

Stratus Technologies

Uptime. All the time.

Fault-Tolerant Servers for Automation and MES



Stratus Technologies Korea

이 동 홍

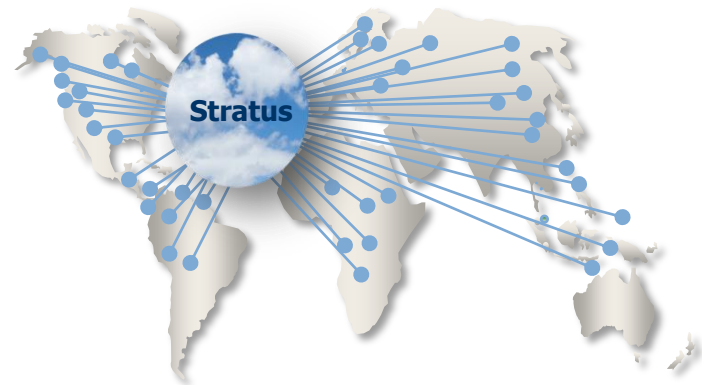
Feb 27, 2013

Stratus Technologies



Delivers the highest uptime assurance in the industry using resilient technologies combined with proactive availability management and monitoring services

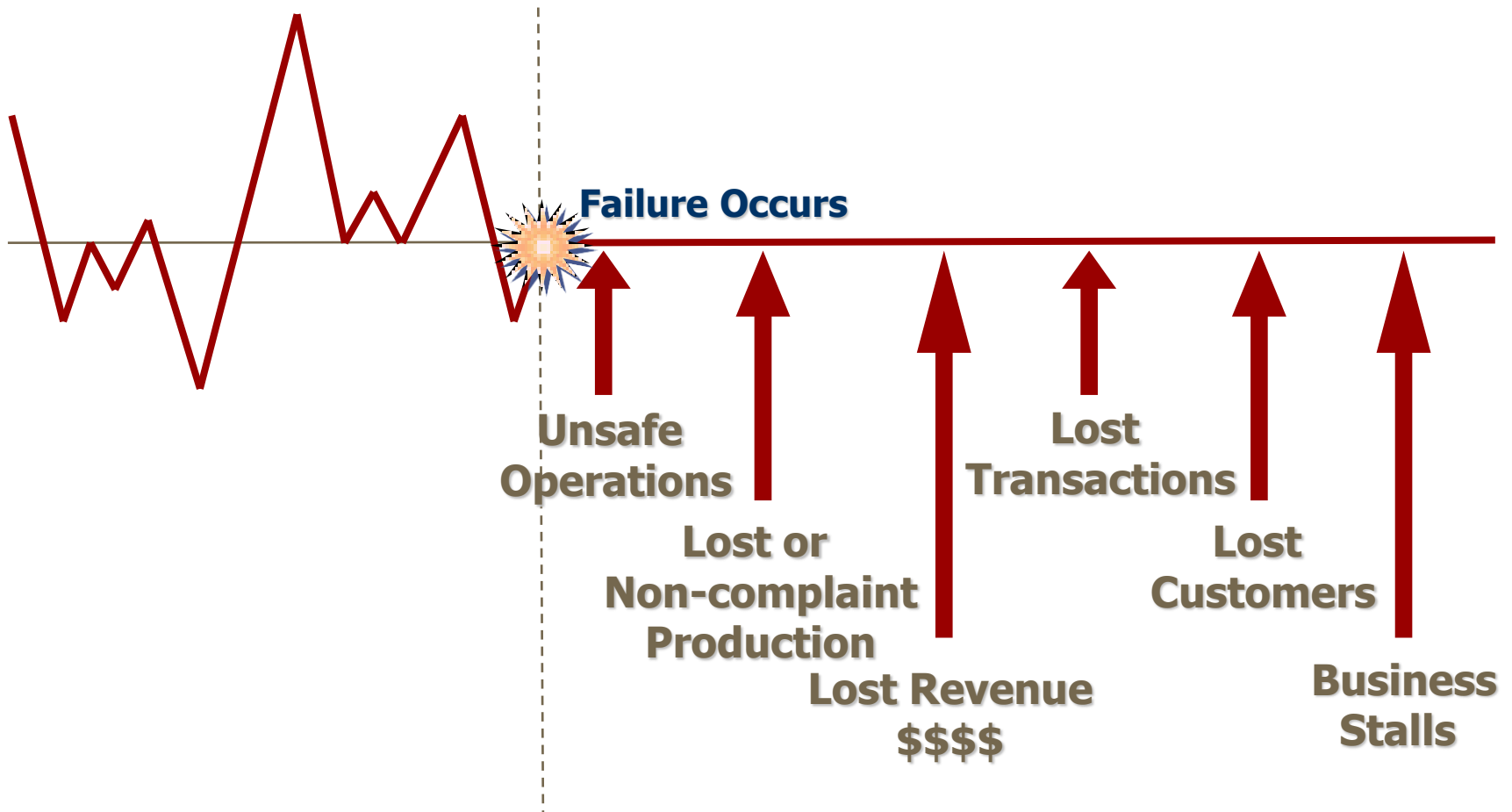
- Patented, time-tested technologies for over 30 years
- Proactive monitoring of hundreds of events
- Preventative analytics
- Highest customer retention
- Uptime-centric culture



