



Industrial IT in a Connected Enterprise

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Failure Avoidance instead of Recovery

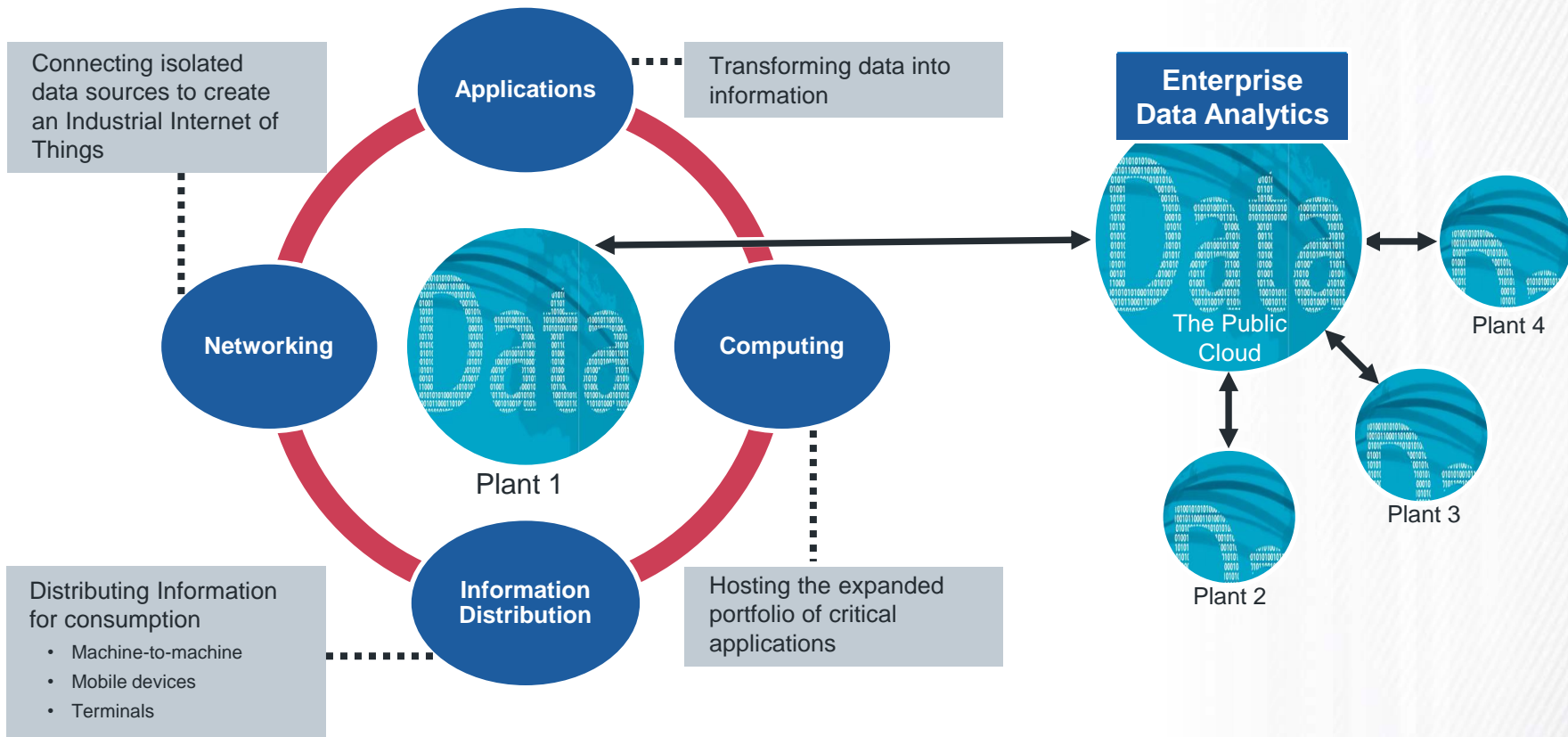
- 30+ patents for our time-tested technologies
- 21,000+ systems installed worldwide
- IT Solution for the OT World
- Award-winning global support with highest customer retention in the industry

Founded in 1980:
30 Worldwide Locations

Corporate Headquarters:
Maynard, MA

Private Ownership:
Siris Capital Group

Building blocks of a Connected Enterprise



Columbia Pipeline's Connected Enterprise

Columbia Pipeline Group delivers over 1 trillion cubic feet of natural gas per year of natural gas to across 16 USA states through 15,000 miles of natural gas pipeline and 37 storage fields



- 103 compression stations
- Modernized automation using Rockwell software suite
- Leveraged server virtualization and Stratus ftServers

Intelligent Pipeline Solution

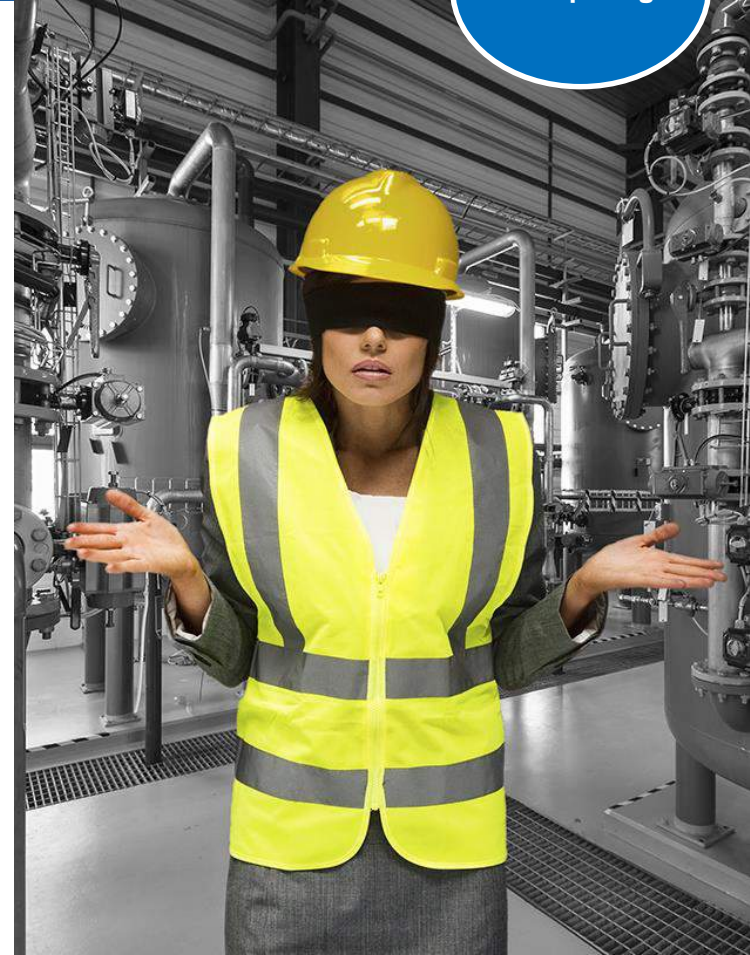


By modernizing its operational environment with an information-enabled, virtualized system, gas transmission company improved reliability and reduced maintenance costs by \$2.3 million.

