Edge Computing in the Maritime Industry

How Alewijnse developed the maritime industry's first future-proof digitalisation platform for critical ship systems and reduced computing footprint.

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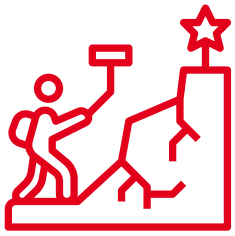
Challenges



- Deliver vessel-wide computing for critical systems requiring multiple IT components
- with limited onboard space and operation in harsh environment
- Efficiently manage multiple critical automation and control systems without
- unplanned downtime
- Contant IT refresh cycles of trditional computing infrastructure relative to 30+ year
- lifespan of vessels with limited onboard IT personnel and expertise

Your benefits

- Fast, user-friendly and extremely reliable digital platform on board
- Maximum uptime and optimal operational safety
- Much easier and efficient maintenance and management
- Better and faster software testing and rolling back
- Software life-time extension by the independence of the platform
- Extreme security from intruders

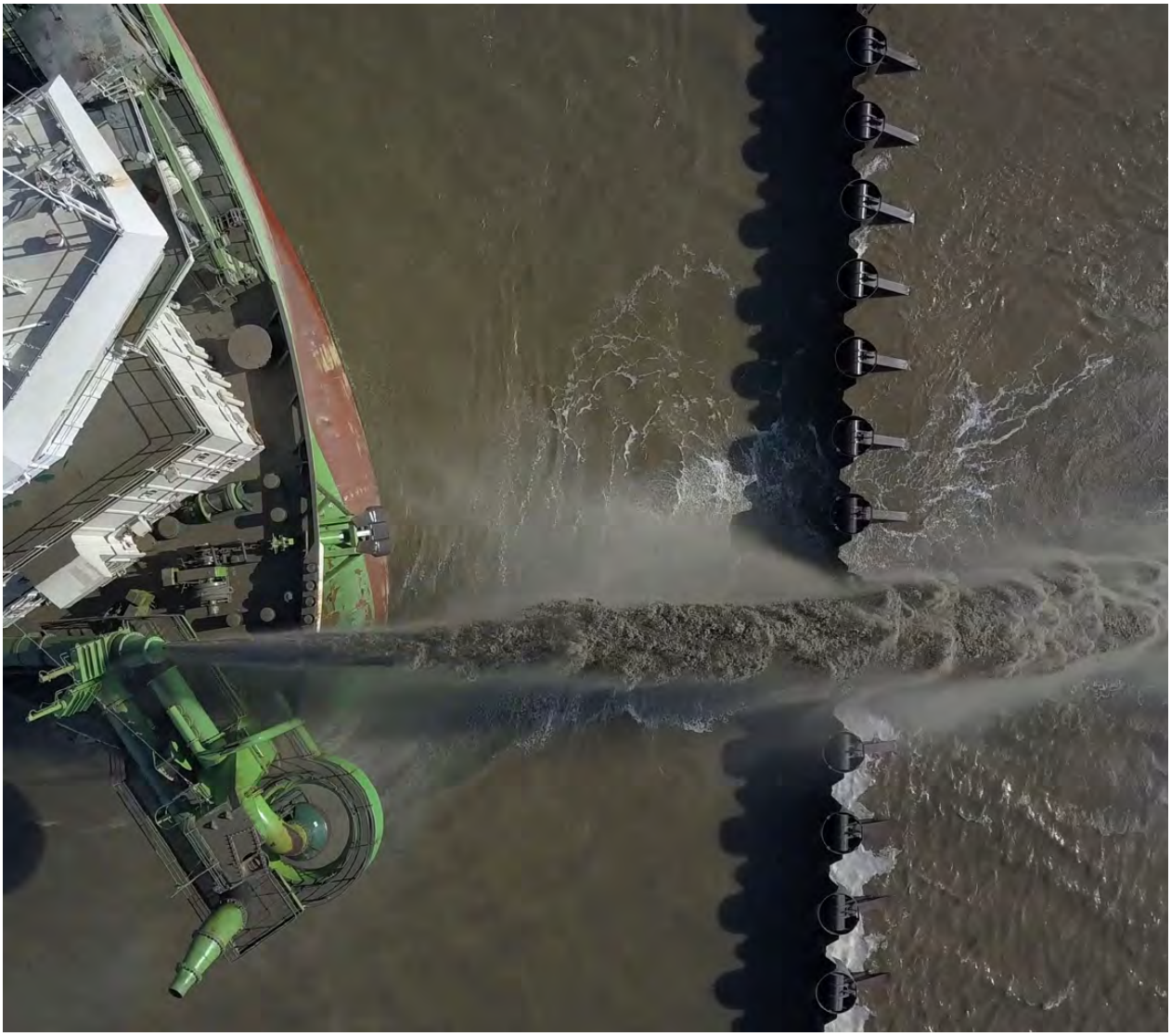
Our Services

- Fast and flexible solution, consisting of several virtualised process-related systems.
- Replacement of the usual computer, keyboard, video and mouse (KVM) equipment and reduction of cabling on board
- Visualisation of multiple ship’s systems on individual screens and display of single system on multiple screens

Global leader in maritime technology

With a 130 year history, Netherlands based Alewijnse is a global leader in marine technology for critical ship systems for Yachts, Naval & Governmental, and Dredging, Offshore & Transport. The company designs, delivers, and integrates on-board electrical systems, automation systems, and advanced marine electronics.

Using Edge Computing, the company introduced AlViVi, the maritime industry's first future-proof digitalisation platform for bridge control of critical vessel systems. The platform relies on application virtualisation to drastically reduce IT requirements and enables shipwide visualisation of information. Overall, AlViVi reduces onboard computing footprint by approximately 75% and reduces customers' IT maintenance costs by 50%.



AlViVi: breakthrough digitalisation platform

