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Ensuring Enterprise Application Resiliency With Tivoli And zEnterprise

PulseANZ 2010

Meet the people who can help advance your infrastructure

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Resilience

Main Entry: **re·sil·ience**

Pronunciation: \ri-’zil-yən(t)s\

Function: *noun*

Date: 1824

1 : the capability of a strained body to recover its size and shape after deformation caused especially by compressive stress

2 : *an ability to recover from or adjust easily to misfortune or change*

Source: http://www.merriam-webster.com/dictionary/resilience

Something meaningful is happening… The world is about to get a whole lot smarter.

"Every human being, company, organization, city, nation, natural system and man-made system is becoming **interconnected, instrumented and intelligent.** This is leading to new savings and efficiency—but perhaps as important, new possibilities for progress."

IBM Tivoli Application Resilience: Keeping the Smarter Planet highly available, predictable, and resilient

Smart is: Maintaining *continuous business and IT services and operations* while rapidly adapting and responding to risks and opportunities

SMART IS: Always open for business in a 24/7 world with predictable execution of business processes.

SMART IS: Reducing cost through proactive incident response and reduced downtime

SMART IS: Managing risk with enterprise-wide resiliency strategy

SMART IS: Responding with speed and agility while minimizing risk exposure.

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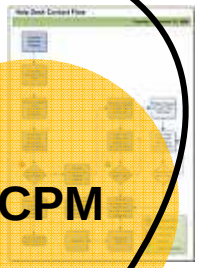
System Automation High Availability and Resiliency Solutions

Automated alert and escalation management

SA IOM

Adjunct to automation and high availability solutions for remote management, alerting, and escalation

Business continuity workflow process management



BCPM

- Provides automated solutions to improve business resiliency
- Leverages automation technology
- Implements Workflows for service management and business continuity

Complex application automation for heterogeneous clustered and stand-alone servers

SA AppMan

- Extends high availability across clusters and heterogeneous environments
- Integrates operational capabilities end-to-end

Distributed server clustering with heterogeneous platform support

SA MP

- Standalone high availability for distributed platforms
- Integrated high availability across platforms

Event automation for z/OS

SA z/OS

Foundational z automation technology

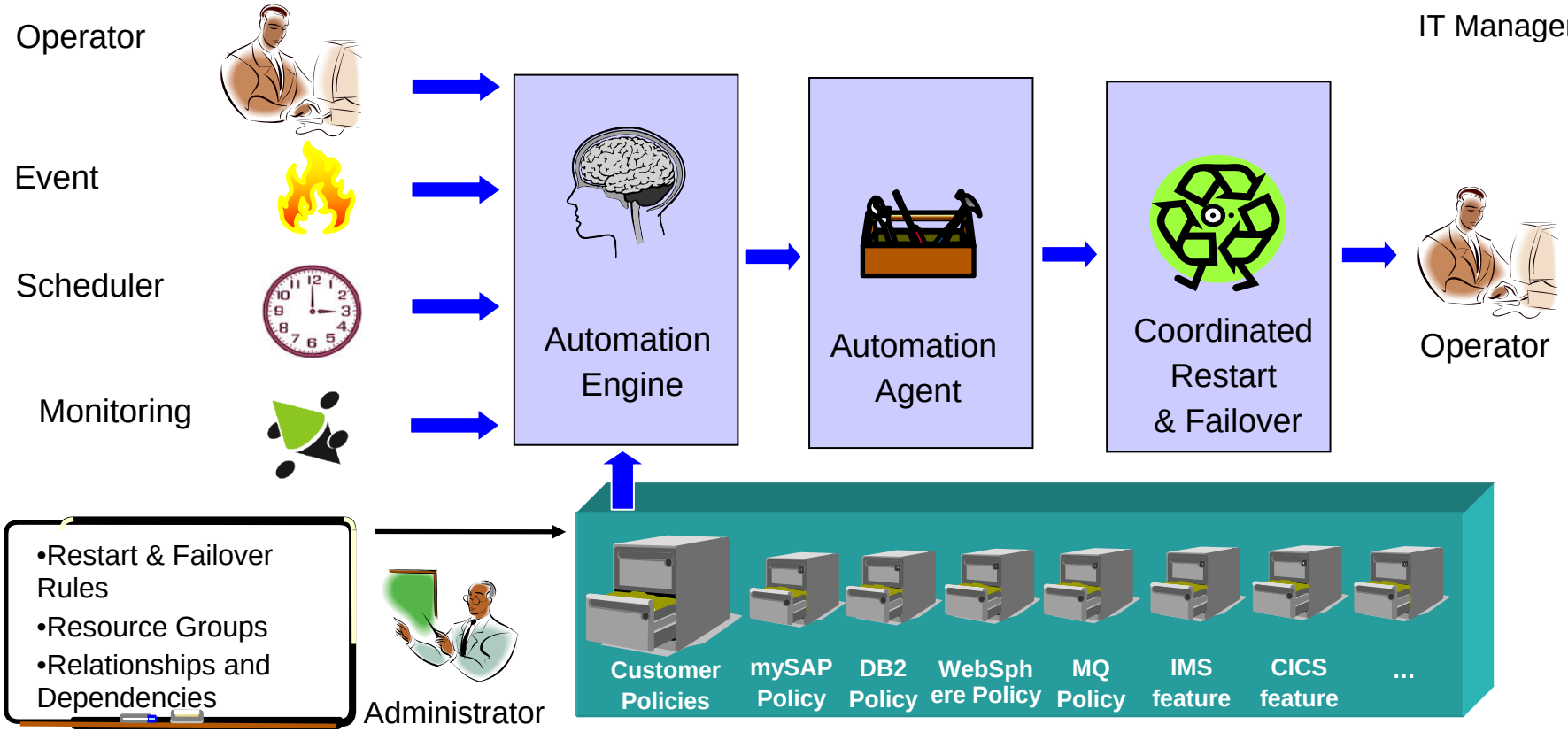
Introducing Tivoli Application Resilience Offering for zEnterprise

- Software
  - System Automation for z/OS
  - System Automation for Multiplatforms
  - System Automation Application Manager
  - System Automation for Integrated Operations Management
  - Tivoli Workload Scheduler for z/OS
  - Tivoli Workload Scheduler
- Services
  - Implementation And Customization Services

Application Resilience and the *IBM Tivoli System Automation Family*

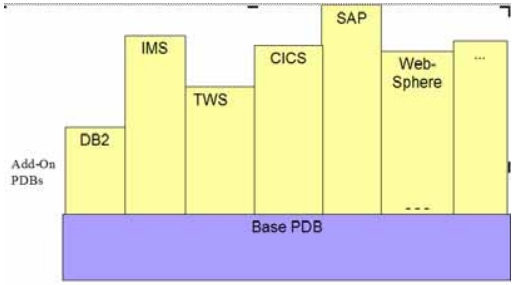
- Provide **Continuous Availability** of IT resources
  - Applications, processes, IP addresses, file systems, …
- Capability to **automatically start and stop** resources with knowledge of…
  - Resource groups, relationships, backup resources, …