Minimizes average server downtime to 1 minute/year

Stratus Technologies: Uptime = Peace of Mind

Industrial Applications Must Not Stop



If it does stop, who's there to fix it?

Complex Plant Infrastructure Leads to IT Pain

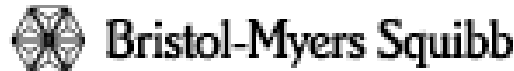


- Unplanned Application Downtime
- Excessive Planned Downtime
- Difficult Change Management
- Nearly impossible to root cause problems



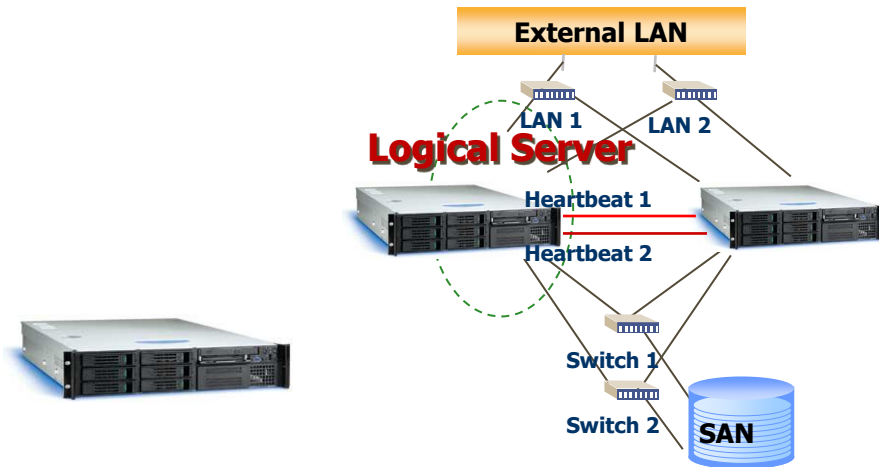
**Stratus Solutions and Services
Addresses These Issues**

The Leading Companies in the World Depend on Stratus



Running their most critical applications

Uptime Infrastructure Options



everRun[®] MX

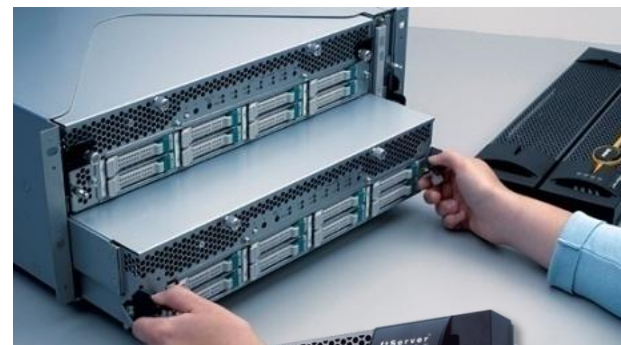


Traditional Server	2-Node Cluster	Avance [™] Software	ftServer [®] System
Low	← Uptime	Level	→ Highest
<ul style="list-style-type: none"> ■ Low cost; not HA ■ Single points of failure: CPU, I/O memory, hard drive, ■ High risk of data loss 	<ul style="list-style-type: none"> ■ HA; requires cluster expertise to implement ■ Requires SAN, 2 servers ■ Expert failover scripting / testing/management ■ Multiple software images ■ Data loss during failover 	<ul style="list-style-type: none"> ■ Superior uptime ■ Prevents downtime and data loss ■ Predictive failure detection and handling ■ Automated Migration: ■ Simple to install, use and maintain 	<ul style="list-style-type: none"> ■ Fault tolerant HW w no single points of failure ■ Zero downtime and data loss ■ Detects, isolates and reports faults ■ Simple to install, use and maintain ■ Online serviceability

