us so that we can take the responsibility for the system from the fourth year.

Consolidate Hardware

Most services provided by office servers do not require cutting-edge performance of hardware. We employ virtual machine technology to consolidate hardware and save overall cost. We even set up some instrument control computers in the VM.

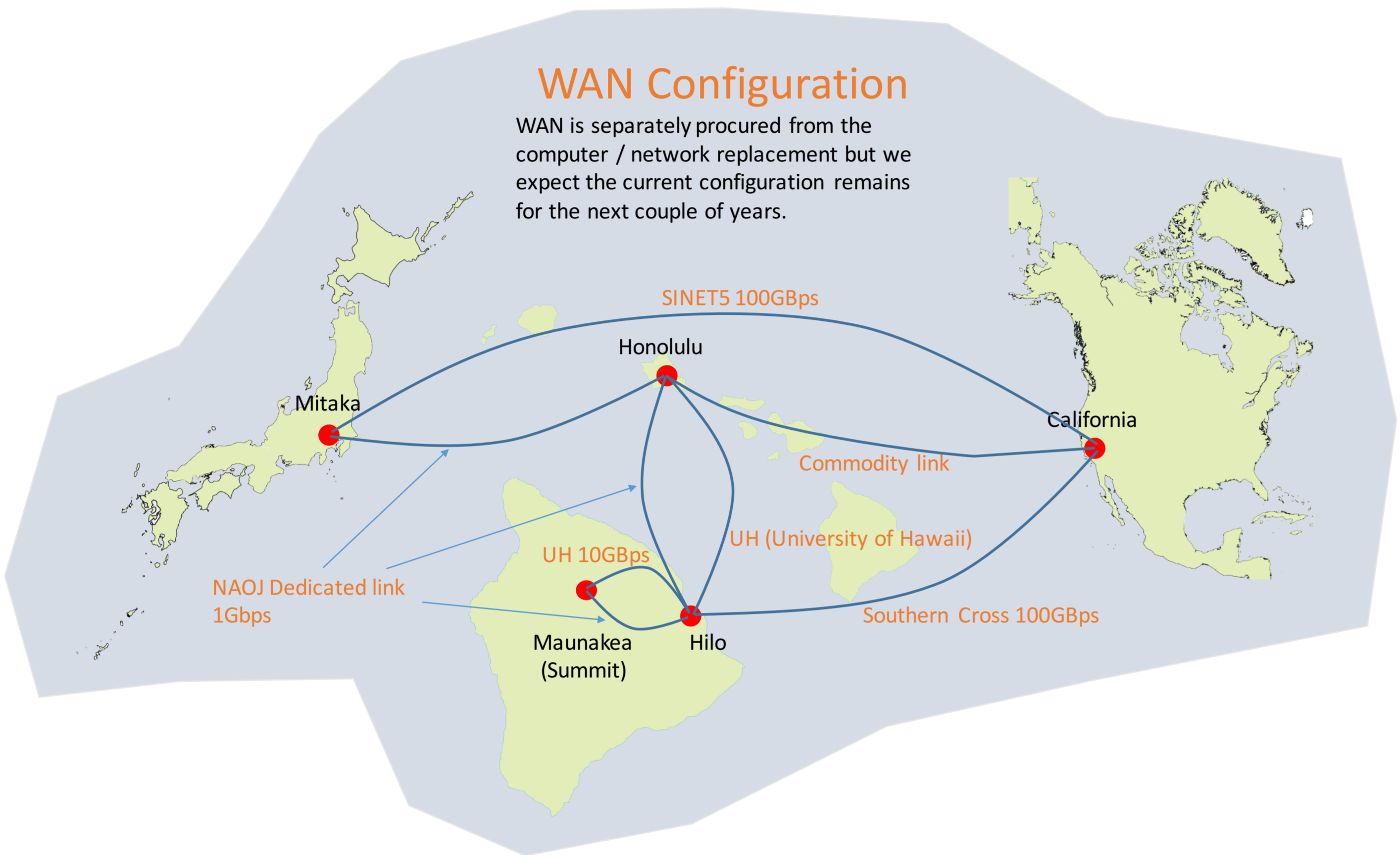
Move it to cloud

We already moved email service to the cloud which works really well. More services may go to cloud as we find it as reliable and secure as on premise service.