IT Manager

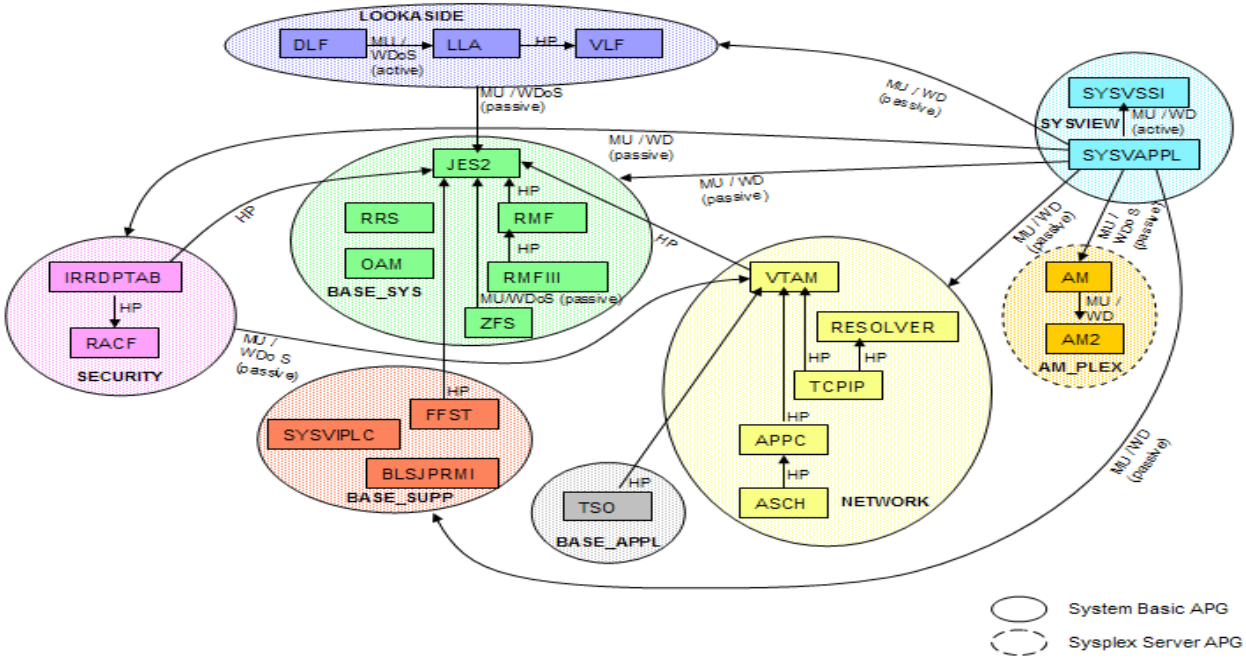


Sample Automation Policies Based on Best Practices

- **Base Policy + Multiple add-on policies**
- **Structured Collection of Policies**
- **Unique Definitions across all policies**
- **Solution Oriented**
- **Arbitrary selection of add-on policies**



DB2
TWS
WebSphere
IMS
ITM
CICS
NMC
USS
ProcOps
OMEGAMON
GDPS
SAP
TBSM



Powerful Relationship Support

START and **STOP** relationships

- Relationships define how one resource relates to another resource
  - HasParent
  - MakeAvailable, MakeUnavailable
  - PrepAvailable, PrepUnavailable
  - ForceDown

Condition associated with relationship

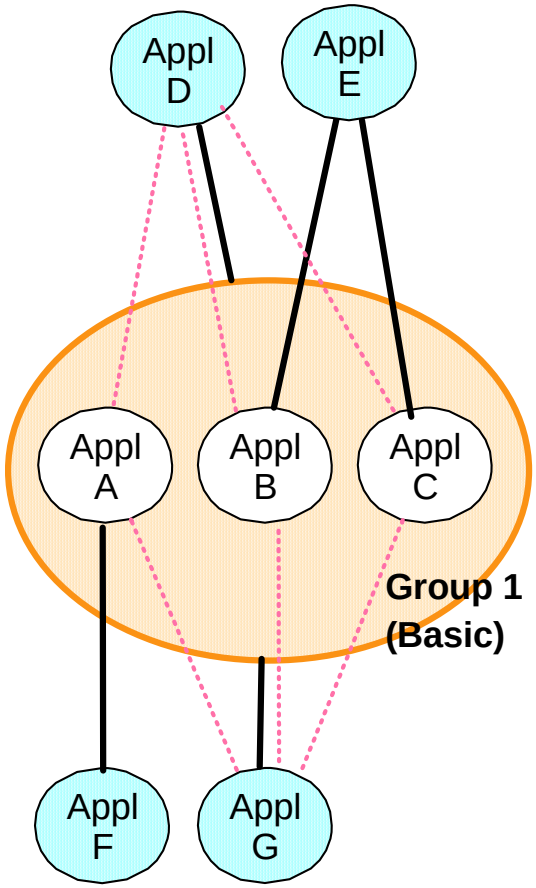
- WhenAvailable
- WhenUnavailable
- WhenAvailableOrStarting
- WhenUnavailableOrStopping
- WhenObservedDown

- **Automation option**
  - Active vs Passive

Unidirected, sysplex-wide

Evaluated when goal not equal status

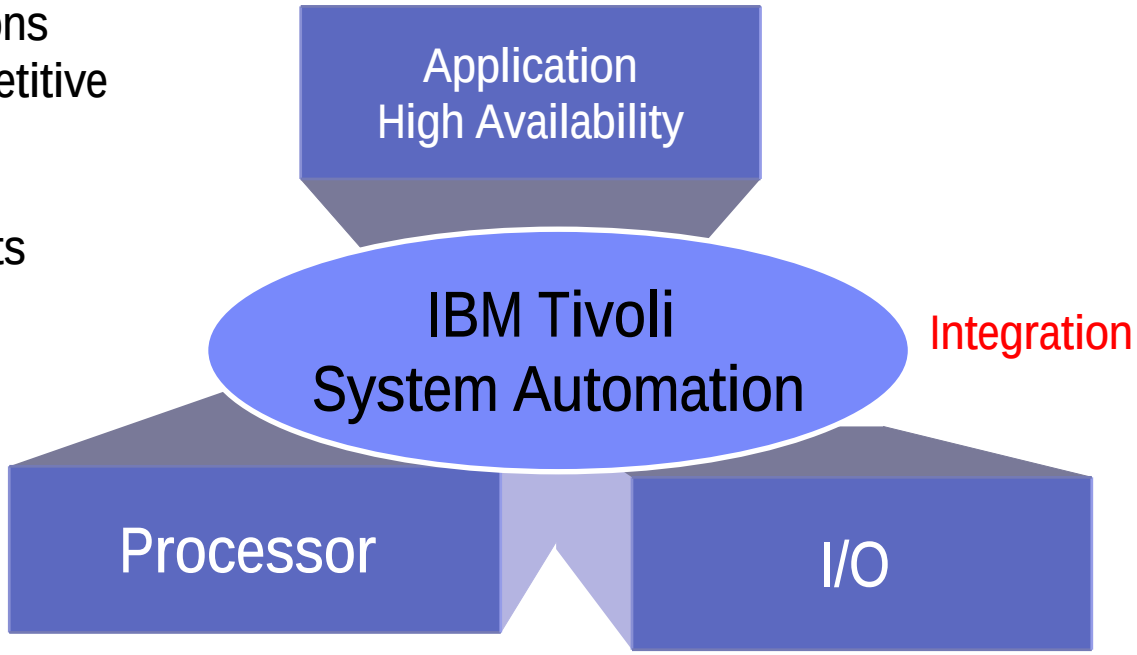
Group and Conquer



- A group is a collection of multiple resources
- Status derived from the aggregated status of its members
- A group can be part of any dependency or other group
- Membership in multiple groups possible
- Groups are referenced by a sysplex or system-wide unique name
- Members can be distributed within a sysplex
- Enables automation and control for a complete (business) application
- Frees operator from knowing the various pieces that comprise an application

What Can You Automate With SA for z/OS?

- Automate applications
- Automate many repetitive and complex tasks
- Monitor processes, messages, and alerts