Stratus Fault-Tolerant Servers



- Redundant hardware
- Zero failover time
- Application transparency
- Hot-swappable components
- Hardened drivers
- In-flight data integrity
- 24/7/365 service infrastructure
- Typical configurations distributor pricing: \$12,000 to \$28,000



Resilient Servers



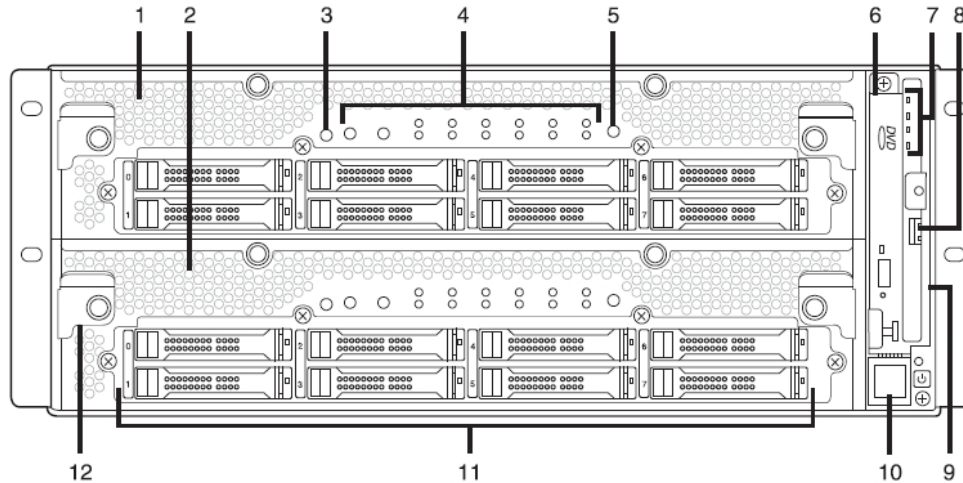
Duplex Hardware Components



- Purpose build to provide Uptime unachievable by standard servers
- Manage like single x86 server
- Ideal for mission critical apps in the data center or remote sites

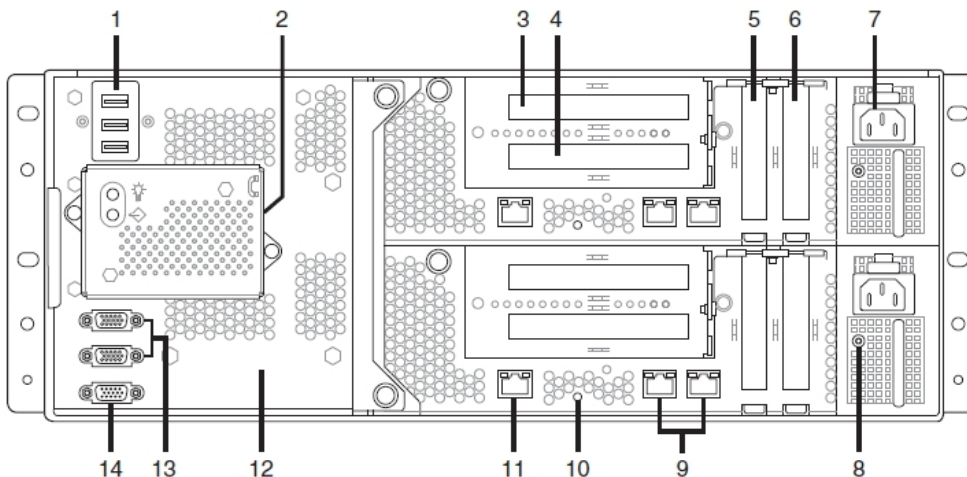
ftServer의 구성

전면부



1. CPU-I/O enclosure 1
2. CPU-I/O enclosure 2
3. System ID 버튼
4. System Visual Fault Indicators (LED)
5. NMI (Dump) 버튼
6. DVD R/W
7. 전면부 패널 LED
8. USB 포트
9. 전면부 패널
10. 전원 버튼
11. 2.5" 내장 디스크 드라이브 (16개)
12. 조임 나사

