

Whitepaper

Simplicity **Engineered**

TECHNOLOGY INNOVATION AT SEA



SCALE
COMPUTING

“Simplicity is the ultimate sophistication”
Leonardo da Vinci

The shipping industry is known to have many challenges. From new CO2 emission rules to the fast-growing number of cyber-attacks. Ships and crew are vulnerable and must stay safe at all times. New technologies like onboard IoT devices don't make it easier. There is no in-depth IT knowledge between the hull and the bridge. Onboard computer technology must become simpler, more secure and more resilient.

Scale Computing is pleased to provide you with "Technology Innovation at Sea", a whitepaper explaining the increased dependence on the combination of onboard IT infrastructure, the cloud and central, shore-based datacenters.

This paper is intended for ship owners, fleet managers and IT staff implementing and managing maritime information technology.

Understanding the Requirements on the Edge

We understand the demanding requirements of large volume edge computing deployments. We support various industries from retail chains, fuel stations, hospitality, casino's, shipping, manufacturing to other volume IT infrastructure deployments on the edge. No matter if you talk about 10 or 2.500 sites. Scale already serve over 5.000 customers worldwide.

Some of our customers include:

- *Shipping*– Northern Marine, Telford Offshore ([case study](#)) and Mitsui O.S.K. Lines (MOL)
- *Retail*– Delhaize (part of the Royal Ahold Delhaize Group, currently deploying over 2.000 servers at 800 locations – [case study video](#)), Argos Sainsbury and Jerrys Foods
- *Leisure and entertainment*– SOHO House, Holiday Inn Hotels ([case study](#)), Genting Casino's implemented 42 casino's ([case study](#))
- *Consumer Packaged Goods*– Coca Cola Beverages Africa
- *Printing*– V-TAB AB ([case study](#))
- *Other*– Swedish Institute of Standards

Today, Scale Computing has over 600 published case studies.

The Scale HC3 Edge IT infrastructure is designed for the Edge. The “Edge” is defined as remote environments where mission critical applications run outside the core datacenters. Deploy local and manage onboard or central, depending on the ships location. Scale HC3 Edge solution is designed for organizations who want to lower overall IT infrastructure TCO, driving simplicity and need to improve resiliency and uptime. Scale HC3 is ideal for nano-style deployments to larger enterprise solutions, supporting over a petabyte raw data in a single cluster. Optional, the innovative new Edge Portal solution makes deployments “zero touch” and dramatically reducing initial installation and on-going management costs.



Early 2020, Northern Marine (part of the Stena Line group) started to implement a 3-node Scale HC3 Edge Computing cluster on the ships they have under management.

The Scale HC3 Edge solution is a cluster of 3 or more servers (nodes). These servers can be extremely small to very large, depending on the requirements. The Scale software combines the 3 servers to one platform, managing and sharing storage, compute and provides integrated server virtualization, disaster recovery tools and management.

Implementing Scale HC3 Edge has the following effect for IT on your ships:

1) Reduce Total Cost of Ownership

- a. Reduction of installation time to under 1 hour.
- b. Reduction of ongoing management hours up to 70%.
- c. Reduction of onboard networking issues up to 50%.
- d. Reduction of hardware support cost.
- e. Reduction of systems CapEx cost.
- f. Dramatic faster recovery to normal operations after a cyber-attack.

“Since we started in March 2018 to implement Scale HC3 Edge to our 800 supermarkets in Belgium, we have had zero minutes of downtime in any store.

Secondly, our networking problems reduced with 70% and our security dramatically improved.

Scale HC3 Edge is powerful and the simplest solution to implement and manage we have seen against the best TCO in the market”.

Rolf Vanden Eynde – Head of Infrastructure Innovation

Ahold Delhaize is a global \$80B retailer with 7.000 supermarkets

2) Increasing resiliency and uptime

- a. Integrated self-healing technologies reduce hands on maintenance.
- b. No downtime during software updates and upgrades.
- c. Continuous operations: even when a disk or a complete server breaks, the system keeps running.
- d. Rapid fallback on a snapshot of prior state due to integrated snapshot technology. This decreases the risk of operation continuity in case of a cyber-attack.
- e. Reduction of security challenges of Internet of Things (IoT) devices.

3) Dramatic decreased complexity

- a. One integrated platform, easy to install.
- b. Onboard and remote management with an intuitive web interface.
- c. No expensive long training courses are required. Training of the is crew done in a fraction of the time versus traditional environments.
- d. Scale HC3 Edge is the most simple IT infrastructure in the world available today.

CHALLENGES

To keep a ship up and running 24x7x365 is not easy. It is important to become more agile managing ships while lowering TCO. For centuries, the shipping administration has been collecting huge amounts of manual scripts and reports in a continuous effort to maintain the OpEx and the CapEx under control. Only the last few decades technology have managed to bring the ships closer to shore-based operations.

Bandwidth and Connection

Traditionally, once a ship port, she was isolated from communication with the shore. This was true until the introduction of radio on ships at the beginning of the 20th century. Since then, both the capacity and coverage of ship to shore communication has been gradually evolving. However, we are now experiencing a step change in this field, with digital signals that can be transferred from ship to shore, and in the reverse direction, at significant rates, independent of the ship's location. Satellite communication is big business.

