



CROSS-SECTOR SUCCESS GUIDE FOR SCADA

Taking Advantage of Modern Technology to Minimize
Planned and Unplanned Downtime

modernize
AUTOMATION

Eliminate Unplanned Downtime



THE NEW INDUSTRIAL WORLD ORDER

The Dusseldorf Water Authority needed an IT solution that would allow it to control its water infrastructure via a network of measuring devices with around 40,000 data points. One major requirement for the new IT infrastructure was to keep the SCADA control system up and running so that data could be securely collected and stored for legal, health and safety reasons. Additionally, the Water Authority required a solution that would improve return on assets (RoA), provide an extremely high level of availability across the entire IT environment and do so in an easy to manage, easy to administer manner. After careful evaluation, Dusseldorf's management chose Stratus.

Another example of how modern technology, and more specifically the Industrial Internet of Things (IIoT), is transforming industrial operations comes from John Miri, chief administrative officer at the Lower Colorado River Authority (LCRA), who spoke at the [Cloud and DevOps World conference in London](#). The LRCA acts as a wholesale provider of electricity to homes and businesses in central Texas and is actively involved in mitigating the risk of residents experiencing power outages. Miri talked about how IIoT solutions are transforming the authority's operations. Historically, the LCRA relied on local residents to keep tabs on rising water levels and the risk of flooding along the Colorado River. Today, it uses around 270 IoT sensors to do the job instead.

\$20B

(or almost 5 percent of production in process industries)

AVERAGE IMPACT OF UNSCHEDULED DOWNTIME*

*SOURCE: ABERDEEN GROUP

10x

COST FOR UNPLANNED EVENTS VS PLANNED IN PROCESS INDUSTRIES

5-10%

INCREASE INVENTORIES, LABOR COSTS, DELAYED DELIVERY, REDUCED PROFITABILITY

2-5%

LOST PRODUCTION IN PETRO CHEMICALS

TRANSFORMING OPERATIONS

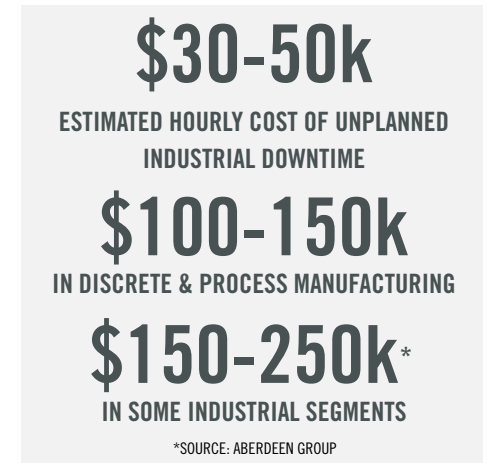
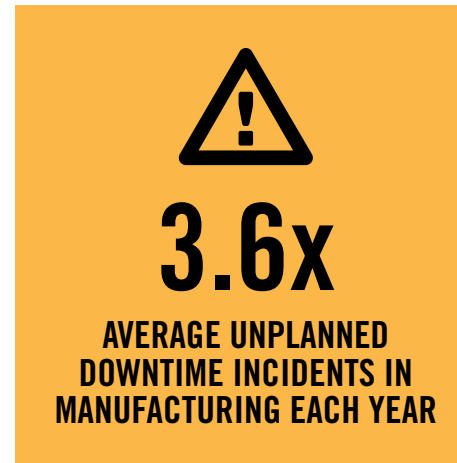
"In the old days, we would have people with logbooks living near areas prone to flooding and they would come to us and say when they saw something out of the ordinary, but people don't move as fast as the water does. What we found with IoT, and working on the premise that the speed of light is faster than the speed of water, we can use a larger number of dispersed IoT sensors to detect where flood waters are and keep people safer."

- [Computer Weekly](#)

INCREASED EFFICIENCIES & INNOVATIONS WITH MODERN OPERATIONAL TECHNOLOGY

What LCRA and the Dusseldorf Water Authority have in common is the need to modernize Industrial Control Systems (ICS) and streamline operations while reducing costs. One of the key priorities for companies across the industrial sector in 2016 is how to increase efficiencies — boost operating-equipment effectiveness, lower maintenance and personnel costs, and improve return on assets (RoA) with less investment. To achieve those goals, leaders in the industrial sector employ technology solutions to ensure visibility and availability of industrial automation.

Traditional systems are no longer sufficient for handling the downtime risks associated with critical business applications, especially when running interconnected systems and new IIoT solutions. Modern technology, specifically virtualization and fault tolerance, mitigate downtime — both planned and unplanned — to allow plants to operate smarter, faster and safer. Here's why and how plants can harness advances in modern technology to get the most of their current systems investments and future-proof their operations for the IIoT.



