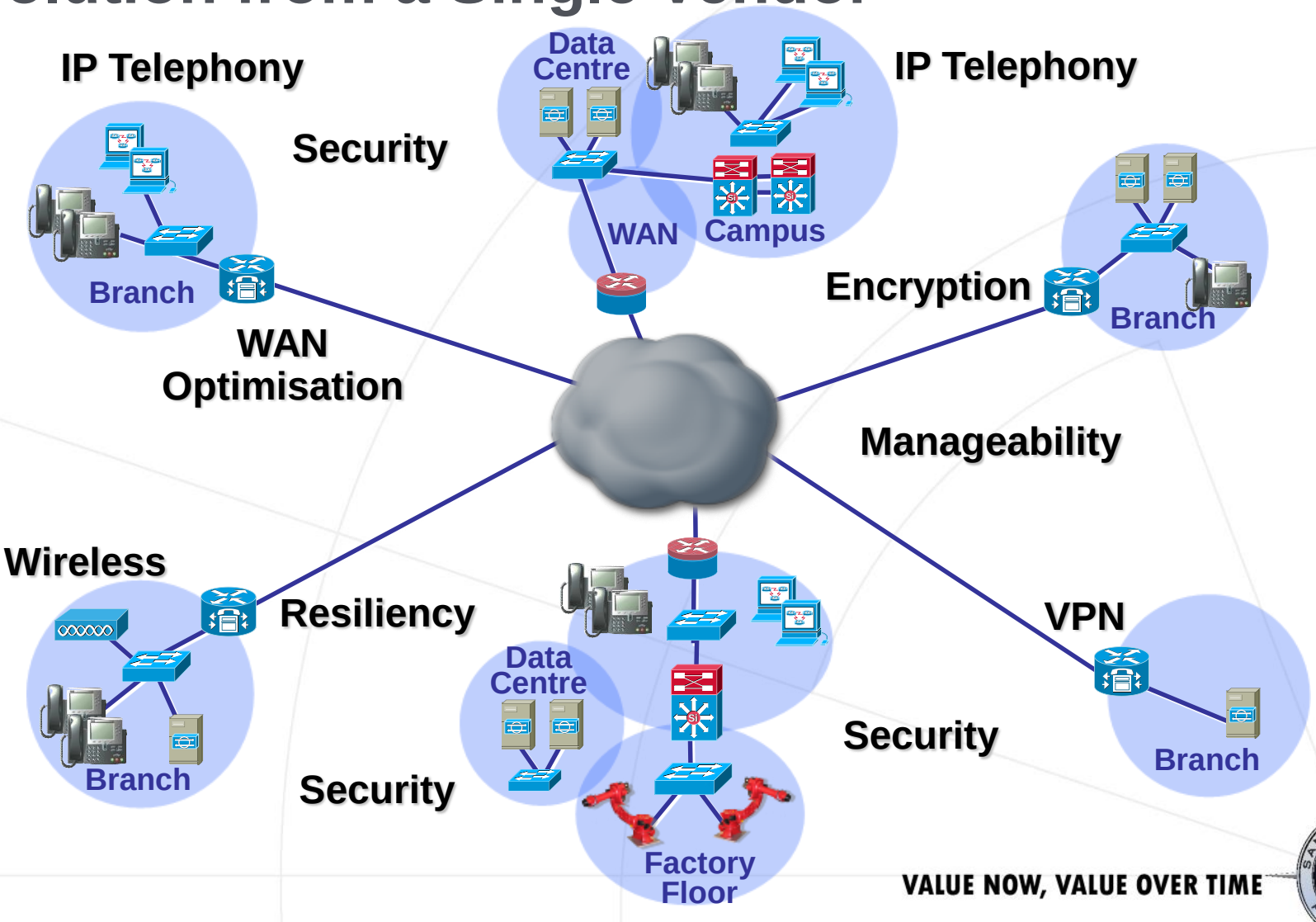
Transparency of IT to support Operations for increased profitability

Martin Otterson
CEO, WiredCity

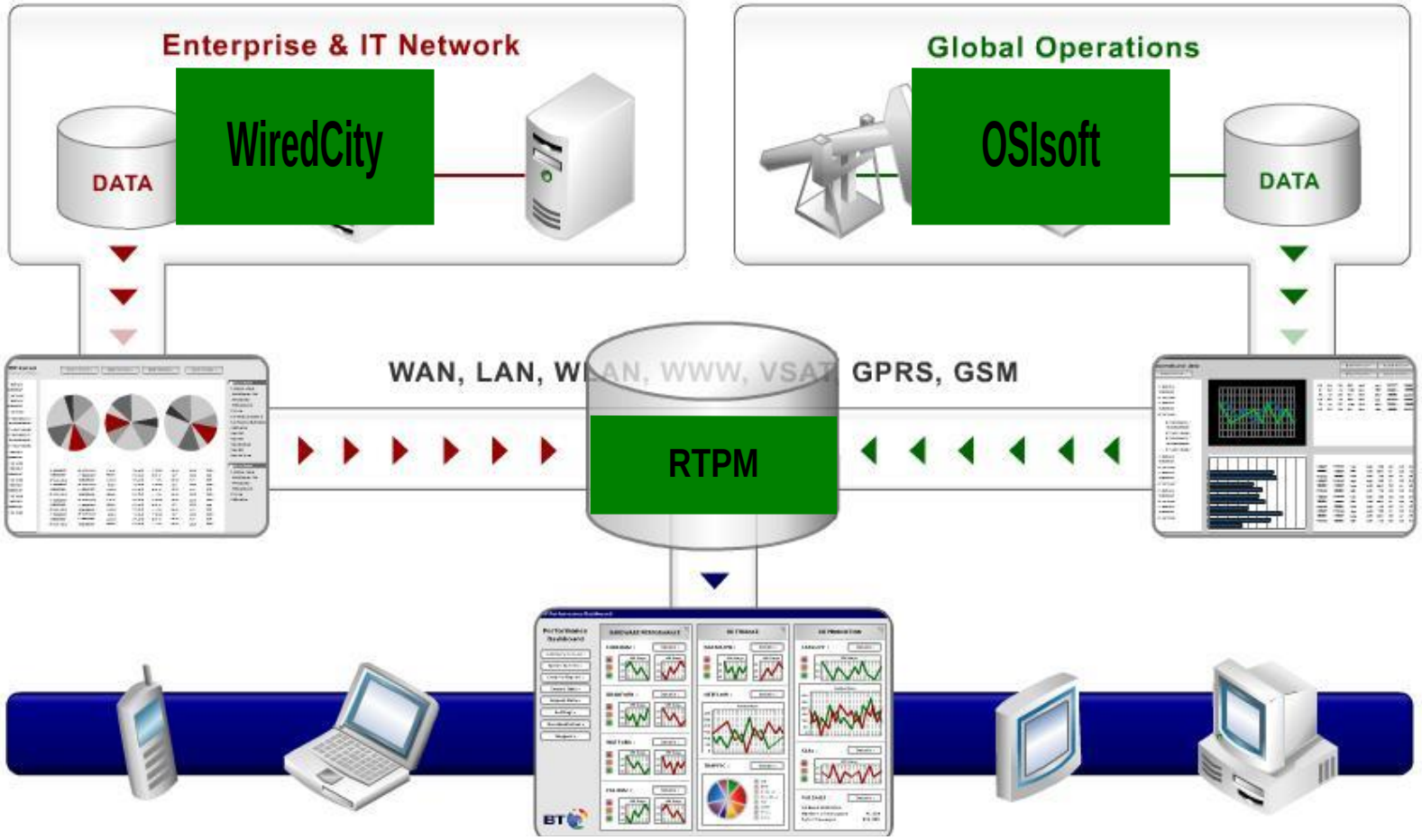
January 2006

Ethernet to the Factory is the Only Complete Solution from a Single Vendor



VALUE NOW, VALUE OVER TIME

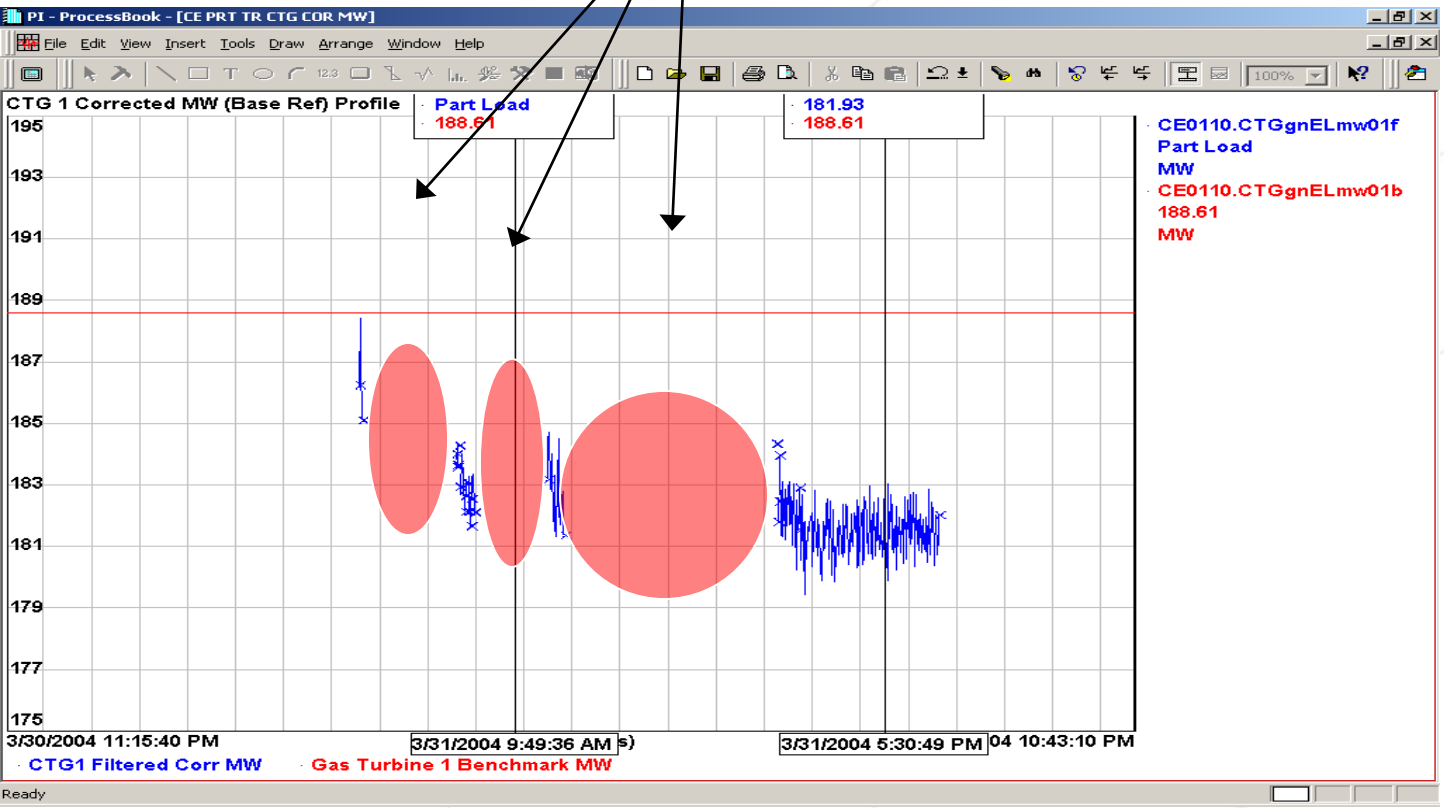
Hybrid Networks- Deliver true RTPM



A single integrated real-time 'business driven' dashboard

Intelligent Decision Support

Why the gap in Operational data?



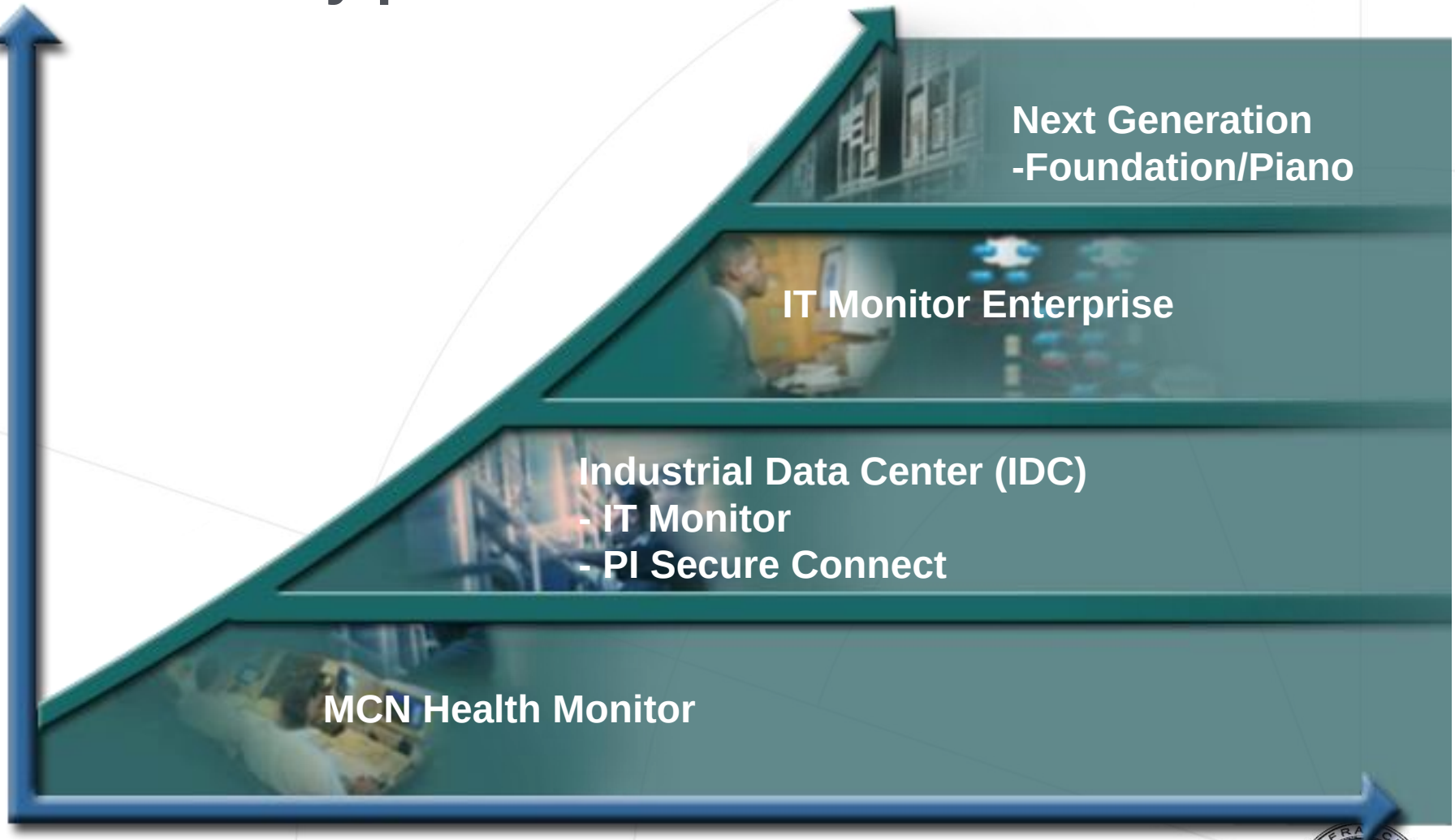
Communication related- Network?

Interface Instrument down- Application/ Hardware?