Operational simplicity is key

Computing

- Industrial solutions must be designed for the environments where they are deployed:
 - Unmanned operations
 - Lack of IT clustering skills
 - Complexity is the #1 cause of downtime!



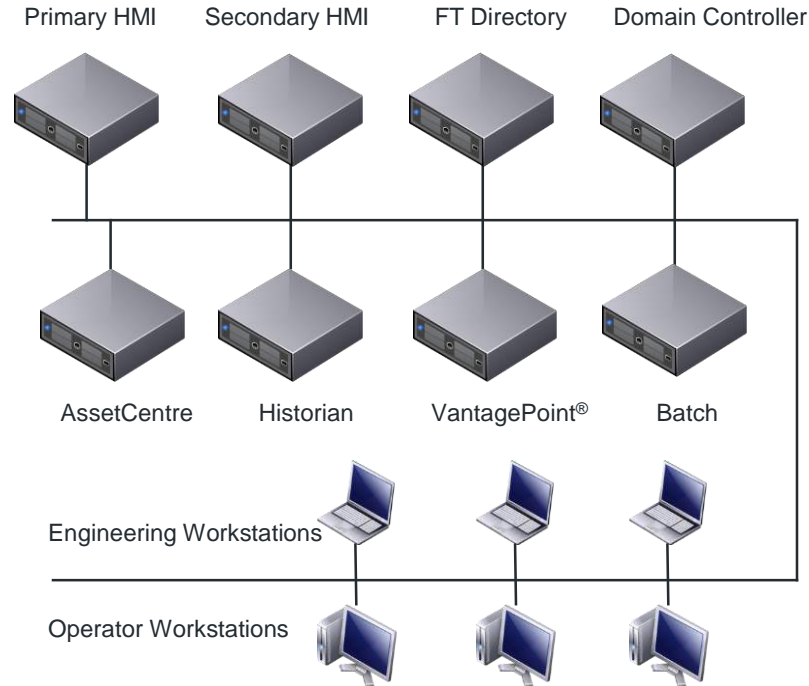
Unplanned downtime a significant issue

Computing

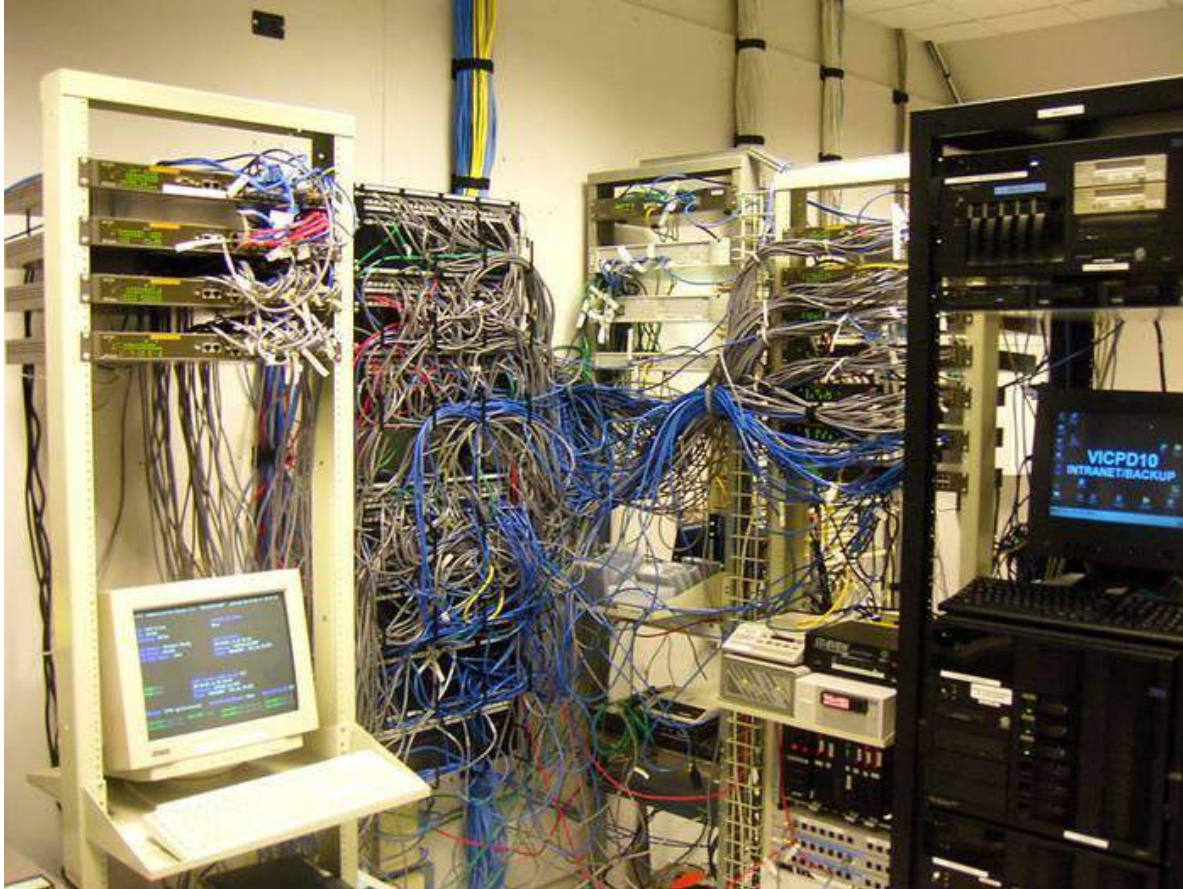
- Failure of industrial applications causes multiple issues
 - “Blindness”
 - Inability to control remote locations
 - Loss of data/report generation
 - Regulatory compliance
 - Analytic purposes
 - Manual operation
 - Deployment of resources into field
 - Increased costs
 - Loss in integration