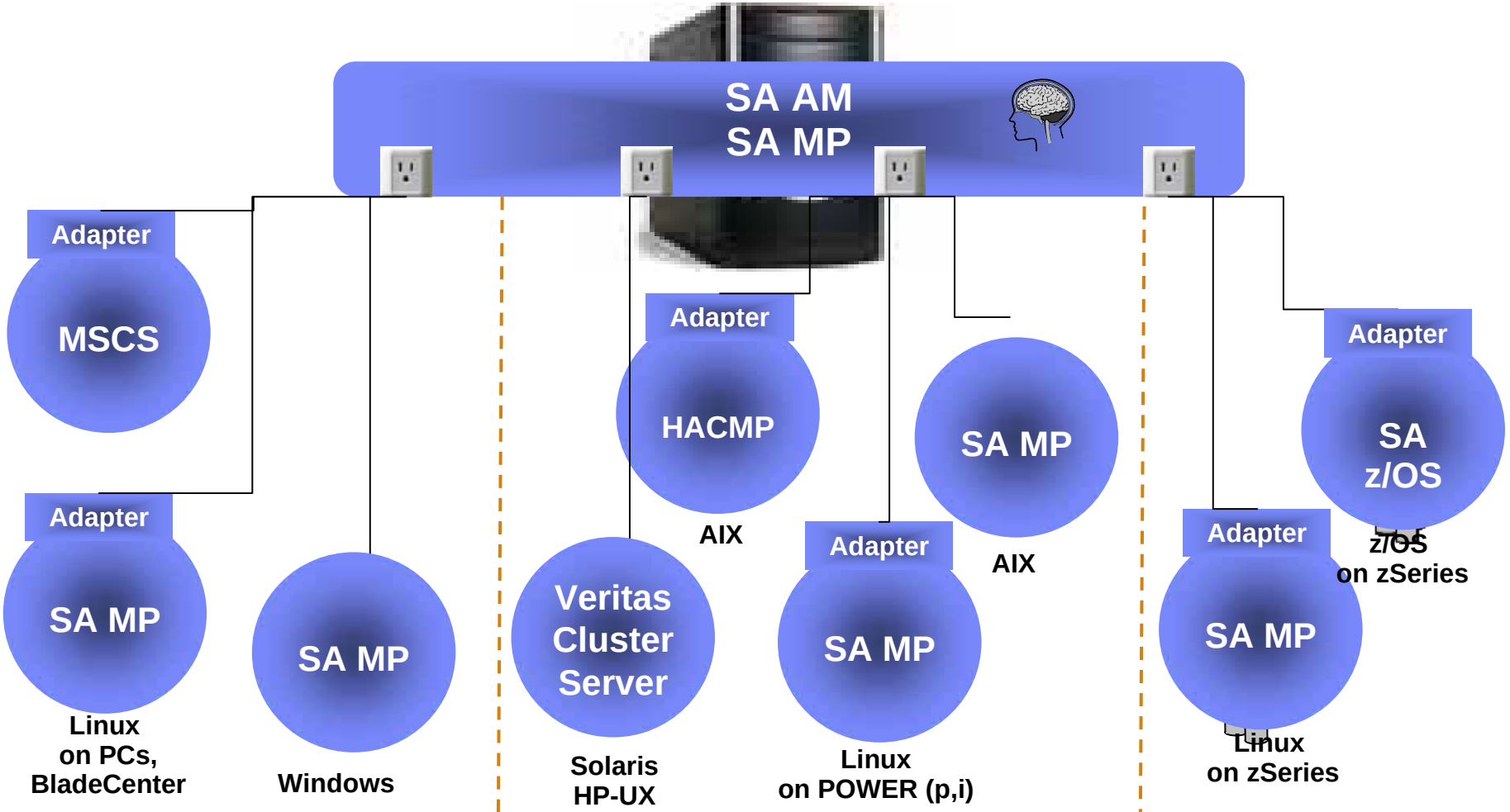


- Initialize, configure, recover, and shut down servers
- External monitoring and automation from a single point of control

- Change I/O configuration on the fly
- Safe through system-integrated switching
- Manage ESCON & FICON Directors

Tivoli System Automation for z/OS Demo

System Automation for Multiplatforms
System Automation Application Manager



Product Provided Automation Policy Templates (Linux / AIX)

http://www.ibm.com/software/tivoli/products/sys-auto-linux/enablement.html

- Data Management
  - –DB2 8.x/9.x ESE
  - –DB2 8.x/9.x ESE DPF
  - –DB2 8.x/9.x HADR
  - –DB2 7.x WE, EE
  - –Oracle 9i
  - –Oracle 8i
- WebSphere
  - –WebSphere Application Server 6.0
  - –WebSphere MQ
- Tivoli Products
  - –Tivoli Workload Scheduler
  - –CCMDB / TADDM
  - –Tivoli Storage Manager (TSM)
  - –TSM Client
  - –Tivoli Enterprise Console 3.8
- SAP
  - –SAP Replicated Enqueue environment
  - –SAP Application Server
- Shared File Systems
  - –NFS Server
  - –NFS Client
  - –Samba
- Groupware
  - –Sendmail 8.11
- Web Servers
  - –Apache Web Server
  - –IBM HTTP Server
- Currently under development:
  - –WebSphere Application Server 5.1
  - –DP for mySAP
  - –DRBD
  - –SA MP End-to-End Component
  - –Tivoli Provisioning Manager

Automation Activity and Measurement Reports

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Startup and Shutdown Times for a selected resource Report

Domain name:	FriendlyE2E		
Resource Name	DB2 Production Server FEPLEX2/SYS1		
Time Interval:	Mar 26, 2008 12:00 AM - Apr 27, 2008 12:00 PM		
Active policy at report generation:	Policy 1	Active since:	May 7, 2008 6:20 PM
Displayed graph depth:	All		

Summary

Cumulative startup time (including dependencies)		Gross startup time		Observed startup time	
Minimum	2min 15sec	Minimum	2min 15sec	Minimum	22sec
Maximum	2min 47sec	Maximum	2min 47sec	Maximum	29sec
Average	2min 29sec	Average	2min 29sec	Average	26sec
Cumulative shutdown time (including dependencies)		**Gross shutdown time**		**Observed shutdown time**	
Minimum	3min 47sec	Minimum	3min 47sec	Minimum	12sec
Maximum	4min 34sec	Maximum	4min 34sec	Maximum	29sec
Average	4min 11sec	Average	4min 11sec	Average	20sec

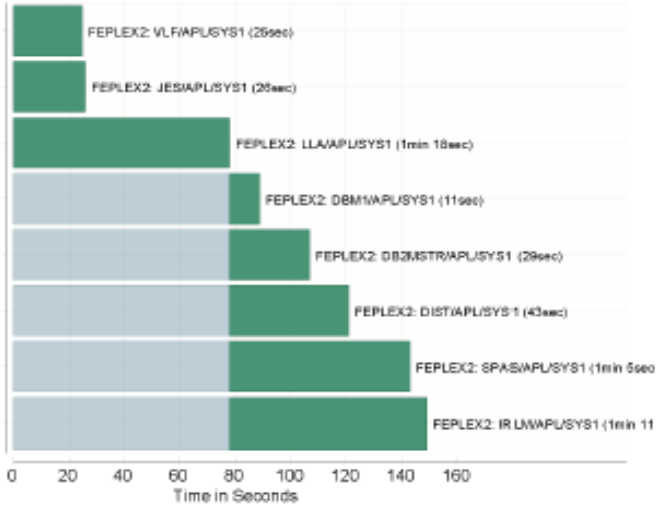
Startup times

Chart shows average cumulative startup times

May 7, 2008 6:20:34 PM GMT+02:00 1 / 6

Tivoli IBM

Times shown in graph are the cumulative average startup times. If a resource has startup dependencencies, the average cumulative startup time of this dependency chain and the resources own average startup time are displayed in parentheses. The times displayed are formatted like this: Cumulative Startup Time (Dependent Startup Time + Own Startup Time)



Resource Name	Cumulative startup time (including dependencies) Minimum	Maximum	Average	Startup time Minimum	Maximum	Average	Number of startups
DB2 Production Server FEPLEX2/SYS1	2min 15sec	2min 47sec	2min 29sec	2min 15sec	2min 47sec	2min 29sec	Not applicable
FEPLEX2: DB2/APG/SYS1	2min 15sec	2min 47sec	2min 29sec	1min 5sec	1min 20sec	1min 11sec	Not applicable
FEPLEX2: Z_OS_BASE/APG/SYS1	1min 10sec	1min 27sec	1min 18sec	1min 10sec	1min 27sec	1min 18sec	Not applicable
FEPLEX2: DB2MSTR/APL/SYS1	29sec	29sec	29sec	29sec	29sec	29sec	1