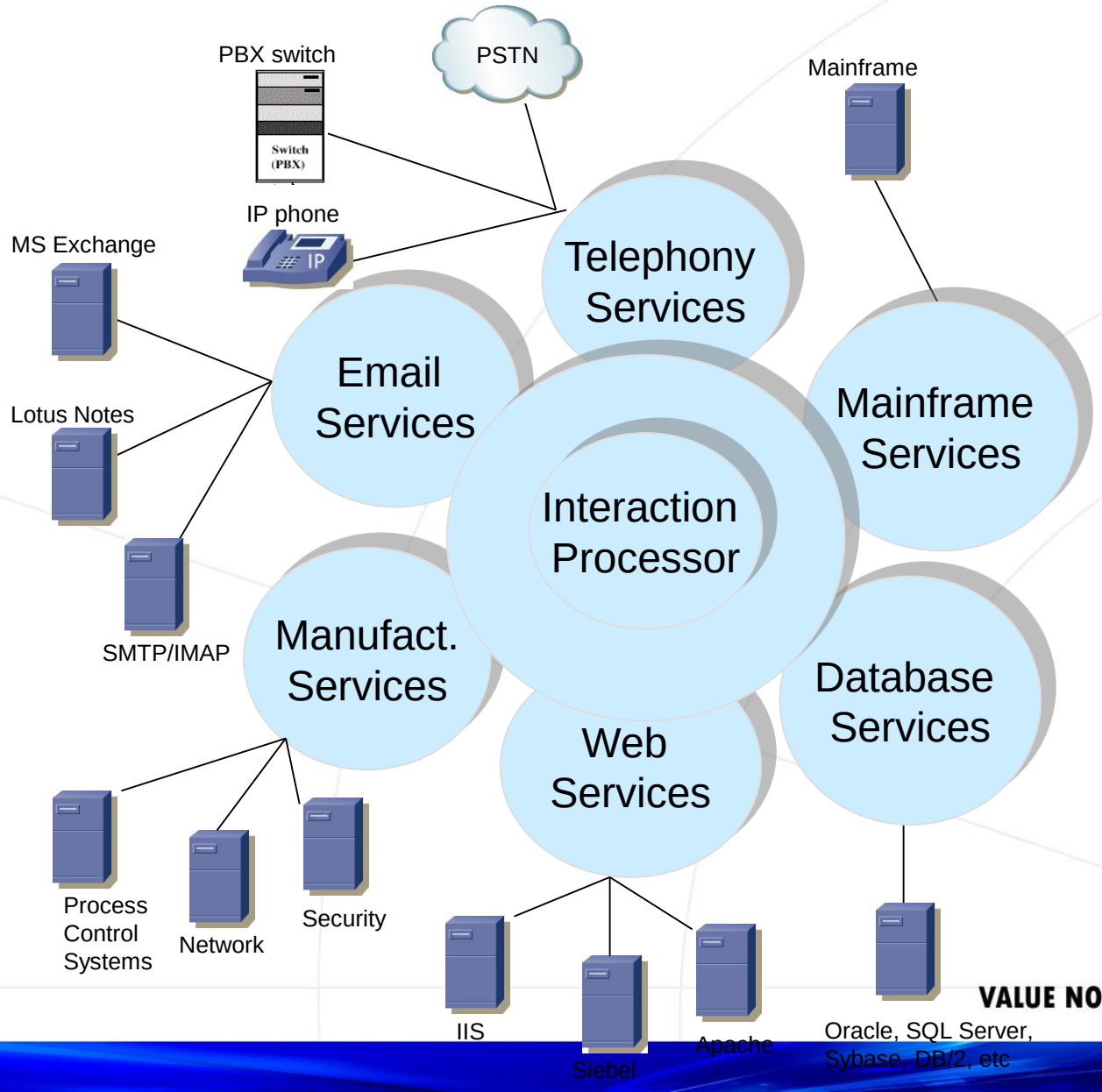
Security issues?

- Allows adaptation based upon previous experience.
- Allows common communication of degrading performance.
- Allows operators to know if the information they are acting upon is up to date, old, or justifies intelligent resource investments in the right places.

OSI/WiredCity product evolution



Enterprise Scope- IT Monitor



Applications

- IP Telephony
- Microsoft
- SAP
- Oracle

Hardware

- Servers/PC's
- Routers
- PABX (Ericsson, NEC etc.)
- Storage Area Networks

Performance

- Network Bottlenecks
- System Utilization
- Wireless Networks
- Voice Busy Hour/Grade of Service Reporting

Non-IT Equipment/ Industrial Control

- Process Control Apps.
- HVAC, PLC, SCADA
- Power usage
- Security Access
- Environmental

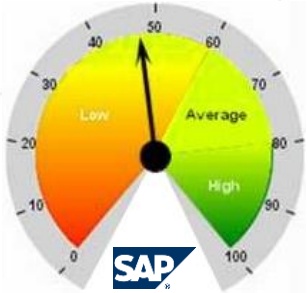
VALUE NOW, VALUE OVER TIME

Measurement to Value

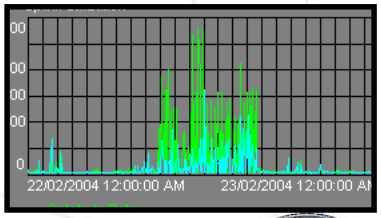
- **MEASUREMENTS**
  - **VOIP Applications**
  - Response times
  - Call detail records
  - **Network LAN**
  - Latency (ping)
  - TCP Response
  - **Servers, Routers**
  - CPU Usage
  - Available Memory
  - Octets in/out
  - Errors in/out
  - SNMP/IP-SLA
  - Netflow
  - Packet Capture
  - **Firewalls/IDS**
  - SYSLOG

- **BUSINESS RULES**
  - How do these affect the user's ability to perform their job – Specifically as it pertains to VOIP
  - Slow response times drive down productivity.
  - Network failure (router or switch) drives transaction Rate to zero.
  - Errors can contaminate SAP data.
  - Level 6 attacks increase the risk that data will be Compromised or stolen.

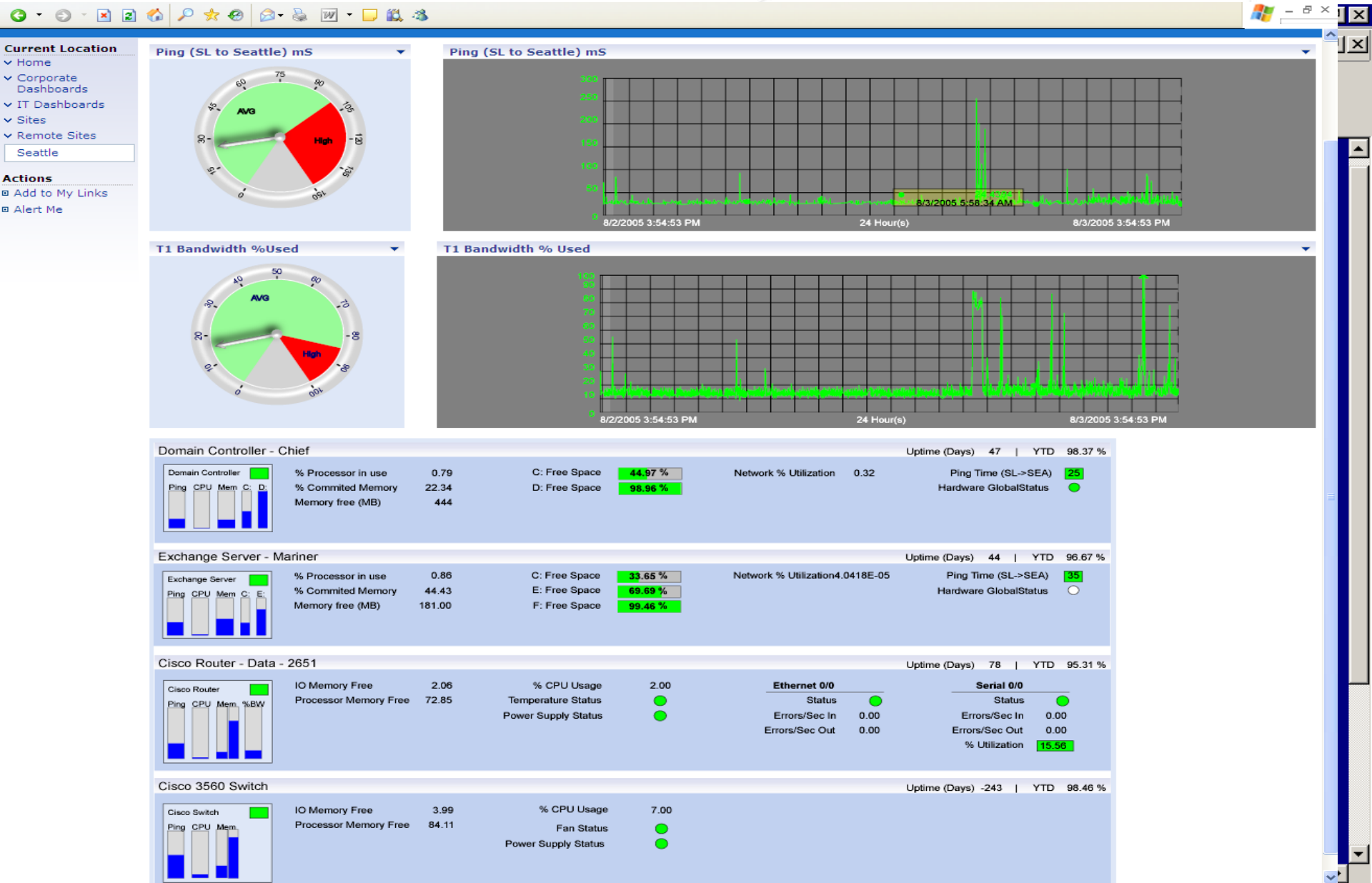
- **KPI**
  - Calculations based on actual experience
  - Indicators