THE PERILS OF DOWNTIME IN THE INDUSTRIAL SECTOR

When industrial automation (IA) applications — such as Supervisory Control and Data Acquisition (SCADA), Human Machine Interface (HMI), Manufacturing Execution Systems (MES), Data Historians and others — stop working, a number of problems start to arise. First and foremost, operators “go blind” and have to manually monitor equipment until systems are restored. In addition to manual monitoring and diagnostic processes that must be initiated, there is the risk of process interruptions, quality and safety issues, and lost data. Those issues create operational, regulatory and compliance challenges that can ultimately result in additional costs and disciplinary fines — as well as loss of revenue, reputation and long-term business relationships.

SUCCESS GUIDE TO REDUCING THE IMPACT OF PLANNED AND UNPLANNED DOWNTIME THROUGH CONTINUOUS ICS SYSTEM AVAILABILITY

Hardware failure is the leading overall cause of downtime for small and medium-sized businesses, responsible for 55 percent of downtime incidents. Software failure is the culprit 18 percent of the time ([Quorum](#)). The software and hardware that powers an industrial automation solution, such as SCADA or MES or others, is the key to maintaining a plant's operations and availability. Here's what those solutions should provide:

1 | Continuous Availability

Fault-tolerant IT solutions are the key to ICS uptime. When a component of a fault-tolerant solution fails, processing continues in an uninterrupted fashion on a redundant component, thereby avoiding system downtime. Plants need fault-tolerant solutions that work across both physical and virtual environments. A physical server can do the work of one server or, when partnered with virtualization software, the work of multiple servers. With virtualization, companies can run more workloads and processes with fewer servers, thereby increasing efficiency and saving both operating and capital expenses. But the implementation of a virtualized environment amplifies the need for fault tolerance, as multiple applications are now at risk if the server fails.

STRATUS CONTINUOUS AVAILABILITY: MALISKO ENGINEERING

Dan Malyszko, director of operations lead engineer, Malisko Engineering, a systems integrator for manufacturing automation:

"We are able to legitimately offer our customers what they want — continuous uptime. When you look at what Stratus offers, not only is it a fault-tolerant solution for continuous availability, it's a very simple, whiz-banged solution. The biggest thing that Status has done for our customers is peace of mind."

"With Stratus, one of the biggest advantages for our customers is that not only do they say it's continuously available, but it's proven. Stratus have met and exceeded my expectations. It's the peace of mind knowing that Stratus is continuously up and my plant's going to stay running."

2 | Fault Tolerance through Software

For those customers who choose to run on existing corporate standard x86 servers, software solutions can provide cost-effective fault tolerance efficiently with two off-the-shelf x86 servers and the plant's choice of storage, whether at the network's edge or in the plant.

3 | Server System Visibility

Visibility into all servers, both physical and virtual, is critical in minimizing downtime. With the ability to view how all servers are performing in real time, plant managers can correct problems in real time and use metrics to determine how to configure servers to optimize performance and maximize efficiency.

Continuous availability and full system visibility can be achieved not only through fault-tolerant servers but also through software solutions.

HUNDREDS OF COMPANIES HAVE CHOSEN THE SOFTWARE PATH

Stratus' everRun® software-based continuous availability solution is deployed in hundreds of installations world-wide in environments where availability is critical, including airports, universities, manufacturing plants, public safety centers, retail environments and health care organizations to name a few.

STRATUS SERVER SYSTEM VISIBILITY: ALUNORF

The world's largest aluminum rolling and casting plant, located in Germany, deployed fault-tolerant solutions from Stratus Technologies. Alunorf chose the solutions for their ability to monitor and effectively control plant operations, provide continuous availability, and offer simple administration and a high level of serviceability. That serviceability included self-diagnostic technology and proactive monitoring to automatically report potential problems, as well as the fast replacement of failed components.

Because of its consistently positive experiences with Stratus, Alunorf has gradually expanded its use of Stratus fault-tolerant servers. Today there are four fault-tolerant servers in the hot-rolling mill for the pit and push furnaces, which run around the clock 365 days a year. These systems have run for six years without a single second of downtime.

"The bottom line was that ftServer® did not go out of operation for a single minute. Any other solution would have cost us a few days of work," said Markus Haastert, line manager, Alunorf.

4 | Operational Simplicity

Solutions that are specifically designed for running ICS require shorter implementation times, less intervention and lower costs compared to alternative options. The primary alternative is a server cluster, or a group of connected servers that run ICS. But plants must have the IT expertise, the time and the money to implement and manage clusters, which precludes many of them from pursuing such an option.

STRATUS OPERATIONAL SIMPLICITY: COLUMBIA PIPELINE GROUP

Steve Adams, lead automation electrical engineer: *“When the need for a high availability solution was determined, we looked at Stratus and at other vendors, but the big deciding factor was that Stratus has one machine instead of multiple, and [it has] the high availability solution, that would provide the hardware redundancy, configuration capabilities that we haven’t had before.*

If our solution went down, the operator would be running blind: they don’t have a way to control their units or to see what’s going on with the units at that point. The other aspects of the systems going down would be lost data, which is used by our corporate analytics team to provide prognostics and predictive maintenance on the units and in a case that a component starts to fail, we can plan our downtime, instead of having an unplanned expensive outage. Now that the Stratus ftServer is in place, we never think about it. The phone-home feature, combined with the fact that they contact you when they notice an issue and the next day will send a replacement for the outed component, has really made a difference for us.