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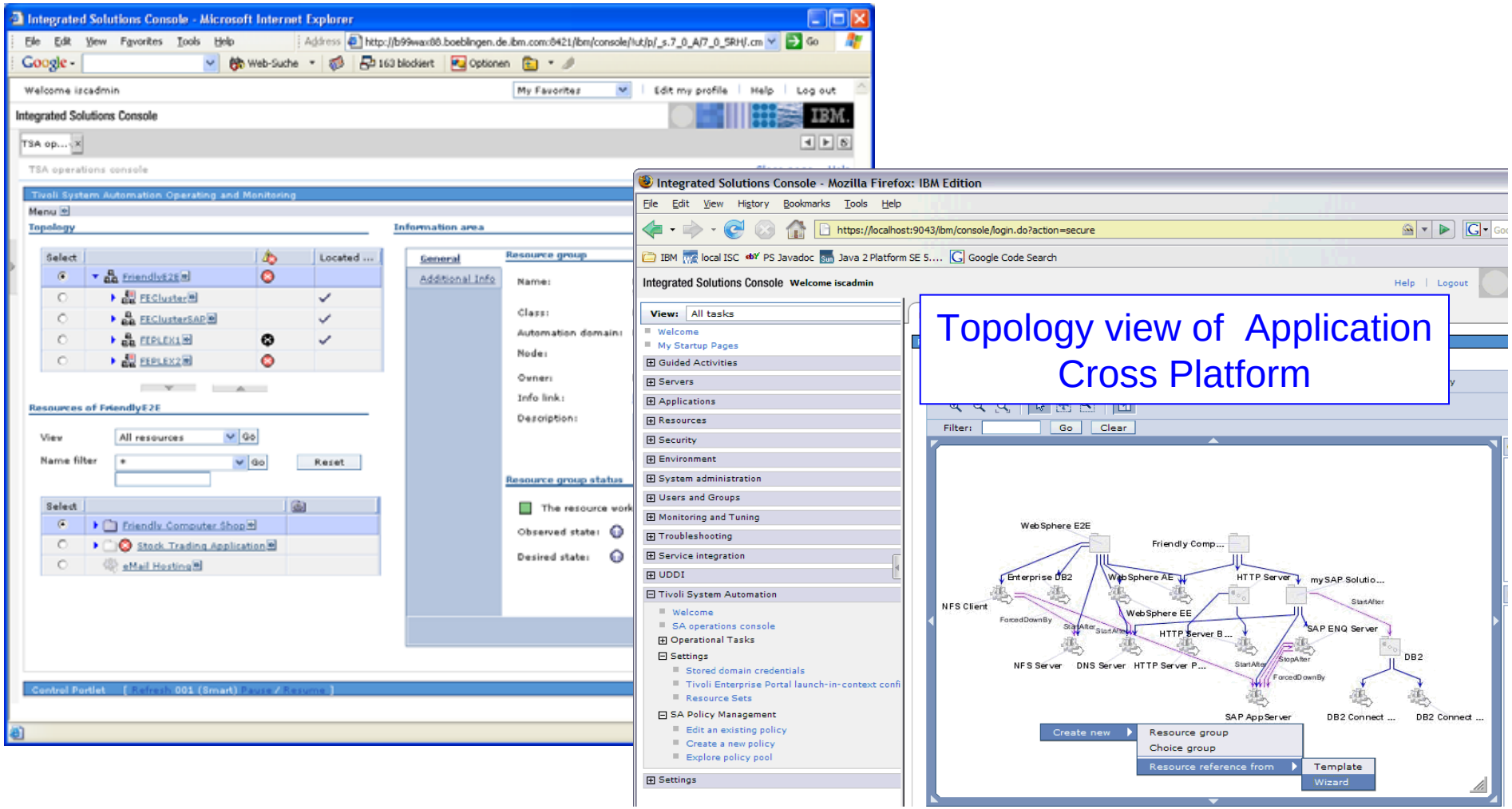
Operations Console and Policy Editor

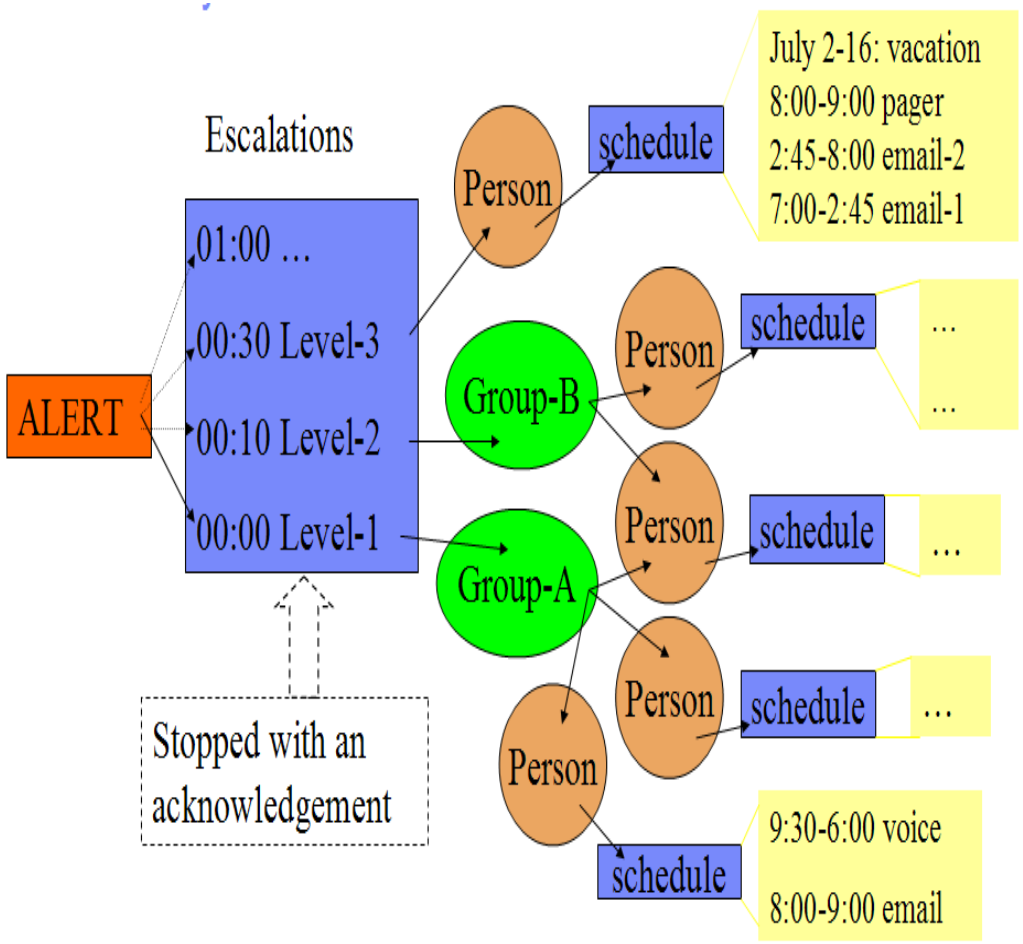


Tivoli System Automation for Multi Platform Demo

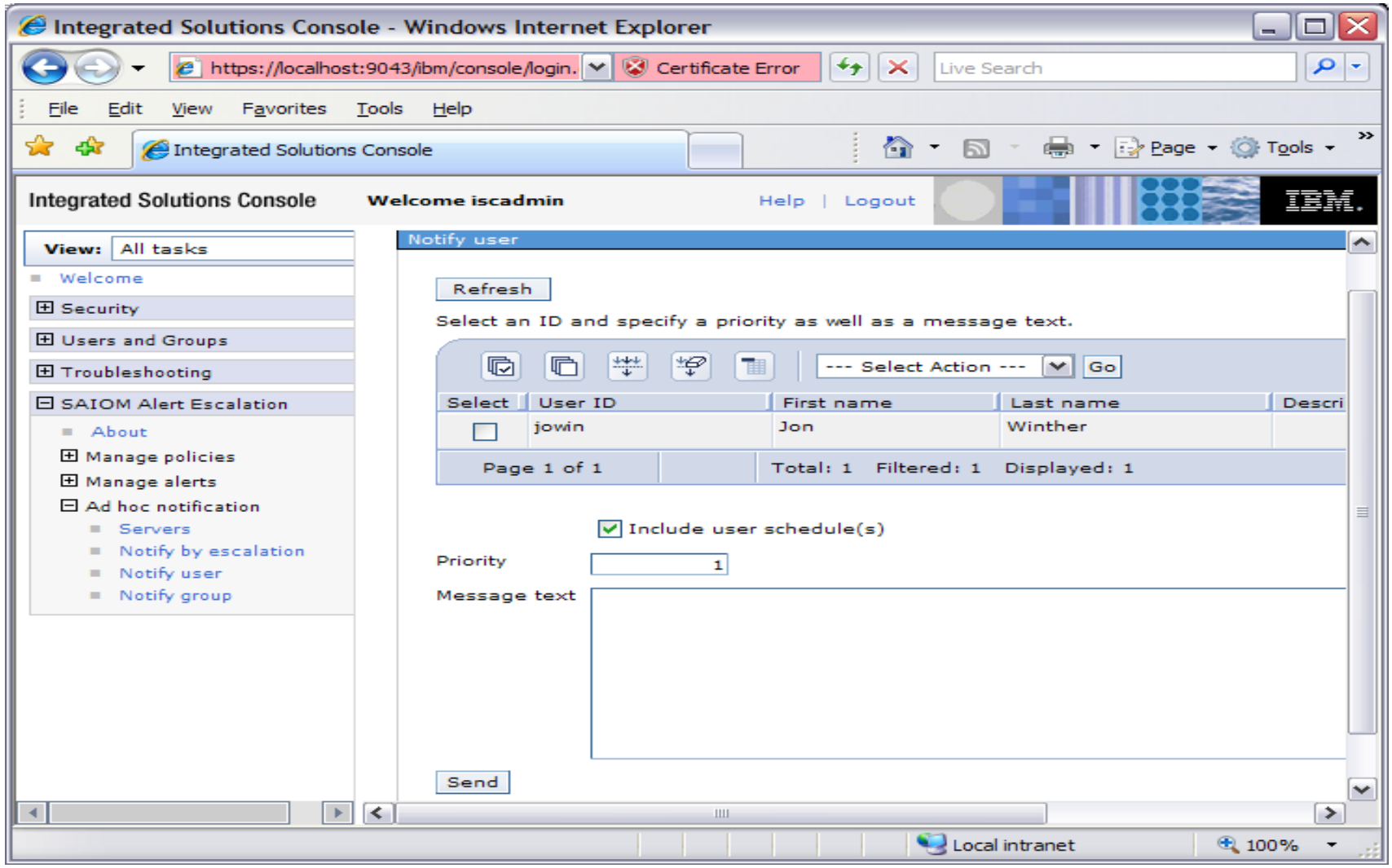
SA IOM Alerts and Notification to Enhance Automation