How the Plant Floor Network Grows

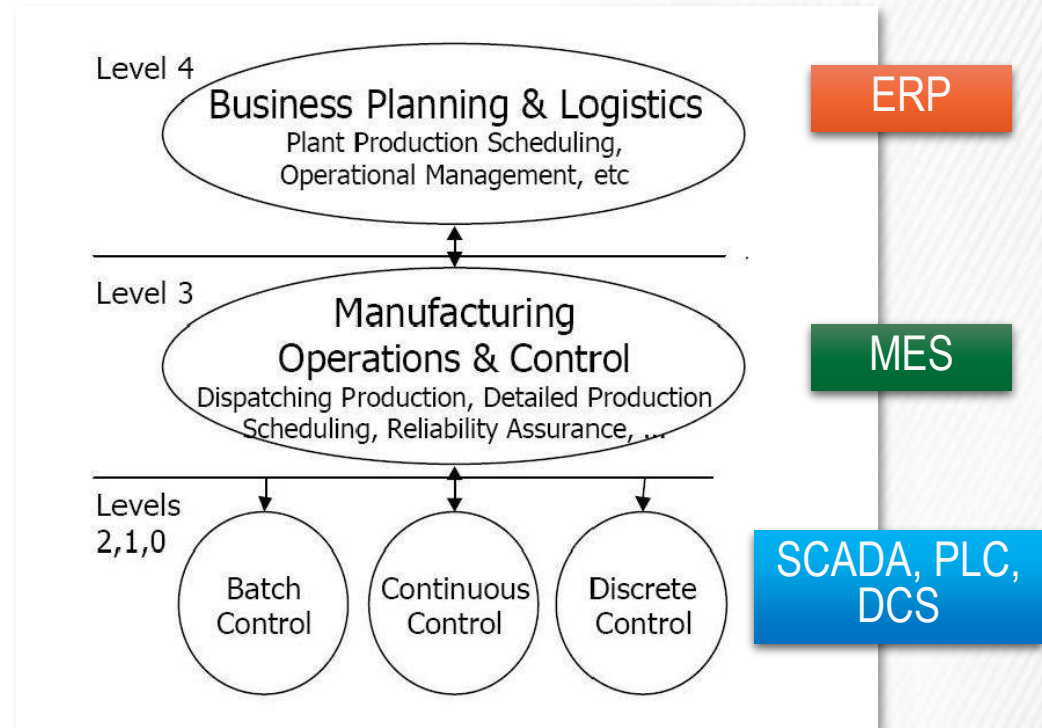


Server Jungle!

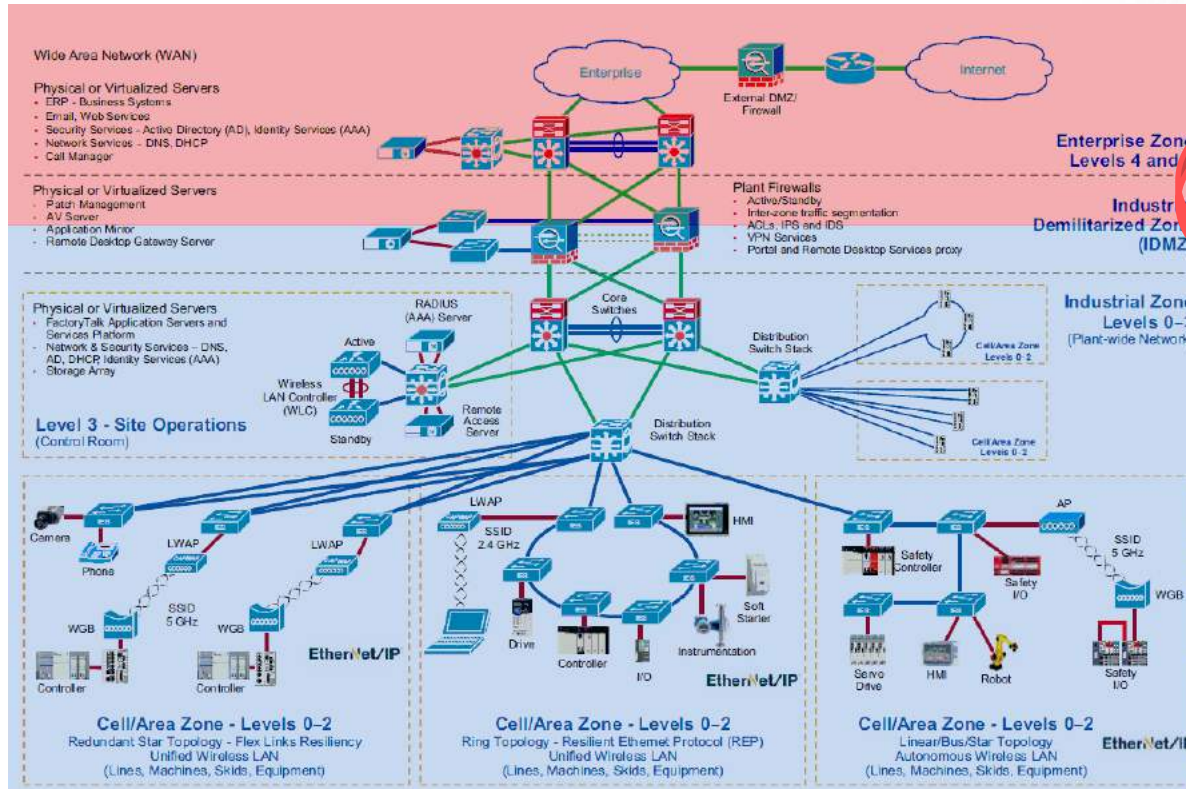


Increasing need for integration of networks

- ISA-95 → International Standard for developing an automated interface between enterprise and control systems.
- Operational Technology (OT) historically lived in Levels 0, 1, and 2 of the ISA-95 Hierarchy.
- Integrating elements of Levels 3 and 4 are increasingly being asked of Distributors / Integrators, especially with regard to how data flows.



Logically Speaking



IT

convergence

OT

Requirements For Industrial Compute Resources



Factory requirements:

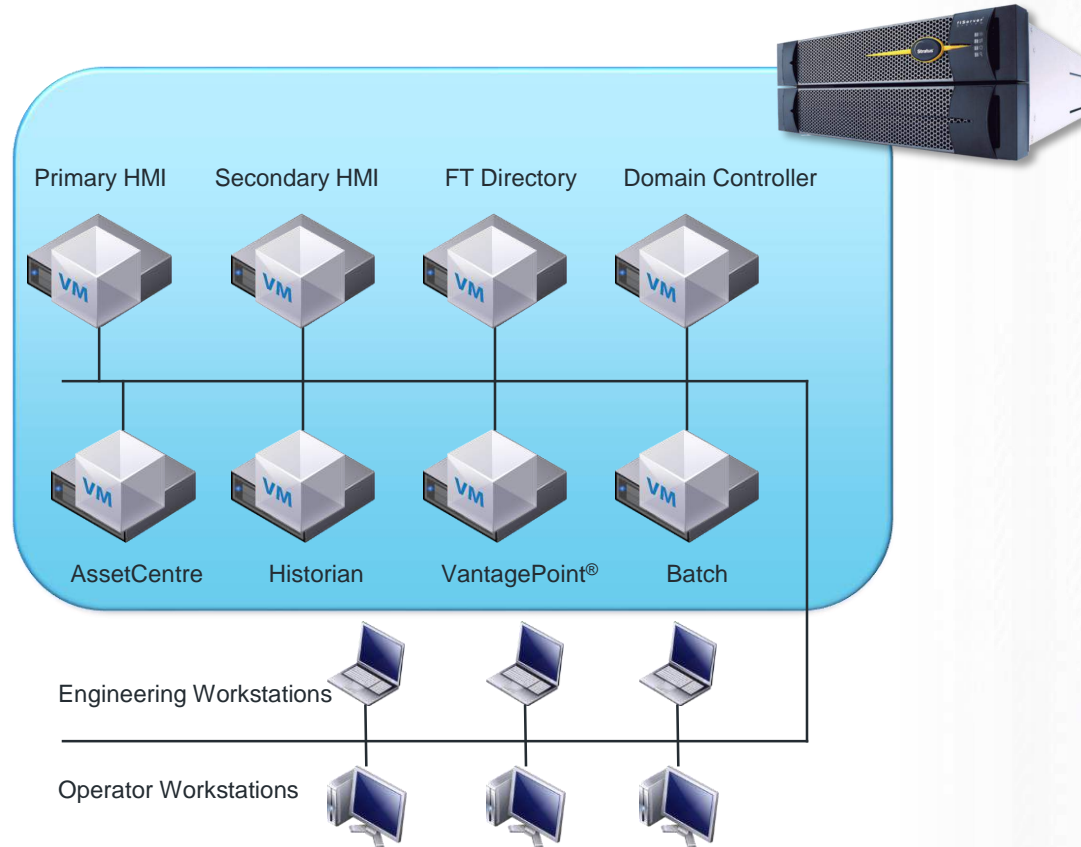
- Simple to deploy
- Always-on availability
- Simple to maintain
- Secure
- Long platform life

Factory compute requirements differ from enterprise solutions

- 1) Virtualization
- 2) Thin Clients
- 3) Fault-Tolerant Computing
- 4) Performance Monitoring
- 5) Low Admin Threshold (Set & Forget)

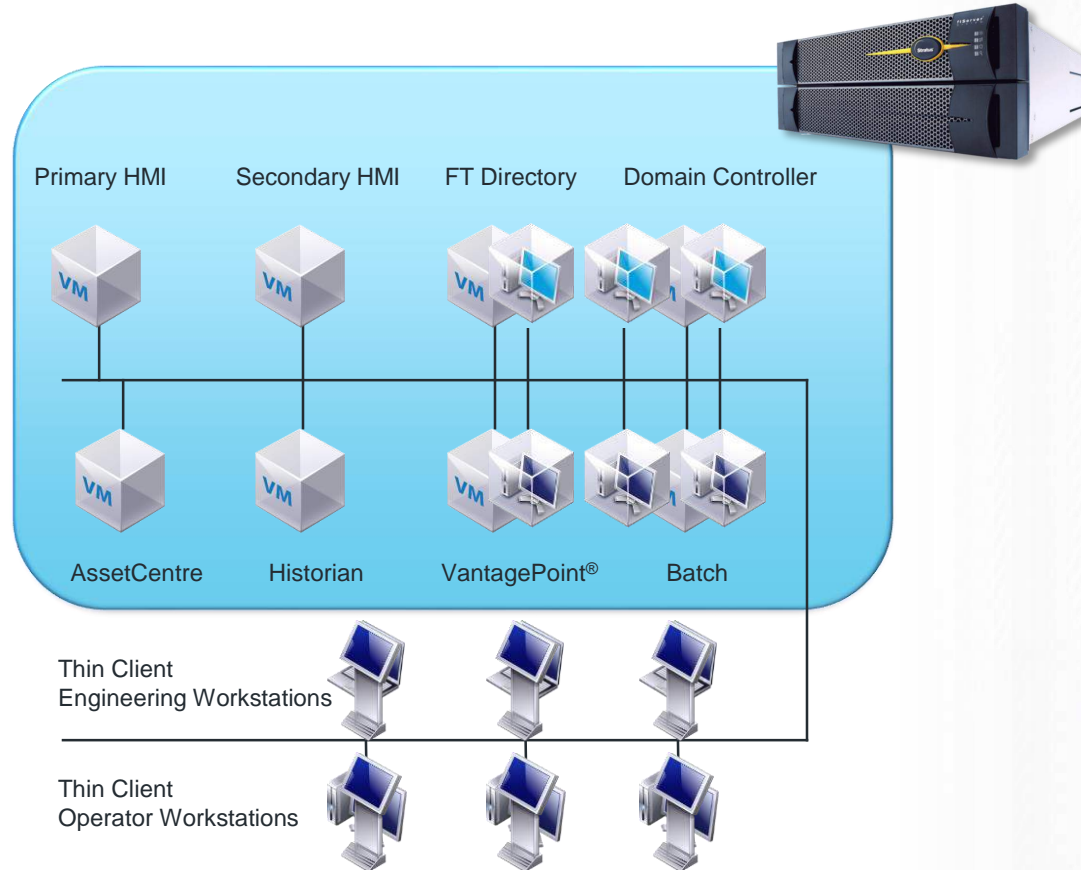
Generation 1 Architecture

- **Complex**
- **Difficult to manage**
- **Requires a lot of space**
- **High power consumption**
- **Many single points of failure**
- **Increased licensing costs**
- **High Total Cost of Ownership**