Ship operators want to see more transparency understanding how much data is used and how much is needed. Crew demands more connectivity. They want to chat with their families and friends onshore, use social media and stay connected. It is key for the crew's welfare.

A modern onboard IT-infrastructure bridges two worlds: traditional on-board IT and the cloud. There is however no guarantee that a connection with "the cloud" or the shore is always available. Where more and more bandwidth became available and shore-based connections dramatically improve over the last decades, continuous operation and safety drives the need of an onboard datacenter approach. Again, connection cannot always be guaranteed. Many ship operators faced communication problems in the middle of a storm, during a satellite switch, during a cyber-attack or worse, communication might be jammed during a hijack attempt.

The need for a modern, more secure, robust and reliable IT infrastructure is therefore more important than ever. That immediately creates a problem. As the role of ship computers increase by the day, how do you manage these systems? There is seldom in-

depth IT knowledge available on a ship and communications with shore-based support staff is not always available.

Complexity

Reducing crew turnover and improve training of seafarer assets becomes more important than ever. Now-a-days crew need to become “digital native”. The systems they work with are increasingly sophisticated and complex regulatory expectations make it ever harder from them to do their job.

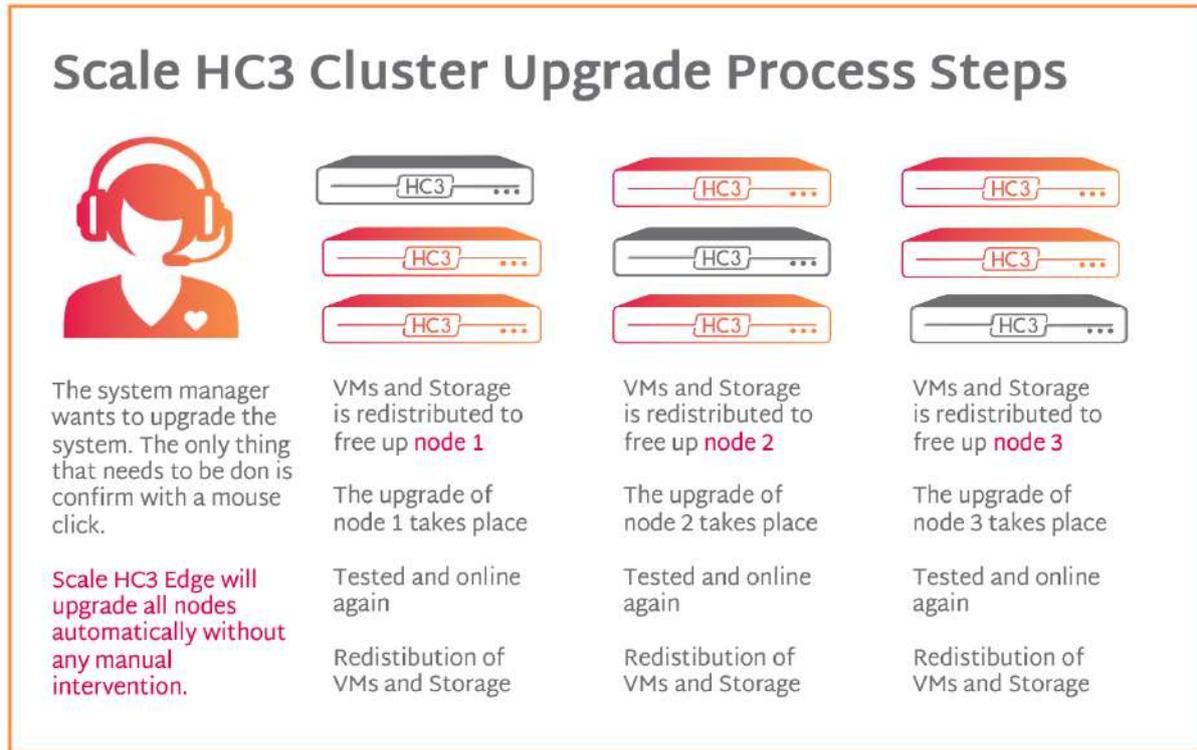
More systems mean adding more complexity and as said earlier, IT knowledge is limited on ships. IT companies have done very little to make things easier. This is a growing concern for most shipowners and ship management companies. Human failure is still on top of the agenda when it comes to reducing accidents at sea according to Benedikte Wentworth, CEO of Propel. Human error accounted for “approximately 75% of the value of almost 15.000 marine liability insurance claims” according to Allianz.

“Complexity causes and increase mistakes, endangers operations and causes frustration among the crew”.

Source: Hellenic Shipping News

Complexity causes and increases mistakes, endangers operations and causes frustration among the crew. Complexity also increase system downtime. This might lead to voyage deviation, increased loading/unloading time or even worse to more accidents. Dramatic automation, self-healing processes and Scale Computing’s passion for simplicity help to overcome complexity to a minimum versus more traditional solutions. Traditional onboard infrastructures with a number of servers, separate server visualization, a separate storage unit or backup device are too complex and difficult to manage.

Suppose an upgrade of the servers operating system needs to be done. This is a difficult process in a traditional setup. With Scale HC3 Edge, the process is 100% automated. No local, onboard knowledge is required. Systems must become simple.



