

BENEFIT FROM



Continuous Availability for SAP Perfect Plant Environments

Lower the costs and complexities
of your plant infrastructure and improve
the decision-making process



Abstract

SAP AG has taken an innovative business approach to delivering manufacturing integration and intelligence to the shop floor through a program called the **Perfect Plant**. The Perfect Plant program brings together best-of-breed solution partners – creating a technology ecosystem that delivers the functionality, integration, data synchronization, and certified platforms that enable companies to optimize their performance. In this paper Stratus Technologies, an SAP Global Technology Partner with a singular focus on ensuring end-to-end availability, describes best practices for the IT infrastructure required to deploy SAP Perfect Plant solutions.

Global Challenges, IT Complexity

To achieve imperatives for efficiency, quality and regulatory compliance, manufacturing, oil, and utilities companies are implementing integrated IT solutions. Manufacturing Execution Systems (MES) are becoming commonplace, and islands of automation are disappearing now that interdependent systems are fundamental to running production and maintaining required records.

At the same time, in order to respond quickly to changing market demands, industrial companies need solutions that allow them to efficiently exchange data between their manufacturing plant floors and the rest of their enterprise in real time. Companies are turning to the SAP® xApp™ Manufacturing Integration and Intelligence (SAP xMII) packaged composite application, which integrates their enterprise resource planning (ERP) applications with systems at the plant. A key component of the SAP Perfect Plant, SAP xMII enables companies to make better business decisions by gathering real-time manufacturing intelligence using data pulled from plant operations.

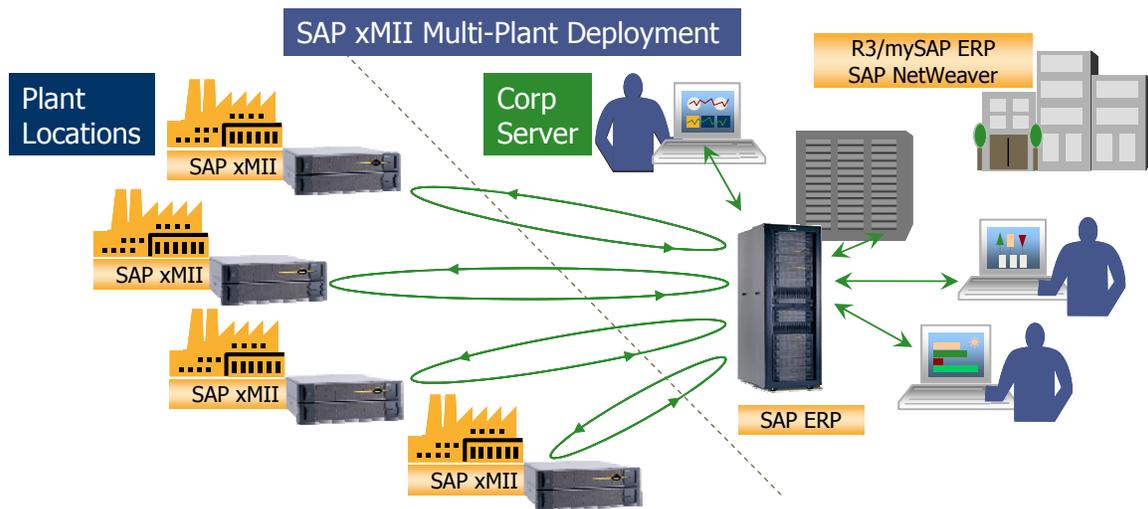
Creating an SAP Perfect Plant

The vision of the SAP Perfect Plant is to create a technology ecosystem that delivers the functionality, integration, data synchronization, and certified platforms that enable manufacturers, oil companies, and utilities to optimize their performance. Stratus plays a key role in this vision, delivering the platform of choice to support the SAP xMII application, as well as other SAP and third-party applications, as they run on the plant floor.