- Flexible model for scheduling call outs
- Allows individual notification preferences
- Can be used to activate a blackout period for a given escalation ID (to prevent alert flooding)

08:00-09:00 pager
14:00-16:00 email
17:00-24:00 SMS
Sep01-20,2006 vacation



SA IOM Ad-Hoc Notification



At-A-Glance Status of Notifications

Event history

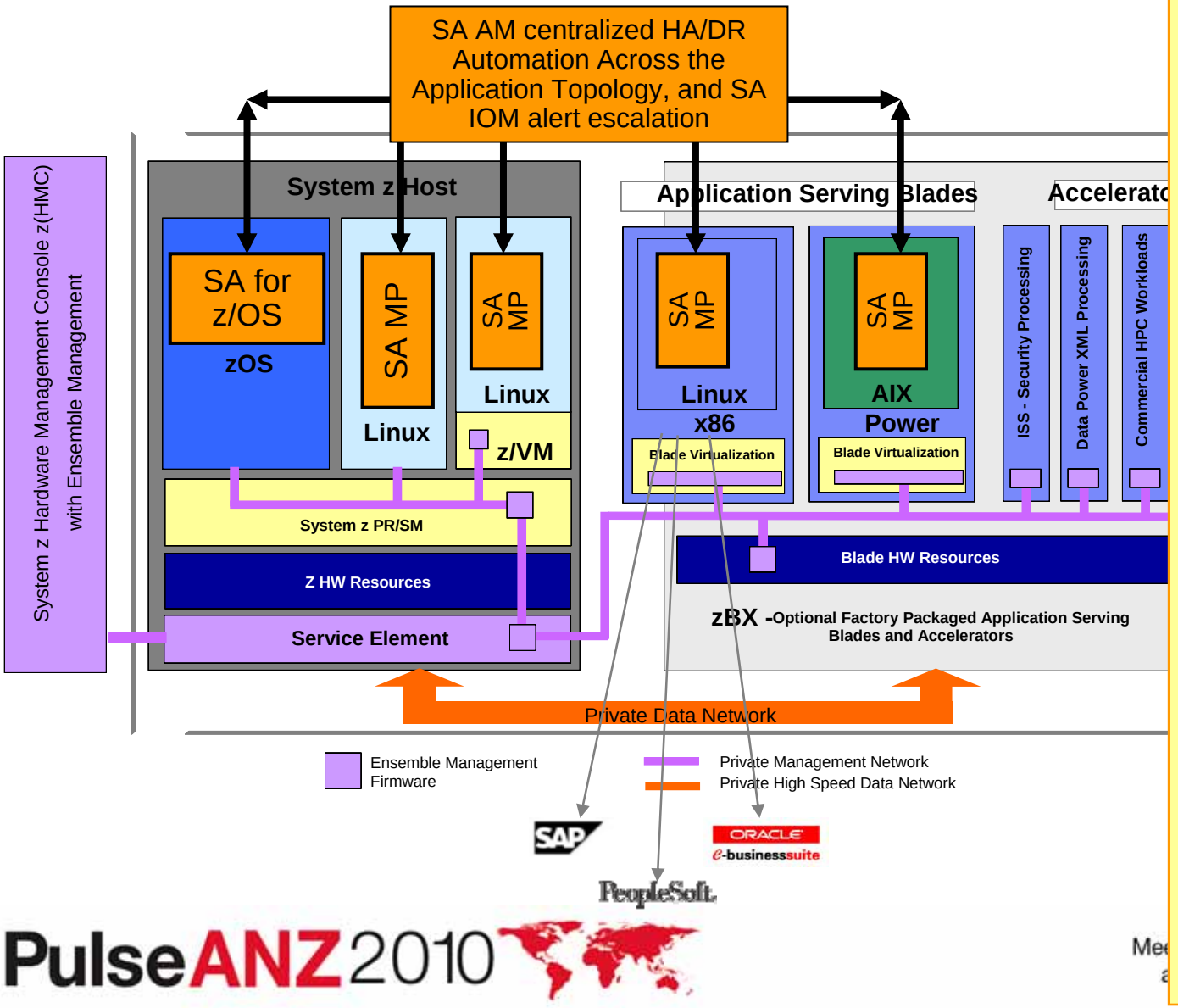
Refresh

--- Select Action --- Go

Select	Time stamp	Alert ID	Esc. ID	Esc. L...	Event type	Info
	Filter	= 4,797	Filter	Filter	Filter	Filter
○	19.03.2007 15:38:48	4797	SMS_ESCALATION	1	Status change	new status=exhausted
○	19.03.2007 15:38:48	4797	SMS_ESCALATION	1	Escalation end	total notifications: 2
○	19.03.2007 15:38:48	4797	SMS_ESCALATION	1	Escalation level end	level expired
○	19.03.2007 15:33:49	4797	SMS_ESCALATION		Helper script end	result from NotifyEmail(5) result=OK desc=
○	19.03.2007 15:33:48	4797	SMS_ESCALATION	1	Helper script invoke	NotifyEmail.rex started with 2 recipients
○	19.03.2007 15:33:48	4797	SMS_ESCALATION	1	Person processing	user=Gunnar notification=email
○	19.03.2007 15:33:48	4797	SMS_ESCALATION	1	Person processing	user=Christa_eMail notification=email
○	19.03.2007 15:33:48	4797	SMS_ESCALATION	1	Escalation level start	duration=5 minutes
○	19.03.2007 15:33:48	4797	SMS_ESCALATION		Escalation start	ING140I ALERT 'OS_PROBLEM' FOR 'IOMBROKEN/APL/SAT1' ON 'SAT1' AT 17:33:40 2007-03-19
○	19.03.2007 15:33:47	4797	SMS_ESCALATION		Alert arrival	