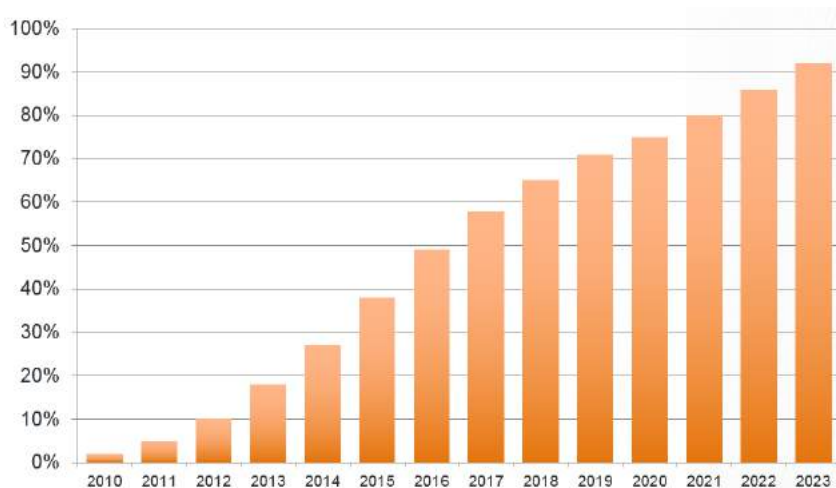


Modern Architecture

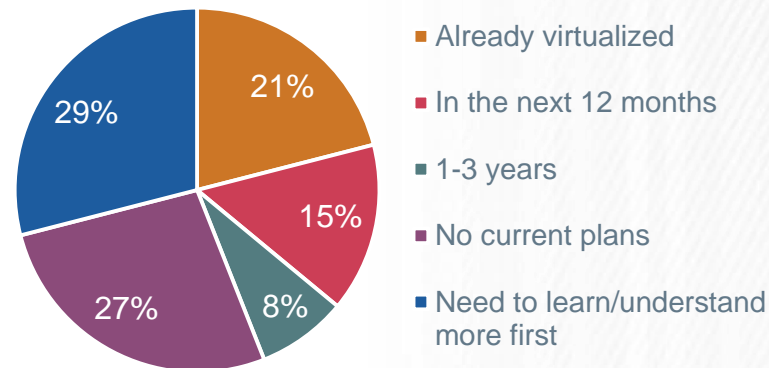
- Converged
- Easy to manage
- Requires less space
- Reduced licensing costs
- Low Total Cost of Ownership
- Longer lifespan



Virtualization solves many challenges



When are you planning to move to a standard based virtualized environment?

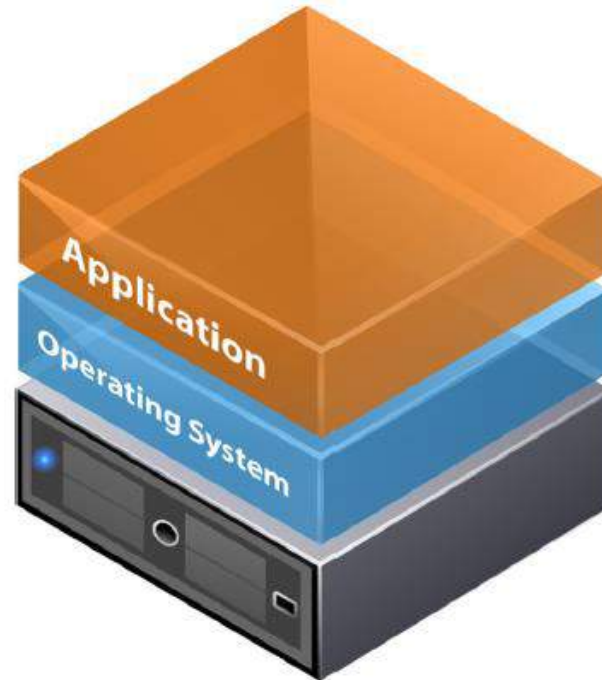


IT world has largely virtualized

| OT world lags behind

Traditional Server Architecture

Traditional Server are based on one operating system per physical server

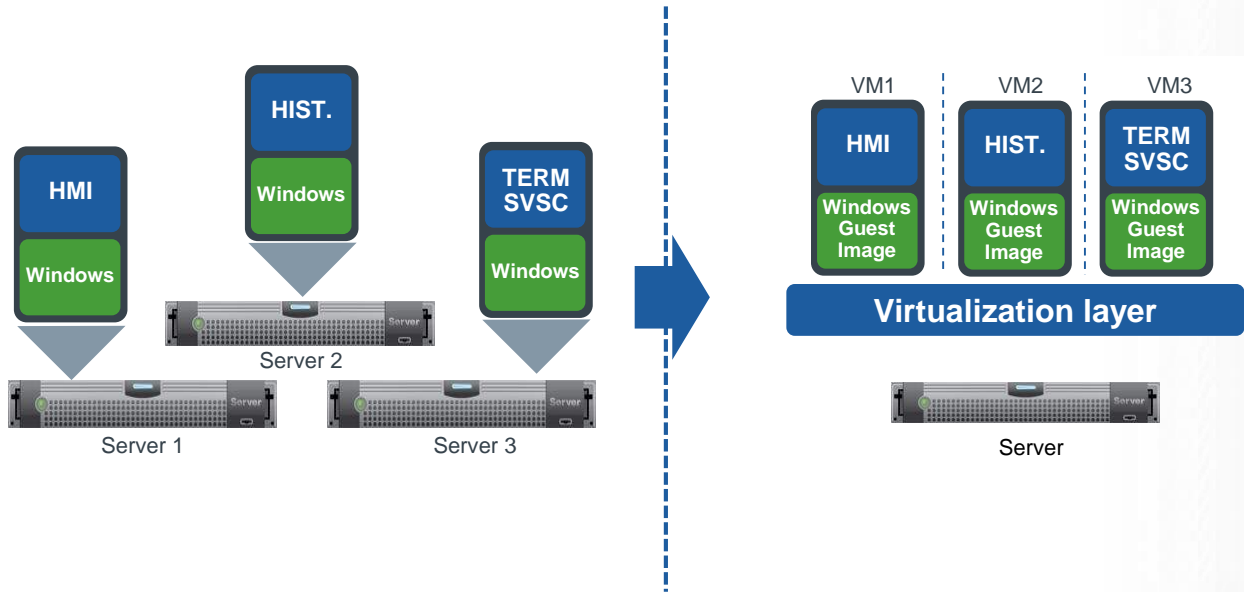


Hardware Virtualized Servers

Hardware virtualized servers remove the dependency of the hardware from the operating system, and allow multiple separate operating systems to share common hardware.