Traditionally SAP applications ran inside a controlled datacenter supported by a dedicated staff trained in managing and maintaining complex IT infrastructure. The datacenter, which is connected to a company's remote plants via a wide area network (WAN), receives data from the shop floor and stores it in a central location. Unfortunately, should the WAN go down, the remote plants are left stranded, disconnected from the main instance of the SAP application. In addition, when regular maintenance occurs, such as installing patches, production on the plant floor can grind to a halt as systems are taken offline to perform the necessary activities in the datacenter.

SAP Perfect Plant solutions can resolve these problems. In this scenario, SAP applications like SAP xMII are deployed onto servers located at the plant. SAP xMII provides real-time connectivity between the plant floor and business operations by linking a variety of plant floor applications to the ERP system. In addition, SAP xMII offers manufacturing visualization and analytics tools that provide plant personnel with a single view of their operations via a role-based dashboard that delivers alerts, reports, and key performance indicators.

Figure 1: Perfect Plant Implementation



This new way of working offers key business benefits to industrial companies. For example, business operations personnel now have access to real-time data – including information on orders, materials, costs, and product quality – that facilitates business decisions, improves asset performance and order fulfillment, and reduces operational costs.

Equally important, having servers running the SAP xMII application located in each plant significantly reduces the costs associated with planned and unplanned system downtime. If a plant is disconnected from the main instance of SAP due to a WAN failure or because of maintenance activities in the datacenter, the SAP xMII server in the plant can provide the required SAP screens and collect all the transactions taking place in the plant and then synchronize them with SAP in the datacenter when it becomes available.

Although SAP xMII and other mission-critical production systems have arrived at the plant, the additional IT specialists to support them have not. Often, operating and maintaining the plant computing infrastructure is one more duty piled onto the already full workload of the plant engineer who oversees a facility's automation equipment. This is far from an ideal situation for critical SAP infrastructures that need to be available 24/7.

New Best Practices Required

When things go wrong, the benefits that advanced IT solutions bring to your production facility can be undone in a flash. Unplanned computer downtime can idle production lines and puts critical manufacturing data at risk of loss or corruption. For some manufacturers, government regulations may leave no choice but to destroy an entire batch of product when production data is lost. The potential impact ranges from thousands to millions of dollars.

As a result, platform robustness, security, disaster recovery practices, and change management of the computing infrastructure must also be retooled to meet the needs of an IT powered, perfect plant. In highly regulated industries such as life sciences and chemical processing, just keeping up with routine change management often overwhelms plant resources, entailing an expensive process to make sure no problems are introduced along with the patches and upgrades.

Complex Solutions Result in IT Pain

- Unplanned application downtime
- Backup, Disaster recovery
- Change Management
 - Ongoing qualification of infrastructure
 - Patch management
- Monitoring and alerting of critical infrastructure and application parameters
- Incident management

Monitoring and alerting on the status of critical systems and applications are an important consideration as well. To avert unplanned downtime and data loss, it is ideal to take preventive steps before issues result in outages. Yet most plant IT infrastructure environments do not have the monitoring tools to provide for this proactive approach. When informative monitoring data is available, a high level of skill is needed to use this data for preventative actions.

Incident management is another concern. Rebooting the system is a common response when a server crashes or blue screen occurs. However, restarting the typical server wipes out information about the system state. The issue and its consequences are likely to repeat because the details needed to identify and fix the root cause of the problem are lost.

Answering Perfect Plant Mandates for Continuous Availability and Operational Simplicity