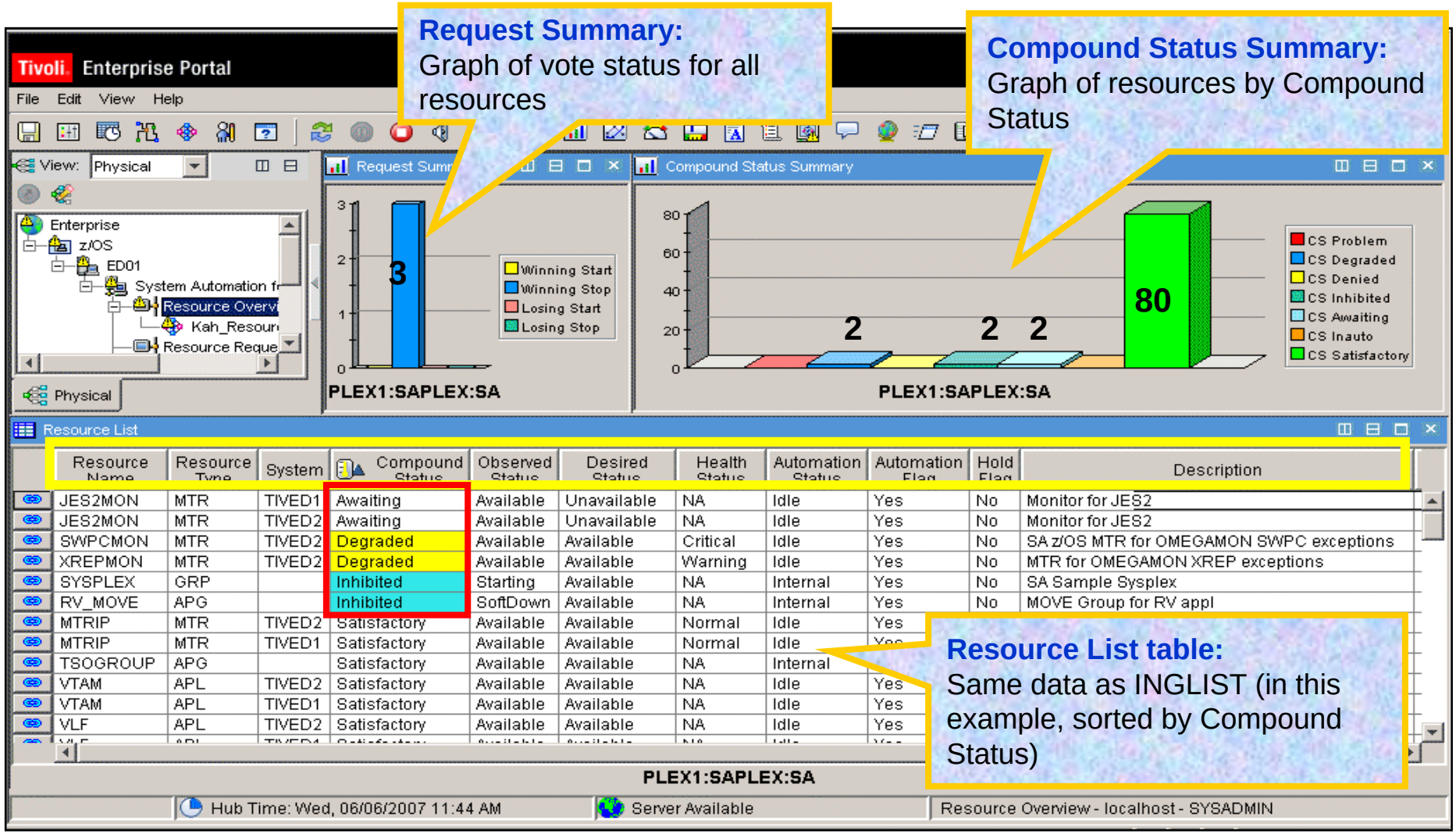
Page 1 of 1 | Total: 10 Filtered: 10 Displayed: 10

End-to-end and Tivoli System Automation



- First-level automation for single systems, or system clusters
- End-to-end automation across single systems and system clusters, across platforms
- Central point of control for HA/DR application and resource automation from SA AM web-based console
- SA AM provides lean agentless adapter to automate applications on a single system
- Standardize HA automation and UI across all domains
- Provide alert escalation based on roles

Integration with Monitoring (TEP)



Application Resilience and the *IBM Tivoli Workload Automation Family*

- Tivoli Workload Automation: Automates application processes and maintains their dependencies and SLAs
  - What?
  - When?
  - Where?
  - What if?
- Centralized planning, forecasting, orchestrating, delivering, and adapting critical workloads
- ROI generated by
  - Predictably executing workloads with complex dependencies and spanning complex application topologies
  - Reduce SLA violations, downtime
  - Reduce manual intervention
  - Optimize resource usage

Unify management of end-to-end composite and heterogeneous workloads in a platform agnostic way and in a single point of control.

Consolidate

Converge calendar and event-driven workloads into **predictable long-term plans**. Proactive control and KPI on business services

Predictability

Prioritize business critical workload and automatically promote critical activities to reach business goals

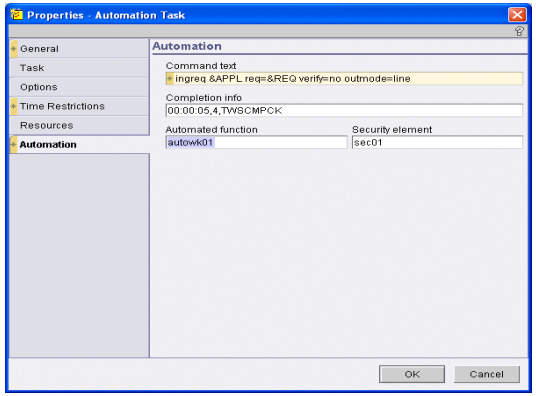
Help SLA

Decouple workload by IT infrastructure, with dynamic dispatching of workloads to best available resources, based on workload requirements and user policies

