Empowered by Innovation

NEC

USHIO

Customer

- USHIO

Industry

- Light application products, industrial equipment and other businesses.

Challenges

In 2011, USHIO implemented a manufacturing process management support system using FileMaker® software on their special industrial lamp production line and tried to improve factory floor efficiency. However, there was a fear that broad implementation would increase the risk and they needed to ensure system redundancy through the use of dedicated, high-reliability servers.

Solution

- Backup of FileMaker by using two Express5800 servers with EXPRESSCLUSTER installed enables auto-recovery.

Results

- 24-hour production line continuity is preserved even if a FileMaker failure occurs.
- The system can be rolled out to other lines and provides managers with a greater sense of security.
- Because of secure system stability, link with mission-critical systems becomes easier.

Overview

Since its establishment in 1964, USHIO INC. (USHIO) has expanded from a manufacturer of industrial light sources to a creator of products that encompass unique application technologies. Wanting to improve factory floor efficiency, in 2011, USHIO implemented a manufacturing process management support system using FileMaker® software (developed by FileMaker Inc.) on their special industrial lamp production line at the Harima Plant in Hyogo Prefecture. The new system eliminated paper-based instruction sheets and diagrams by providing workers on the line with a tablet computer on which they could display instructions, diagrams, and even photographs simply by scanning components and semi-finished items with a barcode reader. Masayoshi Nishioka from the Production Department 3 at USHIO talks about the impact of FileMaker. "The major benefit of FileMaker is that even people like me who are not from the IT department or IT professionals can create a system to suit the conditions of our own factory."

Challenges

Old system improved efficiency but reliability during 24-hour operation remained a problem

The system developed by Nishioka was well-received, but there was a fear that broad implementation would increase the risk of line stoppages should a system failure occur. The company was therefore hesitant to expand the system to other production lines.

Kazuhiro Uemura, manager of USHIO's Harima IT Group, remembers the situation at the time. "We were very concerned about expanding the use of the system being trialed without introducing fail-safe measures. We needed to ensure system redundancy through the use of dedicated, high-reliability servers."

While attending a FileMaker conference in Tokyo, Nishoka came to know about EXPRESSCLUSTER*.　　　　　　*Sold as CLUSTERPRO in Japan.

Solution

The only product that could provide both FileMaker backup and auto-recovery

"EXPRESSCLUSTER caught my attention because there was no other product that could back up the FileMaker Server software and also provide auto-recovery functionality," explains Nishioka. The benefit of
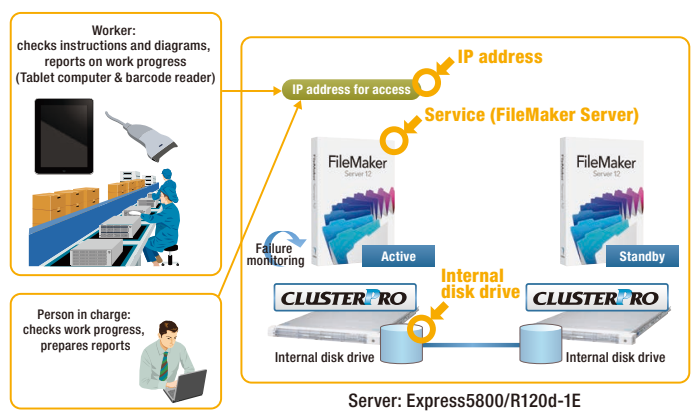
a FileMaker-based system is that it can be modified immediately to reflect requirements for improvements on the factory floor. On the other hand, FileMaker systems are usually developed by people with no specialist IT knowledge, so they tend to be not as reliable as systems developed by IT engineers.

The production line operates in three shifts over a 24-hour period. If the system crashes during the early morning or late night shift, production has to stop until the engineer comes and recovers the system. A mechanism to prevent this situation was therefore essential. "I felt that EXPRESSCLUSTER would be the best choice because it preserves the benefits of FileMaker while securing business continuity," says Nishioka. Working together with the IT department, Nishioka confirmed that NEC's system would work well, and could be implemented at a reasonable cost. Thus, the decision introduce EXPRESSCLUSTER in the system was taken. Simultaneously, it was also decided to switch the machine to run EXPRESSCLUSTER from the current PC to an Express5800 server to improve overall system reliability.

"Prior to the implementation, NEC held a technical seminar to explain the operation of the new system and how to configure the settings, so we were not really worried about the switchover," recalls Uemura.

Production line continuity is preserved even if a FileMaker failure occurs

The system implemented by USHIO was a redundant system consisting of the FileMaker-based manufacturing process management support system running on two Express5800 servers on which EXPRESSCLUSTER was installed. Of these two servers, one is active and one is on standby during normal operation. EXPRESSCLUSTER automatically detects failures in the active server, the network, or the OS, as well as FileMaker response anomalies or failures and triggers a failover to the standby server so that operation continues uninterrupted, significantly raising the reliability of the system as a whole. Nishioka praises NEC's implementation support. "The NEC engineers took great care to explain the system so that even someone like me who is not an IT professional could understand and easily explain the system to my superiors and the workers on the factory floor. Also, as this was our first experience with operating a redundant system, we took advantage of the 2-day implementation support service provided by NEC."

Worker:
checks instructions and diagrams, reports on work progress
(Tablet computer & barcode reader)

IP address for access

IP address

Service (FileMaker Server)

FileMaker Server 12

Failure monitoring

Active

FileMaker Server 12

Standby

CLUSTERPRO

Internal disk drive

CLUSTERPRO

Internal disk drive

Internal disk drive

Person in charge: checks work progress, prepares reports

Server: Express5800/R120d-1E

Results

The system can be rolled out to other lines and provides managers with a greater sense of security

The implementation of EXPRESSCLUSTER reduced the risks involved in operating a 24-hour production line and made it possible to roll out the system to other production lines. Currently, the system has been rolled out to more than 70% of the processes administered by the Production Department 3. General Manager of the Production Department 3, Takahiro Kajikawa, talks about the effect of the new system. "The FileMaker system allowed us to change from using paper-based instruction sheets and daily reports to data-based documentation, improving data utilization. Also, design changes that used to take up to two weeks to implement can now be reflected in real time because the documents can be modified and used immediately. By implementing EXPRESSCLUSTER, we've been able to create a robust system that allows us to respond quickly to detailed factory floor requirements and improve our business processes, but without worrying about the system crashing. This means that we can expand the system not just to lines operated by our department, but also to lines operated by other departments."

The FileMaker Server software used to run on a regular PC and had to be administered by the manufacturing department. However, the server running EXPRESSCLUSTER provides functionality to allow it to be administered by the IT department, alleviating the factory floor management workload. "Currently, the PC server is administered in the server room, where it is constantly monitored by a number of people including the manager from the IT department. If a failure occurs, alert emails are sent to multiple people, giving us a much greater sense of security," explains Kajikawa. Dependency on a single person has been reduced as the new system distributes the workload more fairly, leading to more stable management within the company.

Achieving a more cost-effective system by linking with mission-critical systems

Along with expanding implementation of the new system, USHIO is also moving ahead with plans to link the system with the company's mission-critical systems. "If the number of lines using the new system increases, naturally linking between departments will become necessary," says Nishioka. Uemura concurs. "Because we have been able to secure system stability, it will be easier to link with our mission-critical systems." Uemura also talks about the future. "We're looking to expand the new system to a large number of our production lines," he says. "We believe that by aggressively promoting the implementation of a shared-server configuration, we can achieve a range of cost efficiencies."