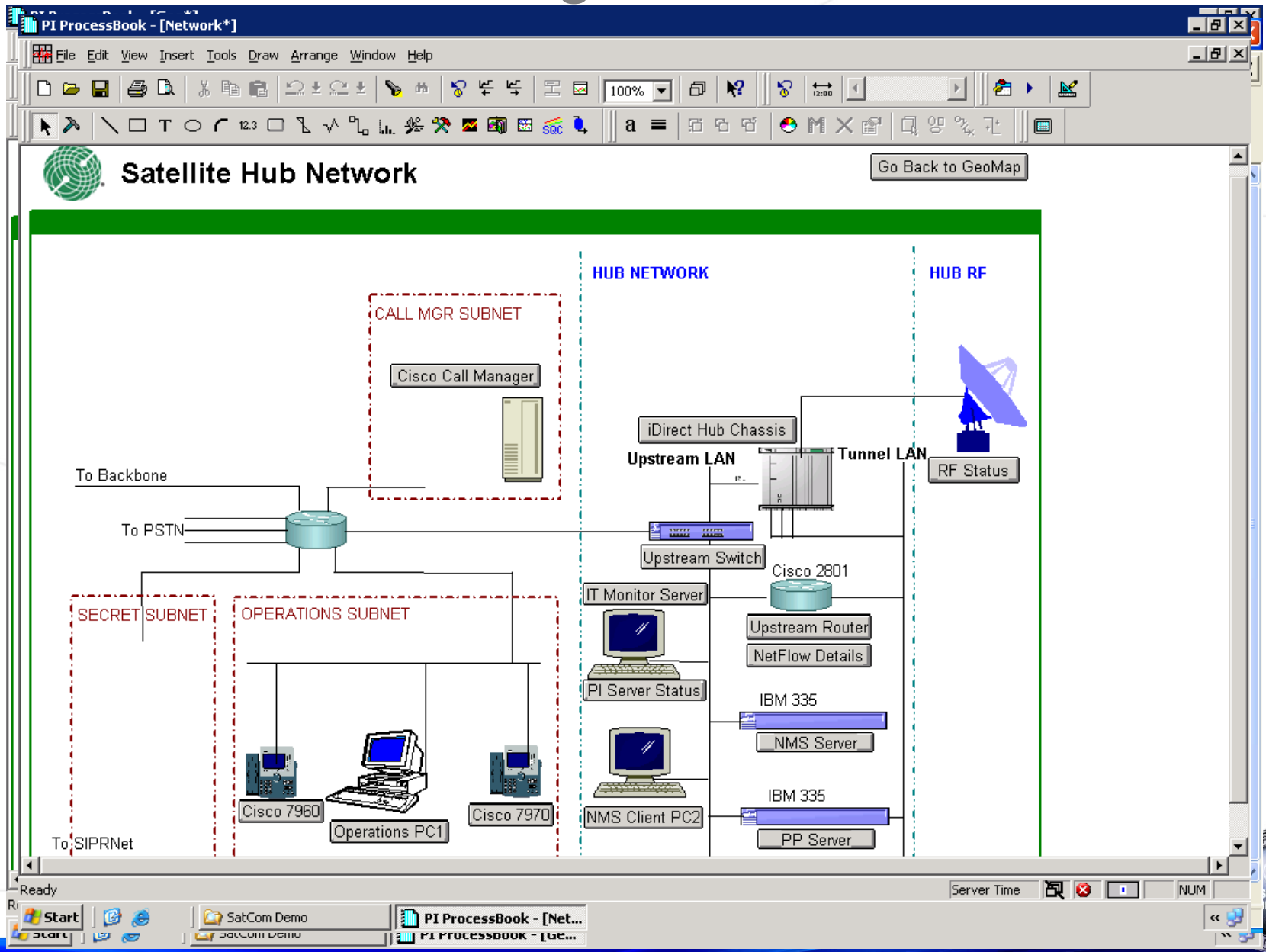
  - Display real-time and historic



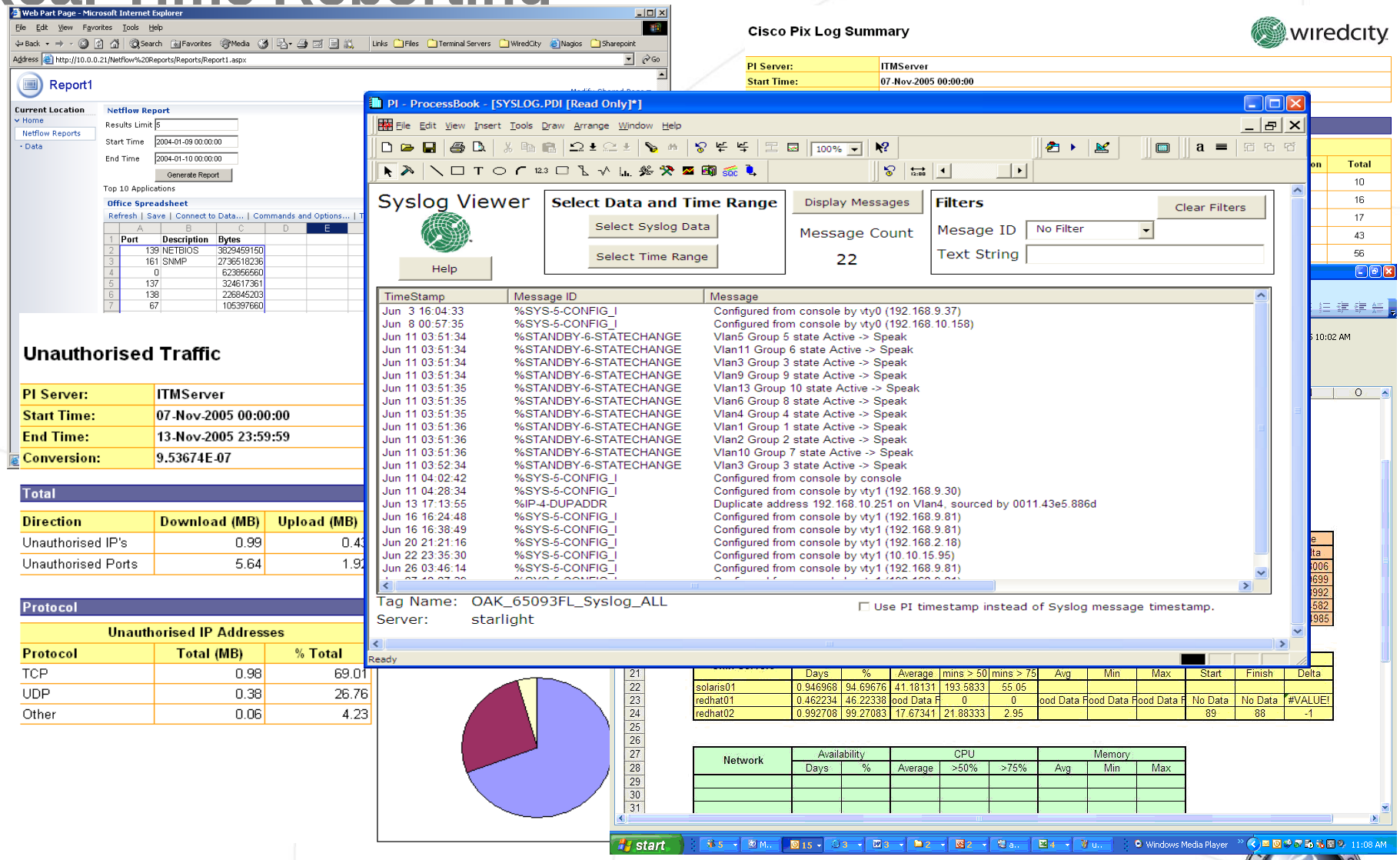
Summarize in Dashboard Format



End to End Monitoring



Real-Time Reporting



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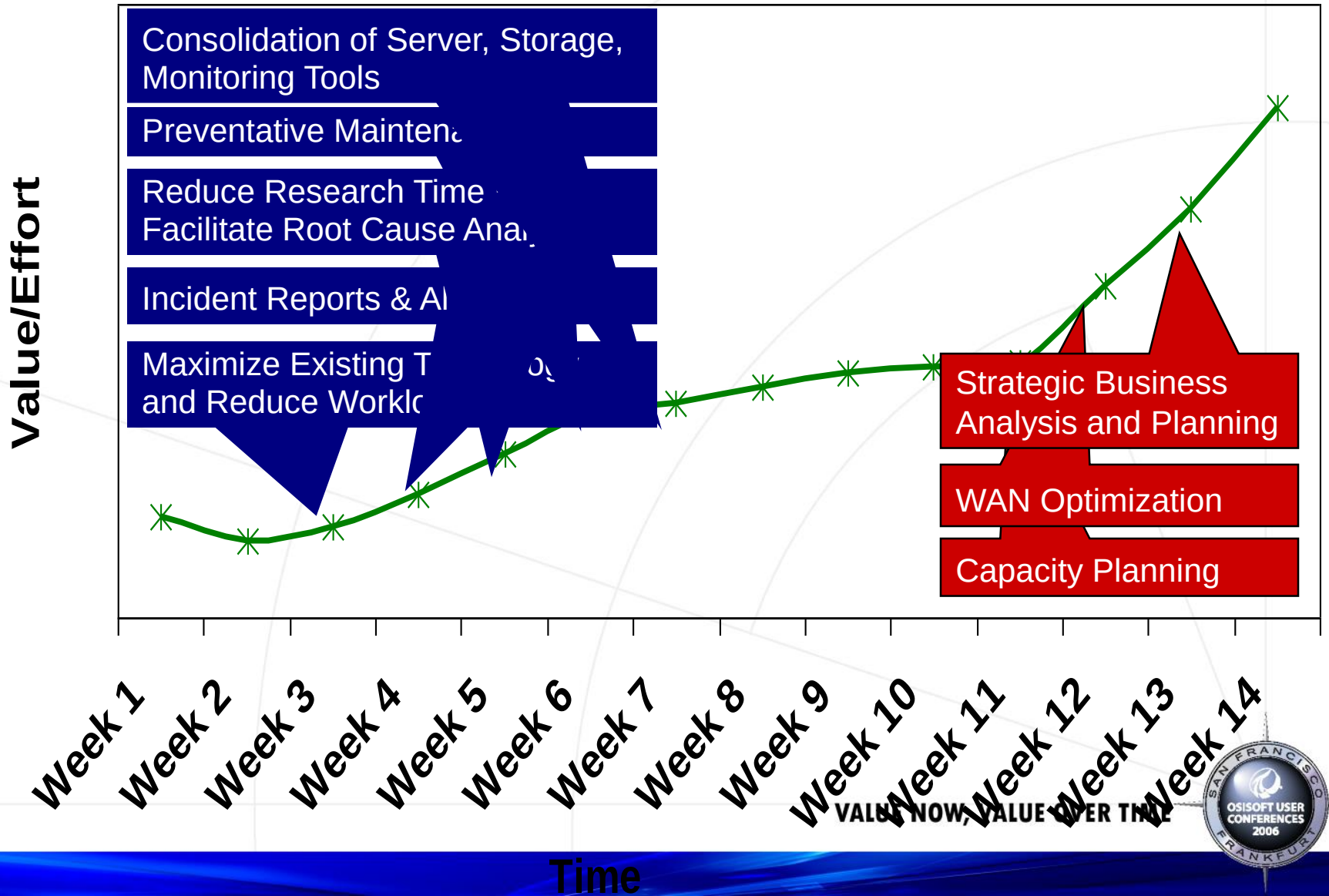
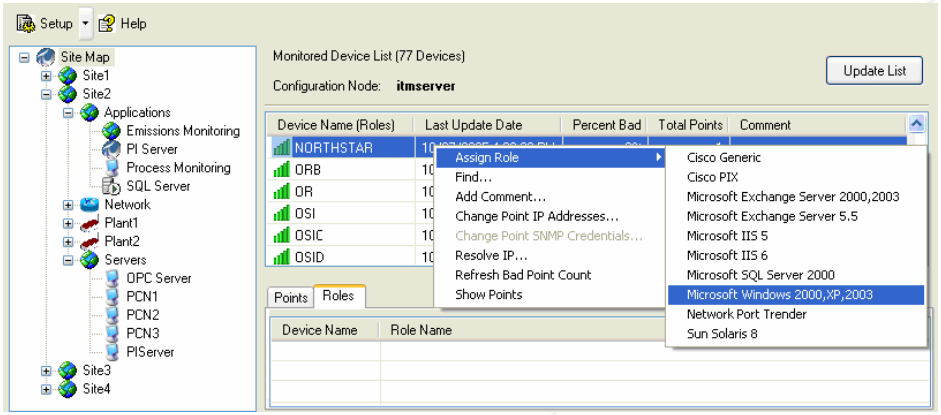
Real-Time platform for all projects
Value today, Value over time



MCN Health Monitor ™ *enabling plant operators*



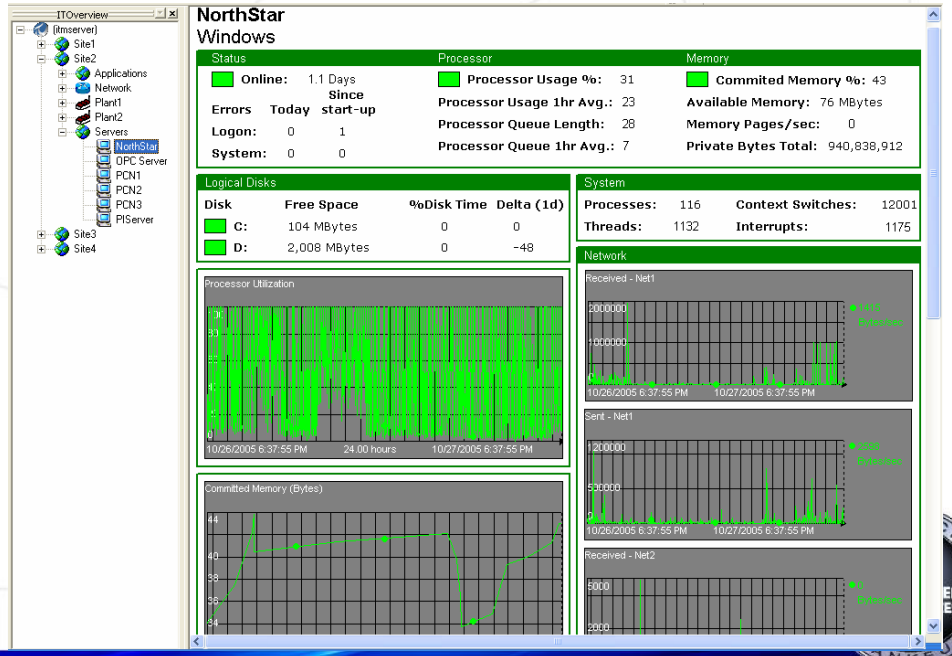
Simplified Installation & Usability. Implement, configure, and begin using MCN Health Monitor within minutes on your own, or with assistance from OSIsoft or one of its business partners.

Management Console. MCN Health Monitor utilizes a new IT console to centralize the viewing and management of your IT infrastructure within manufacturing. From a single console view you can build tags, configure monitoring of IT devices, organize devices in a logical IT view and automatically create displays of your plant-monitored IT environment.

Extensive sets of Interfaces. Using a wide spectrum of communication protocols, connect MCN Health Monitor to almost any device, application, operating system, database, network component, or infrastructure technology in your manufacturing process facility.

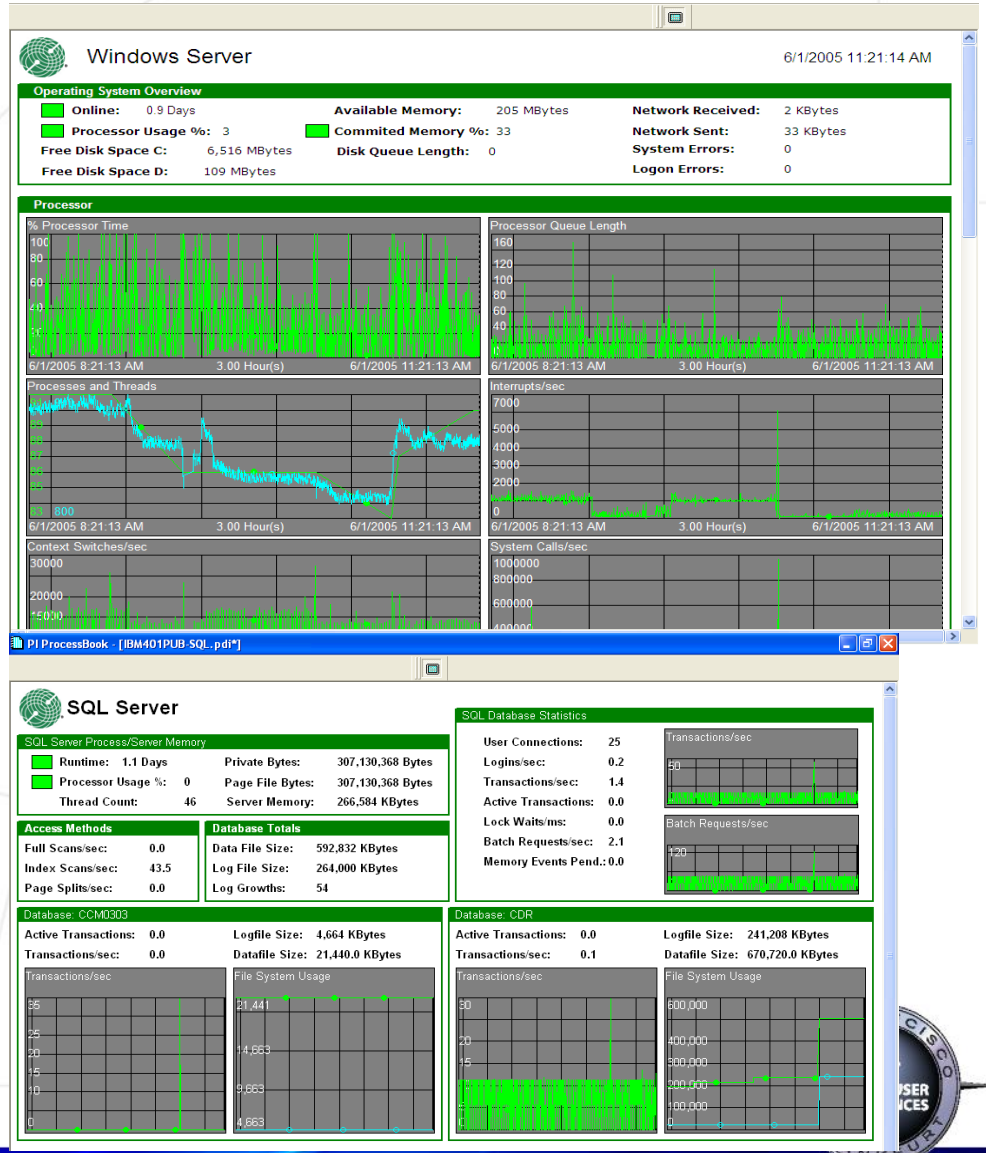
Standardized templates. Incorporate industry-best practices in your collection and visualization of performance data, so you can reap the productive benefits of MCN Health Monitor with great ease and speed.

API node. Install MCN Health Monitor as an API node or on other API nodes, as many times as needed, one instance for each PI System present in your manufacturing environment.