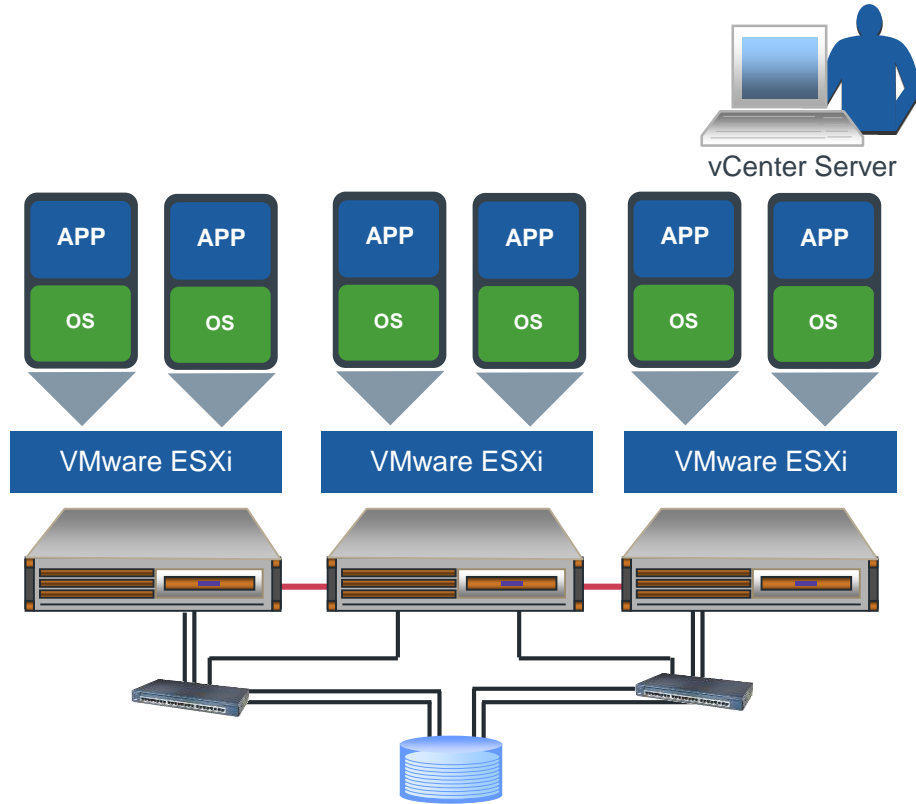


Consolidation increases the impact of downtime



When you put all your eggs in one basket that basket needs to be strong

Typical VMware high availability clustering



- Three servers
- External storage (SAN)
- Redundant switches
- vCenter Server
- Multiple Licenses
- VMware Essentials Plus License (\$4,000)

Stratus fault-tolerant hardware solution



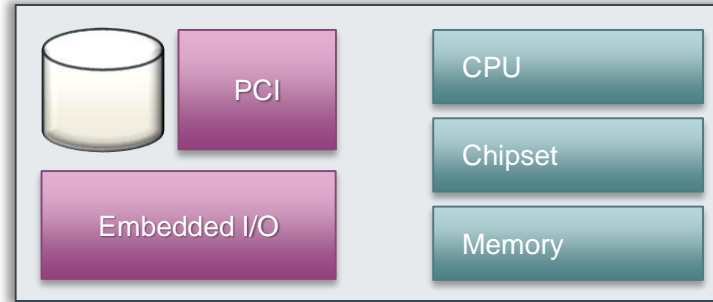
✓ Simple ✓ Lower Cost

✓ Higher Availability

You don't need:

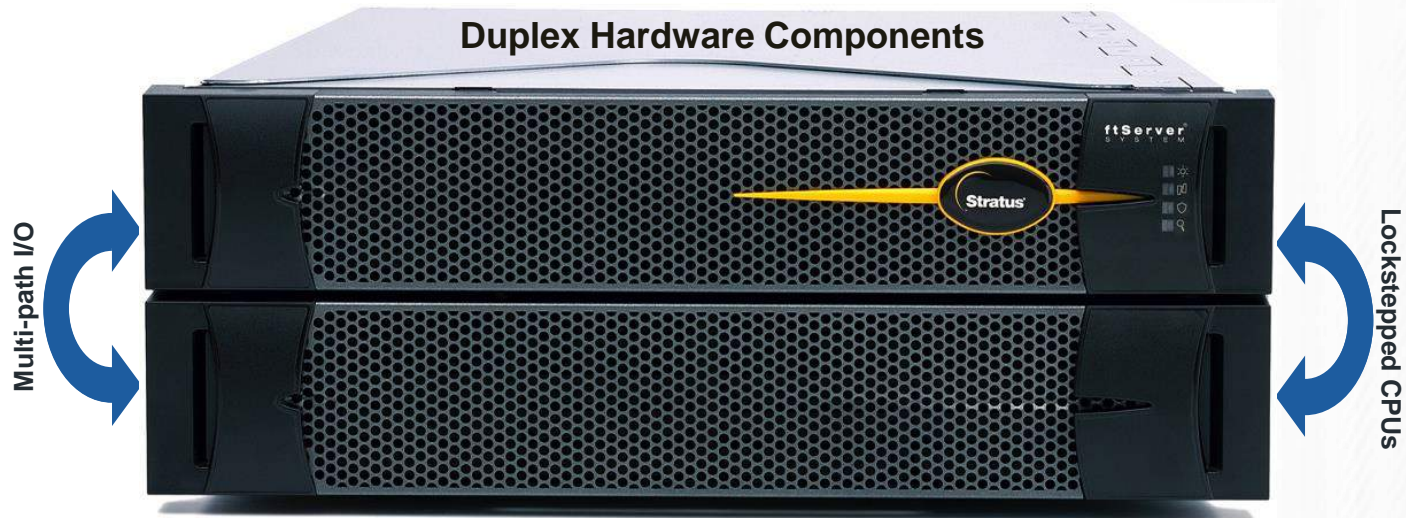
- ✗ vCenter Server
- ✗ Multiple Servers
- ✗ Multiple OS Licenses
- ✗ Redundant fabric switches
- ✗ External storage (SAN)
- ✗ VMware Essentials Plus License (\$4,000)

Standard Intel architecture server limitations



- Industry standard components
- Uptime is not primary design goal
- May have limited features like redundant power supplies
- Requires “bolt on” availability like clustering

The Stratus ftServer difference



Always on – No Downtime

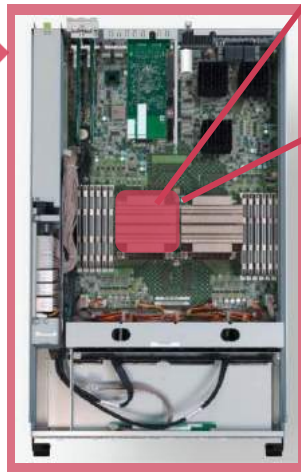
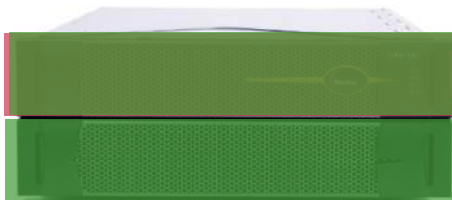
Operationally simple



Transparent fault tolerance
System is managed just like a stand-alone system



ActiveService™ Architecture: System Generated Replacement Ordering



Component fails. System
ISOLATES fault and notifies
Stratus that a CPU has failed