I don’t have to lie in bed at night worrying about whether the automation solution is going to go down or not. If I have to give three words to describe our Stratus experience, they would be reliability, configurability and sustainability.”

5 | Easy Serviceability

ICS availability solutions offer the advantage of being not just easier than alternatives to implement but also easier to maintain. For ICS availability solutions to generate the RoA that plant managers need, they need to deliver automatic error detection and fault management, and simple, single points of access for viewing plant system activity.

6 | 1.5x to 2x Longevity

Standard IT systems become out of date with each new release. However, plants rarely invest CapEx in upgrades, so they need ICS availability solutions that will stand the test of time, just as they need their industrial equipment to last for decades. Stratus has proven longevity at industrial sites, and can provide double the longevity of other commercial offerings. Stratus servers have been running for seven to ten years, while most commercial servers typically run for three to five.

STRATUS EASY SERVICEABILITY: CONCORDE REISEMOBILE

Stratus solutions offered advantages that were in line with Concorde's business and technical objectives: around-the-clock access to critical business applications, high availability for standard x86 servers, integrated virtualization, ease of operation, with automatic error detection and fault management, and simple installation and maintenance.

STRATUS LONGEVITY: RUHRKOHLE AG (RAG)

Germany's leading domestic coal producer has had Stratus servers in production for a decade and has not suffered a single breakdown. *"We have had one technical failure. Admittedly it was only one component, a hard disk controller, which failed. We didn't even notice that it had failed originally because the computer just continued to work. So, despite the failure of one piece, our operations didn't stop. And this is exactly why we have bought these systems,"* said Dietmar Misch, automation engineer in the Auguste Victoria mine.

7 | Highest Return on Asset (ROA)

RoA should be a key metric for ICS availability systems just as it is for industrial equipment. Stratus maximizes RoA with servers and software that require little to no maintenance. The ftServers have swappable blades and other features that contribute to maximum return on investment. An additional component of RoA for ICS and industrial equipment is delivering visibility into systems that enables plant operators to maximize uptime and anticipate and fix problems before they happen.

KAPSTONE PAPER & PACKAGING

KapStone chose Stratus for its assurance of 24/7/365 operation and close to 100 percent continuous availability: *“We considered a conventional server, for our server solution. But for our 24/7/365 operation, we were looking for the best uptime assurance we could get,”* said Emerson Beach, director of IT operations at KapStone.

“The downtime for us is about \$33,000 an hour, per machine. You never recover that when you’re running 24/7/365,” said Christophe Deslandes, chief information officer, KapStone Paper and Packaging. *“Investing in a solution built for maximum uptime takes the risk out of the equation. With the ftServer system, we were able to tell plant management that we’re putting in a system built not to shut down. Being able to implement the application and product development within months, instead of years like some of our competitors, is an important advantage.”*

STRATUS ROA: ISUZU MOTORS LIMITED

Isuzu Motors chose Stratus’s solutions for their reliability and performance: *“The line stops when the server stops, so reliability is absolutely required for the server,”* says Kazunari Fukasawa manager, information systems planning, Isuzu Motors Limited. *“Unlike a cluster, it is not necessary to be conscious of the system redundancy, so my team can concentrate on implementing and configuring the software. The ftServer system is better for system developers. If a problem occurs, the ftServer system keeps running without interruption. Stratus ftServer systems are the best answer for a production site with mission-critical business applications.”*

KEY TAKEAWAYS

Modernized Automation solutions enable plant operators to maximize efficiency and minimize both unplanned downtime and the effects of planned downtime. Industrial plants need to choose solutions that will both improve their current operations and future-proof them for the coming of the IIoT.

The pillars for success in choosing OT solutions are continuous availability, server system visibility, operational simplicity, easy serviceability, longevity and highest possible return on assets.

Plant operators need virtualized IT solutions that enable them to do more with fewer resources. Fault tolerance is at the heart of minimizing downtime. End-to-end visibility into systems enables plant managers to increase efficiency, minimize downtime and optimize operations of OT systems.



Stratus Technologies is the leading provider of infrastructure-based solutions that keep applications running continuously in today's always-on world. Stratus enables rapid deployment of always-on infrastructures, from enterprise servers to clouds, without any changes to applications. Stratus' flexible solutions – software, platform and services – prevent downtime before it occurs and ensure uninterrupted performance of essential business operations.

**FOR MORE
INFORMATION,
PLEASE VISIT
OUR WEBSITE**



www.stratus.com/mfg

Or follow on Twitter @StratusAlwaysOn