The automated, hands off upgrade process of Scale HC3.

Safety and Security

The number of computer systems, software applications and IoT (Internet of Things) devices like sensors and beacons onboard ships have increased and will be increasing even more so in the nearby future. This is driven by the need to secure overall ship performance improvement, regulation and security requirements.

Using IoT devices across the fleet helps to gain a competitive edge and supporting decision making. More and more devices are implemented to streamline operations at sea across the fleet from tank and draft sensors to load/unload sensors. From vessel tracking, crew safety, voyage planning optimization to predictive maintenance. Sensors, monitoring and analytics provide guidance to the ship crew planning the most efficient route.

At the same time more IT systems and more IoT devices make ships more vulnerable. These devices open a can of worms when it comes to security and standardization. Even more so compared to other industries, security is key. Security represents the most significant problem implementing IoT devices on ships.

“Cyber-attacks on the maritime industry’s operational technology (OT) systems have increased by 900% over the last three years with the number of reported incidents set to reach record volumes by year end.”

Source: Hellenic Shipping News

There might not be a connection with shore-based systems in the middle of a storm. If systems are jammed due to a hijack attempt, often this is done and possible due to less secure, open systems like IoT devices. “Cyber-attacks on the maritime industry’s operational systems have increased by 900% over the last three years with the number of reported incidents to reach record volumes by year end.”

What to do about this? It is not easy given ships are most of the time “connected”. Other industries have to deal with many of the same challenges. When we make comparisons with other industries, like retail and how they handled a more secure environment the same is applicable to the shipping industry.

Growing regulations around cyber security increase the need for continuous availability and a tested DR/backup strategy for every ship owner and operator.

Regulations

The shipping industry is faced with various regulation challenges as well. Ship Energy Efficiency Management Plans (SEEMP) are implemented by many. More (likely IoT) devices and new applications are to be installed to improve the overall ships performance and efficiency while reducing CO2 emissions at the same time. As we see the number of software applications growing, driving the need for better systems.



Supermarket chain Delhaize (a part of the \$80B Ahold Delhaize Group) is implementing the Scale HC3 Edge solution in 800 supermarkets in Belgium. All running a 3-node Scale micro Datacenter-in-a-Box cluster. Due to the high security risk of IoT devices, they separated the IoT device itself and the software operating the device. The software now runs as a small virtual machine on the Scale HC3 Edge cluster, protected by an enterprises level security solution.

Digitalization and data analytics

To improve ship performance, data analytics is key. To make informed decisions, collecting data and being able to analyze data real-time becomes a re requirement.

Data analytics can support ship owners with technical management functions in applications and decision-making processes for compliance with regulations, safety operations, planned maintenance, fuel reduction and more. Most of these analytics can be performed non real-time. For the crew, better insight related to vessel performance, onboard safety and risk exposure, real-time analysis is required to make that one

informed decision when needed. They simply cannot wait for a few hours till the data is analyzed.

The automation and technology advancements mean the shipowner, fleet manager and crew have to deal with an exponential explosion of data. Being able to understand this “big data” means investment in solutions and systems. Both on shore and ship based. Continuous data analytics is possible only when applications and systems are capable supporting these activities.

“By embracing analytics and turning data into actionable insights, shipping players have an opportunity to drive improved efficiency and quality”.

Source: Ibrahim Al Omar, CEO of Bari

Trelleborg whitepaper “Use of Big Data in the Maritime Industry”.

System Support

Support of IT systems in the shipping industry, on an oil platform or even in a windmill on sea, is not as easy as you might expect. Compare it to a shore-based operation. When your server goes down and you call support. They analyze the problem and if a repair of a component or server is required, an engineer is sent to your location. At sea, to contact shore-based support staff is not always possible and they cannot send someone to the ship to repair.

That means that traditional IT solutions are not capable to provide the required continuous operation of a modern smart ship. If a component or a complete server fails and as a result you cannot perform certain operations, this might become a tremendous liability and endanger safety of crew and ship.

Downtime might cause voyage deviation, leading to higher fuel consumption and inability to stay secure at all times. IT infrastructure on ships must become resilient and always “on”.

Backup and resiliency

Automatic, real-time transfer of data from ship to shore might be in place but is not always sufficient. Although available bandwidth is optimized by modern solutions and the data that has to go to the shore is minimized, it is not elimination all your risk. If the ship gets jammed or a cyber-attack takes place, you might need to roll back quick to a state as it was an hour or a day ago.

Onboard replication of data and ability to roll back to a prior state is costly and, in many cases, not possible without shore-based support or complete backups being retrieved from a shore-based data store. Some processes can wait, other cannot. The need for instant local rollback is a requirement for smart ships.

Performance optimization, improving TCO

Managing the total cost of ownership/operation is fundamental to any successful ship owner or operator. There are tens if not hundreds of situations you can think of that have an impact on your TCO. To name a few:

- Regulations, like the new CO2 emission rules, might require high investments. impacting TCO;
- Course deviation resulting in higher fuel consumption;
- Negative crew moral might result into higher sickness levels;
- Maintenance and repair timing and execution;
- Hull fatigue conditions;
- Procurement conditions;
- Cyber-attacks: this alone might cost millions in case you are attacked.

