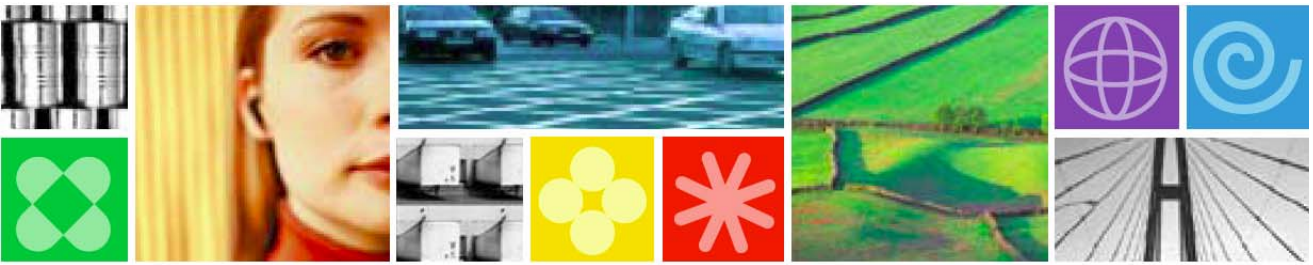
Ensuring application-level availability and process automation across your enterprise

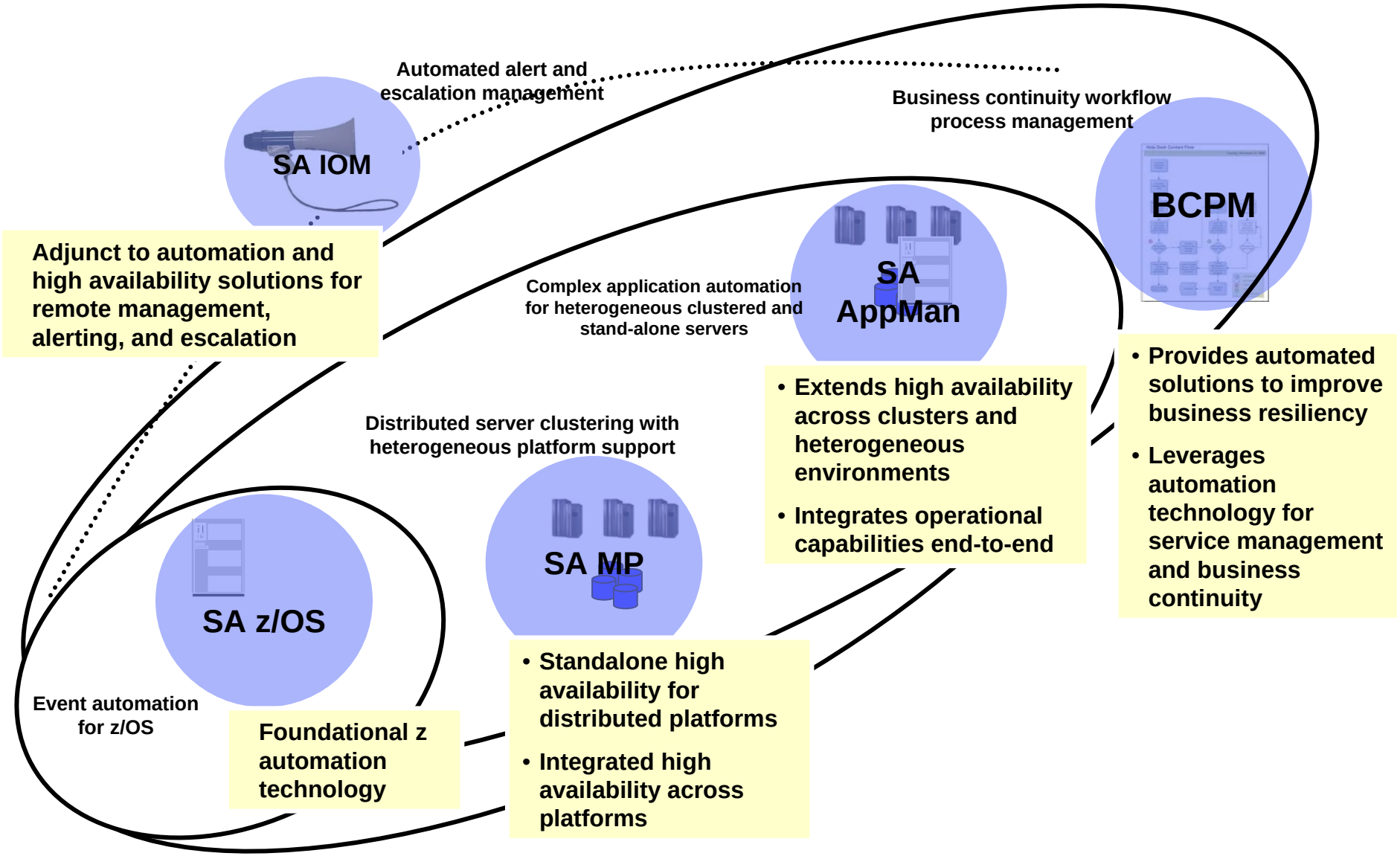


System Automation Topics

1. System Automation Portfolio Highlights
2. System Automation for Multiplatforms Update
3. System Automation Integration with Tivoli Portfolio

Place holder for format; needs to be cleaned up