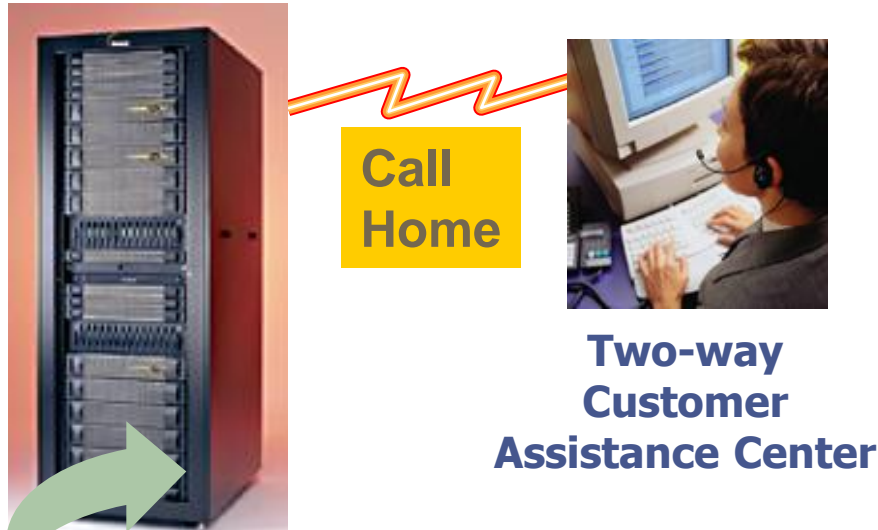
후면부



1. USB 포트 (3개)
2. ActiveService 모듈
3. PCI adapter slot (PCIe 또는 PCI-X)
4. PCI adapter slot (PCIe 또는 PCI-X)
5. PCIe 어댑터 슬롯 (low-profile)
6. PCIe 어댑터 슬롯 (low-profile)
7. CPU-I/O enclosure 전원리셋터클 (2개)
8. 전원공급장치 LED
9. 내장 10/100/1000 네트워크 포트 (4개)
10. CPU-I/O enclosure LED
11. 내장 10/100 관리용 네트워크 포트(2개)
12. 시스템 백플레인
13. Serial (COM) 포트
14. VGA (모니터) 포트

Automated Uptime Layer

ActiveService Architecture at Work



1. Unit fails - system isolates fault and continues operation with redundant unit

2. Call home technology reports fault opens support issue with the Stratus Customer Assistance Center (CAC)

3. CAC contacts customer to confirm issue and initiates shipment of replacement part

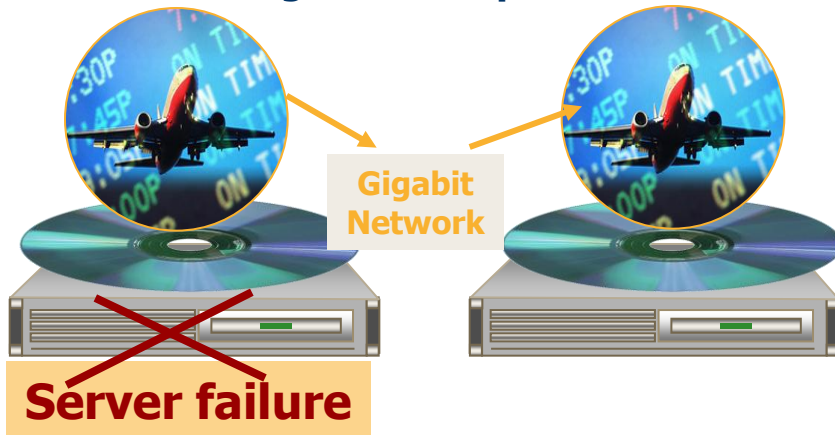
4. Customer receives and replaces part - system synchronizes with replacement and continues operation



Fault Tolerance is Not a Single Technology Feature

Software Lockstep

1st generation product



- Protects data by replicating state to another VM via network
 - Complexity,
 - Blackouts during failover
- No failure diagnostics or transient error protection; faults may recur/propagate to other server

IMPACT: Does not provide sophisticated data protection or diagnostic features

Hardware Fault Tolerance

4th generation product backed by 28 years of FT expertise

>99.999% uptime

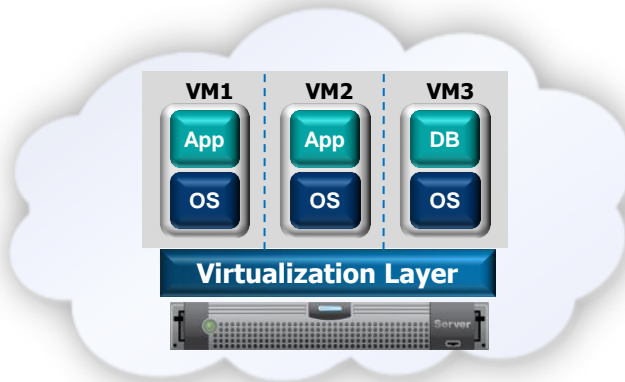


- Hardware lockstep eliminates failover
- Automated built-in online diagnostics, error isolation, reporting, resolution
- Root-cause problem analysis for server, virtualization layer and guest OSs
- No blackouts; in-flight data preserved
 - Transient error protection