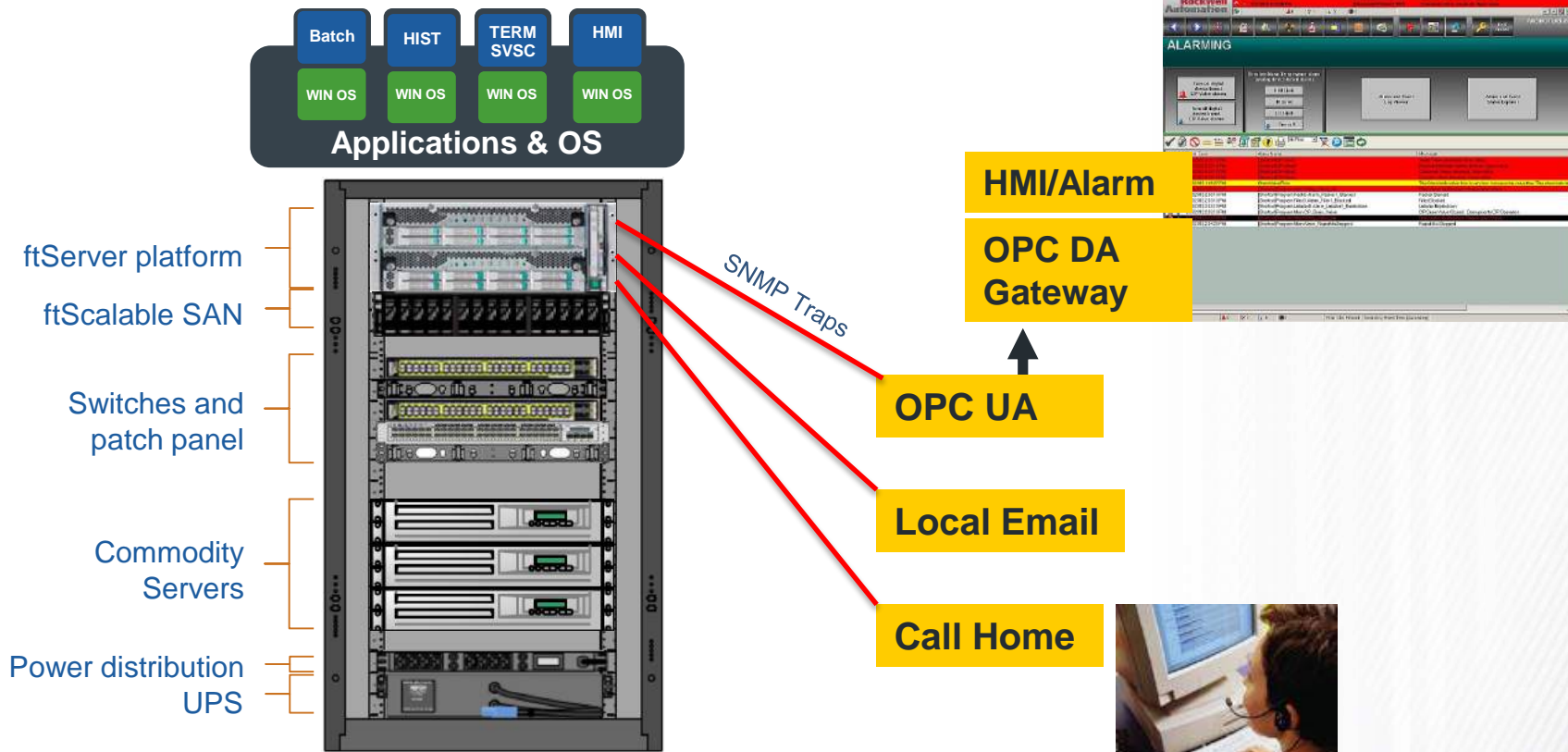
System automatically orders
CORRECT replacement part
Next Day Delivery Service

Hot-pluggable components are
EASY to replace

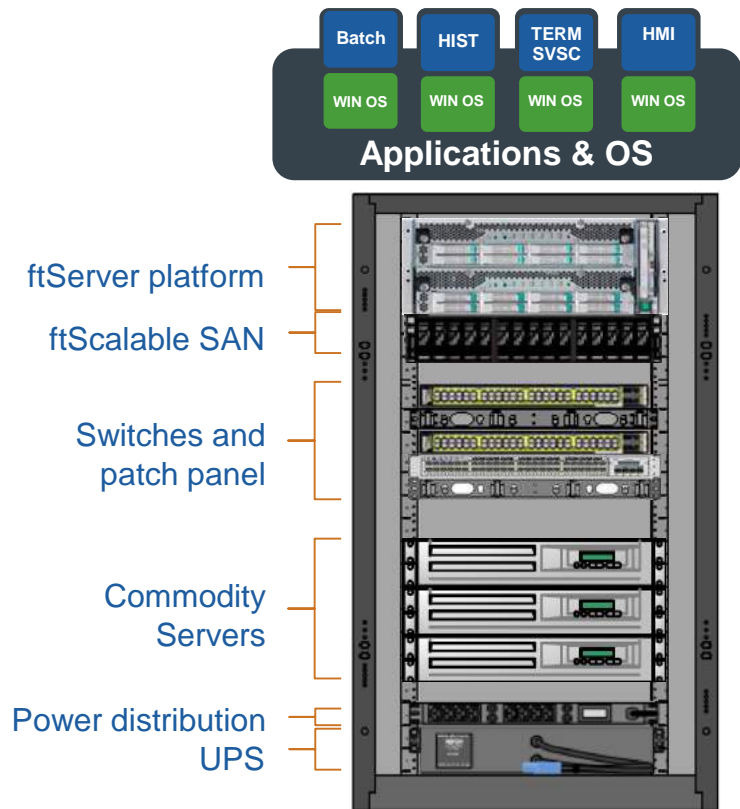
System synchronizes with
replacement component

Normal processing continues throughout process!