CASE STUDY: TELFORD OFFSHORE

Telford Offshore is a global company built on years of experience in the oil and gas industry. Headquartered in Dubai and the Netherlands, the organization was formed through a number of vessel acquisitions.

The company supports multiple offshore activities, focusing on high capacity accommodation, lifting, fabrication and installation services. A single Telford Offshore vessel can accommodate 400 marine crew for projects including laying pipelines and carrying out subsea construction. Each vessel is able to provide accommodation services, to transport, lift and install subsea or topside components, lay pipe and carry out subsea construction work. The company's fleet of modern vessels, all build since 2007, with multipurpose capabilities ensuring that diverse operations can be undertaken by one single vessel.

As part of its acquisition Telford Offshore took over a legacy IT environment which was built on HP Blade systems. The company saw this as an opportunity to bring in a completely new and modern IT infrastructure that could be customized to suit the business' unique requirements.

The existing storage was difficult and hard to manage. The company was acquiring different businesses at this time which posed the perfect opportunity to re-evaluate its IT systems. Not only was it important to ensure smooth and streamlined IT management, but any new system should be future proof and able to meet upcoming edge computing plans. Wouter Lustig IT Manager at Telford Offshore commented, "The legacy system we had inherited through the acquisition was reaching the end of its lifespan and it required more time to manage than we had available. As a new company we wanted to start fresh with an IT system that was right for us. We wanted a solution that was simple to manage and would be future proof for further deployments on the vessels at sea as well. It was essential that this solution would save us time on the day-to-day management."

Ensuring Telford Offshore deployed the right solution was critical to the business. With vessels at sea, the technology must be available 24/7/365 and it was critical any system

deployed would be fully redundant. The IT infrastructure also needed to be incredibly simple and time-efficient to manage the business with a low overhead on day-to-day IT administration. Working offshore and in remote sites means the company does not have the same level of onsite expertise to hand.



Scale HC3 Edge ready to be installed on board of the Telford 25.

In addition, with internet connectivity slow and costly at sea, the company decided any infrastructure would need to be local and on-premises. With these key requirements Telford Offshore decided a hyperconverged solution was the way forwards. Lustig explained, “We knew we needed a hyperconverged solution as it combines everything, we need for our IT infrastructure into one easy to manage appliance, all while being cost effective and efficient.”

He continued, “Our WAN connection is via satellite, which is extremely expensive, instantly ruling out a possible cloud solution as it would not work in the long run. In

addition, with limited IT staff on our vessels we needed a system that was so simple to manage it could be installed and used by someone with no technical experience. If we needed to send out technical staff to manage any issues it could become vastly expensive.”

After deciding on a hyperconverged solution, Telford Offshore evaluated a number of different vendors including Nutanix and SimpliVity, before choosing Scale Computing’s HC3 Edge solution. Lustig explained, “We evaluated the market, however Nutanix and SimpliVity weren’t what we were looking for. We needed to be able to guarantee performance and ensure simplified management.

“We are still amazed at how easy it is to install, deploy and manage – we don’t need to worry about the management of the day-to-day solution, it just takes care of itself.”

Wouter Lustig – IT Manager Telford Offshore

Telford Offshore reached also reached out to Scale Computing. The company were open and helpful in answering a number of questions we had around hyperconvergence and how it would fit with our requirements. After all, three, it was clear that the Scale HC3 platform offered us exactly what we needed – a complete, cost effective, easy to manage data center in-a-box.”

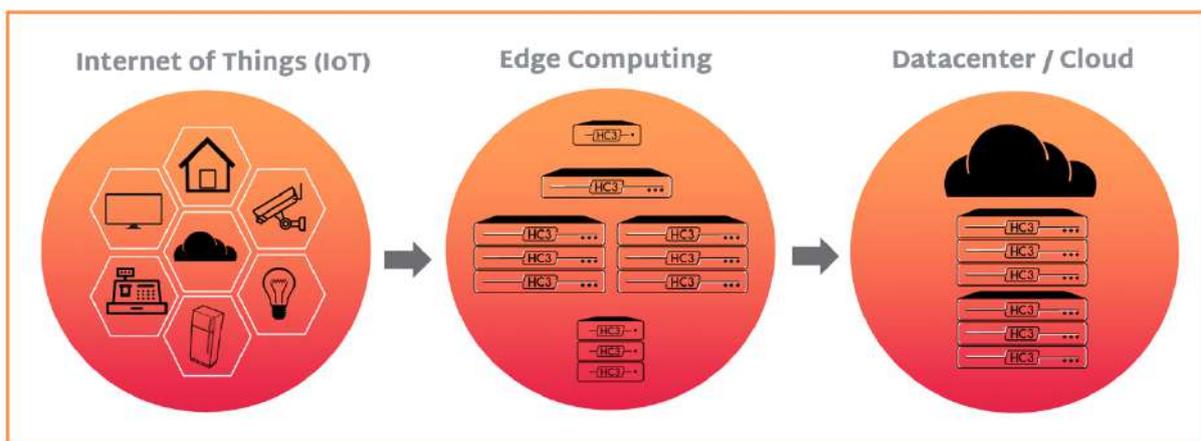
Telford Offshore immediately noticed enhanced performance and simplified management as soon as the solution was deployed. Lustig noted, “The Scale HC3 solution arrived, there was no need for an instruction manual, and within 40 minutes we had the first Windows server up and running – it was as easy as that. We copied the data base over, and the performance increase was immediately noticeable.”