IMPACT: Total availability. Proven solution provides zero downtime and data loss

Strategic Direction

New



- Deliver cloud availability platform including FT cloud layer and comprehensive availability manager
- Establish Stratus as the de facto standard for Business Continuity in virtualized cloud environments

Current

Stratus
OpenVOS

Stratus
ftServer™

everRun® MX

Stratus
AVANCE™

- Maintain our position as the industry-leading provider of uptime solutions
- Expand offerings and presence in Software uptime market

시스템 제원

Note: All I/O options specified in logical count, physical count is 2 times numbers specified

2700
Low-end system



4700
Mid-tier system



6400
High-end system



	2700 Low-end system	4700 Mid-tier system	6400 High-end system
Processors	1-socket	2-socket	2-socket
CPU <i>QPI Performance</i>	Quad-core 1.8 GHz 8.5 GT/s QPI	Quad-core 1.8 GHz 8.5 GT/s QPI	Octa-core 2.6 GHz 10.7GT/s QPI
CPU Cache	10 MB Shared	10 MB Shared	20 MB Shared
Memory Bandwidth	34.1 GB/s	68.2 GB/s	85.3 GB/s
Memory Slots	8 DIMM Slots	16 DIMM Slots	16 DIMM Slots
System Memory	32 GB	256 GB	256 GB
Embedded	SAS, 2x ENET (10/100/1000) , 3x USB2.0 (rear), 1x USB2.0 (front), 2x COMM, VGA, BMC, DVD R/W (front)		
PCI Slots Embedded	2 x PCIe	2 x PCIe	4 x PCIe
PCI Slot Expansion	Not Available	2 x PCIe Gen 2	Included
RAID 1 Disk (Internal)	8 x 2.5" SAS Disks		
Form Factor	4U Rack	4U Rack	4U Rack

Storage Options



Internal Storage

- Software-based RAID 1 and 1+0; 16 disk capacity
- Capacity (usable)
 - 8TB maximum (7200 RPM SAS)
 - 2.4TB maximum (15K RPM SAS)



External ftScalable Storage

- Stratus sold & supported
- Hardware RAID
- Fiber Channel:
Direct or SAN attach
- Capacity (raw)
 - 72TB maximum (7200 RPM SAS)
 - 21TB maximum (15K RPM SAS)



Advantages of the ftServer



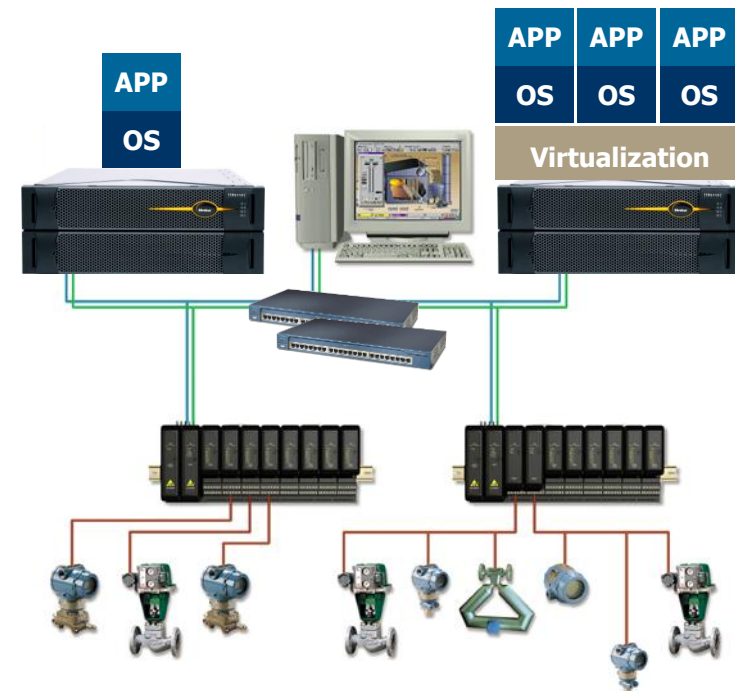
- **Unsurpassed uptime**
 - Eliminates data loss and application outages
 - Meets regulatory requirements (i.e. life sciences)
- **Easy to setup**
- **Easy System Maintenance**
 - Remote monitoring and alerts
 - Plug-and-play components
 - IT support not required for hardware replacement
- **Reduced project costs**
 - Saves on software licensing (Windows, VMware, etc.)
 - Reduces implementation and validation time
- **Root Cause Analysis**
- **Long-term platform support**
 - Stratus has systems in production for over 15 years