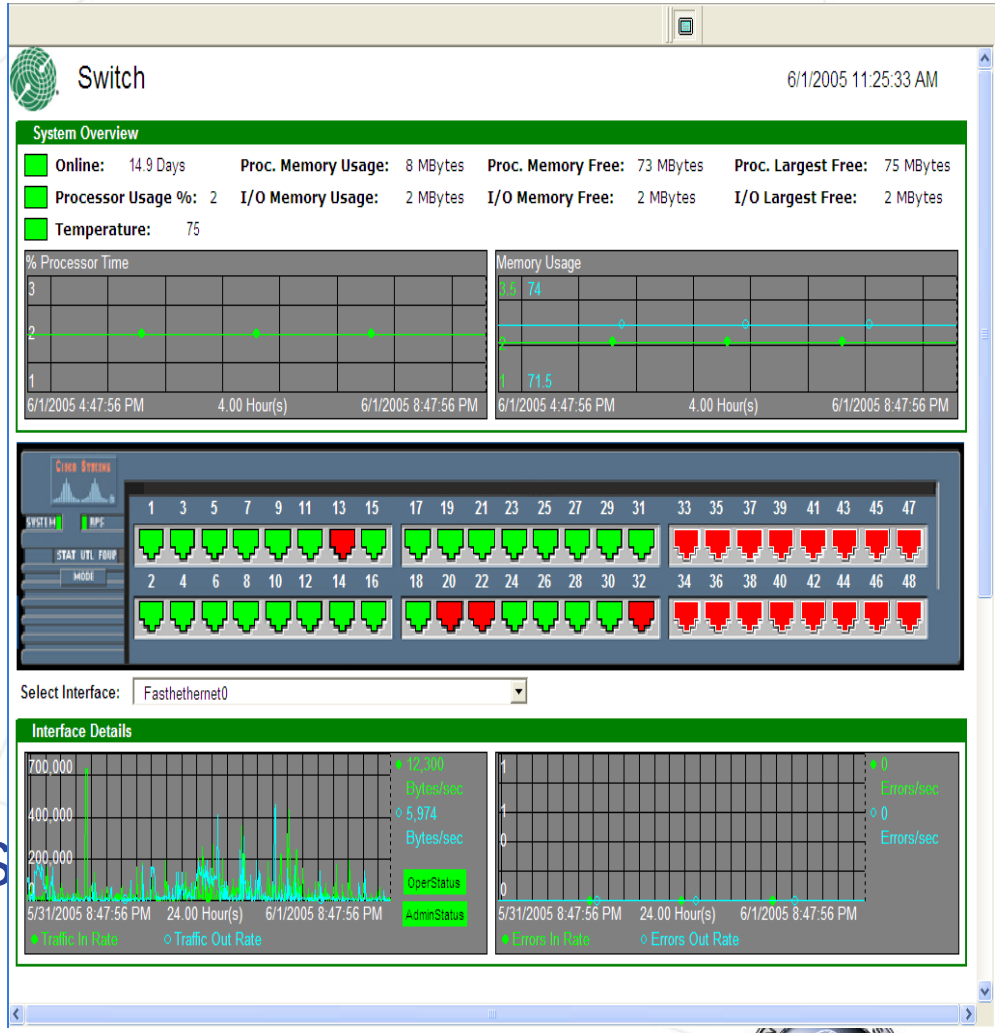
MCN Health Monitor - Perfmon

- **Perfmon**
- Uses Windows Performance Counters
- Windows Devices
  - CPU
  - Memory
  - Network Utilization
  - Disk Space
- Applications
  - PI
  - SQL Server
  - Lotus Notes
  - Many other third party applications



MCN Health Monitor - SNMP

- The interface monitors
- Routers, Switches, Firewalls, Modems
  - CPU, Memory, Uptime, Bytes I/O, Temp
- Applications
- Traffic Volumes
  - CPU, Memory, Uptime, OS
- Intrusion Detection Systems
- Databases



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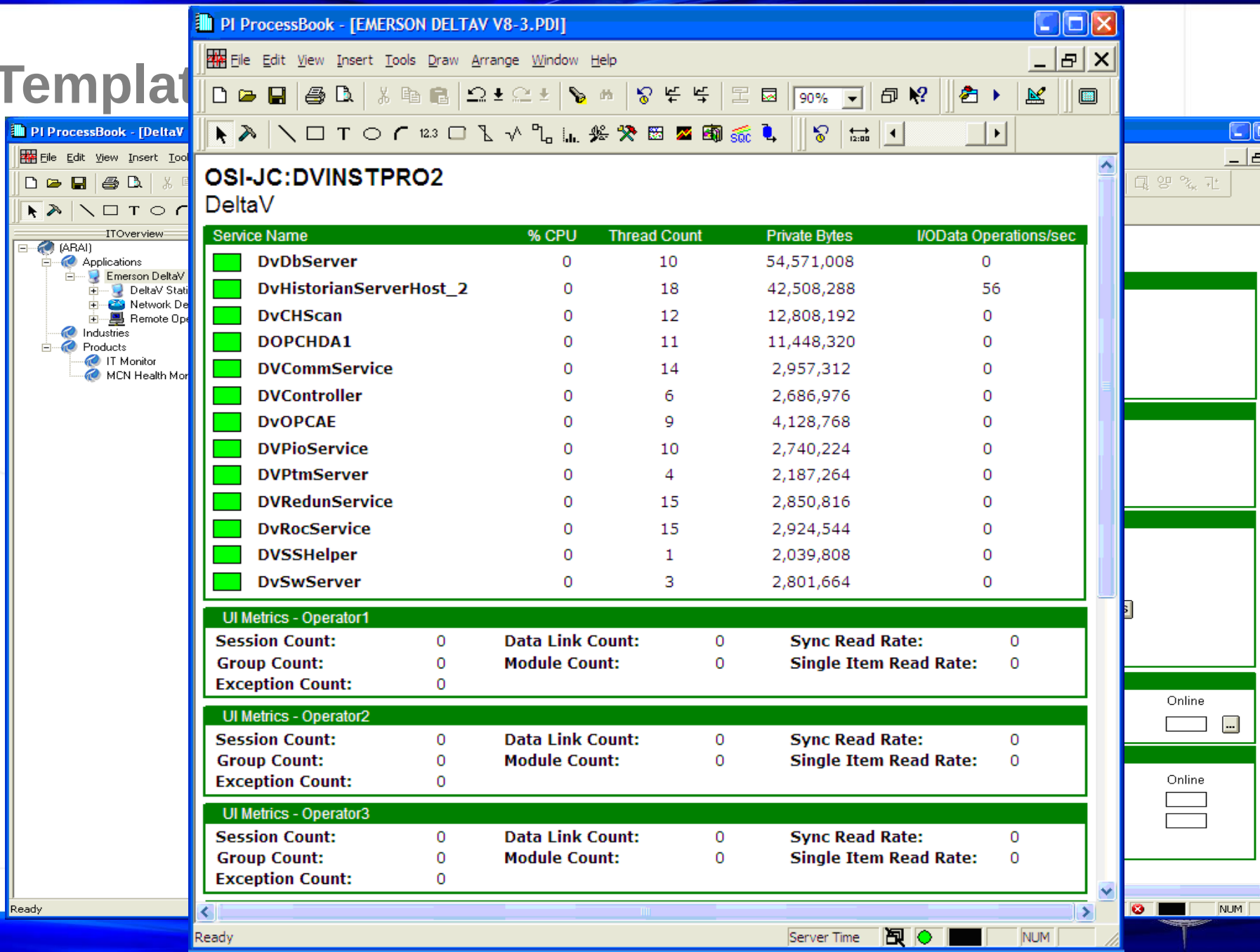
Templat

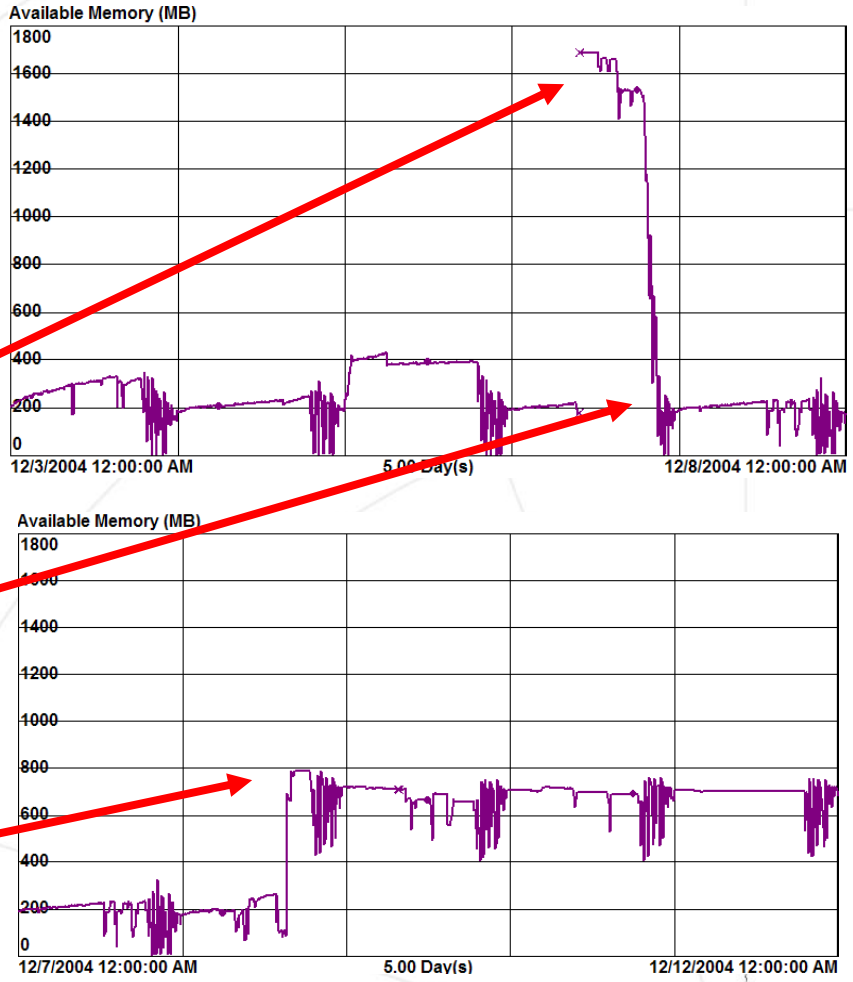

PI ProcessBook - [EMERSON DELTAV V8-3.PDI]
File Edit View Insert Tools Draw Arrange Window Help
90%
OSI-JC:DVINSTPRO2
DeltaV
Service Name % CPU Thread Count Private Bytes I/OData Operations/sec
DvDbServer 0 10 54,571,008 0
DvHistorianServerHost_2 0 18 42,508,288 56
DvCHScan 0 12 12,808,192 0
DOPCHDA1 0 11 11,448,320 0
DVCommService 0 14 2,957,312 0
DVController 0 6 2,686,976 0
DvOPCAE 0 9 4,128,768 0
DVPioService 0 10 2,740,224 0
DVPtmServer 0 4 2,187,264 0
DVRedunService 0 15 2,850,816 0
DvRocService 0 15 2,924,544 0
DVSSHelper 0 1 2,039,808 0
DvSwServer 0 3 2,801,664 0
UI Metrics - Operator1
Session Count: 0 Data Link Count: 0 Sync Read Rate: 0
Group Count: 0 Module Count: 0 Single Item Read Rate: 0
Exception Count: 0
UI Metrics - Operator2
Session Count: 0 Data Link Count: 0 Sync Read Rate: 0
Group Count: 0 Module Count: 0 Single Item Read Rate: 0
Exception Count: 0
UI Metrics - Operator3
Session Count: 0 Data Link Count: 0 Sync Read Rate: 0
Group Count: 0 Module Count: 0 Single Item Read Rate: 0
Exception Count: 0
Ready
Server Time
NUM
PI ProcessBook - [DeltaV
ITOverview
(ARAI)
Applications
Emerson DeltaV
Industries
Products
IT Monitor
Ready
Online
Online
NUM

Customer examples using MCN Health Monitor

1. Application Performance
2. Asset Upgrade
3. Server Troubleshooting
4. Application Upgrade
5. Asset Upgrade

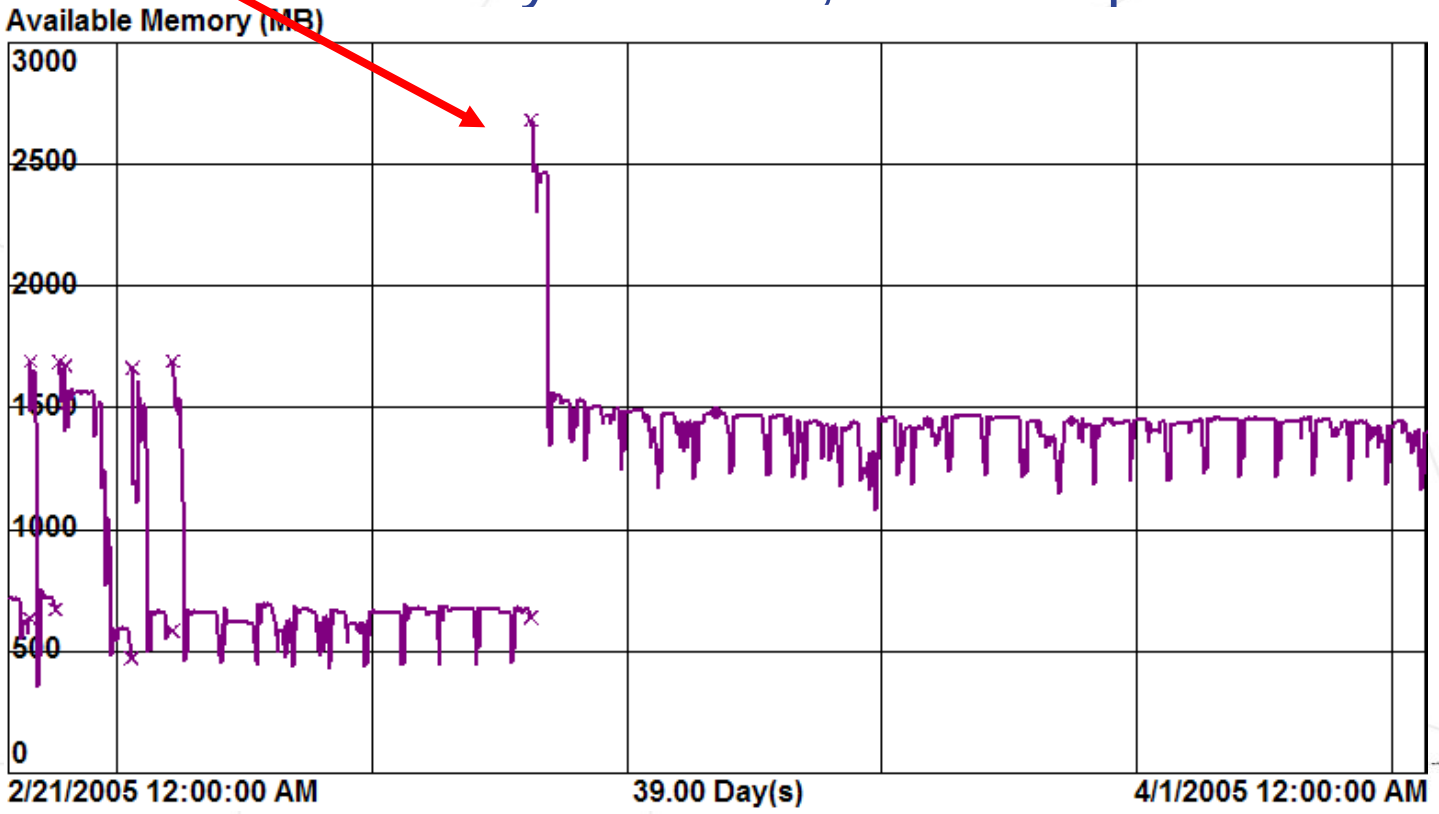
Application performance

- SQL Server running several apps (Valve tuning, PI-PB, weather data I/F)
- Periodic crashes
- occurring without clues to why in event log
- Upon reboots, server had plenty of memory until next run of nightly reports
- SQL reports grabbing all available memory and not letting go
- Limited the amount of memory available to SQL so that it would be available for other apps



