



SHIBAURA INSTITUTE OF TECHNOLOGY STRENGTHENS CYBERSECURITY MEASURES WITH ALL-FLASH STORAGE

Preventing cyberattacks with NetApp anti-ransomware capabilities

Cyberattacks, including targeted emails and ransomware, are increasingly complex and sophisticated — and potentially catastrophic. With a keen awareness of the risks born from hard experience, Shibaura Institute of Technology employs NetApp® AI technology to quickly identify threats and instantly generate Snapshot™ copies of potentially impacted data. The institute now boasts of a system that can restore data from the most recent recovery point. In a very real sense, storage security has emerged as the “last frontier of multilayer defense.” Let’s explore how Shibaura Institute of Technology (SIT) enhanced theirs.



After suffering damages from a ransomware attack, SIT prioritized its transition to all-flash storage and invested in increased cybersecurity measures. SIT revamped its integrated file server, which is used by its 10,500 students and faculty members. The institute continues to rely on NetApp for its storage, which it has employed for more than 15 years.

Now, in addition, it has implemented NetApp AFF A400 all-flash storage, as well as NetApp anti-ransomware functionality that delivers AI-based storage security.

TRANSFORMING EDUCATION THROUGH IT MODERNIZATION

In September 2022, a 14-story headquarters building was completed and opened at the Toyosu Campus of the Shibaura Institute of Technology. Environments include active learning classrooms along with open labs that promote activities beyond the framework of laboratories. It is expected that undergraduate and graduate education will be further accelerated through the formation of world-class research bases.

According to Mr. Takeshi Sato of the Information Systems Section, "The Shibaura Institute of Technology is promoting university reforms to secure its position as one of the top 10 Asian engineering universities by 2027, the 100th anniversary of the university's establishment. We aim to send out a great number of competent and talented people with individuality, which we refer to as 'science and technology combined with globalization.'"

As part of its reforms, SIT has announced a shift from the department system, in which students hone their expertise in specific fields, to a curriculum system, in which they can acquire knowledge in multiple fields.

Sato continued, "Departments and curricula will continue to change and evolve to allow students to acquire a wider range of knowledge and engage in practical learning. The Information Systems Department will put even more effort into creating an environment that nurtures talented individuals who possess a wide range of expertise and skills and who can play an active role in the world." Since 2004, SIT has been on a continual path toward IT modernization. As a key part of this journey, in 2016, the institute installed a third-generation integrated file server, the NetApp FAS 8000, which provides high-quality storage services to the university community.

TRANSITIONING TO ALL-FLASH FOR ENHANCED SECURITY

More recently, SIT launched a new integrated file server used by about 10,500 students and faculty members. The new server includes a NetApp AFF A400 all-flash storage system and the associated NetApp anti-ransomware capabilities, which provide AI-based storage security.

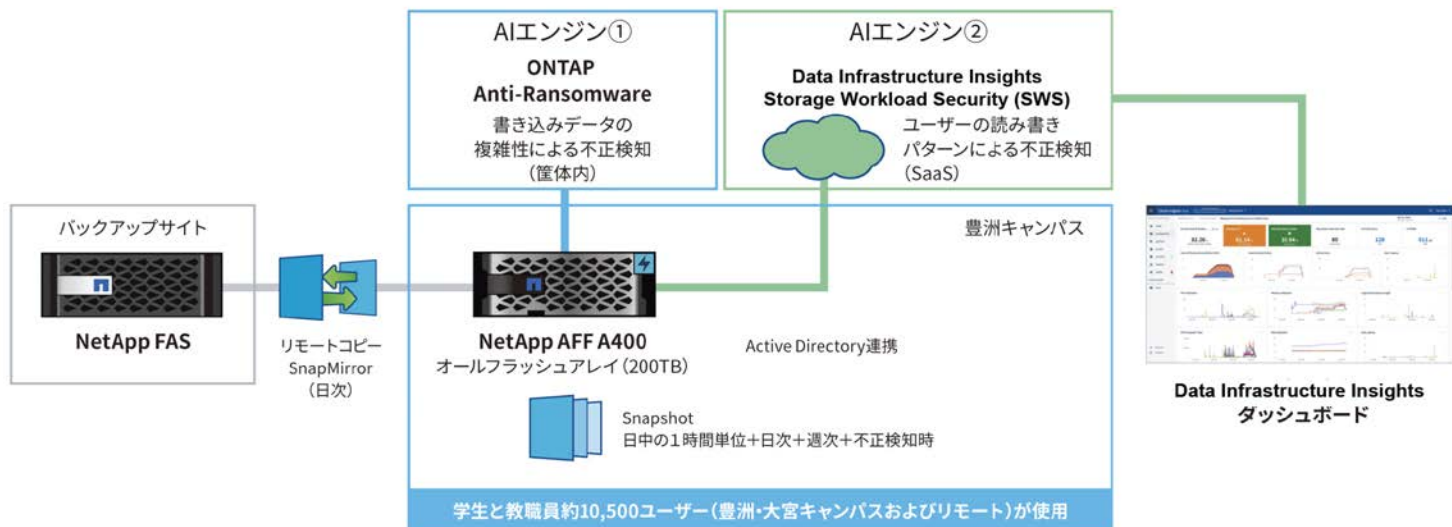
"Modernization today is characterized by transitioning to all-flash and enhanced security. [This] is the most effective way to provide more comfortable performance and response while ensuring capacity that meets user needs. In addition, since we suffered damages by ransomware in 2016, we thought it was essential to strengthen our cybersecurity measures," Sato explained.