System Automation High Availability and Resiliency Solutions



System Automation Basic Principles

- 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

Operator

Event

Scheduler

Orchestration

Automation Engine

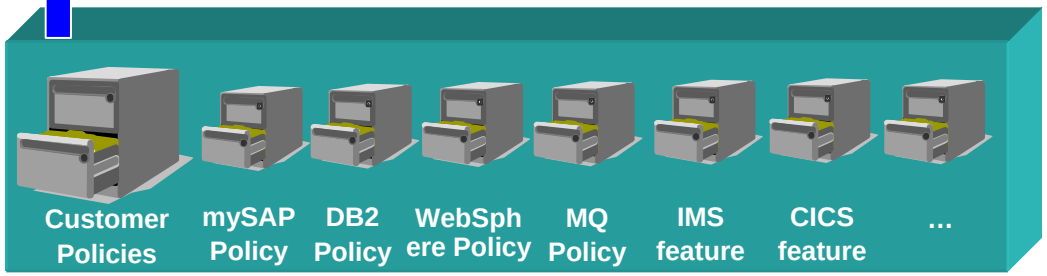
Automation Agent

Coordinated Restart & Failover

Operator

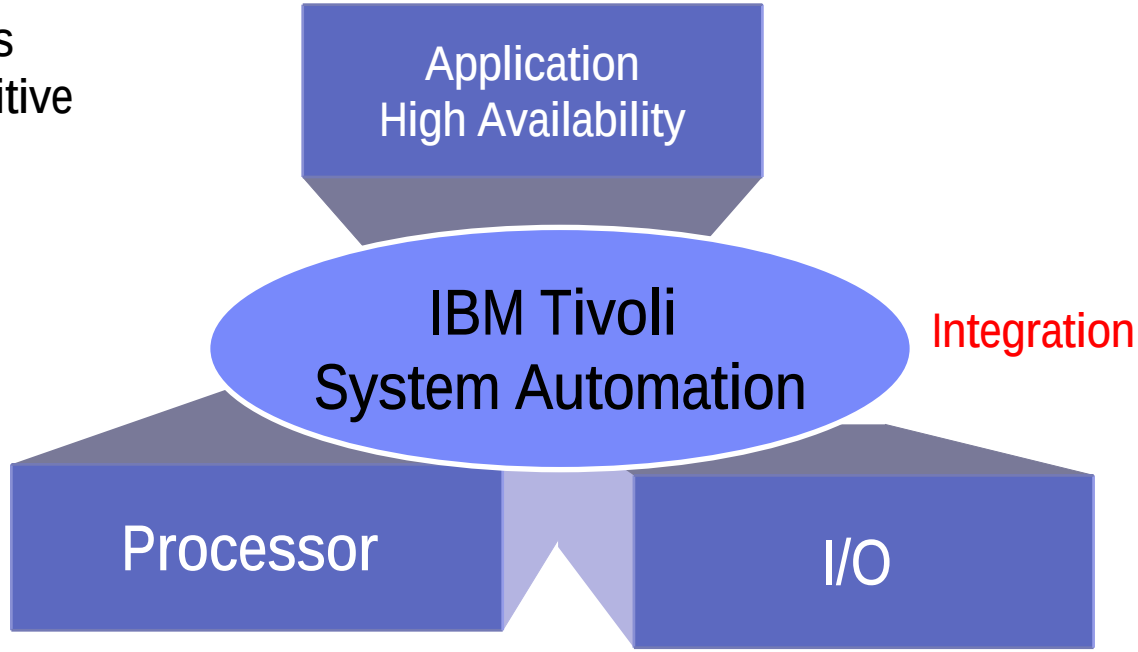
- Restart & Failover Rules
- Resource Groups
- Relationships and Dependencies