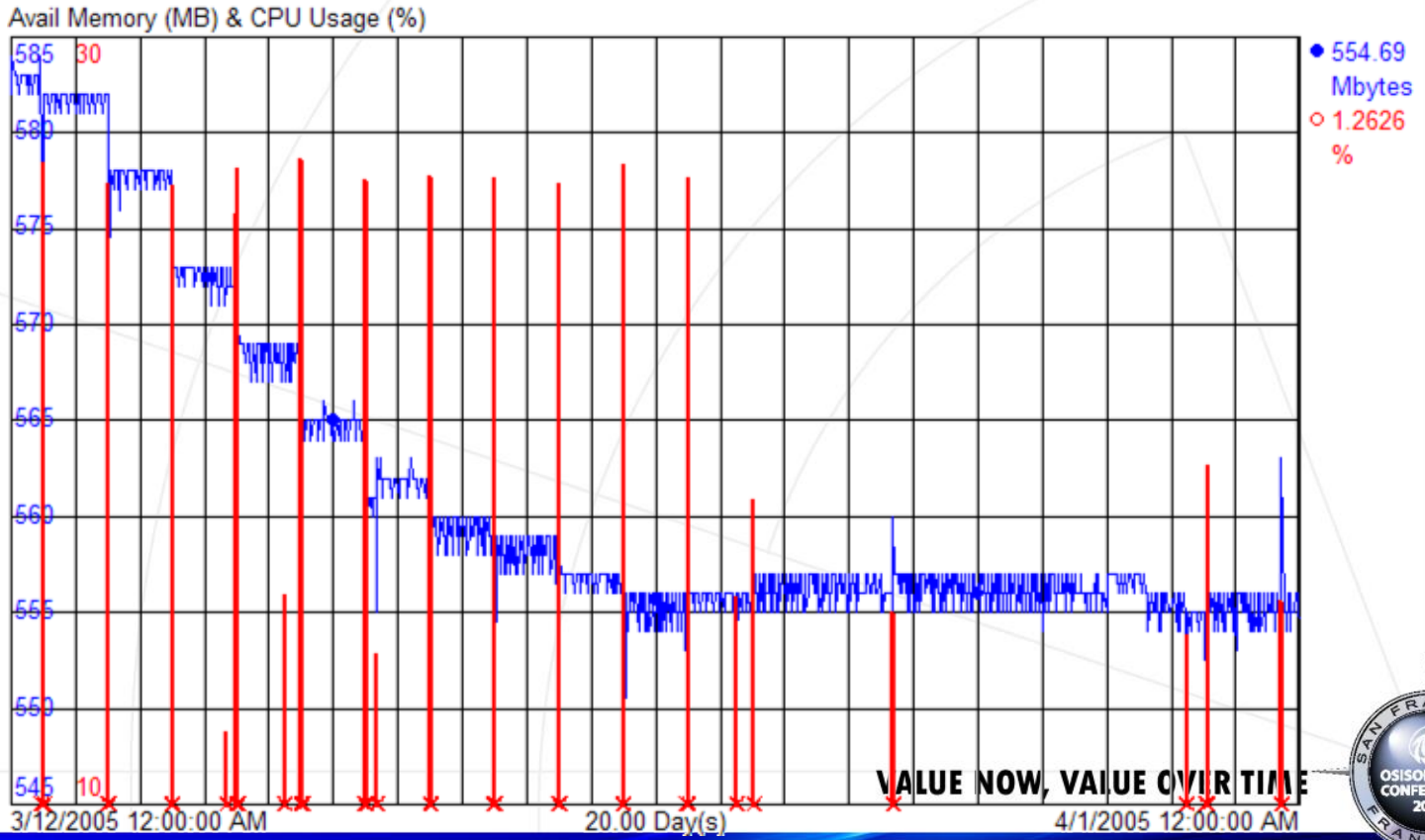
Asset upgrade

- Still experiencing server crashes after limiting available memory for SQL
- Documented results justified addition of more server memory, even though we already had 2 GB
- Added 1GB memory to server; no more problems



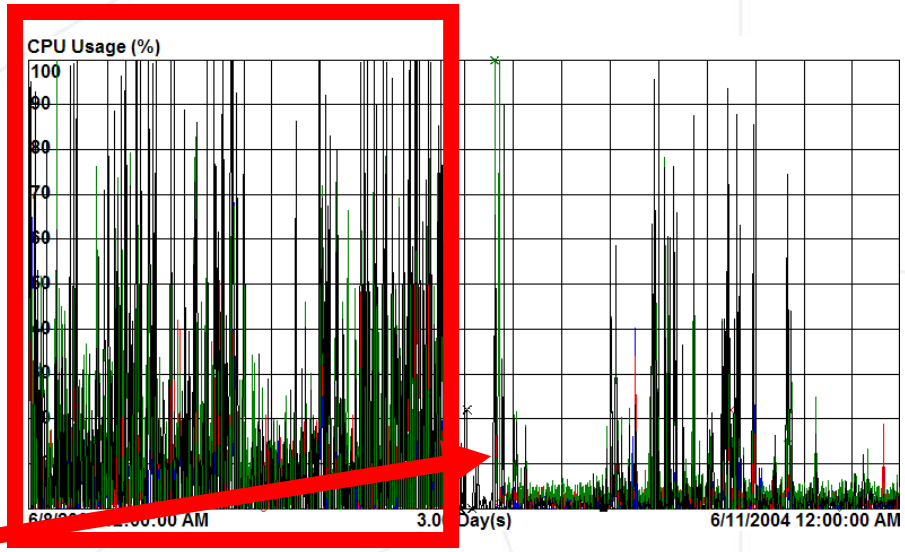
Server troubleshooting

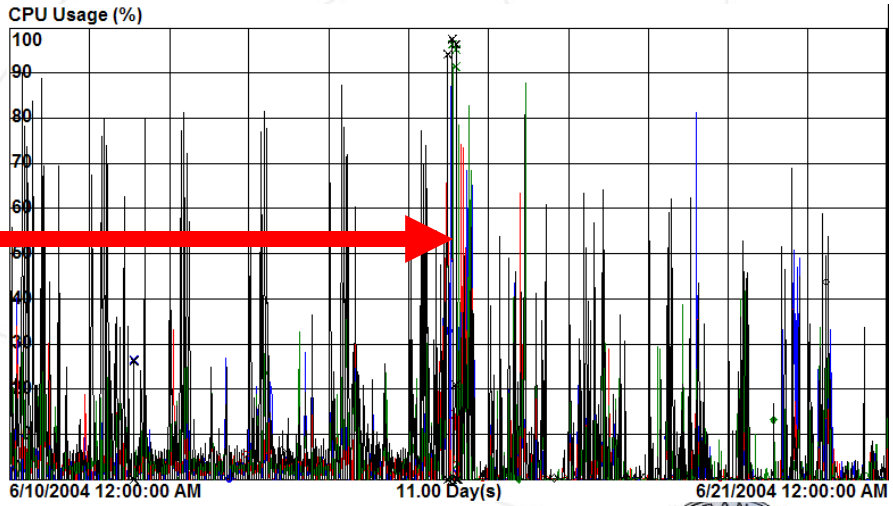
- Discovered slow memory leak on a Server 2000 machine that had step change drops when CPU spiked each day
- Happening on other servers, but not all – only Server 2000 OS
- Problem due to AV scans on Server 2000 machines
- Changed AV scan settings to fix memory leaks



Application upgrade

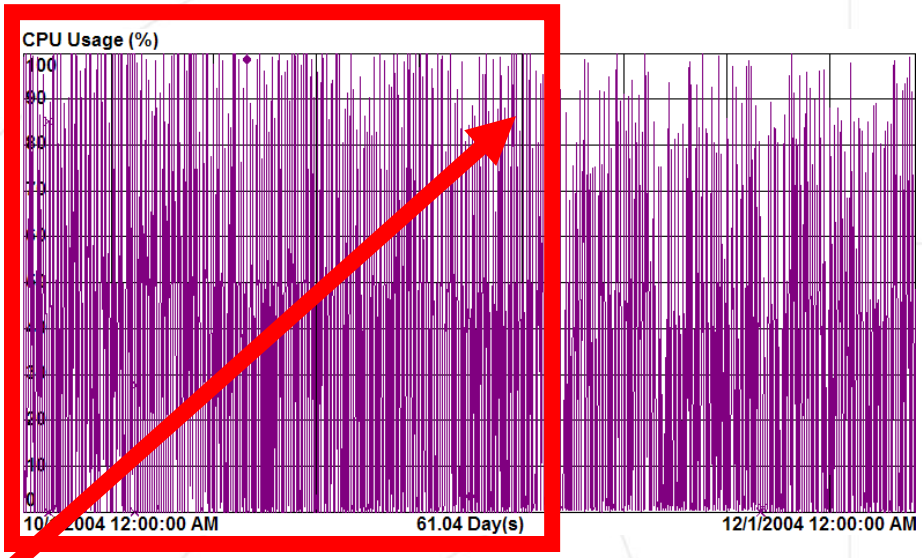
- PI server
  - Performance problems
    - morning reports maxing out CPUs
    - taking up to 10 minutes to run one particularly large report
  - Justified new server using same PI UDS 3.3 (3.4 with multi-threading not available, yet)
    - Reduced CPU usage
    - same report runs in 30 seconds
  - Upgraded to PI UDS 3.4 with multi-threading:
    - same report now runs in 4 seconds
    - spread spikes out during peak usage periods
    - Impact most likely larger if done without hardware upgrade

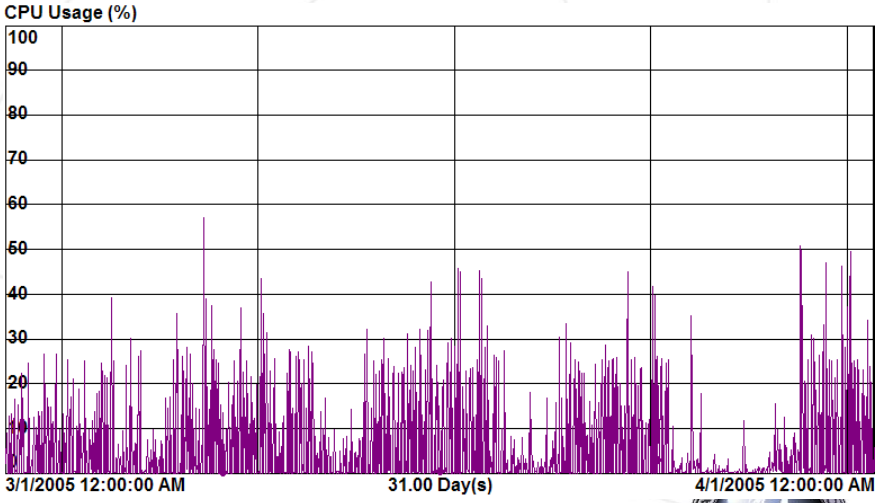




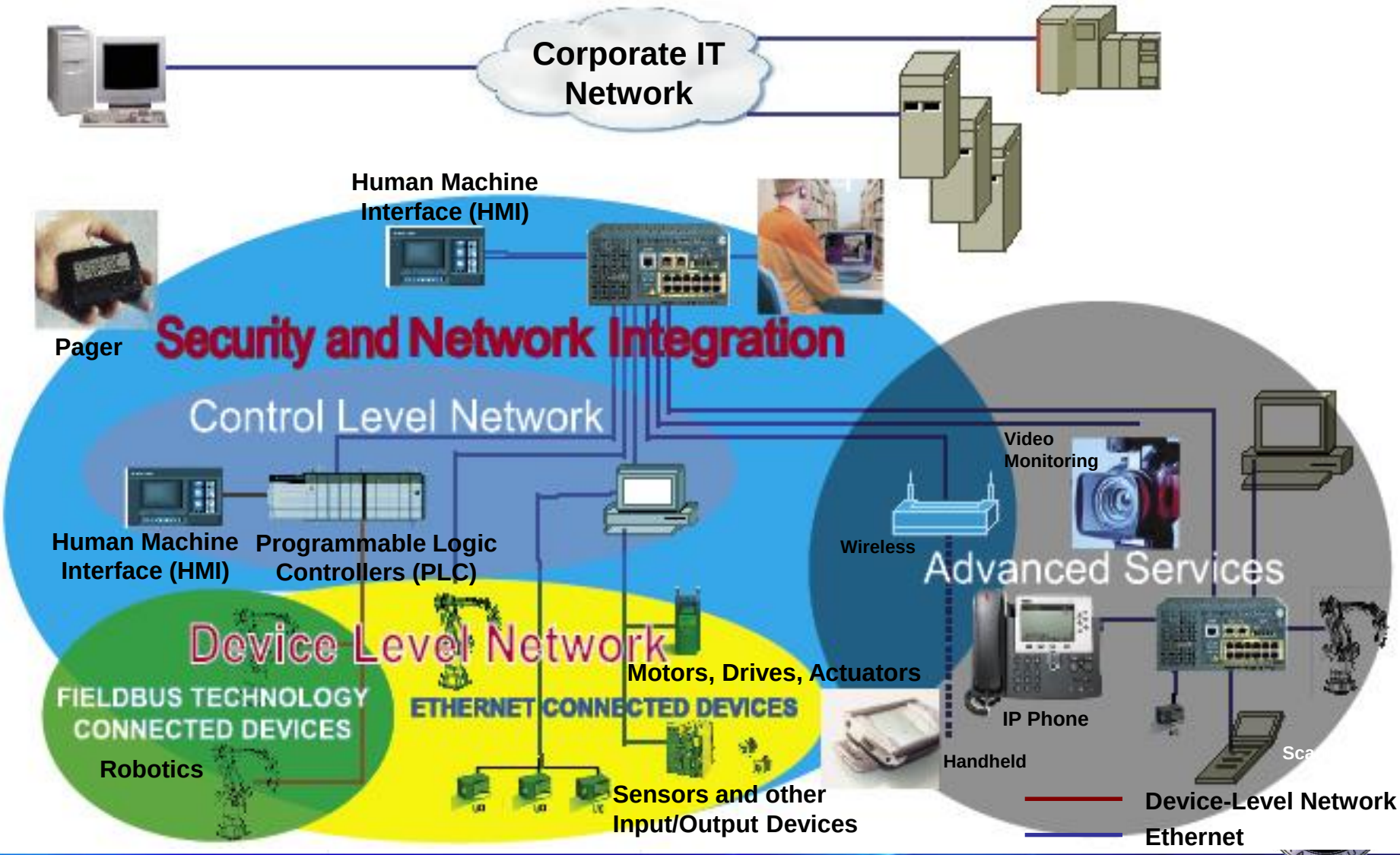
Asset upgrade

- Shipment Scheduling application server
  - Performance problems: very slow response over several months
  - Trends showed very high CPU usage
  - Increased memory from 500MB to 1GB; slight CPU improvement, but still high
  - Able to show that hardware was impacting performance & justified purchase of new server
  - Big improvement