As part of the latter effort, SIT implemented multilayered security measures from the network to the server side and endpoints. In the storage environment, NetApp ONTAP® FPolicy is used to filter out filename extensions used by ransomware and to restrict writing into files.

Since no organization can ever be 100% prepared for insidious and ever-evolving cyberattacks, it is essential to continually invest in threat prevention. Sato explains, "In integrated file servers, the most effective countermeasure against ransomware that destroys and encrypts data is to detect suspicious behavior as soon as possible and to acquire a backup in the shortest time after detection. Protecting data just before it is tampered with minimizes the risk of user impact."

In the integrated file server, backups are created hourly during the day, daily, and weekly, and a system is also in place to protect backup data at a remote site. This system has been further enhanced in the modernized environment.

"In addition to regular backups as before, it is now possible to create Snapshot copies at the moment suspicious behavior is detected. ONTAP Snapshot technology, which allows instant logical backups, is used to the fullest extent, significantly decreasing the risk of data loss," said Sato.



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—Mr. Takeshi Sato, Information Systems Section, Information Systems Department, Shibaura Institute of Technology

LEVELING UP ANTI-RANSOMWARE

NetApp anti-ransomware features combine ONTAP data management software and Data Infrastructure Insights Storage Workload Security (SWS), a security function provided by the cloud-based integrated monitoring environment NetApp Data Infrastructure Insights.

“We have set up a mechanism to detect suspicious behavior and anomalies on the storage in two different layers and to acquire Snapshot copies at the moment of detection. The point is that NetApp’s AI technology automatically executes everything from detection to instant data protection,” said Sato.