Terminate unnecessary services and delete unnecessary data

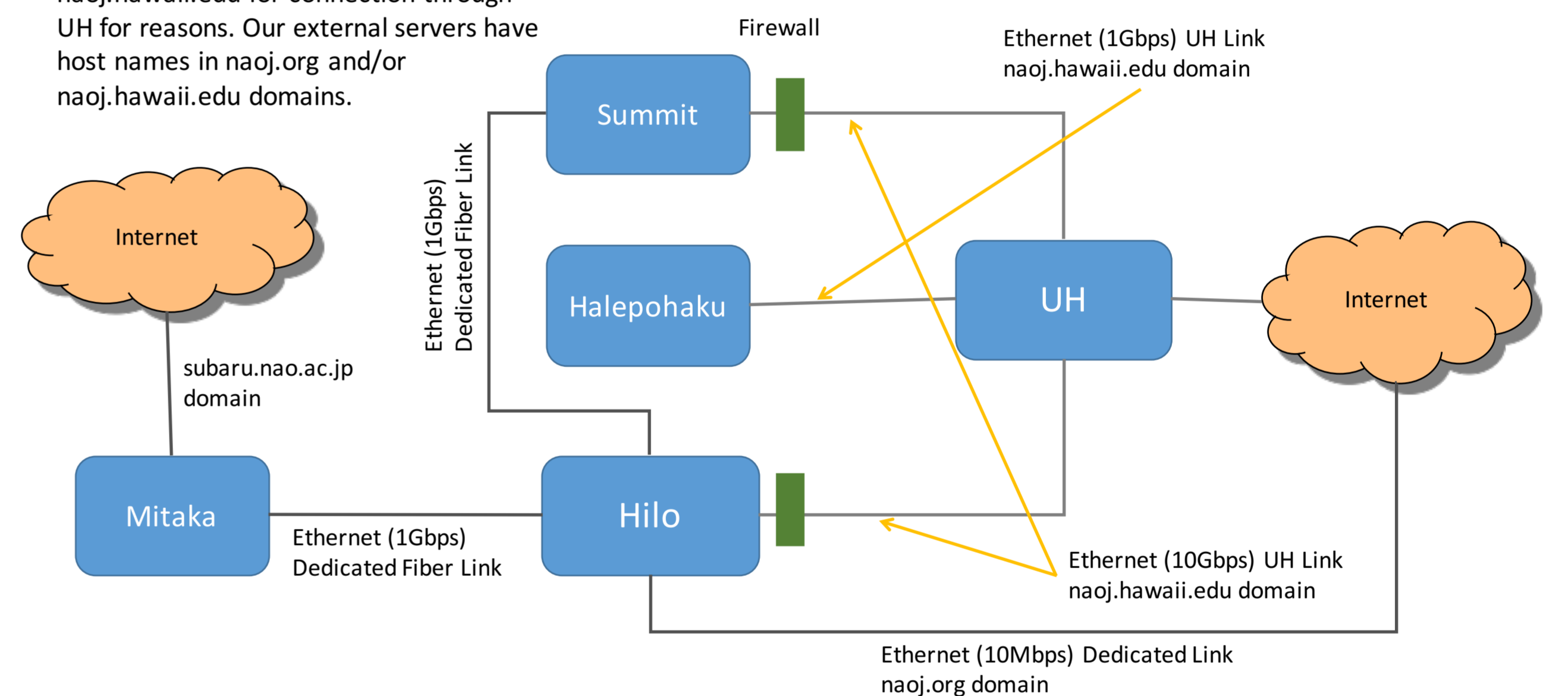
Although we may have only a few services which no body need, this will be a good start to clean up our system. Old data has been just backed up over past migrations. If no one wants it right now, maybe no one will want it in future.