To innovate for customers, Alewijnse sought to solve one of the largest challenges for the maritime industry — simplifying the IT architecture required to operate multiple, critical ship systems in a constrained space. Rather than deploy and manage individual IT architectures spread across the vessel for each control system for propulsion, energy, navigation, communications, electrical, security, and others, Alewijnse turned to Stratus Edge Computing to consolidate computing and software, and centralize computing for automation and control.

The company developed AlViVi (Alewijnse Virtualisation and Visualisation), a breakthrough digitalisation platform to consolidate process-related systems. The innovative AlViVi platform — and first of its kind in the maritime industry — acts as a central hub to integrate and control ship systems, and uses Rockwell Automation's ThinManager® to distribute information to networked screens for visualisation anywhere on the ship. With applications virtualised on the platform, AlViVi is software agnostic, able to run any application whether it be on dredging control, weather monitoring, propulsion, or power and utilities.

Johan van Rikxoort
Product manager
Alewijnse

Most computer equipment needs to be replaced every four years. This is a recurring and timeconsuming investment if you have twenty computers on the bridge and in various locations on the vessel. By comparison, with AlViVi and Edge Computing, there is a lot less hardware to replace. It is all in one location and the platform itself needs replacing only once every eight years."

Uptime reliability for critical control systems

For critical ship systems, it was essential that the platform delivered the highest level of application availability and reliability, and the team incorporated computing redundancy for more than 99.999% availability.

“We chose Stratus because of the technology, especially, the redundancy in the hardware. We use the Stratus ftServer® 4900 which is a fully integrated platform which is simple to deploy, simple to manage and simple to service without the need for IT skills. Additionally, it is more cost effective than multiple servers. The core is organised with Stratus,” said Johan van Rikxoort, product manager, Alewijnse Dredging & Offshore.