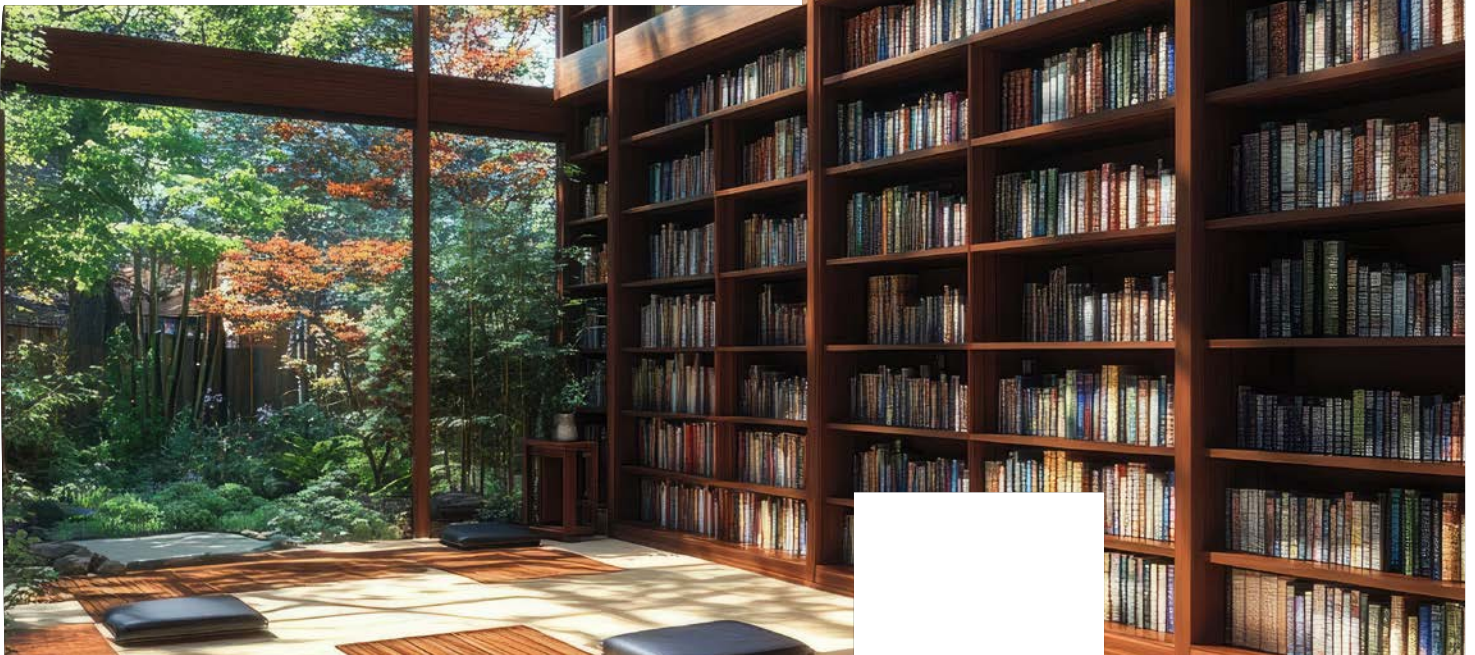
With ONTAP anti-ransomware, the AI engine learns data read/write patterns for file servers and scores them in terms of data complexity (entropy). When the AI engine determines that something is suspicious, such as when the frequency or time of writing is significantly different from the normal score, an alert is sent to the administrator and a Snapshot copy is acquired.

With Data Infrastructure Insights SWS, meanwhile, the AI engine that has learned access patterns for each user issues an alert when it detects unusual user behavior, such as deleting or taking out a large number of files, automatically creating a Snapshot copy at the same time. The log can then be checked by linking it with the ID information of the Active Directory, so if the user is on campus, they can immediately take appropriate actions such as contacting and reporting.

Over time, the AI engine of Data Infrastructure Insights SWS improves the accuracy of problem detection because it continuously learns during the operation process.

“There is peace of mind because Data Infrastructure Insights SWS log data is stored in the cloud for 13 months, and as much data as needed can be downloaded in CSV format for use in reports. This is a great advantage in that it can be used for forensics (preservation of legal evidence) against unauthorized access and cyberattacks,” said Sato.

Sato continued, “The status of the on-premises NetApp AFF A400 can be comprehensively ascertained from NetApp Data Infrastructure Insights, and details can be investigated and confirmed if there is an alert. NetApp AFF A400 is configured and operated using the familiar ONTAP System Manager and command console.”



PEACE OF MIND WITH HIGH-PERFORMANCE ALL-FLASH ARRAYS

NetApp AFF is an all-flash storage system renowned for its industry-leading performance and ONTAP 9 data management capabilities. The NetApp AFF A400, which the Shibaura Institute of Technology adopted as the new integrated file server, runs dual controllers in an active-active manner in a 4U chassis, achieving high performance and excellent fault tolerance.

ONTAP with NetApp storage is highly rated for its resistance to cyberattacks. There has never been an incident where ONTAP itself was attacked and remote operation or command execution by a third party took place.

According to Sato, "What greatly exceeded our expectations was the reduction in the amount of data. With the NetApp AFF A400, deduplication and compression are effective for the entire storage system rather than each volume, resulting in a data reduction effect of nearly 60%."

SIT's new integrated file server has evolved by transitioning to all-flash and incorporating enhanced security, and the environment has been fully prepared so that it can be operated with peace of mind for 5 years, until 2027.

Sato concluded, "We've used NetApp products for many years, and they have evolved significantly with each generation change. In particular, the enhancement of cloud services and cloud-linked products is astonishing. We believe NetApp Data Infrastructure Insights is one of the most user-friendly cloud services. SIT's environment is also becoming a cloud and on-premises hybrid. We expect NetApp's technology to provide integrated and simplified management of hybrid environments that tend to be complex."

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