Finding Opportunities - Applications That Need Availability



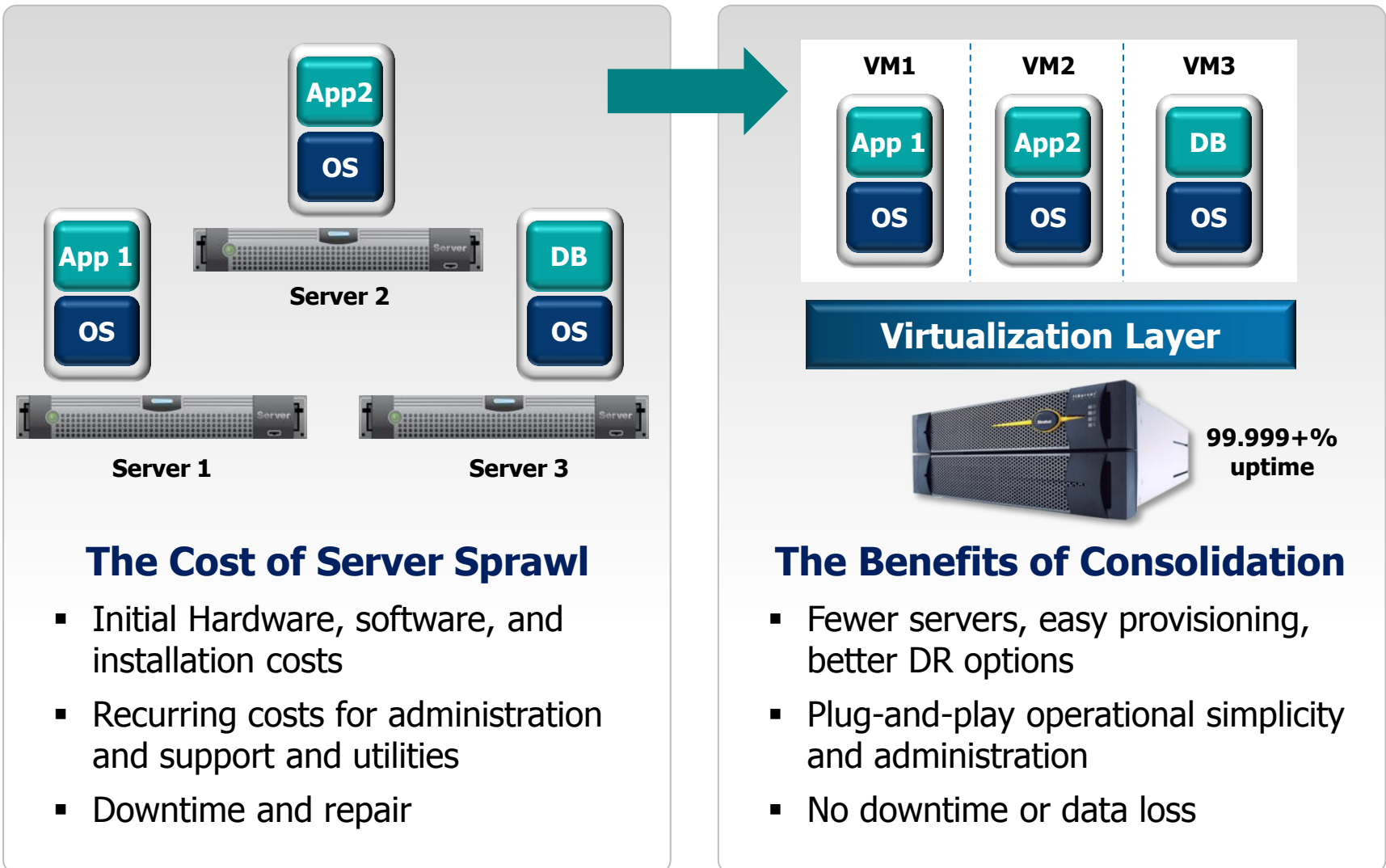
Typical Applications deployed on Stratus Servers include:

- ✓ View SE
- ✓ Batch
- ✓ Historian
- ✓ VantagePoint
- ✓ ProductionCentre MES
- ✓ Virtualization



Eliminate the Impact of Downtime and Data loss

Leveraging the ftServer for Virtualization and Consolidation



Fault-Tolerant Virtualization



**Automatic
5-Nines+
Availability**

You don't need:

- Multiple licenses
- Second server
- FC Switches
- HA Network
- External SAN

**Lowers Costs
& Complexity**

*When you put all your eggs in one basket
make sure that the basket won't get dropped*

Example: Amalgamated Sugar



Sugar plants in Idaho rely on Rockwell Software to perform many functions including visualization using RSVIEW. Stratus fault-tolerant servers gave Amalgamated the confidence to virtualize these applications and achieve a significant savings

- ◆ Stratus® ftServer® systems ◆ VMware vSphere™ virtualization
- ◆ Total Assurance support services

- (1) ftServer 4500 running VMware at each plant
- Each server runs 4-8 VMs including RSVIEW, domain name server, and domain controllers
- Benefits include eliminating unplanned downtime, lowering costs, and simplifying management of infrastructure

Uptime = Savings

Example: NASA Kennedy Space Center



Losing control during a launch procedure is not an option. So Stratus ftServer platforms were selected to support virtualization of Rockwell applications. The first pilot project has been implemented and is running flawlessly

- ◆ Stratus® ftServer® systems ◆ VMware vSphere™ virtualization
- ◆ Total Assurance support services

- (1) ftServer 4500 running VMware supporting three virtual machines
- Benefits include migration of Rockwell software off of old computer hardware, better DR options, and uptime assurance for all virtual machines

Uptime = Safety

Example: Pfizer MES



It's not just the platform, it's the total service model that delivers the uptime that Pfizer needs to run MES with full Electronic Batch Recording

Rockwell PMX MES ♦ Stratus® ftServer® systems ♦ Total Assurance Support

- 17 manufacturing facilities worldwide run Rockwell MES on Stratus ftServer systems
- ftServer systems protect against data loss and unplanned downtime
- FDA reporting requirements make preventing data loss a top priority
- Operational simplicity reduces the burden of qualification and validation in regulated environments

Uptime = Compliance

Example: Transneft Pipeline



The plug-and-play simplicity of the ftServer platform allows deployment of SCADA into very remote locations and keeps it up and running. Sites often have limited or no computer expertise so keeping the infrastructure simple is essential.