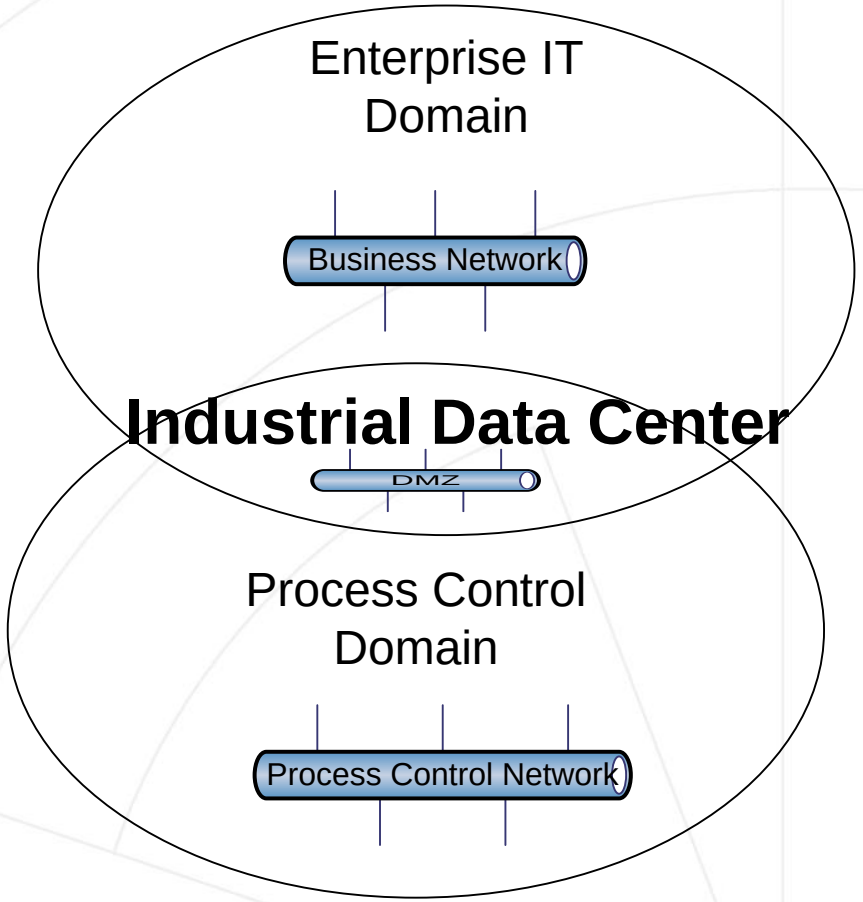


A Converged Network – at Your Pace

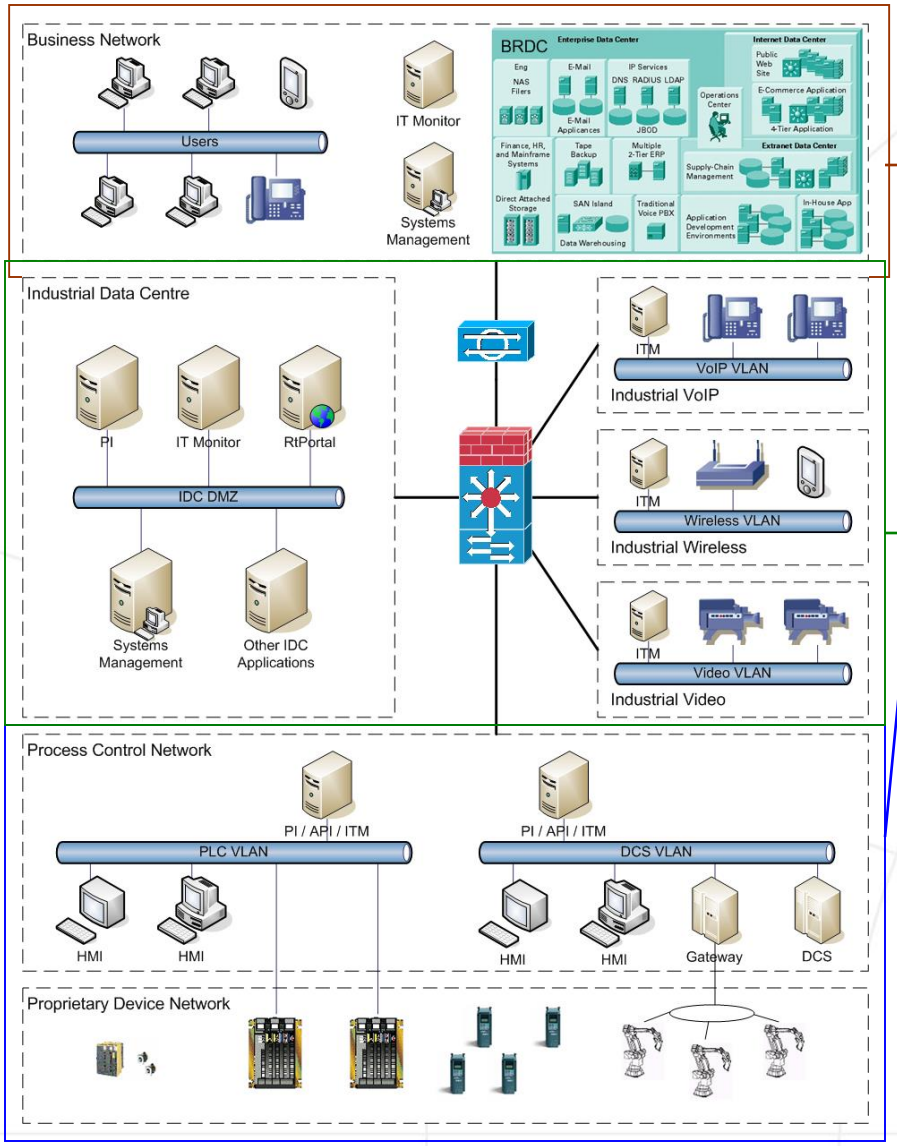


Bridging the Gap with the Enterprise

- Secure Data Link between Information Network and Control Systems
- Isolate/Protect /Secure PCN Data and Devices
- Timely and Appropriate Response to Incidents
- Enterprise and Regulatory Security Policy Compliance
- Allows introduction of advanced technology
- Reduce operation expenses
- Adheres to Enterprise IT management policy



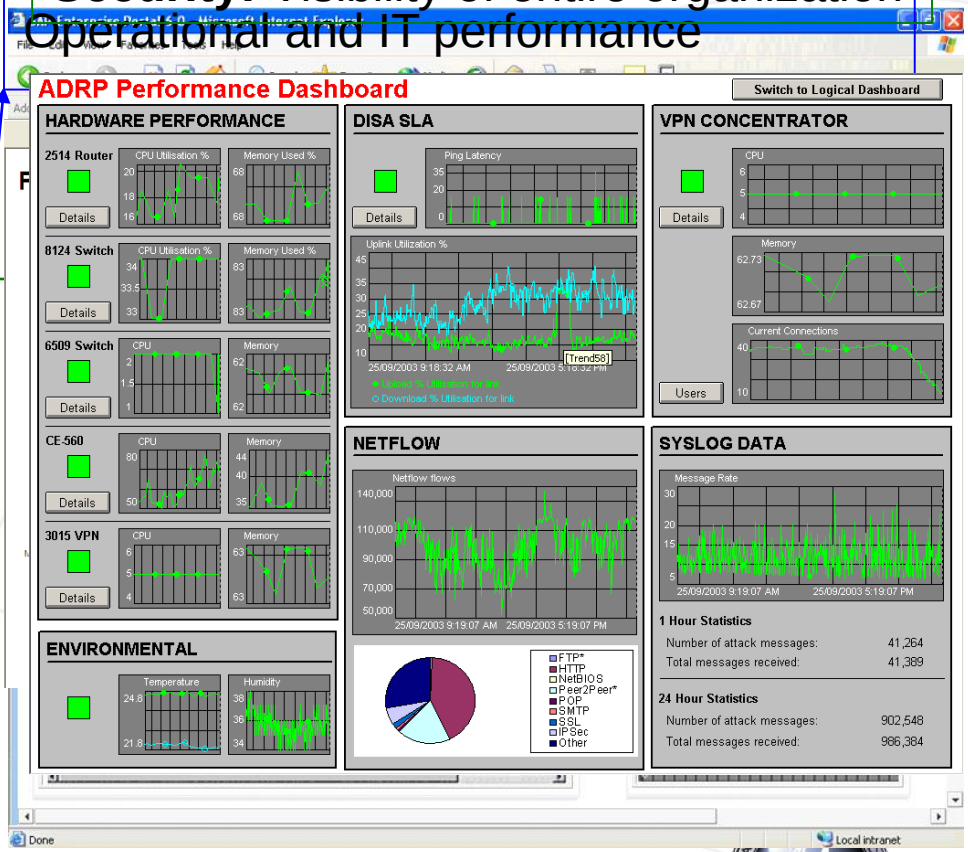
Industrial Data Center



Business Level: Integration with SAP/HPOV/CiscoWorks 2000

Process Control Network: Automate Operational and IT performance

Security: Visibility of entire organization



IT Monitor IDC – SCADA-Security

System

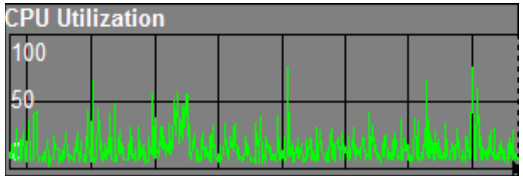
Online

Uptime ..... 68.1 Days

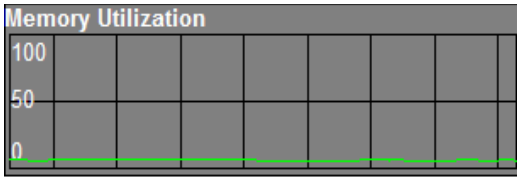
Disks

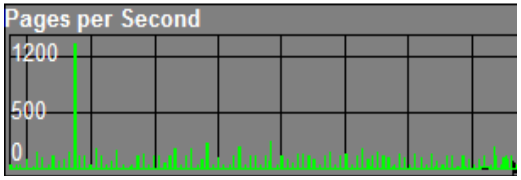
C:	D:	E:
83 %	16 %	72 %

SCADA Processes

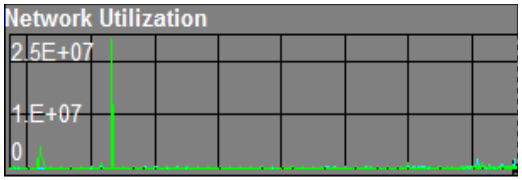


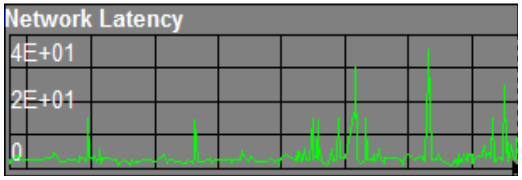
Memory





Network





NetFlow

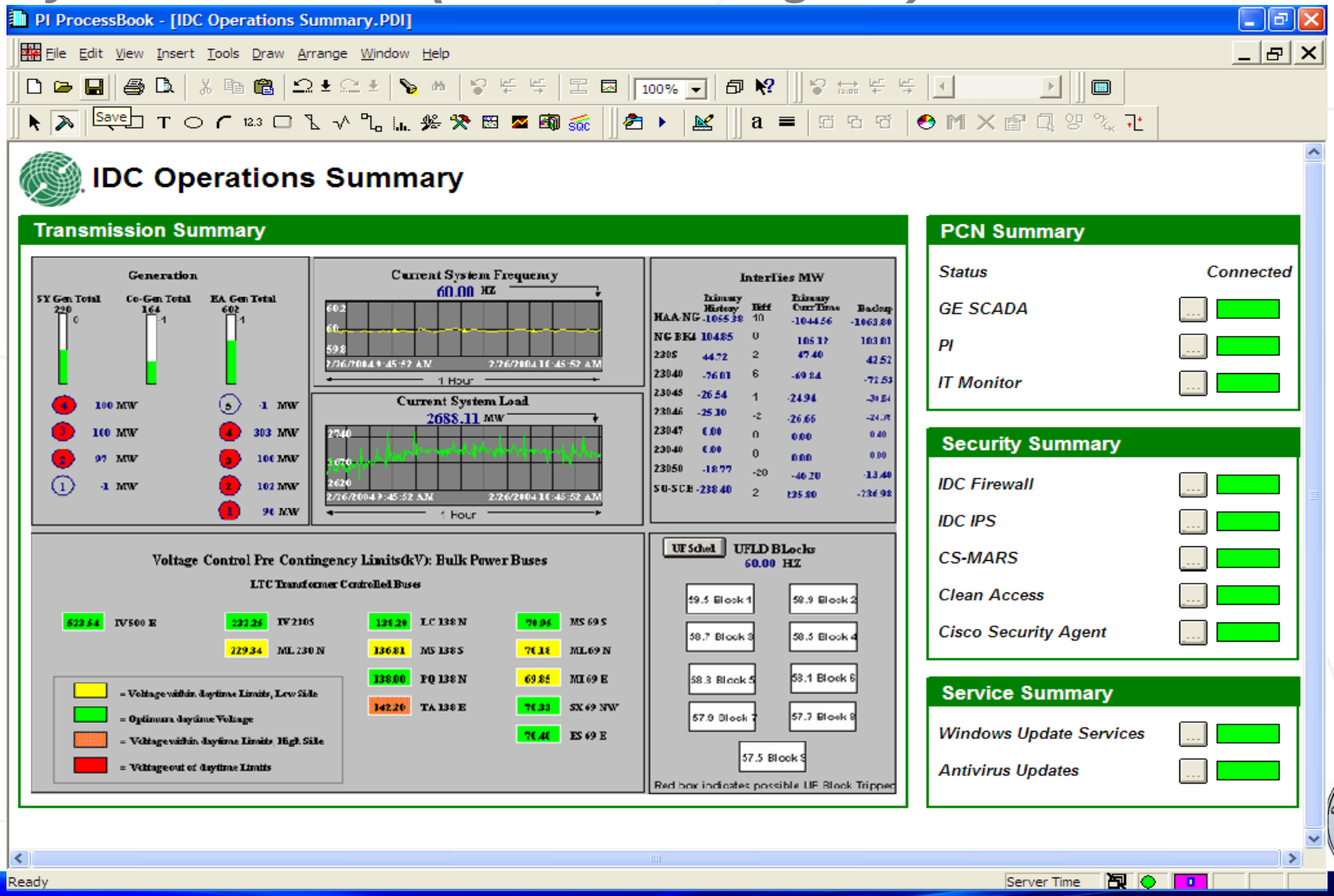
Date	Source IP Address		Source Port	Destination IP Address		Destination...	Bytes	Protocol
1 25-Feb-04 19:59:59.9467...	203.59.3.41	...	60424	203.161.127.131	...	25	130,161	6
1 25-Feb-04 20:00:11.2620...	203.59.3.41	...	60498	203.161.127.131	...	25	130,227	6
1 25-Feb-04 20:01:22.4780...	203.161.102.53	...	1786	203.161.127.131	...	25	698,246	6
1 25-Feb-04 20:03:03.9311...	203.161.102.53	...	1792	203.161.127.131	...	25	698,274	6
1 25-Feb-04 20:03:06.9311...	203.59.3.39	...	37989	203.161.127.131	...	25	130,230	6
1 25-Feb-04 20:03:40.1030...	203.59.3.39	...	38240	203.161.127.131	...	25	130,147	6

Syslog

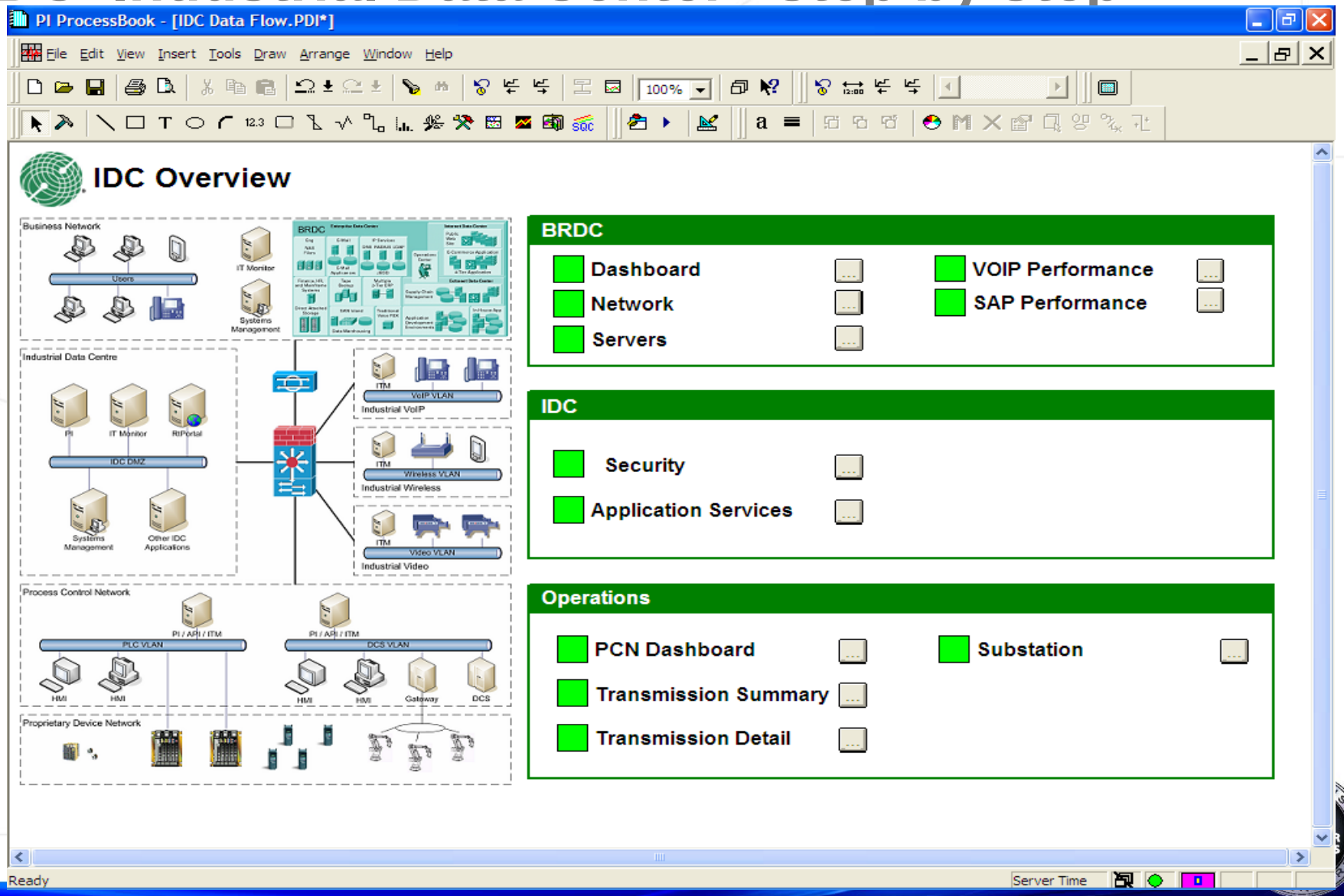
TimeStamp	HostName	Message ID	Message	Facility	Severity
Apr 13 16:47:11	PCN-C3550	%PIX-3-106010	Deny inbound TCP src outside:203.59.3.41/60424 dst inside:203.161.127.131/25	4	3

