



Edge Computing and Next-Generation Control

Five Ways to Power Innovation





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About the Authors





Introduction

Expert insight and real-world examples illustrate crucial opportunities for leaders to deploy Edge Computing for enhanced next-generation control.

Edge Computing is transforming operations across industries from food & beverage to oil & gas, as well as pharmaceutical manufacturing. This emergent technology harnesses real-time data from critical equipment and processes to dramatically improve operational efficiency and enable new insights through advanced analytics. These capabilities act as a foundation for smart infrastructure and Industry 4.0 manufacturing. By leveraging connectivity, collaboration, and insight, smart applications create business value, increase competitive advantage, and enhance productivity.

Read on to uncover how to turn edge data into actionable insights, ensure reliability of critical applications, future-proof and innovate with software, and more by utilizing the right Edge Computing Platform.



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What is Edge Computing?

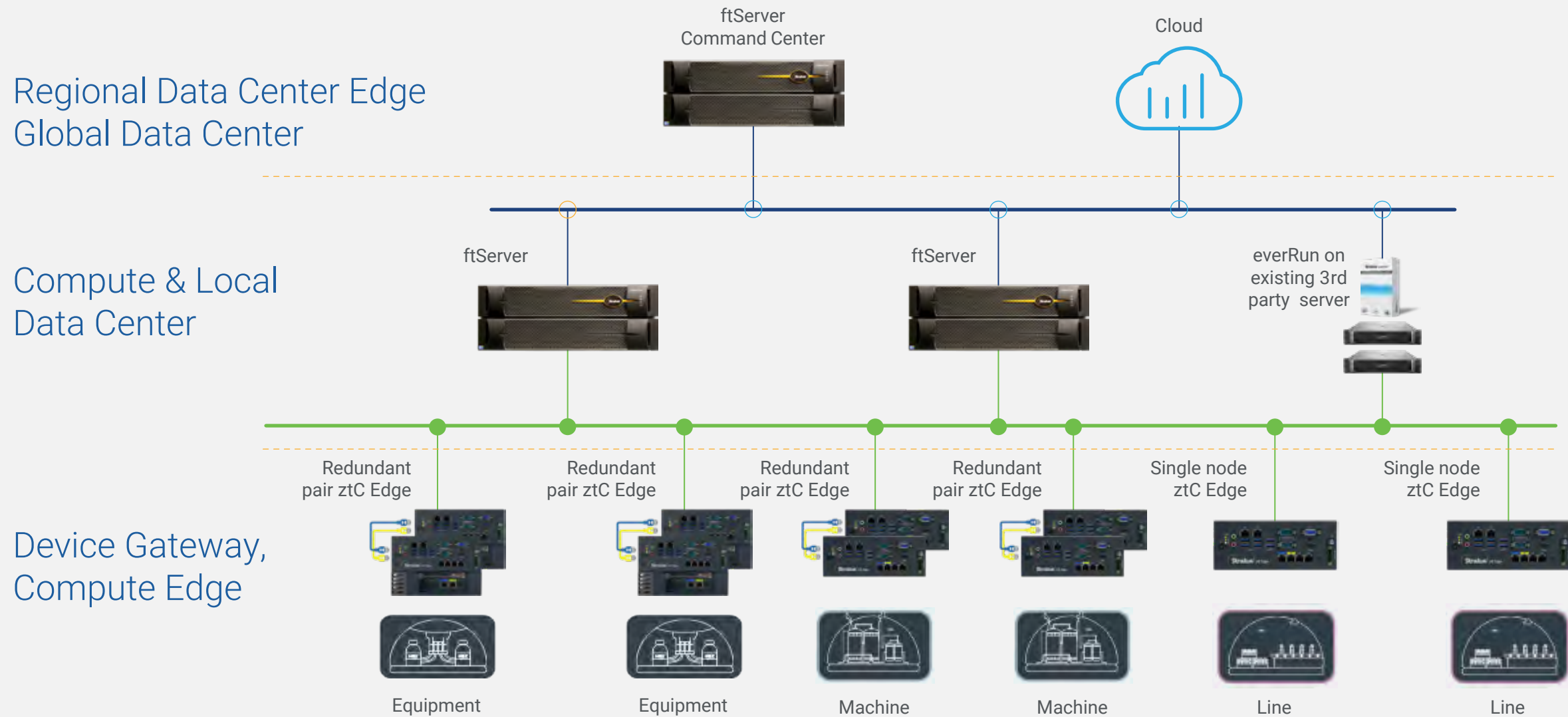
Edge Computing is a distributed computing model deployed in OT environments close to critical equipment or processes - where data is being collected and analyzed - rather than on a centralized server or in the cloud.