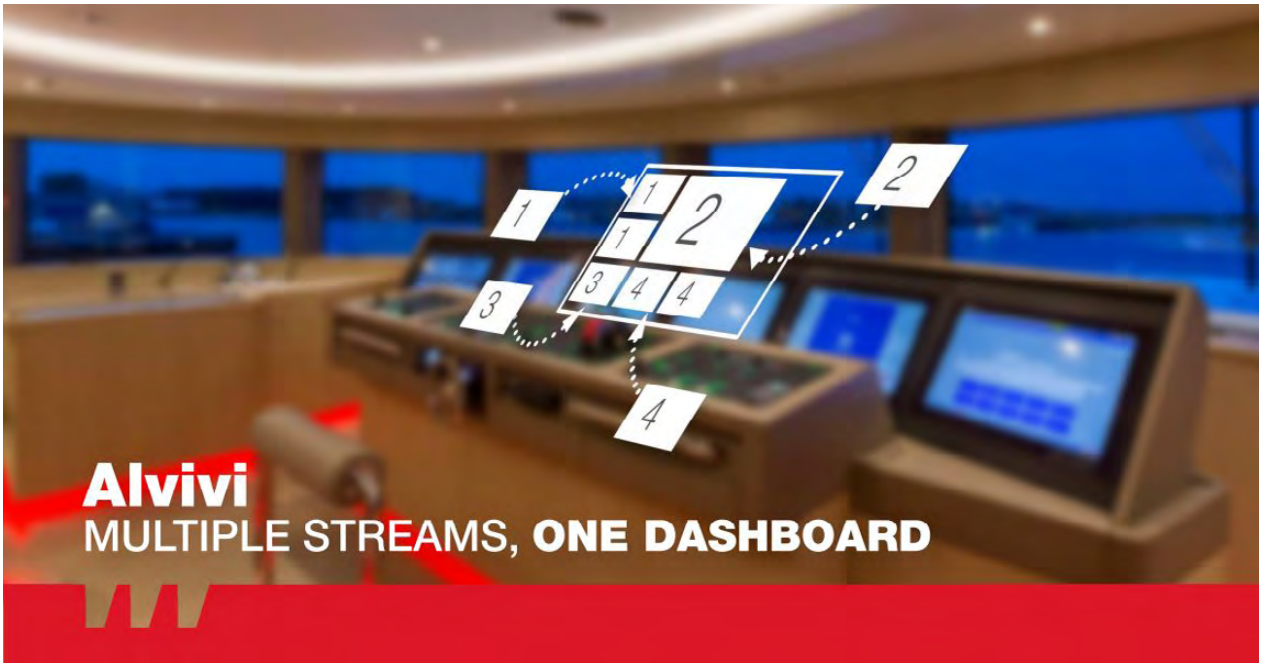
“Now, we are also retrieving more data from the system itself and visualizing it on the SCADA. For example, what is the fault count of the different processors? How is the health status of the server? Our customers now have one view of all critical systems that they can share anywhere on the ship. That visibility and access to information enables quicker response and better decision making for ship operations.”

Alewijnse has developed a unique, future-proof digital platform that can replace most of the computer equipment on the bridge, thus saving space and, very importantly, money.

Reduction in IT footprint

With its AlViVi platform, Alewijnse consolidated multiple ship systems on a single ftServer 4900 to perform as the vessel's server. The result was consolidation of twenty (20) individual PCs to a single compute platform which freed up valuable physical space. AccordingVvan Rikxoort, "In the systems we replaced, there were previously multiple computers and servers performing different functions that were spread out across the vessel. With this solution, the hardware is all in one place.

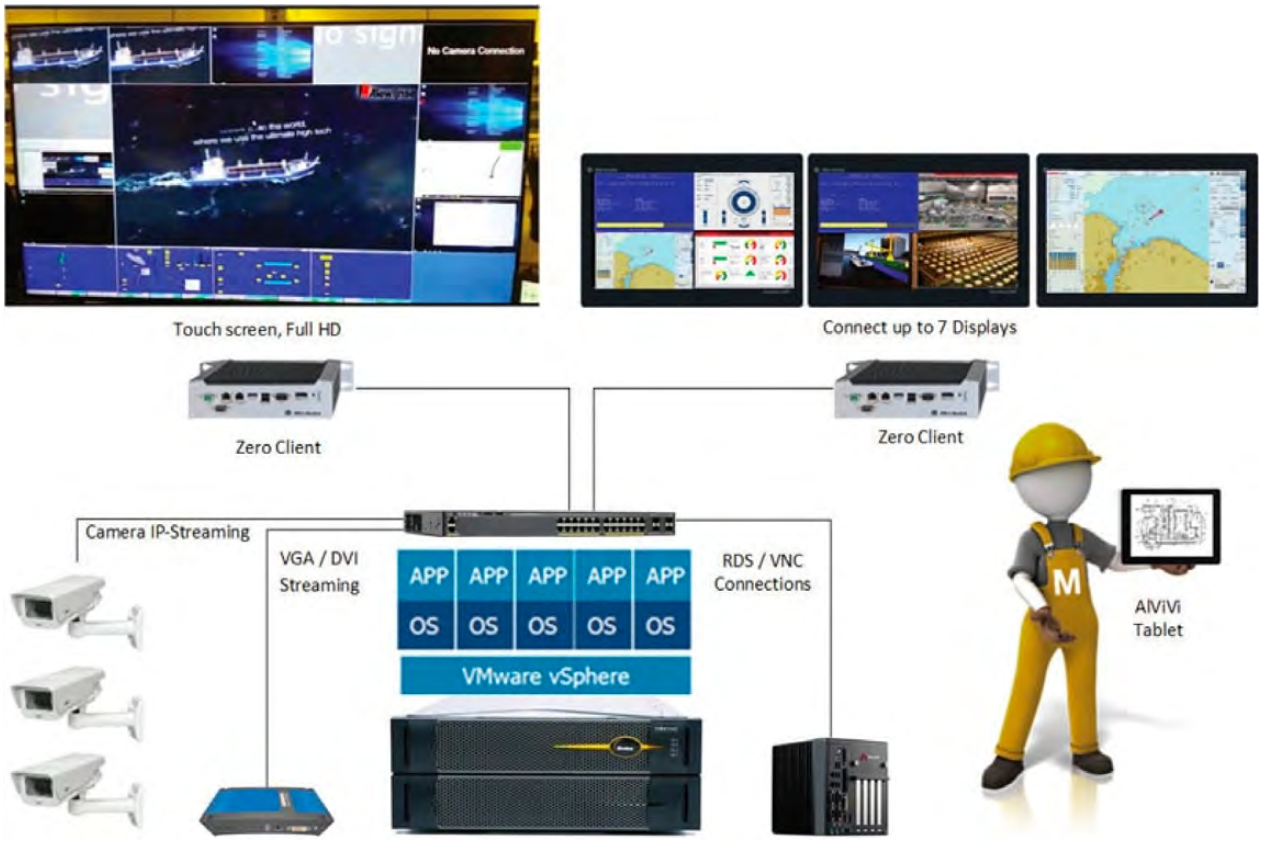
Our new solution takes up 75% less space, phasing out computer hardware, displays, keyboards, and all of the backend." "The significant reduction on space is highly important for our customers. In addition, consolidating on edge computing translates into less hardware and software cost and less maintenance."