In addition, as a growing company Telford Offshore wanted the flexibility to scale and grow on demand. The Scale Computing solution allows nodes to be added as and when its required eliminating the need to over provision storage, as IT infrastructure can be built out to meet unique business and application needs. The system also provides replication, snapshot and cloning technology capabilities, providing the continuity and redundancy needed to keep IT systems up and running 24/7/365.

Alongside performance requirements a key part of the IT deployment was ensuring that Telford Offshore could future proof its environment. Lustig concluded, “We wanted the solution to be a long-term future proof investment with the possibility of deploying it on the vessels at sea. Being low on overhead, the solution needed to be simple enough for the one or two electricians on board to install and deploy. Scale Computing’s solution is perfect to meet these requirements, it operates as its own datacenter in-a-box and can easily connect back to the deployment at the headquarters. We are still amazed at how easy it is to install, deploy and manage – we don’t need to worry about the management of the day-to-day solution, it just takes care of itself.”

THE SCALE HC3 SOLUTION

It is needless to say that an IT infrastructure on board of ships is more important than ever. It needs to become a true datacenter on the edge: easy to use and manage due to the lack of on-board IT expertise, resilient, always available and secure. The slightest deviations on a vessel's route can make a huge difference in bunkers consumption and hull fatigue. Especially with the International Maritime Organization (IMO) CO2 emissions regulations fuel management is key.



The Scale HC3 Edge Computing positioning bridging the gaps between the Internet of Things, the edge computing site, cloud and shore-based datacenter.

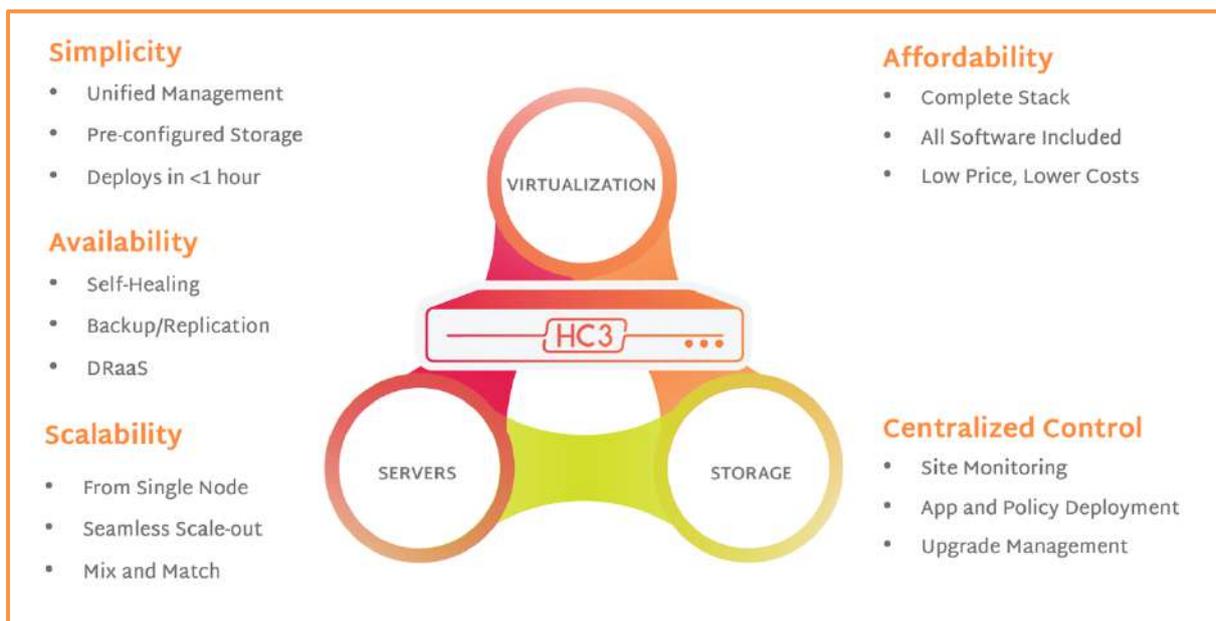
With the Scale HC3 solution, you will benefit over other solutions you used in the past or are now evaluating as possible replacement. Scale HC3 solutions offer a complete datacenter experience on the edge at the lowest TCO in the industry.

In short, the Scale HC3 Edge solution stands for an all in one infrastructure providing you with simplicity, availability, scalability, affordability and central/decentral monitoring. Scale HC3 bridges the gaps between the Internet of Things, edge computing sites and the cloud or central, shore-based datacenter. Furthermore, the solution requires low bandwidth, saving expensive communication costs.

A good edge deployment can be looked at as a micro-datacenter combined with intelligent automation. Datacenter functions such as compute, storage, backup, disaster recovery, and application virtualization can be consolidated into a single, integrated

platform. Infrastructure silos difficult to manage in a centralized datacenter become unmanageable at the edge, and thus, convergence of these into a singular platform is both efficient and cost effective.

