



University of Twente

# Optimization of Data Centre Infrastructure

## UNIVERSITY OF TWENTE.

**Partners:**

A2 Networks & Aginode

**Location:**

University of Twente, Enschede, Netherlands

In 2023, the University of Twente decided to modernize its existing data centre infrastructure with a focus on greater efficiency, scalability, and support for high performance computing (HPC).

"The existing setup had grown organically and had become outdated," explains Onno Otten, Account Manager at A2 Networks. "Different types of racks and servers were mixed together, and cabling ran from point to point through the racks - without a convenient, flexible cable tray structure."

# Optimization of Data Centre Infrastructure

Niels Mejan, data centre and network administrator at the University of Twente, explains why an upgrade was necessary: "Our cabling partly dated back to 2002. We lacked physical fibre capacity from the core cabinets to the rows. Our data centres consist of multiple rows of seven cabinets each, with the infrastructure centralized in the middle cabinet - the so-called 'Middle of Row'. Connecting a server at the end of the row meant running a long cable to the centre - a lot of work!"



"For example: each ESX server requires six fibre connections. With four servers, you're already looking at 24 connections. If the fibre patch panel is full, you have a real issue. Therefore, we routed cables overhead, but that led to a tangle of cabling. At the same time, we were planning to replace our data centre switches. However, it turned out that the existing copper cabling wasn't suitable for 10Gbit capacity."

"At the same time, power consumption was an important factor. The university has a high-capacity power connection, but according to the provincial authority expanding this wasn't an option until 2029. An expansion would also be significantly more expensive. That's why we aimed to achieve more with less equipment - by investing extra in cabling, we save on both energy and network equipment costs."

"Originally, the racks were arranged in an east-west orientation. Ten years ago, half of this layout was reversed following the introduction of a hot & cold aisle cooling concept. However, it was not anticipated that this would hinder proper cable routing through the racks. The cable trays on the east side suddenly became difficult to access, making maintenance challenging. In addition, external parties such as SURF - the ICT cooperative for Dutch education and research institutions - submitted requests to install cabling between various racks."

## Towards a future-proof design

"At the beginning of 2020, the university began assessing its requirements and preferences. Initially, the plan was to install additional overhead cable trays to improve routing between the racks. This evolved into a project to completely replace all cabling and transition to an entirely new cabling concept. 'We were reaching the physical limits of our fibre infrastructure,' says Mejan. "Existing row cabling and infrastructure were being fully utilized. Cables were running overhead from the core rack throughout the entire data centre, but this setup was not scalable enough."

As the number of devices and network connections continued to grow, pressure increased even further.



## Two years of preparation and collaboration

For the design and preparation phase, the university allocated two years. Several parties worked closely together: Aginode, the Campus and Facility Management department (CFM), and Library IT Services & Archive (LISA). "We also exchanged knowledge with other universities with whom we have been regularly collaborating on networking matters for nearly 45 years. Such as Leiden University, who were already working on similar innovations."

"We've been standardizing on Aginode's LANmark cabling for years," says Mejan. "For the tender, we selected an installer based on the concept we had developed together with Aginode. Ultimately, we chose A2 Networks - and the collaboration went extremely well. Although the project was thoroughly prepared, we ran into a few unexpected situations during execution. Everyone contributed ideas, and issues were resolved quickly. That made all the difference."

## Smart installation without downtime

A2 Networks supervised the entire project - from tender to implementation. "The university's desire

to migrate without downtime required a smart approach," says Peter Bakermans, Sales Engineer at A2 Networks. "The choice was made for preconnectorised cabling, which could be installed quickly and flawlessly without time-consuming assembly on site."



This resulted in a new, flexible, and structured cabling infrastructure. Active network equipment and data panels can now be easily patched. Aginode supplied the necessary cabling and components. Thanks to the close collaboration with A2 Networks, it was possible to move extremely quickly.

"We tackled logistical challenges together," says Otten. "Everything worked properly immediately after installation. The choice for Aginode was based on their reliable delivery, guarantees, capacity to thinking along with us, and excellent service."

"The technical support from Aginode was excellent," adds Bakermans. "Their team was able to quickly send people from Belgium when needed. We're already discussing new projects with the university."



## Result: scalable and energy-efficient

"The renewed data centre is clear, scalable and ready for future technological developments," adds Roy Paulussen, Business Development Manager Aginode. "The installation was efficient and there was no downtime. We would also like to thank electrical supplier Eszet Group. They played an essential role in optimising the University of Twente's data centre infrastructure through excellent service, reliable deliveries, flexibility, and a solution-oriented approach."

"Everything is working perfectly now," says Mejan with satisfaction. "Patching is much faster and easier. Previously, I would occasionally need to move through several racks just to connect a server — now, this can all be done within a single rack: an ideal solution. The new infrastructure has been designed with the long term in mind. We hope to keep working with this setup for the next 15 to 20 years."



"Future expansion of the fibre connections has been taken into account, allowing us to keep using the same preconnectorised cabling and modular cassettes. Network equipment is replaced every seven years. By deliberately choosing more structured cabling, we need fewer switches per row. This is expected to result in significant savings in power and investment costs, especially in the long run. Together, we have created a sustainable, future-proof solution."

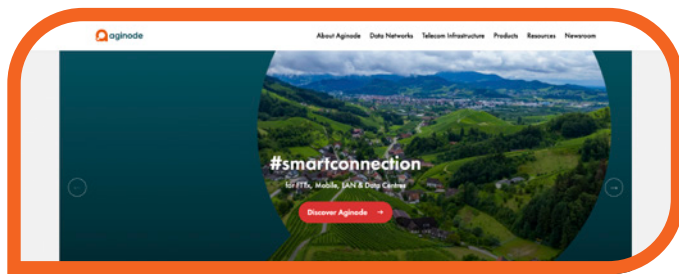
### Installed Aginode copper & fibre solutions

- 196 LANmark-6A Pre-Term Bundle of various lengths
- 291 LANmark-OF ENSPACE Pre-Term of various lengths
- 202 LANmark Patch Panel 24 ports
- 402 LANmark Patch Panel 48 ports
- 96 Universal patch guide
- 185 LANmark-OF Plug&Play Patch Panel
- 442 LANmark-OF Adaptor Plate 12 LC Multimode
- 328 LANmark-OF Adaptor Plate 12 LC Singlemode
- 20 LANmark-6A Field Terminable Plug Cat 6A
- 1500 LANmark-6A F/FTP Cca LSZH cable
- 68 LANmark 6a RJ45 EVO connector

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