Our Strategy

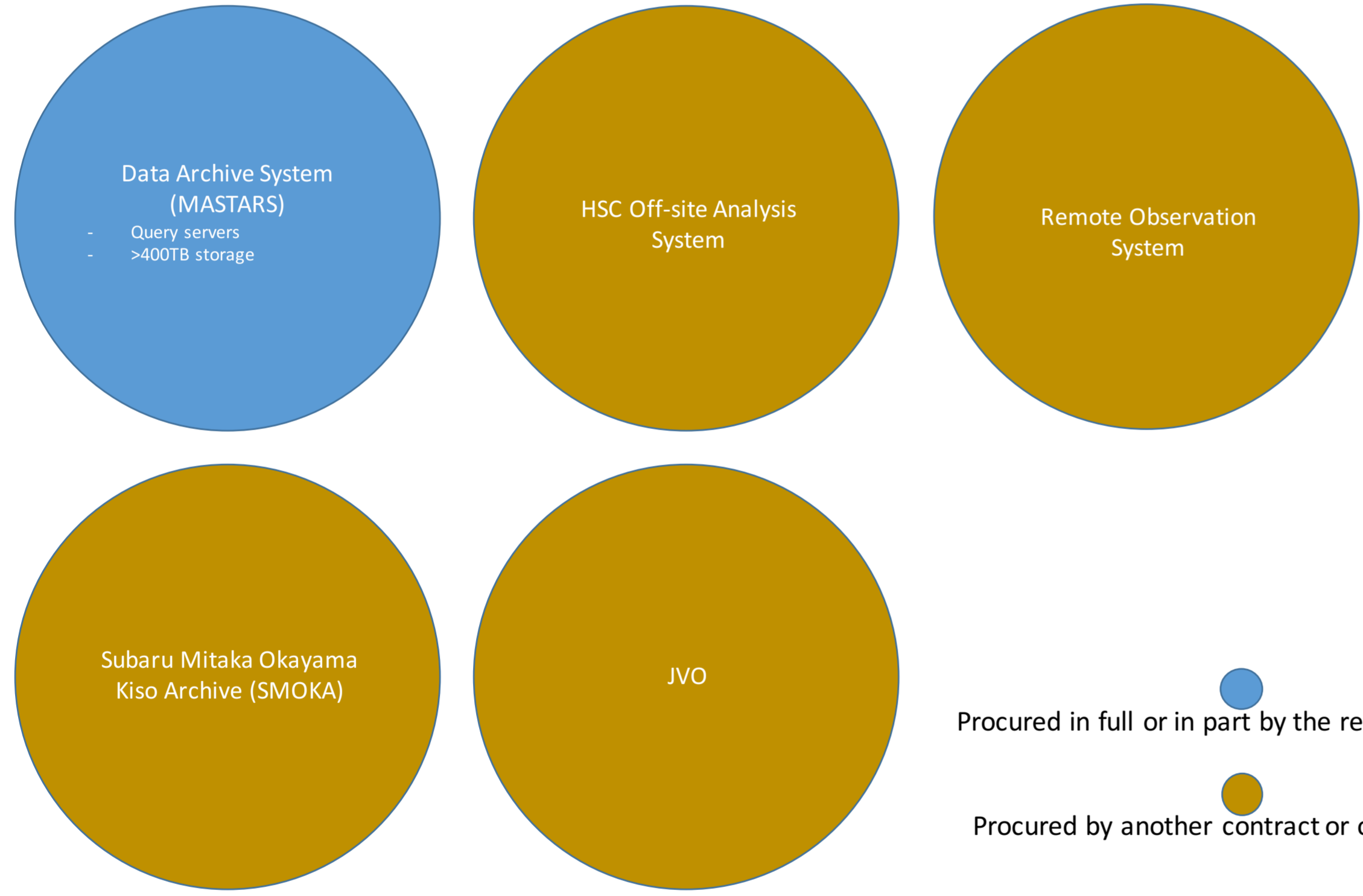


WAN Configuration and Domains

We maintain three domains – naoj.org for our official external web site, subaru.nao.ac.jp for intranet and naoj.hawaii.edu for connection through UH for reasons. Our external servers have host names in naoj.org and/or naoj.hawaii.edu domains.



