# 平成 30 年度共同利用研究・研究成果報告書

研究課題名　和文：CTA 北サイト・ラパルマでのオンサイトデータ解析システムの開発

英文：Set-up and Commissioning of the onsite data center for CTA North in La Palma, Spain

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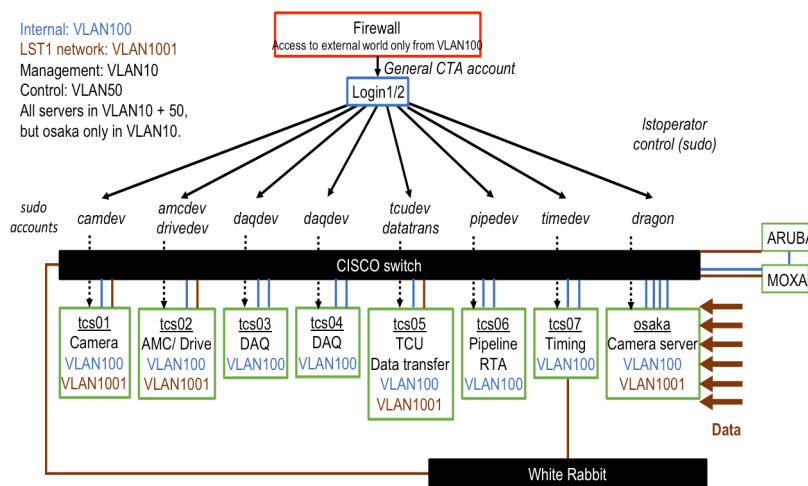参加研究者　SAITO, Takayuki; MAZIN, Daniel; TESHIMA, Masahiro; NODA, Koji

研究成果概要

The next generation observatory for very high energy γ rays will be the Cherenkov Telescope Array covering energies from 20 GeV to 300 TeV with unprecedented sensitivity. This new observatory is now in the pre-production phase. It will be built on two sites: one array will be constructed in the Northern hemisphere (La Palma, Canary Islands, Spain), the other one in the Southern hemisphere (Paranal, Chile). Four Large Size Telescopes (LSTs) of 23 m diameter and 28 m focal length will be arranged at the center of both arrays to lower the energy threshold and to improve the sensitivity of CTA below 200 GeV. The first LST was inaugurated on La Palma in October 2018. The data center onsite of CTA North is being setup by Fujitsu through a contract with the University of Tokyo. The system consists of 2000 cores with 3PB disk space. A sketch of the IT system is shown on the right. I am responsible for this data center, i.e. the correct set-up, the coordination and management of
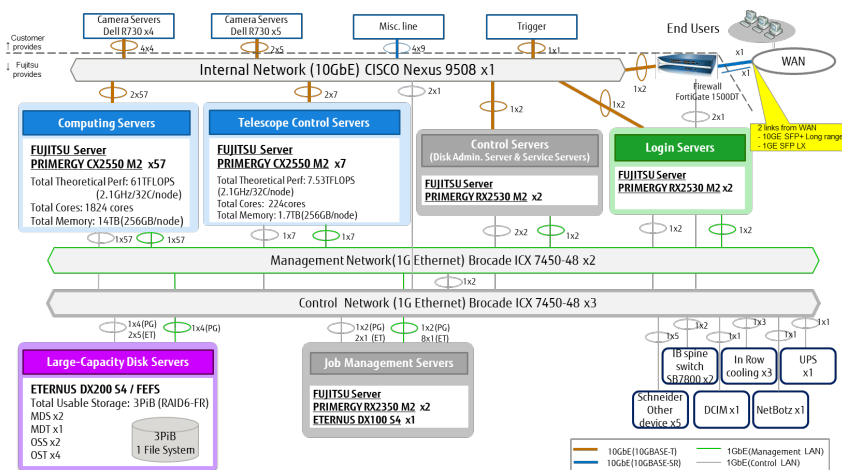
the users and the commissioning of the IT center. During the last year we set up the IT center successfully. In particular the following points were achieved:

- I spent 2 months on La Palma to setup the IT Center to the telescope sub-systems. The network had to be prepared accordingly and interfaces had to be established.

- The Lightweight Directory Access Protocol (LDAP) was installed to guaranty an easy and safe login. A two-step login procedure is implemented in order to avoid unwanted access from the outside world.

- The computing servers are set-up and already used for Monte Carlo simulations and studies that are crucial for precise simulations of the CTA array. I organized the file structure for different sub-working groups and a corresponding quota system.

- The telescope control servers are used for the different sub-systems of the telescope (figure below). I am managing the different accounts. Currently I am working on an automatic back-up and restore system for the machines in case of hardware failures.

- The setup of analysis chains for the fast real time analysis and the precise offline analysis of the data is ongoing. Internal tests were already successful. As a next step the connection to the outside world has to be established in order to receive and send alerts of flaring sources like Gamma-Ray Bursts or Gravitational Waves.

- In collaboration with FUJITSU we established a procedure of safely shutdown the IT container in case of a power cut. This procedure successfully worked already once when an unplanned power cut occurred.

- Purchase of a back-up server with the capacity of 100TB and extendable in future to store sensitive data in the sea level "office" CALP on La Palma. Next step in FY2019 is to install the server as well as to setup and test the back-up system in collaboration with the users who wish to have their software being backed-up and restored automatically.