Edge Computing builds a bridge between real-time data acquisition from mission-critical processes to the control room, cloud, or operations center, providing local compute capability for shop floor equipment or remote assets.

“ Demand for industrial Edge Computing platforms will grow significantly, driven by growth in demand for applications requiring on machine or on production line physical hardware with the necessary computing power for functionality, such as analytics and control.



Edge to Enterprise Architecture





Why Edge Computing?

Increasing computing power at the edge is the foundation needed to establish autonomous systems, enabling companies to maximize operational efficiency, improve performance and safety, automate all core business processes, and ensure **“always on”** availability while enabling personnel to focus on higher value activities within the operation.

Critical Capabilities to Modernize Control

- ② Reliably run HMI/SCADA software
- ② Reduce risks and costs associated with unplanned application downtime, infrastructure management, and serviceability
- ② Support industrial PCs (IPCs), programmable logic controllers (PLCs), and programmable automations controllers (PACs) both on site or remotely
- ② Deliver solutions with performance, scalability, reliability, and longevity for current operations, provide headroom to support future requirements
- ② Capture, process, and store large volumes of edge data
- ② Consolidate siloed applications on multiple, disparate systems
- ② Meet demands of both IT and the OT environment



Five Ways **Edge Computing Powers Innovation**

Insight | Reliability | Future-Proof | IT and OT | AI and ML



Turn Edge Data into Actionable Insight

Today's industrial organizations generate massive amounts of structured and unstructured data. The challenge is to make sense of disparate data so they can be interpreted by operators as actionable information.

Edge Computing platforms are located on or near production operations for data collection, data analysis, and data storage.

Demands common in industrial settings such as remote, inaccessible locations; continuous operations; and easy to manage/self-managing solutions are typical for edge operations.

With Edge Computing, organizations gain actionable insight to increase productivity, gain efficiencies, and improve safety.

Case Study Snapshot

Turn Edge Data into Actionable Insight

Rubberlite, a materials manufacturer specializing in manufacturing polyurethane, launched a Supervisory Control Systems Project with the goal of improving overall data quality, starting with standardizing their SCADA systems.

A Stratus Edge Computing platform allowed them to digitalize their information, standardize data collection at the source to understand performance, and share that data plant-wide. With critical information and insights, Rubberlite was able to realize an **80%** reduction in non-sellable material - critical for customer satisfaction and profit. They also eliminated application downtime and data loss.

“

Our partnership with Stratus has helped Rubberlite evolve into where we are now, and it's put us in the position of where we can continue to grow and improve.

Former Process Automation Engineer

Rubberlite

Read full case study here: <https://resource.stratus.com/case-study/rubberlite/>

Rubberlite
Incorporated





Ensure Reliability for Critical Applications

Failure and downtime are not an option. Compute platforms purpose-built for the edge provide the reliability your organization needs for mission-critical control solutions to run HMI/SCADA and historian applications for Monitor & Control.

An Edge Computing platform should:

Have industrial strength, reliability, and redundancy

- Greater than 99.999% fault tolerance
- 24/7/365 proactive support

Align with industrial grade lifecycle

- Designed to last 8-10 years
- Support for entire lifecycle

Be easy to service, support

- Autonomous operation/failover
- Proactive 24/7/365 support
- Remote monitoring/self-healing management
- Hot-swappable components/nodes

Case Study Snapshot

Ensure Reliability for Critical Applications

Petra Srl owns and operates one of Italy's largest oil depots, handling millions of liters of oil and gasoline and loading hundreds of trucks each day. To enable efficiency for depot operations, Petra runs Nuovo Petrol, a next-generation terminal automation solution from an experienced system integrator, Loginet.

With the Loginet solution and Stratus Edge Computing, Petra automated manual processes and integrated disparate terminal systems to reduce risk, enable real-time data, and centralize visibility of operations. The company reduced depot load times by **33%** and has experienced zero downtime in a decade using Stratus Edge Computing.

“

Petra hasn't had an unplanned outage in **10 years**. They've never experienced any business disruption with Stratus as their foundation. When our customers need that extreme level of reliability, we will continue to rely on Stratus for continuous computing.

Gianluigi Campisano

Automation Engineer, Loginet

Read full case study here: <https://resource.stratus.com/case-study/loginet/>



Petra





Future-Proof and Innovate with Software

Deploy your applications at the edge for better operational performance.