IT resource overhead is also a key consideration. A good edge infrastructure strategy is based around flexibility. After all, new applications, devices, data sources, and needs emerge continuously. Some edge applications may be resource and data storage heavy. Others may only need to run a few, very lightweight applications. For example, say a new deployment needs to run a few small applications which collectively consume just 16 GB of RAM. Would it make sense to deploy infrastructure that itself consumes 10x those resources in order to function? Of course not. Furthermore, the additional cost of such an infrastructure due to this type of excessive overhead is a significant barrier, especially if multiplied across dozens, hundreds, or thousands of locations.



The Scale HC3 Edge platform is an all-in-one integrated micro datacenter, combining compute, storage, server virtualization and central management.

Instead, what is needed is a solution that delivers the core functions of a datacenter, but that is scalable both up, and down, in size. Edge computing brings with it the need to deploy many micro-datacenters of varying sizes, and a proper platform should be able to scale in both directions to accommodate these needs.

While centralized datacenters are measured in terms of rows of full racks, edge

deployments are most often far smaller. They may be single racks, partial racks, or even completely different form factors such as tower-type systems, or IoT-sized platforms no larger than a shoebox.

It is quite possible to deploy a micro-datacenter of three servers, which can run dozens of applications while delivering 10,000 IOPS. This type of radical change in form factor has an impact on where systems are deployed, the power they require, the heat they generate, and cost required for the hardware itself. Furthermore, as needs change, resources will need to be added, and that must be done without disrupting the existing workloads. Taking a 3-hour maintenance window for each of 100s of edge deployments with no local IT staff is simply not a viable option.

Business value

The HC3 hyperconverged solution is specifically built for organizations who want to improve TCO and IT complexity. HC3 solutions are widely used in the health care, education, manufacturing, financial services, retail, government and many other industries. They have been specifically built for easy deployment and to be managed by IT administrators who want to spend more time focused on business needs and applications, rather than troubleshooting infrastructure and hardware issues.

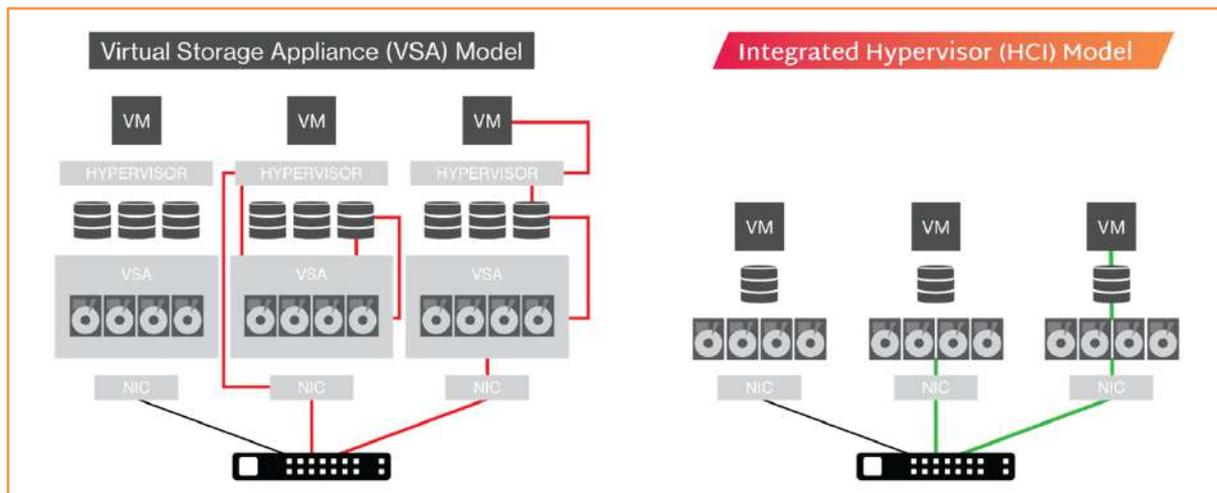


The Telford 28 in action. This ship is equipped with Scale HC3 Edge

Ideal for main offices, remote offices and DR sites, HC3 fits any type of environment where applications need high availability, not high costs and complexity. A TechValidate survey among >240 customers using HC3 for 6 months or longer shows that complexity, time to manage and improved scalability while reducing IT operating cost at the same time are key findings. Source: <https://www.trustradius.com/products/scale-computing-hc3/reviews>

Virtualization

HC3 forms the basis for a complete 'datacenter in a box' with servers, storage and virtualization integrated into a single appliance to deliver simplicity, availability and scalability. The integrated hypervisor offers proven, open source technology with no additional licenses that guarantees easy migration from any physical or virtual environment. Virtualizing applications reduces application deployment costs, management time and capabilities, improving Total Cost of Ownership.



Scale HC3 uses less than 12GB RAM and a fraction of a core in a 3-node configuration compared to other solutions using 96-300GB RAM and up to 12 cores.

Storage

Storage is seamlessly integrated HC3 as a global namespace that is local to the applications running on HC3. No more storage subsystem, SAN, or storage protocols to manage. There is no VSA (Virtual Storage Appliance), saving >90% RAM and CPU cores. With single cluster supporting anywhere from a few terabytes to >1.3 petabyte, the is always a Scale solution that will fit your requirements. The latest all NVMe appliances belong to the fastest in the HCI industry

Scalability

Different nodes types can be mixed and matched in a single cluster, providing flexibility to build out the perfect infrastructure for applications. A single cluster can scale from just hundreds of gigabytes to over one petabyte.