Industrial Data Center™

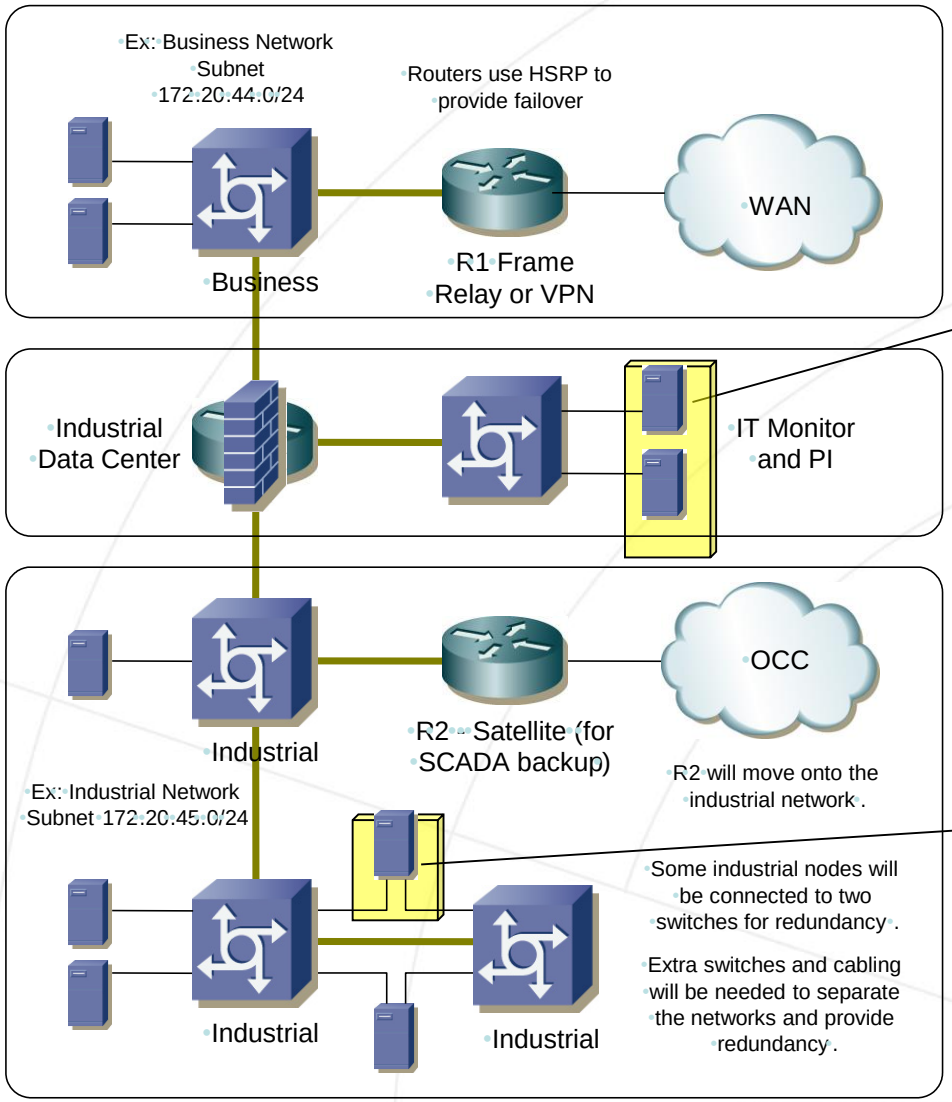
overcoming role-based challenges, hybrid networks (IT and Power grids)



IDC Industrial Data Center– step by step



Network Separation



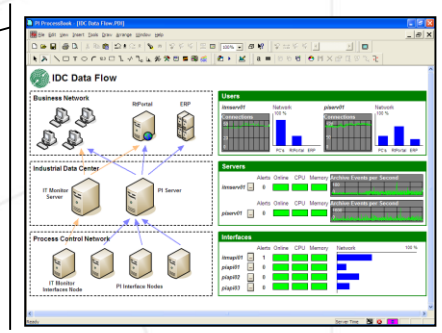
All connections between Industrial and Business networks terminate in the IDC DMZ

Either the business network or the industrial network nodes will be re-IP'd in order to support two separate network subnets.

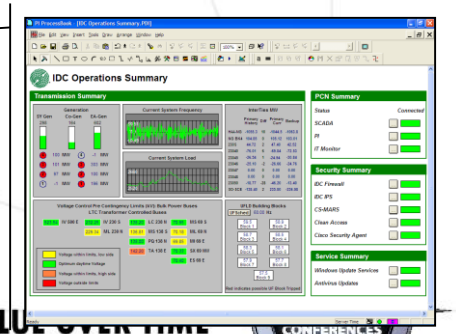
Business and industrial network nodes are strictly on separate switches.

Business and industrial nodes are on separate network subnets.

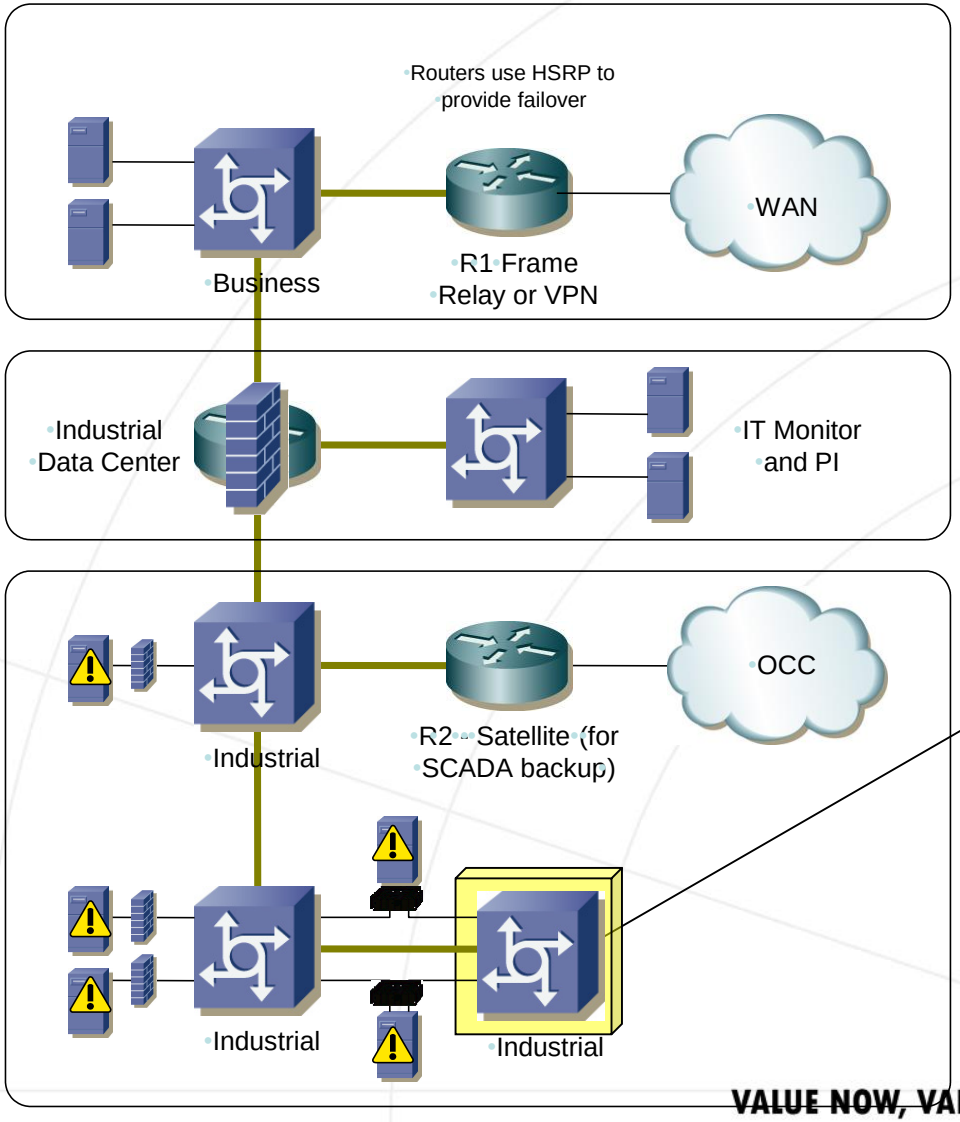
Real-time Data



Operations

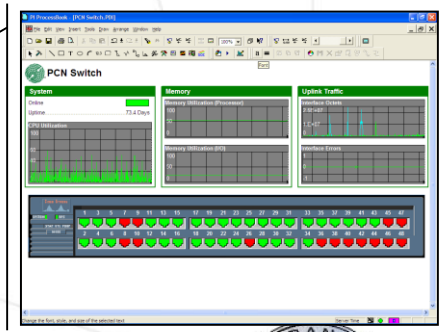


Unauthorized Devices



Layer 2
Port Security

Performance



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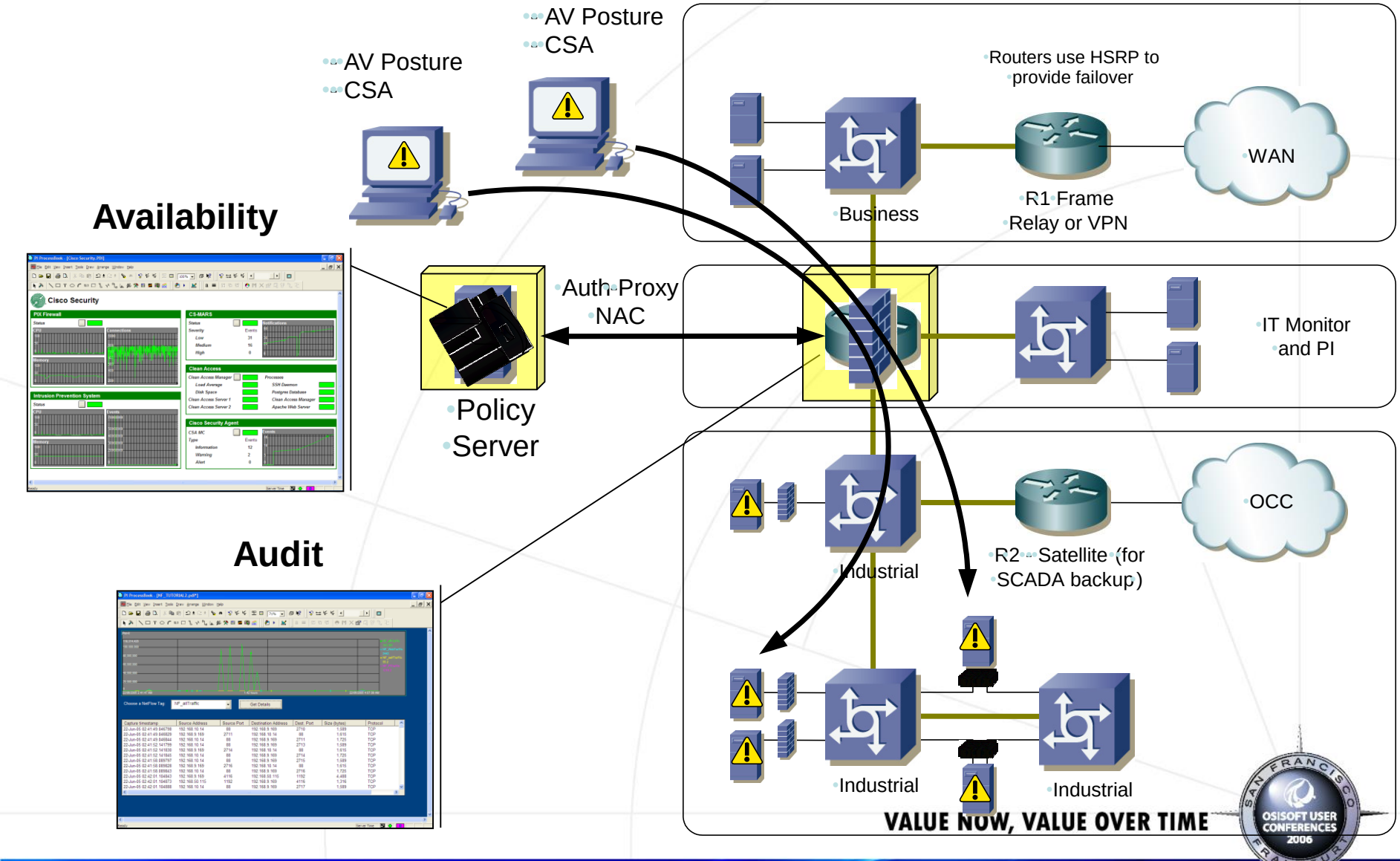
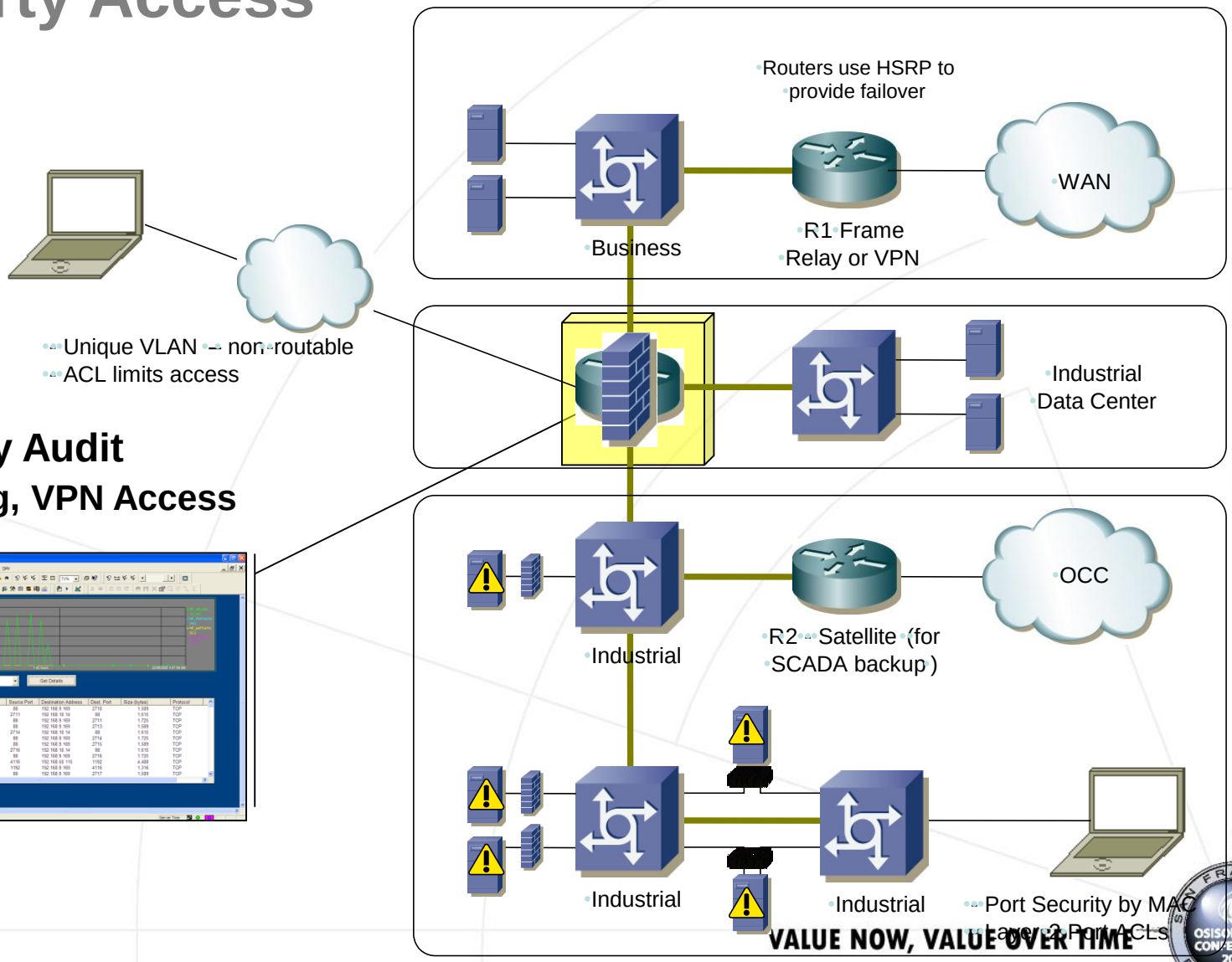
Administration