Monitoring, Alerting, Predictive Analytics



Monitoring, Alerting, Predictive Analytics



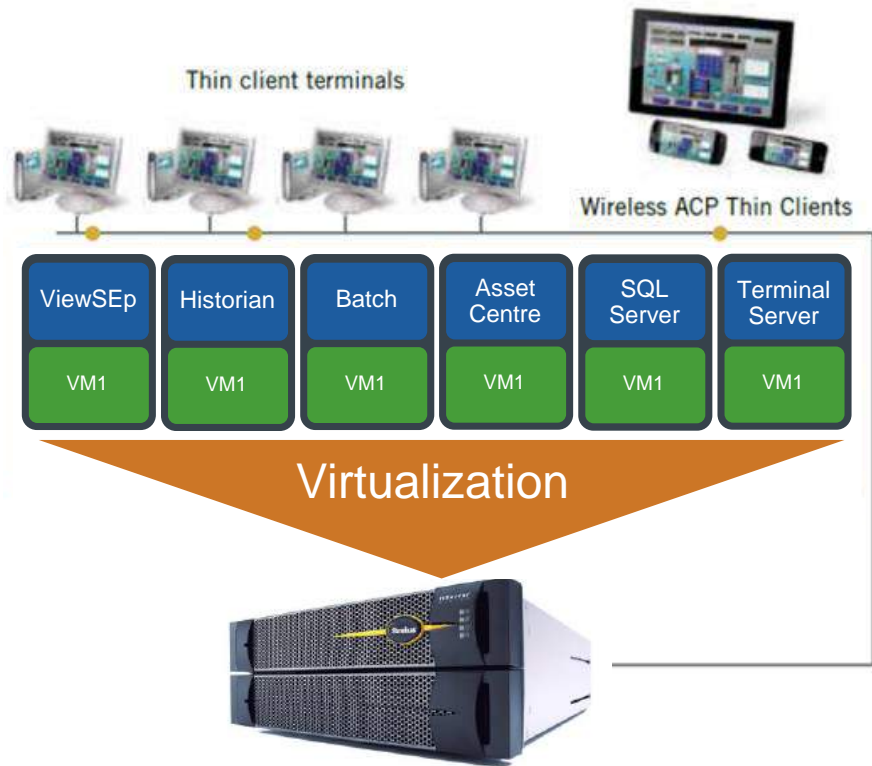
Sightline Assure



Monitoring the entire industrial IT solution stack – Alerts, Predictive Analytics, Historical Trending

- Stratus Hardware
- VMware
- VM OS
- Applications
- SAN storage
- Networking
- 3rd party servers

Modernize Automation Infrastructure



- Easy to manage
- Small physical footprint
- Low power consumption
- 100% availability
- Lowest Total Cost of Ownership

Standard technology



vmware®



Microsoft



redhat.

- Joint program to insure processor determinism
- Early access to new processors
- ftServer® Series systems in Intel labs

- Collaborate on OS availability features
- Hardened drivers
- Memory resynchronization
- Support for mission-critical applications
- Collaborative support model
- ftServer systems in partner test labs

Stratus requirements built into standard technology

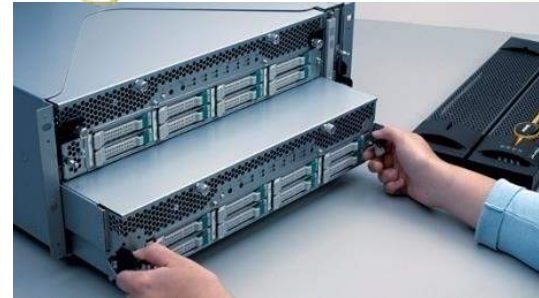
The Stratus Service Difference



- Customer interfaces directly with a support person – no call menus
- Global support capability
- Common worldwide support database
- Near perfect diagnostics (~100% part accuracy)
- Automated issue deposit [call home]
- System components are customer installable
- Customer defines the criticality of the issue

Stratus Fault-Tolerant Servers

- Fully redundant hardware
- Plug-and-play
- Operational simplicity
- No failover time
- No data loss
- Hot-swappable components
- Single System - Single License
- 24/7/365 support service
- 8 – 12 year lifespan



Dairy Farmers of America

Producer of milk, ice cream and other dairy products, sports drinks and salsa for well-known brands



Upgrade server architecture to standardize, ensure absolute availability and improve operation speed of plant **without interrupting operation**



Solutions considered

High-end Dell/IBM/HP server farm
Low-end solutions such as servers from Walmart



Chosen solution

Stratus ftServer system
ACP ThinManager running 15 virtual machines supporting:

- PlantPAX, HMI, FactoryTalk, EWS, Histortian, and more



Requirements

24x7 monitoring of entire stack
Total hardware redundancy
Enough capacity to run all VMs on one server
Long life expectancy
Simple implementation



Business impact

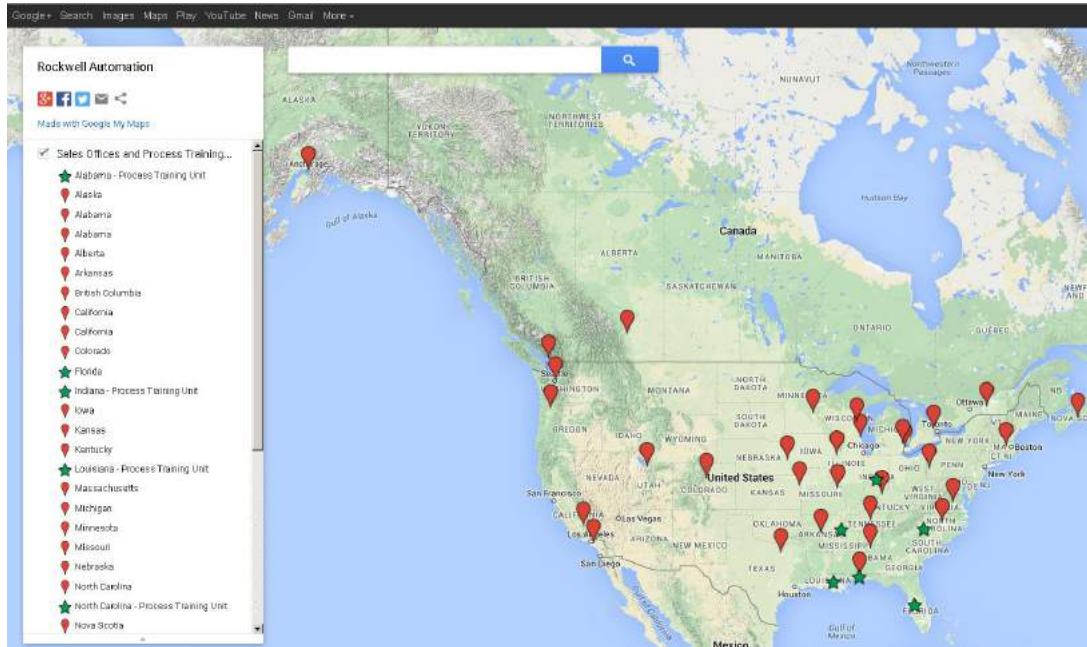
Eliminated downtime
Improved efficiency of overall system
Lowered implementation cost
Enhanced IT infrastructure to support new applications

“Hours and perhaps days of downtime have been eliminated by removing the unsupported PCs and replacing them.”

Eric Miller, Engineering Manager
Dairy Farmers of America

See modern IA infrastructure in action

Rockwell Ecosystem Google Map: www.stratus.com/RA



Schedule a visit to a lab near you!



**41 Rockwell Demonstration
Facilities Run PlantPAx on the
Stratus ftServer**





Thank you

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