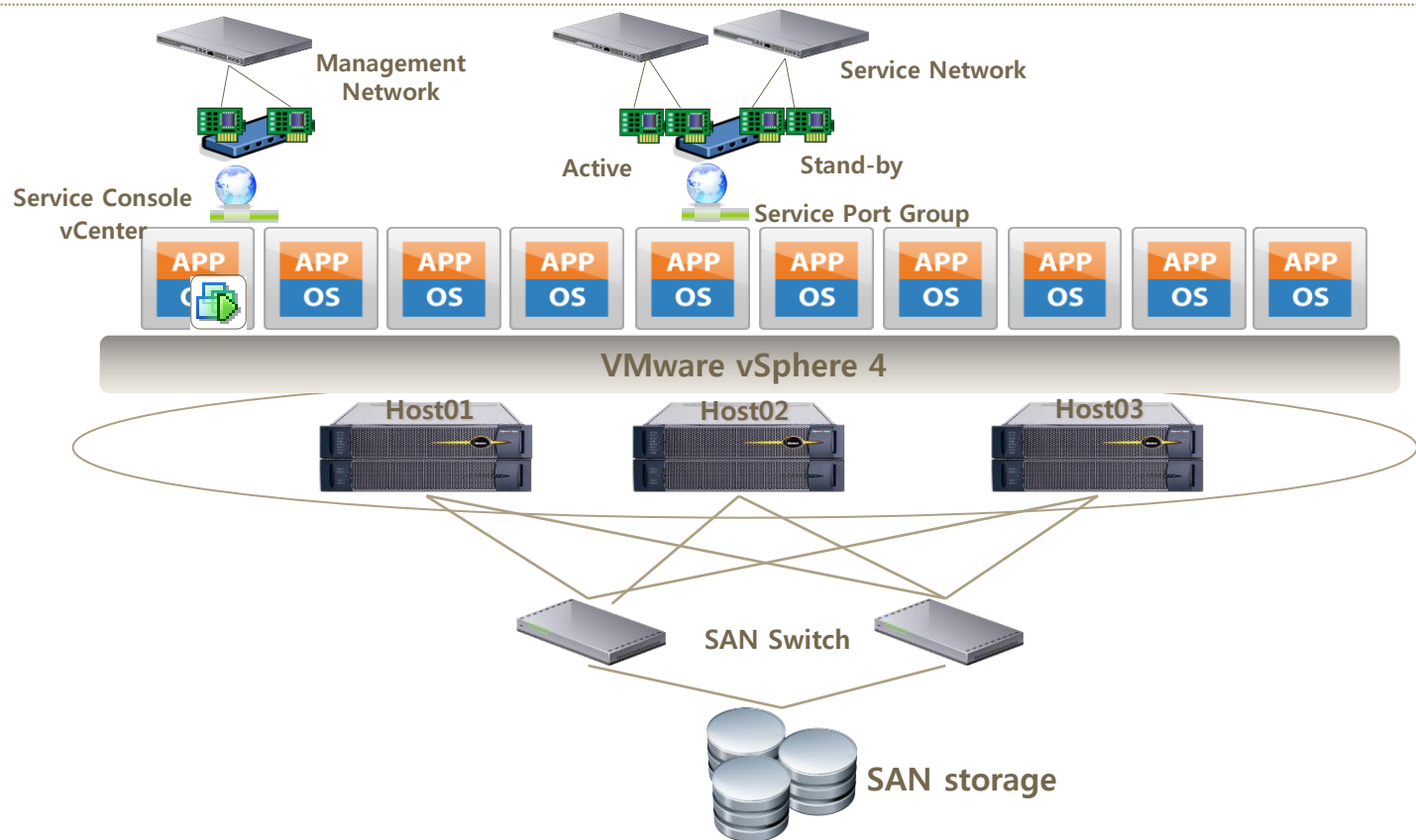
◆ Stratus® ftServer® systems ◆ Windows 2008

- Transneft the state-owned Russian oil transportation company has 30,000 miles of pipeline
- SCADA is being deployed for monitoring pipeline conditions including: leak detection, seismic control, and data acquisition
- A Stratus ftServer was deployed every 190 miles along an upgraded segment
- (37) ftServer 2600 and (20) ftServer 4500

Uptime = Supportable

사례-vmware/ftServer 통합시스템

- 시스템 개요
 - 무정지 통합 가상화 시스템 구축
- 도입효과
 - H/W와 Hypervisor의 99.999%이상 가용성 보장을 통한 Guest OS의 안정적 서비스 제공
 - 안정적인 시스템 통합구축을 통한 획기적인 비용절감



Sales Support



Stratus is a global IT infrastructure company with sales resources in many countries. Our relationship with RA is global and our local sales team is compensated to support local RA sales efforts.

- Stratus can provide in-depth technical overviews to your prospects
- Answer infrastructure questions in RFP documents
- Help specify the right equipment for your opportunity
- Help you overcome sales objections

Contact Stratus Korea or Partner to local support:

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Conclusions

Stratus ftServer Overview



Total Uptime Assurance

- High-performance fault tolerance leveraging up to 12 Intel® processor cores
- 99.999%+ uptime
- Hardware redundancy and lockstep technology
- Load-and-go operational simplicity
- Single software image
- Fault-detection, isolation, and call-home part ordering
- Zero data loss
- Hot plug-and-play components
- Low cost-of-ownership
- and all the benefits of VMware vSphere™ virtualization . . .

Simple is Beautiful

Simplify with Fault Tolerance

- A "never fail" single image system
- No clustering
- No enqueue replication
- No specialized DBAs for scripting
- No lost transactions

Managed like a regular server by VMware vSphere

- Managed with VMware vCenter™ Server
- Leverage mobility features VMotion™, DRS and Storage VMotion
- Implements seamlessly with ordinary servers from Dell and HP



Automatic
Call Home

Stratus 24/7
Worldwide
Support



The \$50,000 Guarantee



No Fear virtualization

- Virtualize your SAP environment
- We're putting our money where the FEAR was
- Only Stratus guarantees 100% uptime for VMware vSphere virtualization*

*Terms and conditions apply

Learn more, contact:

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- www.stratus.com



Questions?