Administrator



What Can You Automate With SA z/OS?

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

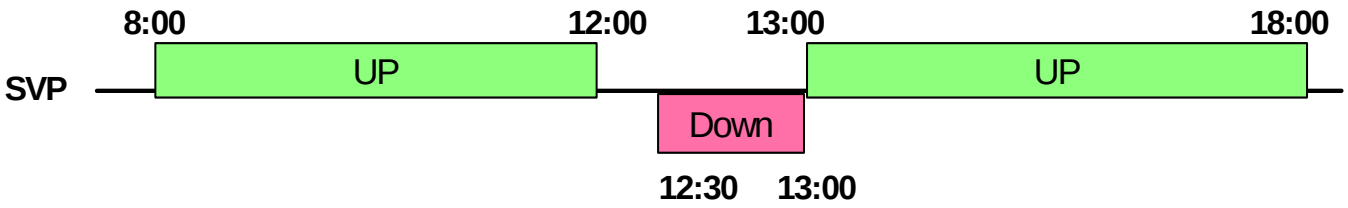


- Initialize, configure, recover, and shut down servers
- External monitoring and automation from a Single Point of Control

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

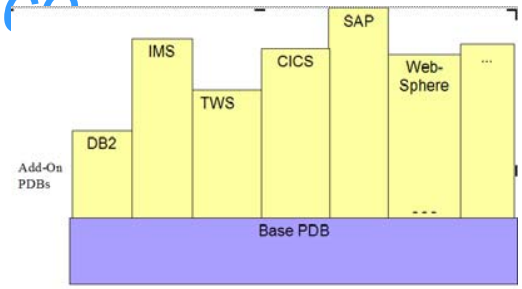
Goal Driven Automation

- **Administrator defines the "goals" for the application according to business requirements**
  - Goals relate to desired state, availability schedule and preferred system
  - Relationships between resources and groups
  - Service Periods:

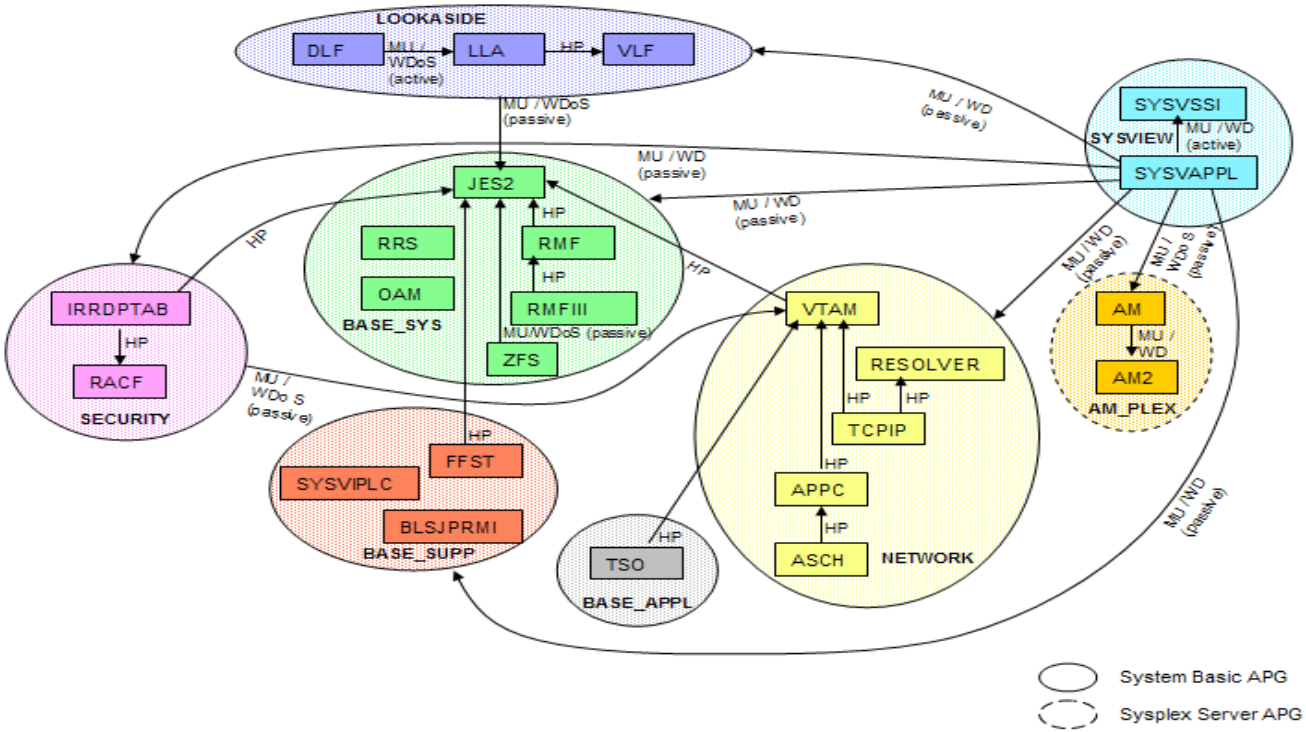


- **System Automation Manager tries to keep the system in line with goals**
- Easy, exception oriented operation
  - Operator can "overrule" the policy goals by overrides or start/stop requests
- **Responsibility moves from the operation to automation administrator**

Sample Policies based on "*Best Practice*"