Performance Management

- Fewer process upsets
- Production improvement
- Lower energy consumption

Product Quality

- Reliable supply
- Improve customer expectations
- Fewer reruns
- Lower waste elimination

Visibility of Operations

- Digitize intelligence
- Unbind knowledge and experience
- Discover the unknown

Safety

- Increase worker safety
- Lower operational risk
- Improved cybersecurity protection

Asset Health

- Reduce unplanned downtime
- Optimize MRO
- Asset performance
- Workforce engagement

Case Study Snapshot

Future-Proof and Innovate with Software

Netherlands-based Alewijnse is a global leader in maritime technology, providing critical systems for vessels ranging from yachts and naval ships to increasingly complex dredging, offshore, and transport rigs. The company designs, delivers, and integrates onboard electrical and automation systems, as well as advanced marine electronics.

Using Stratus® ftServer®, Alewijnse developed the maritime industry's first future-proof virtualization platform to manage critical ship systems. The new platform replaced **20 computer systems** with one server, reducing the system footprint by **75%** and doubling the lifespan to eight years.

“

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.

Johan Van Rikxoort

Product Manger, Alewijnse

Read full case study here: <https://resource.stratus.com/case-study/alewijnse/>

The Alewijnse logo features a stylized 'A' composed of three vertical bars in red, black, and red, followed by the company name 'Alewijnse' in a bold, black, sans-serif font.The Stratus logo consists of a stylized 'S' shape formed by two curved lines, one orange and one white, followed by the word 'Stratus' in a bold, white, sans-serif font.



Enable IT and OT

Edge Computing addresses the combined needs of IT and OT. In the OT environment, equipment must support OT but meet IT requirements. With limited IT staff and skill sets available at edge locations, solutions must be easily maintained by OT staff.

- Cybersecurity
- Integration with business apps
- Standards-based, solution agnostic
 - OPC-UA, MQTT
- Lower cost, non-proprietary

IT Concerns

OT Concerns

- Easy to deploy, manage, & maintain
- Easy to migrate into legacy infrastructure
- Remote monitoring
- Lifecycle independent
- Works with any generation PLC

Converged IT/OT

- Reliability
- Easy to service
- Supports future needs

Case Study Snapshot

Enable IT and OT

A leading life sciences company that manufactures cell biology and DNA, RNA, and protein analysis products needed to eliminate downtime and data loss to avoid costly disruptions and ensure regulatory compliance.

In one week, RoviSys, a global system integrator specializing in automation, deployed Stratus® Edge Computing platforms running Rockwell Automation PlantPAx® for three manufacturing sites. The new production control architectures provided fault tolerance, simplified validation, converged OT and IT, and reduced TCO by **15-20%** compared to a cluster solution. The life sciences company has experienced no unplanned downtime since it went live, and its engineers are able to service the Stratus platforms without dedicated IT support.

“

With Stratus' longevity and durability, and streamlined FAT/SAT verification, our customer has a top-performing, high-availability solution for the long haul.