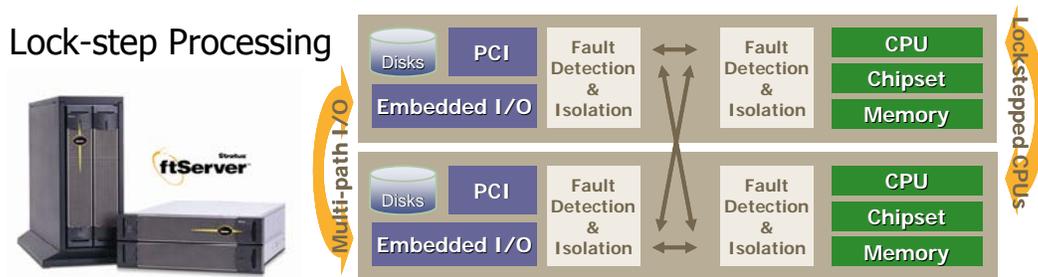
Companies deploying Perfect Plant solutions are looking to Stratus, an SAP Global Technology partner, for continuous availability servers, storage, and services that play an integral role in resolving these issues. Stratus' fault-tolerant ftServer family outdoes high-availability alternatives by enabling industry-leading 99.999% or greater availability, and has become the premier server platform for SAP, MES, and mission-critical automation projects.

	<h3>The Stratus ftServer Value Proposition</h3>
	<ul style="list-style-type: none">▪ Unsurpassed uptime<ul style="list-style-type: none">▪ Eliminates data loss and application outages helping to meet regulatory requirements and improve efficiency.
	<ul style="list-style-type: none">▪ Easy to set up and operate
	<ul style="list-style-type: none">▪ Easy System Maintenance<ul style="list-style-type: none">▪ Remote monitoring and alerting▪ IT support not required for hardware replacement
	<ul style="list-style-type: none">▪ Reduced project costs<ul style="list-style-type: none">▪ Eliminates multiple server licenses▪ Reduces solution implementation and validation time
<p>◆ People ◆ Processes ◆ Technology</p>	

Stratus' current generation of ftServer systems makes continuous availability easy to afford and maintain by taking advantage of standard Intel® server components and off-the-shelf Microsoft® Windows® and Red Hat® Enterprise Linux® operating systems.

Stratus ftServer systems prevent unplanned downtime caused by server component failure and incorporate unique software and serviceability features that also address planned downtime. Our Continuous Processing® technology and services reduce downtime ten-fold or more over competing cluster alternatives without burdening your staff with operational complexities or high costs. Absolutely no modifications to software or special configuration changes are necessary to take advantages of the ftServer system's advanced availability features.

Built into every ftServer system, lockstep technology uses replicated fault-tolerant hardware components that process the same instructions at the same time. In the event of a component malfunction, the partner component acts as an active spare that continues normal operation. This occurs automatically without any human intervention. There is no downtime, no transaction or data loss, and no performance degradation.



Failsafe system software works in concert with lockstep technology to prevent many software issues, including transient errors, from escalating into outages. The ftServer hardware and software handle most errors transparently – shielding the operating system, middleware, and applications software.

ActiveService™ architecture comprises management and diagnostic features that capture, analyze, and report on system hardware and software issues and facilitate problem source identification. Automatic “call home” technology alerts users of issues without any impact on your computing environment.

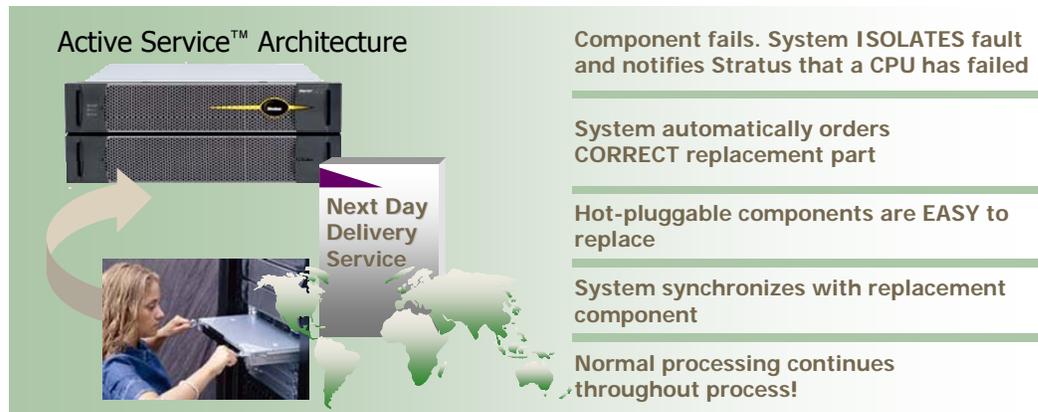
Active Upgrade™ technology mitigates planned downtime by enabling users to perform online software upgrades and operating system hot fixes and patches without taking the server or application offline.