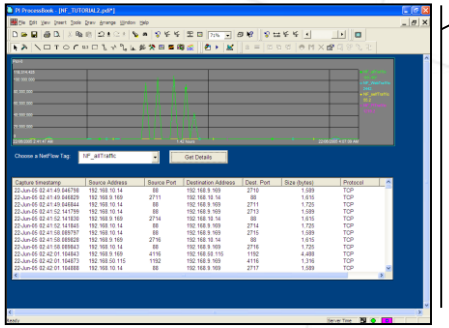


3rd Party Access

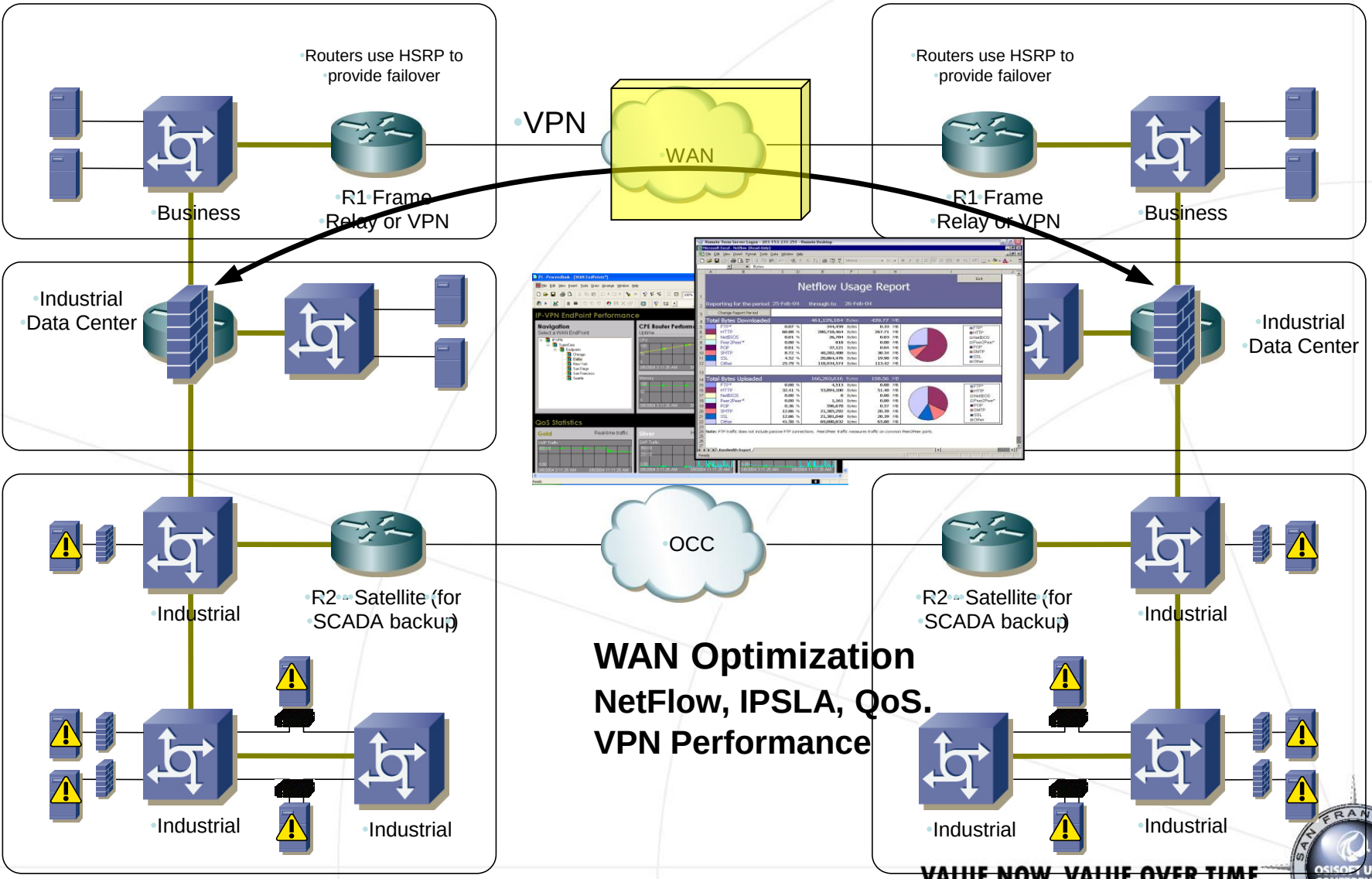


Policy Audit

Syslog, VPN Access



Site-to-Site Connectivity



WAN Optimization

NetFlow, IPSLA, QoS.

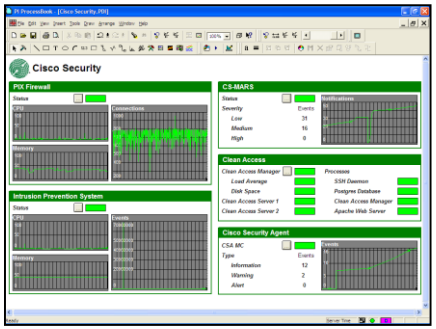
VPN Performance

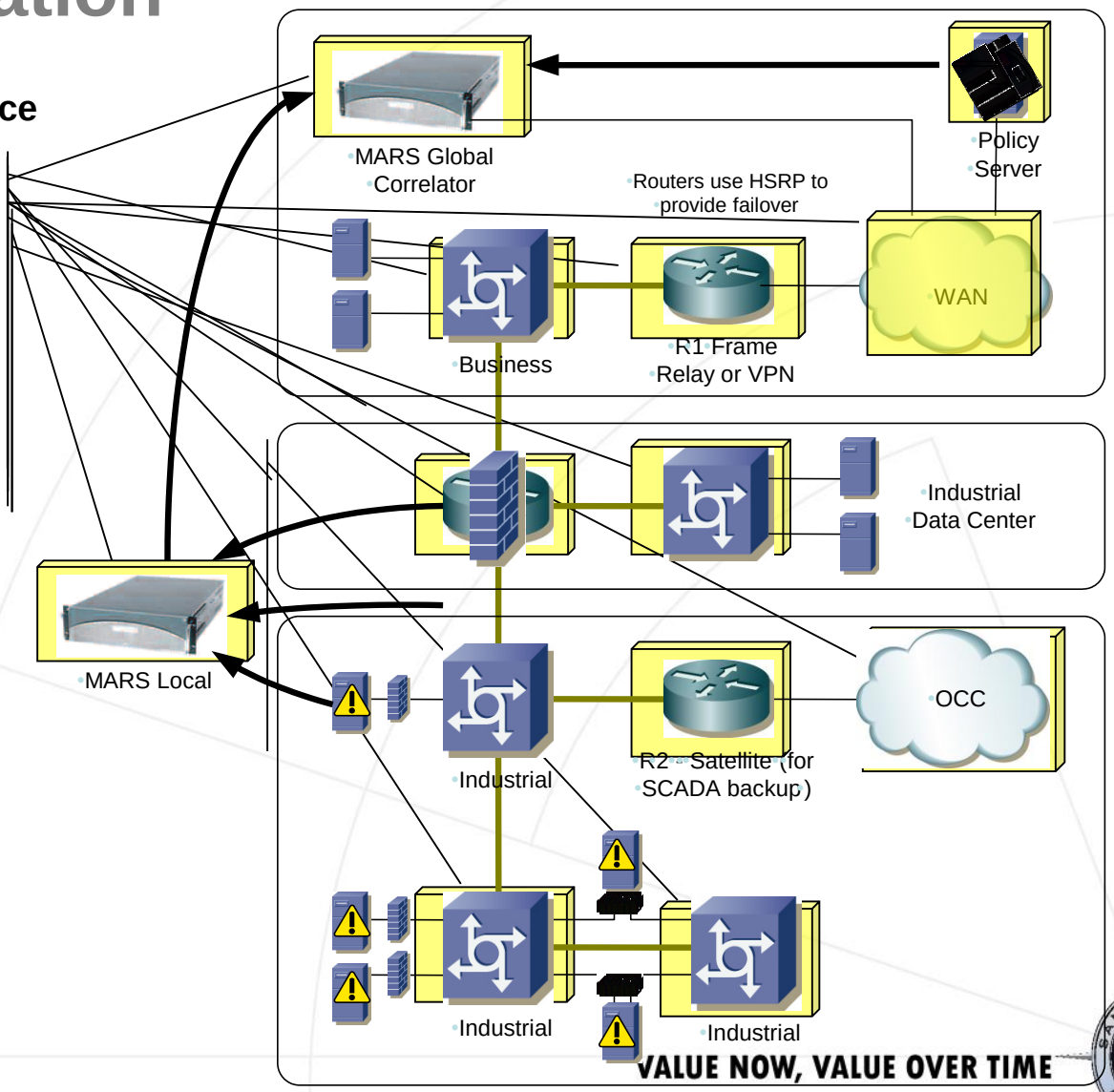
VALUE NOW, VALUE OVER TIME

Event Correlation

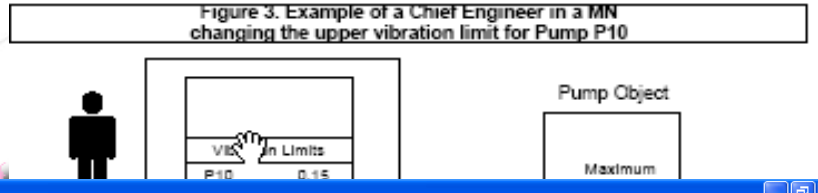
Dashboards

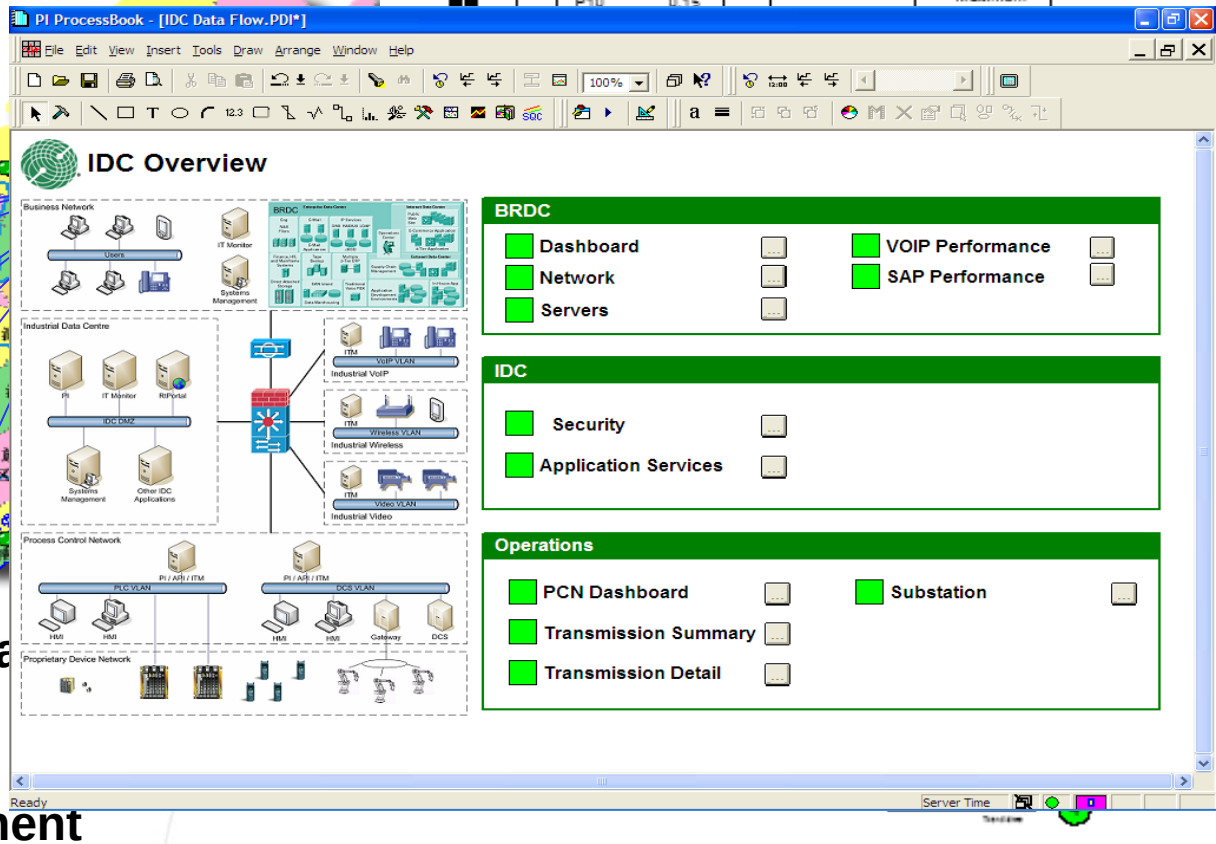
Security and Performance





National Grid of China





- **Complete transparency of Rea Operational and IT Data**
- **Centralized Remote Management**

Enterprise IT of the Future

- *The traditional barrier separating process sites and operations from business IT no longer serves organizations well*

- *The increasingly competitive arena will favor those who achieve Real-time integrated visibility of converged and hybrid operations and use that visibility to:*
  - *Increase core business operations reliability*
  - *Continuously improve process performance*
  - *Identify anomalies before they become disruptions*
  - *Use historical records for pattern forensics*
  - *Monitor systems and infrastructure for enterprise-wide compliance*
  - *Analyze systemic operational affects of both problems and enhancements*

"IT Monitor is a very functional solution for connecting enterprise technology to business performance. Collecting, storing and analyzing data from systems across the enterprise, in real time, allows IT to quickly isolate issues that might affect business performance, and act immediately to fix them. For an 'always on' business, that immediacy can drive down costs and deliver a significant service advantage."

~ Andi Mann, Sr. Analyst, Enterprise Management Associates

Thank you!-

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