Network Engineer

RoviSys

Read full case study here: <https://resource.stratus.com/case-study/rovisys/>

ROVISYS
Automation & Information Solutions



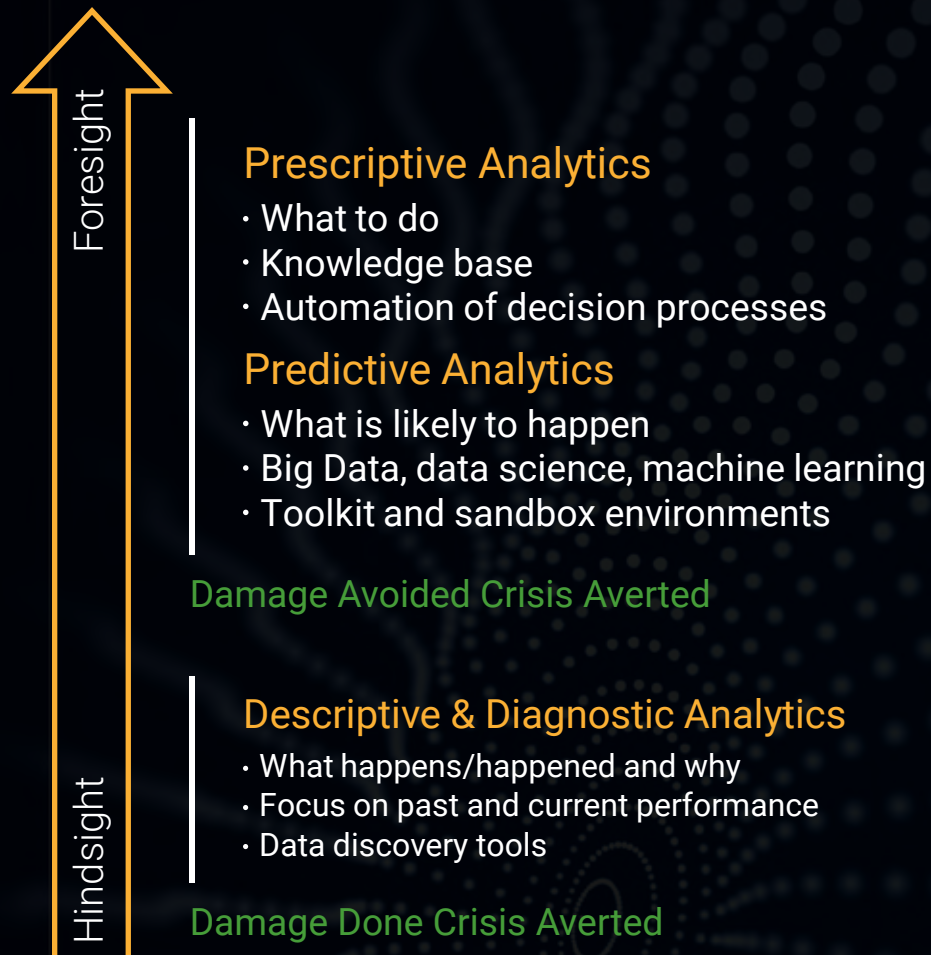
Stratus



Prepare for Advanced AI and ML

Edge Computing platforms help organizations run AI/ML analytic solutions on-site that are fully integrated with HMI/SCADA and other advanced software.

There are various levels of AI and ML analytics:



AI and ML analytics tools combined with HMI/SCADA systems – run on fault tolerant, redundant edge platforms – are a great foundation for a reliable and scalable architecture for the future.

Case Study Snapshot

Prepare for Advanced AI and ML

Streamline Innovations, based in San Antonio, Texas, is a Stratus system integrator that develops and operates a proprietary process that removes toxic hydrogen sulfide (H₂S) in Oil & Gas, Water & Wastewater, landfills, and biogas. To succeed in the competitive oilfield services market, the company continually innovates to operate equipment more efficiently, optimize performance, meet customer budgets, and enable a greener future.

Using Stratus® ztC® Edge, Streamline Innovations developed a visionary solution called the Valkyrie™ Intelligent Platform to bring AI-powered predictive maintenance, remote operation, and **99.5%** uptime to remote oilfield equipment.

“

Having seen what the Stratus Edge Computing platform is capable of in a complex solution such as the Super Valkyrie, it's clear that edge technology has a lot to offer the Oil & Gas industry. I am talking about Smart Wellheads, Smart glycol units, Smart JT Skids, and more.

Dr. Peter Photos

Chief Technology Officer, Streamline Innovations

Read full case study here: <https://resource.stratus.com/case-study/streamline-innovations/>





Edge Computing Provides Maximum Performance and Reliability for Next-Generation Control Systems



Get the most out of your assets



Attract a modern workforce



Update and streamline work processes



Gain new insights into operations to run more efficiently



Become more responsive to customers



Take advantage of emerging technologies to enable Digital Transformation

What to Look For in an Edge Computing Platform

Simple



Scalable

Extensible

Flexible

Optimized

Protected



Downtime Prevention

Redundancy

Industrial Grade

Secure

Autonomous



Health Monitoring

System Status

Global Support

Remote Upgrades



Edge Computing Platforms for your Next-Generation Control Solutions

Edge Platforms for Critical Applications



Zero-touch, secure, and highly-automated platform purpose-built for Edge Computing applications



Fully integrated, continuously available platform for business-critical workloads, manufacturing operations, and control applications

Pre-Configured Edge Control Solution



Performance tested, characterized, and validated Micro Data Center solution - pre-wired, verified, and configured out of the box

EcoStruxure Micro Data Center





About Stratus

For leaders digitally transforming their operations to drive predictable, peak performance with minimal risk, Stratus ensures the continuous availability of business-critical applications by delivering zero-touch Edge Computing platforms that are simple to deploy and maintain, protected from interruptions and threats, and autonomous. For 40 years, we have provided reliable and redundant zero-touch computing, enabling global Fortune 500 companies and small-to-medium sized businesses to securely and remotely turn data into actionable intelligence at the Edge, cloud and data center – driving uptime and efficiency.

For more information, please visit www.stratus.com or follow on Twitter [@StratusAlwaysOn](https://twitter.com/StratusAlwaysOn) and LinkedIn [@StratusTechnologies](https://www.linkedin.com/company/stratus-technologies).

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