Management

- There is no SAN to buy and manage, no separate management servers to buy and manage, and no separate virtualization software to manage. HC3 combines these functions into a single appliance.
- The entire infrastructure is managed from a single web-based interface. Quickly view system health and resource usage in a view of your organization that you can customize. Smart groups and tags for custom environment views. Analyze historical data for detailed insights. Create customized reports from data centrally logged from you core datacenter and every remote site.
- Secure remote site infrastructure with role-based access controls. Centrally view audit logs across all remote sites.
- Utilizing the HC3 management interface, a typical cluster is deployed under 30 minutes.

Deployment Automation

The distributed edge computing environment comes together into view with the management and monitoring capabilities of the new Scale Edge portal. Customize your operational view with tags and smart groups for meaningful insights and actionable data combined with historical reporting. Troubleshoot quickly and efficiently with centralized logging of remote site events and security auditing. Bring hundreds or thousands of sites into view with an intuitive and uncluttered user-interface, a powerful repository of information, continuous monitoring, and remote management at your fingertips.

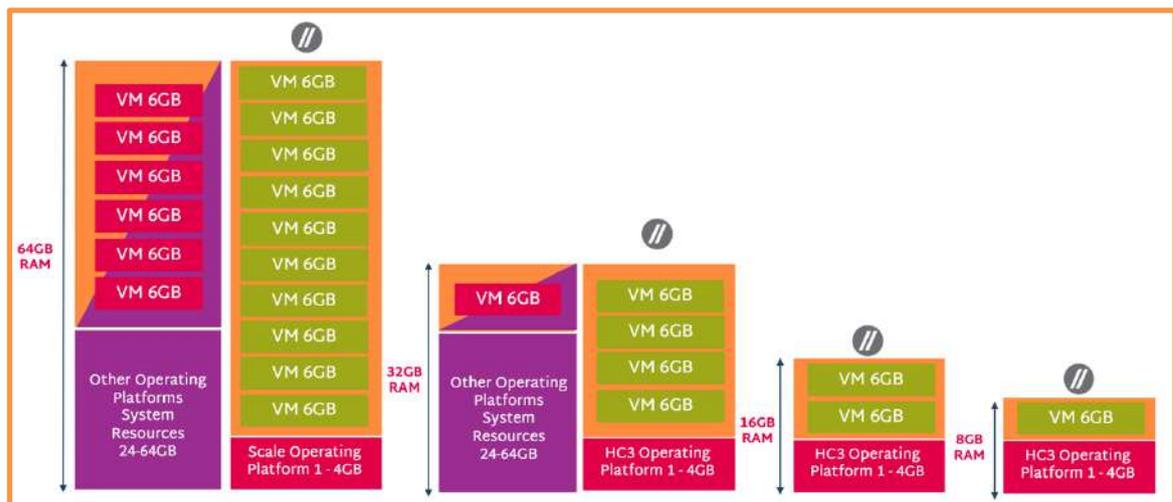
- Centrally deploy one-click HC3 system updates across multiple sites or groups.
- Zero-touch configuration for new site remote deployment or expansion.
- Quickly launch individual site management interfaces.
- Full API standard included

Economic Savings

The economic value of the Scale Computing solution strongly depends on the starting

point and customer situation. In general, moving from the extreme situation where a customer replaces a physical, non-virtualized environment to Scale, the solution has the following benefits:

- Save by increasing server utilization through Virtualization by moving from physical servers to fewer servers with Virtualization (P2V).
- Save on Virtualization licensing (VMware or Microsoft) when moving to HC3.
- Save by eliminating SAN/NAS external arrays by Scale HC3 appliance.
- Dramatically low footprint
- Save on resource. HC3 requires less CPU cores and RAM to deliver the same performance compared to most other solutions.
- Save up to 70% of infrastructure deployment and ongoing management time by using the simplified HC3 web interface running on the servers and dramatically reduce the number of vendors and management tools and required skills.



Scale HC3 Scribe requires a fraction of RAM and CPU resources vs. most other solutions.

ABOUT SCALE COMPUTING

Scale Computing engineered HC3, the IT infrastructure platform that allows organizations to do more with less. Scale Computing HC3® software eliminates the need for traditional IT silos of virtualization software, disaster recovery software, servers, and shared storage, replacing these with a fully integrated, highly available platform for running applications. Using patented HyperCore™ technology, the HC3 self-healing platform automatically identifies, mitigates, and corrects problems in the infrastructure in real-time, enabling applications to achieve maximum uptime even when local IT resources and staff are scarce. It is in Scale's DNA to:

- Radically simplify management
- Provide high availability by design.

Scale's unique technology is powered by 24 patents,

Customers

HC3 is used by thousands of customers worldwide and across every industry. With over 10.000 systems deployed, HC3 is one of the leading hyperconverged infrastructure platforms available on the market today.