Subsystems in Mitaka



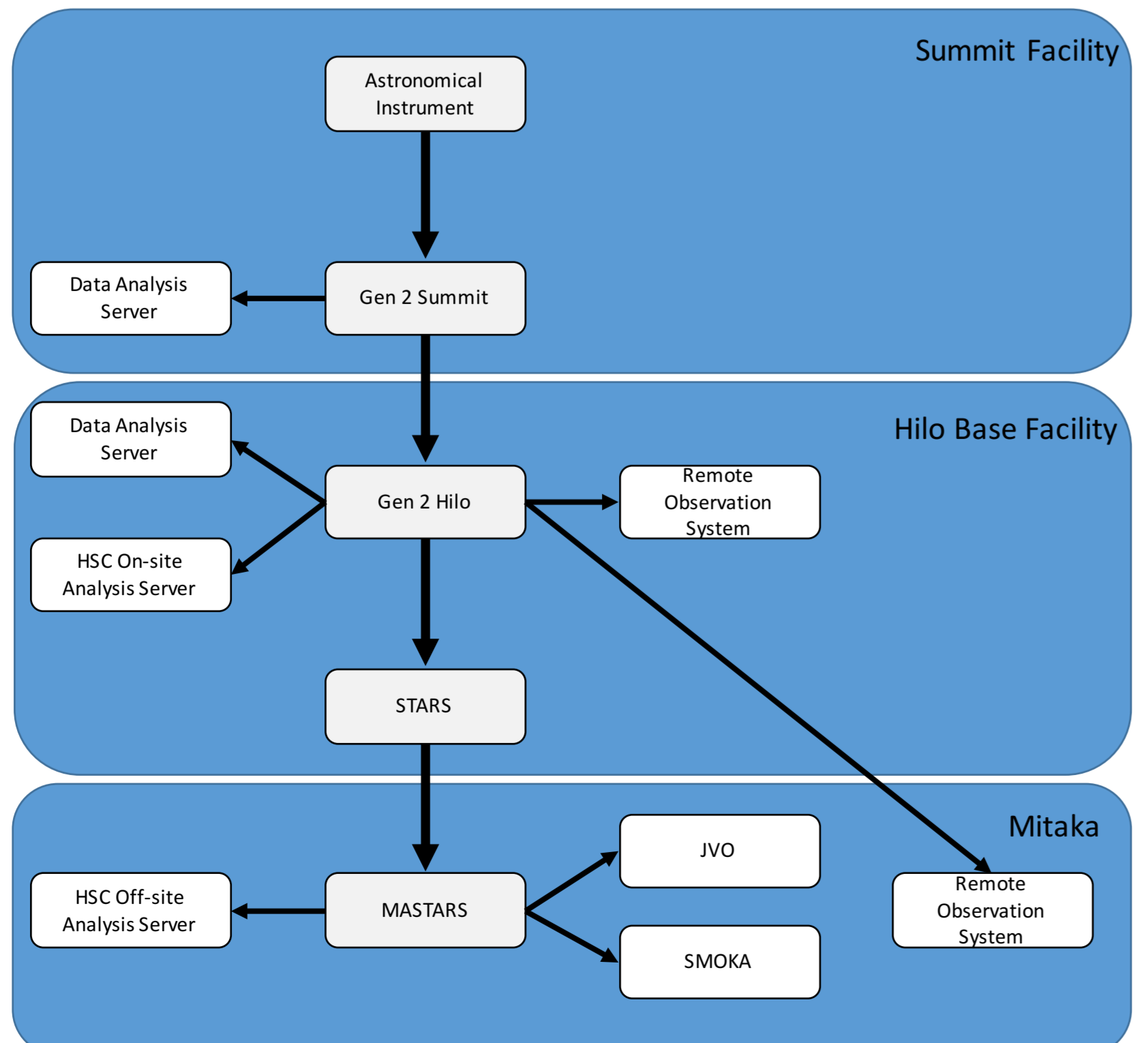
● Procured in full or in part by the rental contract
● Procured by another contract or own system

Subsystems in Hawaii



Observation Data Flow

Observation data is sent to Gen2 at the summit facility. Gen 2 Summit create index files from the data and send together to Gen 2 Hilo. Gen 2 Hilo distributes data to various subsystems. STARS check the FITS format compliance and register the data to its database. STARS send the data to MASTARS. Observers can choose whether to download their observation data from STARS or MASTARS. HSC Off-site Analysis Server, SMOKA and JVO download data from MASTARS.



Status

Due to the amount of the contract, this contract will have to follow the special international procurement guidelines set by the Japanese government. We disclosed RFI (Request for Information) and just came to the due date of information from vendors. We will create the draft specification and may refer to the information that vendors submitted. The draft specification will be disclosed in February 2017 and request for comment. Then the final specification will be issued in May 2017 and the bidding process starts. A vendor will be selected in July 2017 and the system completion is due in February 2018.

Summary

Subaru Telescope has been struggling with reduced operation budget. Computer and network is the basics of, and is closely tied to the modern astronomical observations and interruption of service is not accepted. To keep the current level of stability with reduced cost is a challenge. But we are obliged to procure the next computer and network system with reduced budget.

Current idea is to make a rental contract as we used to make for the next system but this will be the last rental contract. From the one after, we will either buy or lease hardware and operate/maintain the system with our staff. Other a few options will be employed to keep the cost down.