Virtualize

Tivoli System Automation – Workload Automation Integration

Define SA commands in TWS

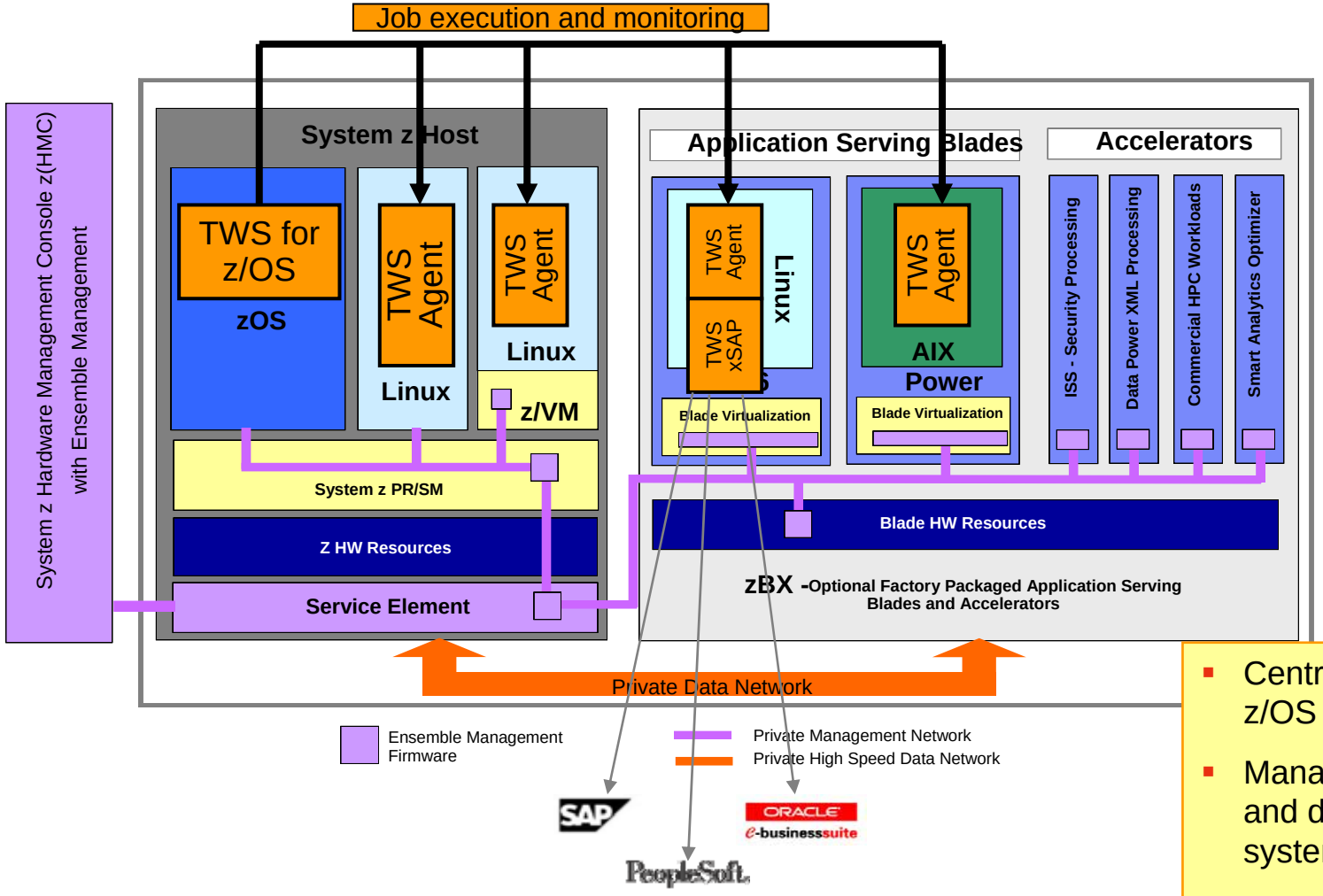


- Execute SA commands from TWS
- Retrieve SA command execution results into TWS

SA Policies

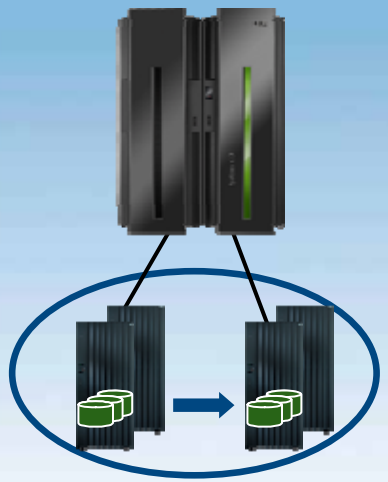
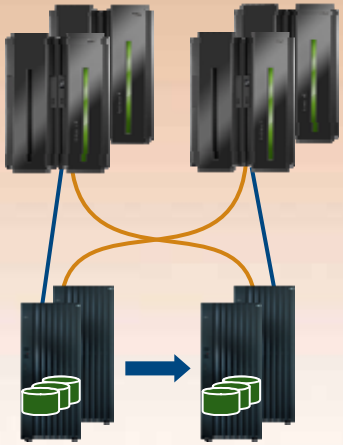
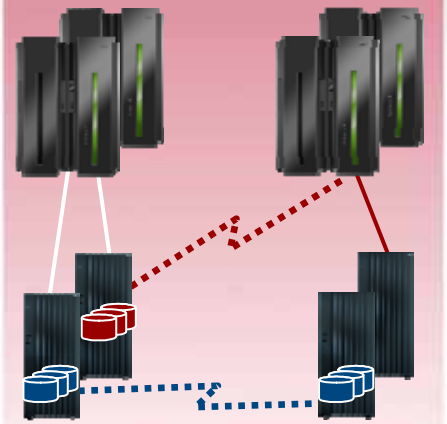
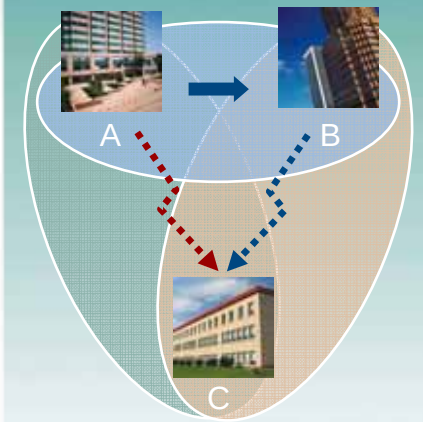
- TWS-SA z/OS integration
  - SA z/OS provides a command interface for TWS operators to execute NetView and SA z/OS commands as part of the job flow / production plan
  - TWS provides operator interface for SA z/OS and NetView operators to modify current plans
- Value
  - Highest degree of availability for service delivery by automating business process execution and application components
  - Add maintenance plans to TWS and trigger SA to stop/start complex multi-tiered applications to perform maintenance at the best time and to shrink maintenance windows

End-to-end and Tivoli Workload Automation

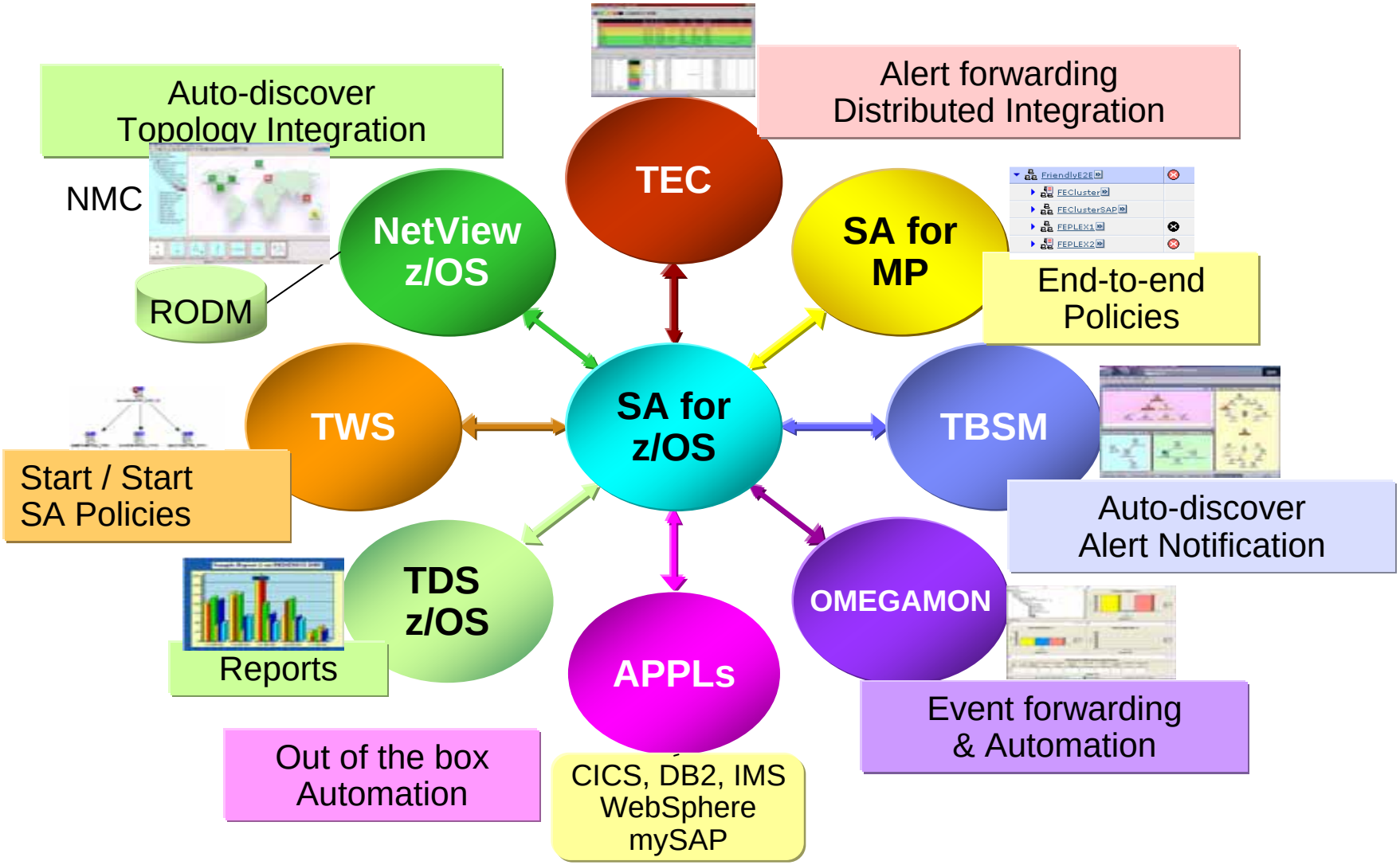


- Central point of control from z/OS
- Manages execution on z/OS and distributed virtual systems
- Workload Manager classify job executions and apply workload policies

