

# Intel® Gigabit Ethernet performance cures Festo AG's backup problems and paves the way for network growth

Festo AG has dramatically reduced its overnight backup windows, removed potential bottlenecks from its network, and laid foundations for future network development by implementing Intel's Gigabit Ethernet solution across its network infrastructure.

## Case Highlights

<b>Profiled Organisation</b>	Festo AG
<b>Challenge</b>	The increasing volume of data generated by Festo's growing population of servers and workstations meant that central backups were taking longer and the need for load-balancing between devices was becoming ever more critical. Added to this, the company's recovery capability was becoming questionable. It urgently required greater bandwidth and higher performance in its backbone network.
<b>Solution</b>	Install Intel® Gigabit Ethernet on the network to provide both the increased data throughput required for network management tasks and a fast, more reliable service for users.
<b>Benefits</b>	Festo can now provide 100 Mbps connectivity to each server for up to 10 users at a time without creating bottlenecks in the network. This enables it to provide a faster, more reliable service, thereby improving the productivity of IT staff and users. The Intel® Gigabit Ethernet solution has also given the company room for future development with the scalability and performance needed to help in meeting future networking requirements. Above all, it has provided Festo with a more reliable throughput at reasonable cost.

## Summary

A privately-owned company with headquarters in Esslingen, Germany, Festo AG is a leading international supplier of automation technology. Its success is based on the simplest drive principle of all: air. As a result, over the last 40 years it has become a world leader in most pneumatics technologies involving compressed air or vacuum.

With 10,000 employees in 250 locations worldwide, and 2002 revenues of approximately € 1.2 billion, the company's network infrastructure clearly represents a major slice of its internal IT investment. Rapid growth in the number of servers and workstations exchanging data, coupled with ever-increasing overnight backup windows, had become major causes for concern before the implementation of Intel's Gigabit network.

Wolfgang Zerrer, Head of Festo's Operating Systems Group, rectified these immediate problems and prepared the way for future network growth, by turning to Intel's Gigabit Ethernet as a long-term solution.

## **Challenge: The need for fast, reliable backup for a growing server population**

Festo runs a fully-switched backbone network built from fault-tolerant components. Its host servers are each connected to two separate switches, ensuring that should one fail, the other will immediately take over. Racks of switches housed in the company's computer room are each linked to a connect switch, which in turn is connected to further switches attached to the central backbone. Each building at the headquarters site is served by two separate networks for internal and external server communications. In this way, the company's users remain safely outside the internal network, and are linked via an access switch. The majority of the central switches attached to Festo's network are dual-port Cisco\* devices, while its servers are predominantly Compaq\*/Hewlett Packard\* devices powered by Intel® Gigabit Ethernet adapter cards.

In 2001, Wolfgang Zerrer and his 10-strong team became particularly concerned about the rapidly increasing volume of data traffic travelling between devices on the network. Equally worrying was the amount of time they were spending each day load-balancing the company's redundant mail cluster servers. Added to this was the fact that the amount of data to be backed up overnight was growing dramatically, with the result that backups regularly ran into the following day.

"It was not only backups that concerned us: we were also worried about recovery," says Wolfgang Zerrer. "Running as slowly as 100 Mbps within the limited overnight window meant that, as time went on, we would inevitably need more and more time for recovery. Consequently, we were potentially very vulnerable."

The 4500 PCs and workstations used in Festo's offices and factory buildings were connected at a maximum speed of 100 Mbps to the company's servers, some running bandwidth-hungry SAP database applications, and to shared printers and storage devices. Many of its users required simultaneous access to multiple applications—from finance and administration to computer aided design and production control.

"The problem was that, running at data transfer rates of only 10 or 100 Mbps, one user accessing multiple applications could easily block a whole server," says Wolfgang Zerrer. "With so many devices to accommodate on the network, it was therefore unrealistic for us to continue employing such low speed connectivity at the server level."

With its server population of 350 rising at an alarming rate, the team knew the time had come to find an all-encompassing solution that would not only facilitate load-balancing, central backups and recovery operations, but also guarantee a fast, reliable service to its users.

## **Process: Meeting current needs and anticipated growth**

Wolfgang Zerrer reveals that one option initially under consideration was migration to Fibre Channel technology and development of a backup/recovery Storage Area Network (SAN). However, this would have involved investing in complex and expensive fibre channel equipment and interfaces simply for backup purposes.

"A more sensible alternative was to bring the network itself up to speed, allowing us to provide a more efficient, uninterrupted service to users, and at the same time cure our backup worries once and for all," he says.

Wolfgang Zerrer says he also considered Asynchronous Transfer Mode (ATM) and other networking standards. However, these were soon dismissed in favour of Gigabit Ethernet, as it seemed better suited to the company's current needs and its anticipated growth. He says that, because Gigabit Ethernet was becoming such a popular standard, he felt confident that future availability of related components would be reassuring, supplying anything that might be required for a reasonable price. He believes that time has proved this decision to be correct: Gigabit components from most vendors today are reasonably priced and totally reliable.

## **Solution: The adherence to industry standards**

Wolfgang Zerrer says he chose Intel in particular because they were the leaders in the standard, and because irrespective of the brand of server chosen in the future, they would frequently come fitted with Intel® Gigabit Ethernet adapter cards.

"Having become such a networking standard, Intel Gigabit Ethernet was the only solution to deliver the level of throughput we required at a reasonable price. Implementing

ATM or any other type of network technology would have meant departing from the industry standard. We already had experience of running ATM for a while at one of our sites, but pulled it out because it was proving to be more trouble than it was worth.”

“Now that we have implemented Gigabit Ethernet at the server level, we can provide up to 10 clients simultaneously with 100 Mbps connectivity without creating any bottlenecks in the network. This is enabling us to deliver data faster and more reliably to our end users, making them more productive.”

## **Future: The natural progression to 10-Gigabit performance**

Thanks to its scalability, Gigabit Ethernet is now enabling Festo to define and develop new processes. Wolfgang Zerrer predicts that the company will undoubtedly upgrade its network in time to 10-Gigabit Ethernet when this becomes available, which will dramatically increase its available bandwidth and offer even higher performance. On the processor side, he says Festo has already successfully trialled HP's new generation of workstations developed in conjunction with Intel, which incorporate the latest Itanium®-based technology with 64-bit addressing.

For Wolfgang Zerrer there is no going back. He says: “Without the Intel Gigabit Ethernet performance we have today, many of our applications and processes would simply fall over. With 1-Gigabit already in place and 10-Gigabit on the horizon, we can now look forward to even greater performance within the same technology standard,” he concludes.

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