ftScalable Storage Adds Another Dimension of Availability

Stratus' ftScalable Storage Array adds another level of fault-tolerant protection for Perfect Plant environments. Configurable to 10.8 TB of data storage, this economical, compact array addresses dedicated, shared, and networked storage requirements. Advanced technologies within the system provide up to 50% better cache performance, RoHS- and WEEE-compliant battery-free backup, and point-in-time snapshot protection against data loss or corruption. And, like Stratus servers, ftScalable Storage is simple to operate and maintain – even in remote plants without fulltime IT support.

Proactive 24/7 Support Model

ftServer systems and ftScalable Storage are always on the job monitoring their own operation. Maintenance software in each ftServer system automatically monitors, diagnoses, and reports system events, accurately isolating faults to the component level. The global ActiveService™ Network provides a worldwide infrastructure that, with the proper authorization, enables service experts to remotely investigate and resolve critical problems 24/7. Replacing a failed hardware component is a simple process of removing the failed slice and plugging in the replacement unit, which can be done by personnel with only minimal training.



Continuous Availability for the Business Process

Stratus Continuous Availability Lifecycle Management (CALM) Services offer you a holistic approach to maximizing uptime, performance, and integrity of a mission-critical IT infrastructure that can span hardware and software solutions from multiple vendors and extend to entire business processes.

Addressing server availability is an important step, but many additional components in the IT infrastructure are also required to deliver a service to the end user. For example, a Perfect Plant application might consist of several servers, applications, and any number of network components that all have to work properly. Stratus Continuous Availability Lifecycle Management (CALM) Services respond to this requirement with a portfolio of consulting offerings and a subscription-based, scalable managed services platform. The CALM methodology and service delivery mechanism support mission-critical IT environments more effectively and cost-efficiently than traditional onsite service models. Furthermore, a CALM Service subscription lets you get started quickly, without heavy expenditures for additional in-house personnel and enterprise management technology.

Role of Stratus in the SAP Perfect Plant

As an SAP Global Technology Partner, Stratus provides the ftServer platform and services that enable continuously-available solutions without adding complexity. Stratus infrastructure solutions are perfect for running the applications that help you achieve “perfect plant” status.

From a technology perspective, the Stratus ftServer platform allows companies to reduce complexity by delivering out-of-the-box, fault-tolerant capabilities that enable you to simply plug in the system and turn it on. The 99.999% uptime availability and operational simplicity delivered by ftServer systems are essential to realizing the potential of today’s powerful plant applications. The ftServer platform, which is SAP certified, integrates seamlessly into existing Windows (or Linux) environments, helping to protect existing investments.

End-to-end continuous availability is best approached by looking at the IT environment holistically. To that end, Stratus provides comprehensive professional services that can assess, design, size, build, deploy, manage, and support an IT infrastructure running the most demanding applications.

Once implemented, Stratus support services are available to provide ongoing support and performance assessment services to ensure your solution continues to operate optimally and that necessary improvements are made over time. We provide proactive monitoring support services that enable our availability experts to remotely review the performance of your servers, identify any critical problems, and then assist in rectifying those problems before outages occur.

Through focused professional services, the ftServer platform, and expert support services, Stratus can help you lower the cost and complexity of your plant infrastructure, reduce the amount of downtime within your operations, simplify the administration of your servers, and improve your business agility.

See the Perfect Plant in Action

Stratus ftServer systems are powering the Perfect Plant Innovation Lab, located in SAP's U.S. headquarters in Pennsylvania. Here customers can see, firsthand, true ERP to shop-floor integration running on fault-tolerant servers from Stratus.

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