IT built for OT systems

Using an edge computing platform, Alewijnse was able to modernize vessel-wide IT architecture for OT control systems, and enable easy management by non-IT staff. With computing redundancy, Stratus removes a single point of failure and eliminates unplanned downtime.

Any failed components are automatically taken offline with zero performance impact, and subsystems are hot swappable by OT teams. The new customer replaceable units are automatically detected, and data is resynchronized, avoiding any additional programming or provisioning.



By consolidating management of twenty systems into a single unit with redundant computing, Alewijnse was able to double the lifespan of IT systems from 3-4 years to 7-8 years. Van Rikxoort explains, “The hardware on vessels face harsh conditions — salty air, dust from the dredging — and due to that, we have to replace all the hardware every five years. ”

With traditional computers, the operating system is obsolete within five years. The SCADA software for graphic facilitations is also obsolete. You have to then replace computers for not only the dredging control and monitoring but also computers for the survey, data loading, office purposes, and other ship functions.”

“With the platform, at the end of the eight-year lifecycle, we can easily manage, modify, and install a replacement at one place. With ‘loose’ computers, you do it every four years.

Eline Savert
Communications Advisor
Alewijnse

We are excited to be the first, and so far, the only company, to offer this fully digitalized platform to the maritime market. It is fast, user-friendly, and extremely reliable, resulting in maximum uptime and optimal operational performance. By bringing together multiple systems in one environment, the management and maintenance becomes much easier and more efficient.”

Platform for future innovation

“The AlViVi platform is fast, userfriendly and extremely reliable, resulting in maximum uptime and optimal operational safety. By bringing together multiple systems in one environment, the maintenance and management becomes much easier and efficient. Updates are better and faster to test or roll back. This is transformational for how we architect critical systems,” said Van Rikxoort. With the efficiency of the AlViVi platform, Alewijnse can incorporate additional ship systems previously not possible due to IT limitations.

It is now feasible to integrate IP-based camera systems on-board and stream to mobile devices. Communication and sonar navigation equipment is embedded into the platform and can be displayed on screen at any location across the ship that operators want. With edge computing, Alewijnse is offering customers a breakthrough platform to manage critical on-board systems that saves time, money, and space. Backed by the continuous availability of edge computing, Alewijnse has created a platform to innovate for customers and lead technology transformation in the maritime industry.

Johan van Rikxoort
Product manager
Alewijnse

The AlViVi platform on Stratus is fast, userfriendly and extremely reliable, resulting in maximum uptime and optimal operational safety. By bringing together multiple systems in one environment, the maintenance and management becomes much easier and efficient.”

We Connect People and Technology

At Alewijnse we believe that by connecting people we are able to deliver the best solution for our customers and as partners make the difference in maritime and industry.

If you would like to discuss your specific needs, or require help in defining and establishing your dreams, please contact:

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