GDPS: The Right Level of Protection for Your Business

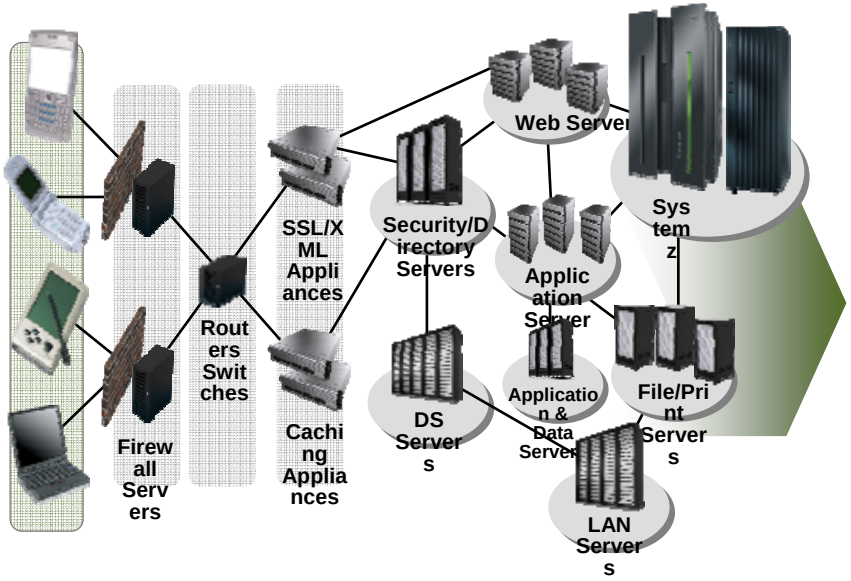
Continuous Availability of Data within a Data Center	Continuous Availability & Disaster Recovery Metropolitan Region	Disaster Recovery at Extended Distance	Continuous Availability Regionally and Disaster Recovery Extended Distance
Single Data Center Applications remain active Near-continuous availability to data	Two Data Centers Systems remain active Automated D/R across site or storage failure No data loss	Two Data Centers Automated Disaster Recovery "seconds" of Data Loss	Three Data Centers Data availability No data loss Extended distances
			
GDPS/PPRC HM	GDPS/ PPRC HM GDPS/PPRC	GDPS/GM (blue line) GDPS/XRC (red line)	GDPS/MGM GDPS/MzGM

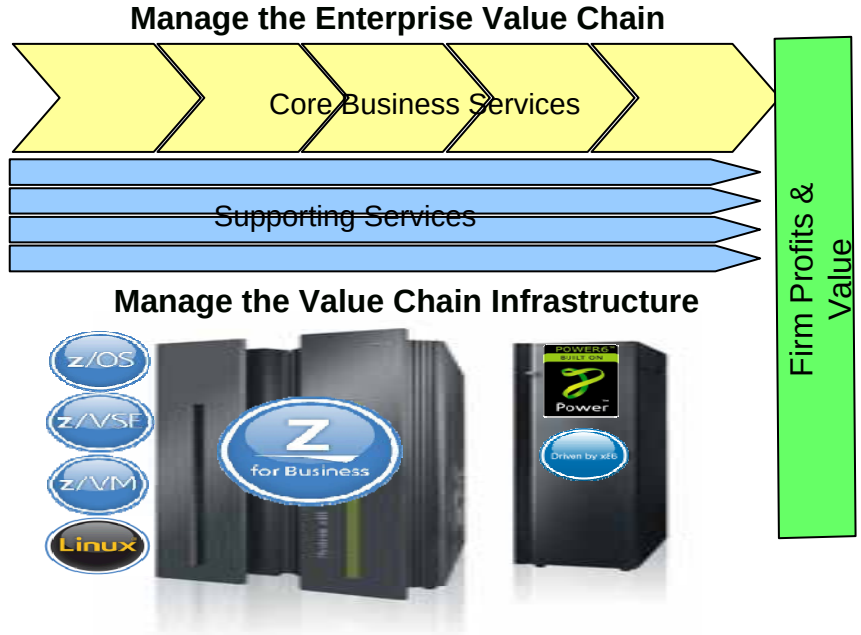
Integration Overview



Summary : Elevate Service Resilience to the Enterprise Level

- Sustain business services and application resources based on goals and policies
- Eliminate islands of automation silo'd by domains and platforms





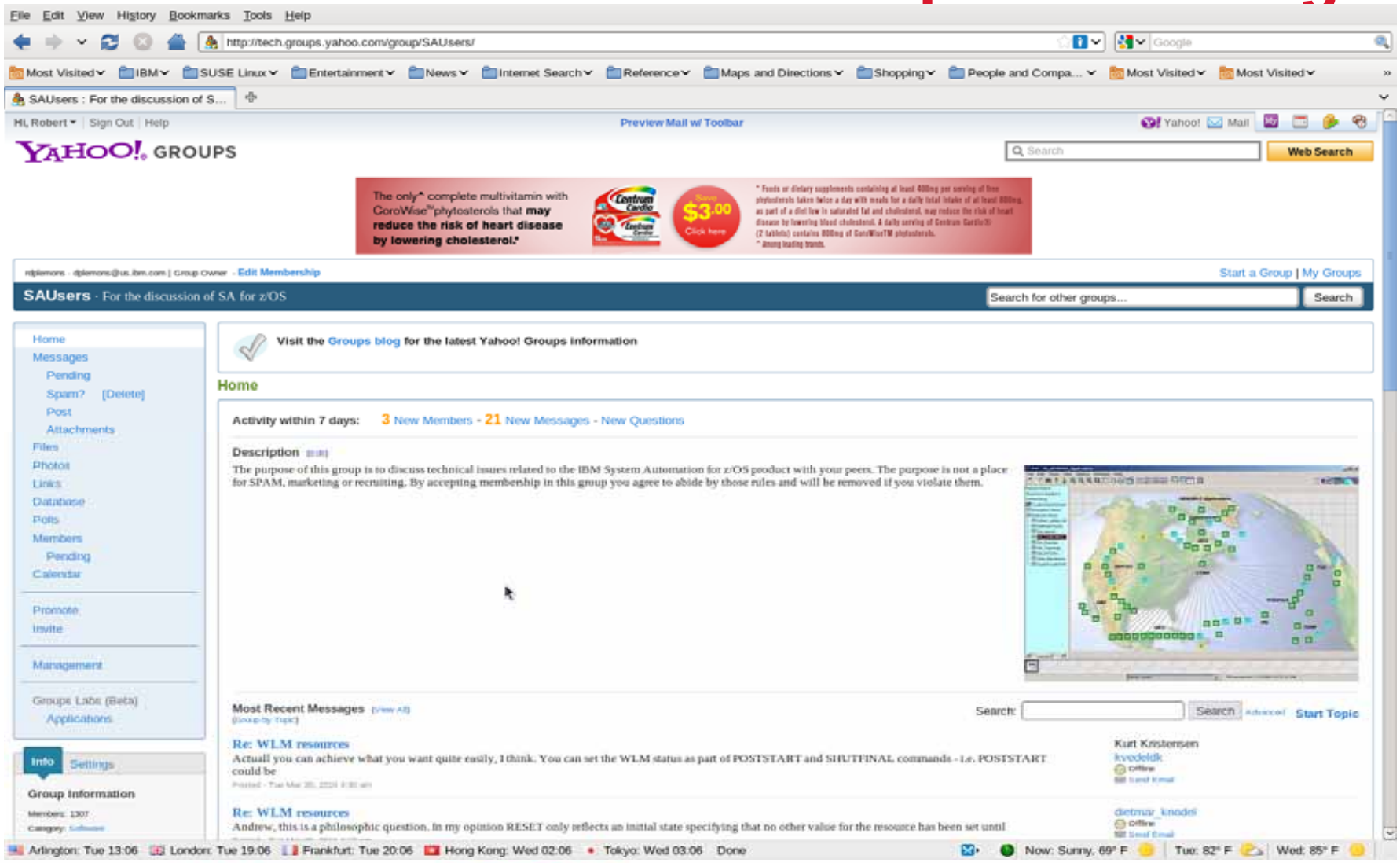
- Common practice
  - Sprawling environment and islands of automation
  - Costly and complex
  - Low availability and poor performance
  - Low degree of flexibility, and high risk

- Goal
  - Focus on creating business impact
  - Manage to the business via centralization and integration of automated ITIL-based management processes across silo'd IT teams and organizations

IBM Tivoli Automation Resources

- Resource Links
  - Business Continuity Process Manager web site
  - GDPS web site
  - System Automation Application Manager web site
  - System Automation for Integrated Operations Management web site
  - System Automation for Multiplatforms web site
  - System Automation for z/OS web site
  - Tivoli Workload Scheduler web site
- Demonstrations
  - Business Continuity Process Manager demo
  - System Automation for Multiplatforms demo
  - Tivoli Workload Scheduler demo
- Interactive Forums
  - Online discussions with customers and IBM specialists about these solutions
  - Product specific forums
- Annual User Conference
  - Subject specific presentations delivered by customers and IBM specialists
  - Excellent opportunity for interaction and discussion

SAUsers Discussion Group: Home Page



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Thanks for Your Participation

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