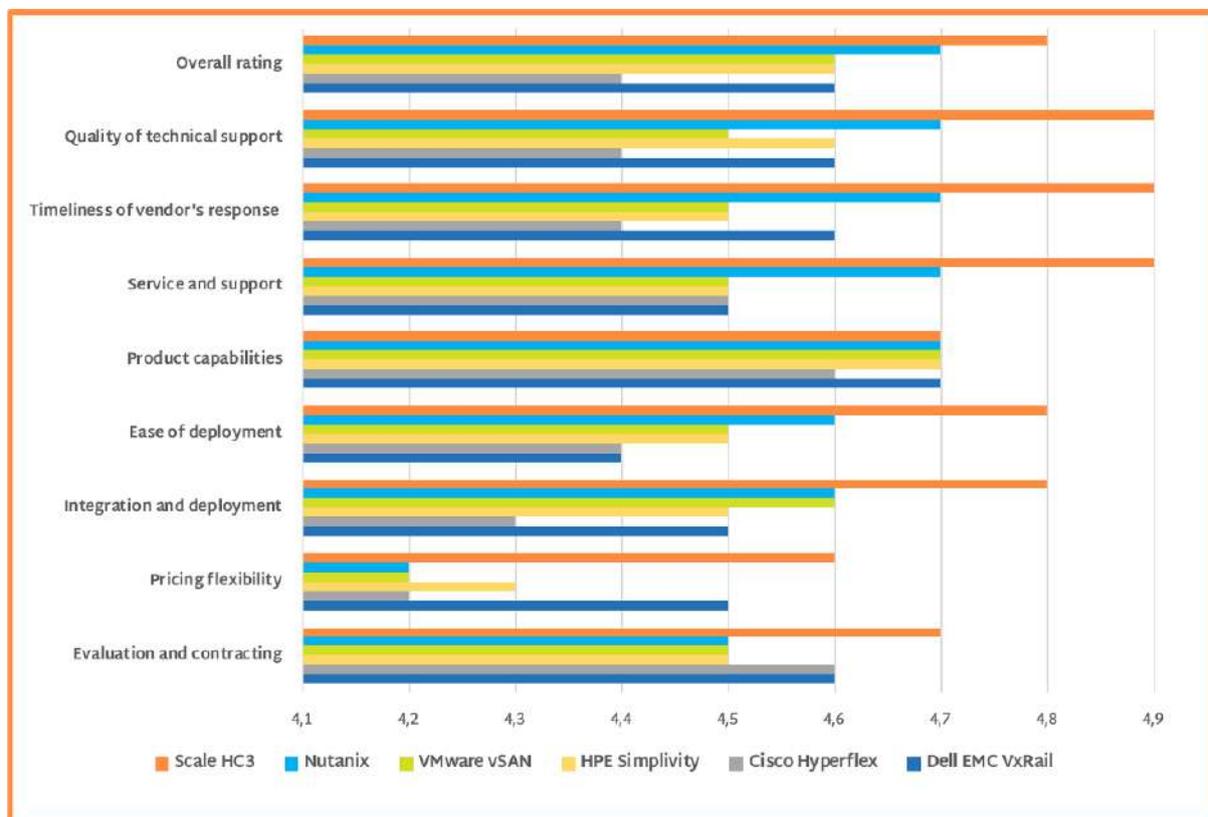
Scale HC3 clusters are used by over 5.000 customers worldwide.

Case Studies and Analysts

The case studies of various organizations are available on the Scale Computing website, YouTube and other sites like Gartner, TechValidate and TrustRadius. Today, there are over 500 case studies of the Scale HC3 solution, more versus any other hyperconverged vendor.

- Scale Computing: <https://bit.ly/2Xk1rQt>
- Gartner: <https://gtmr.it/30KnTAa>
- TechValidate: <https://bit.ly/2kyB8Uu>
- TrustRadius: <https://bit.ly/2JphgeD>
- YouTube: <https://bit.ly/2krNpda>

Scale is the highest ranked hyperconverged vendor within the Gartner Peer Review sections, outperforming in all areas. Reviews are rigorously vetted by Gartner, the world's leading research and advisory company – no vendor bias, no hidden agendas, just the real voices of enterprise users. The Scale Computing HC3 solution is the only 5-star rated hyperconverged solution. Details can be found on the Gartner Peer Review website: <https://gtmr.it/30KnTAa>.



Gartner Peer Review overall rating (March 2020)

Scale Computing is headquartered in Indianapolis with an R&D center in San Francisco (USA). The EMEA headquarter is in the Netherlands, supported by operations in Germany, South Africa and the United Kingdom.

Want to know more?

Scale Computing offers you the possibility to fully experience the benefits of a Scale solution. If you like to evaluate, have an in-depth demonstration, just let us know. Of course it is also possible to buy a test and development cluster. This way you can evaluate in your own environment.

If you to get a solution demonstration, virtual executive briefing session or if you want to know more about our Test & Development program, send an email to emea@scalecomputing.com or visit our website at www.scalecomputing.com for more information.

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This paper describes the challenges in the shipping industry and the Scale Computing solution. The intended audience for this paper includes Executives, IT professionals, technical architects, sales engineers, field consultants, and partner engineers who plan to deploy this solution.

Disclaimer: This solution paper is a suggestion of what can be done with Scale HC3 Edge Computing software and appliance delivering tomorrow's IT infrastructure. No guarantees can be based on this solution paper.