- **Base Policy + Multiple add-on policies**
- **Structured Collection of**



DB2
TWS
WebSphere
IMS
CICS
NMC
USS
ProcOps
OMEGAMON
GDPS

SA z/OS Powerful Relationship Support

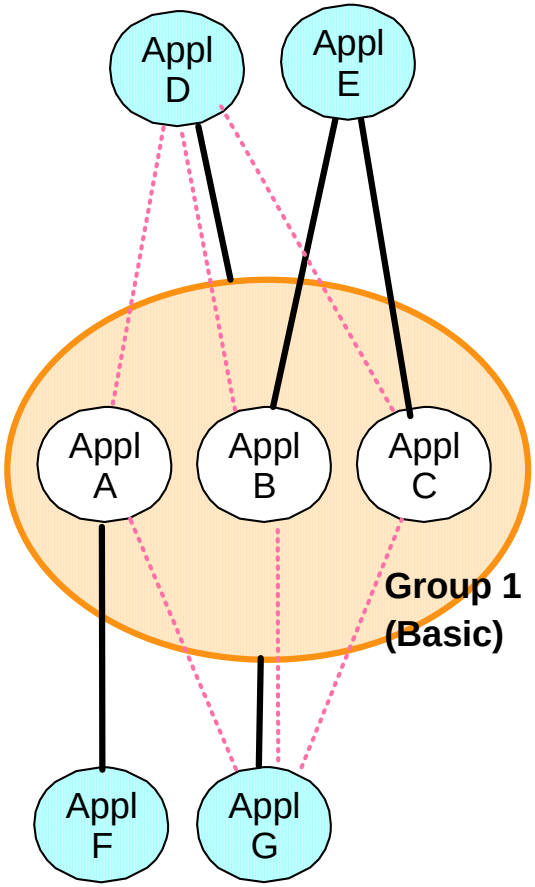
START and STOP relationships

- **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

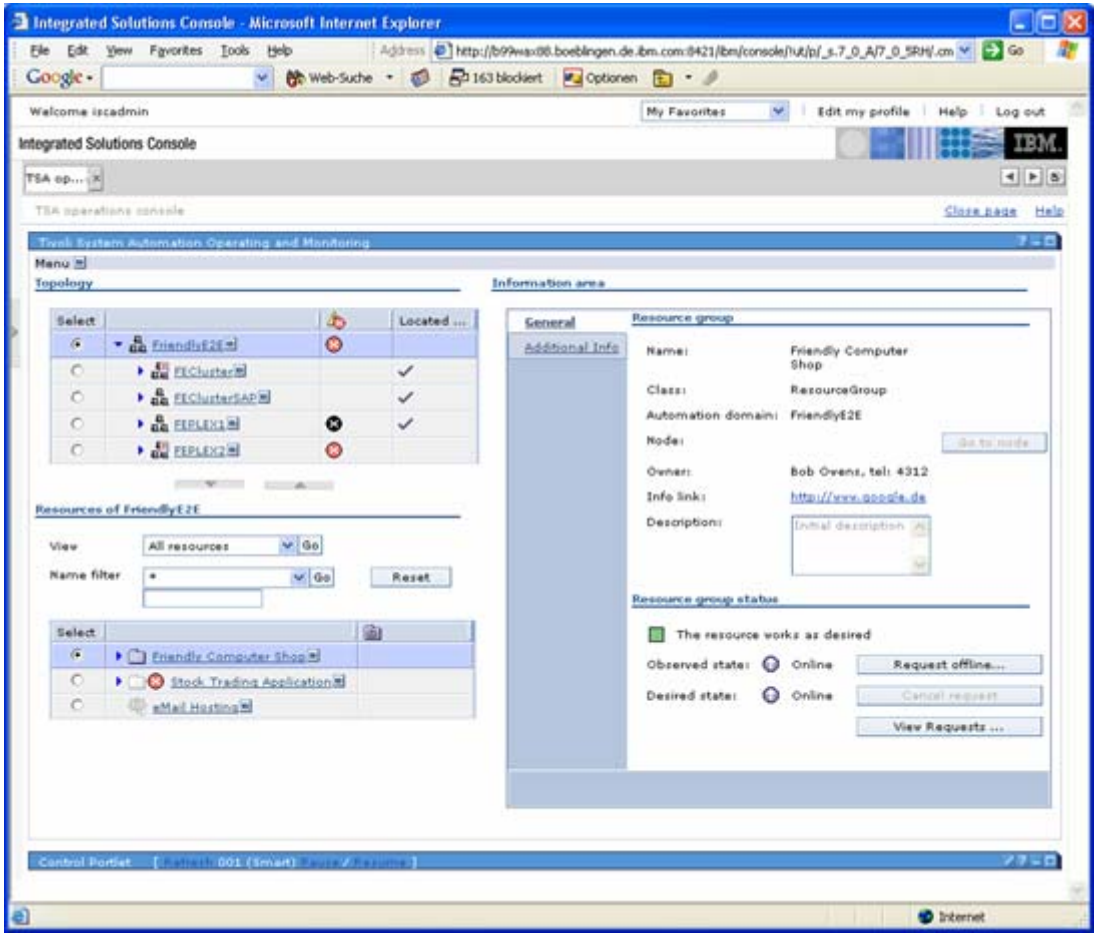
Evaluated when goal not equal status

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 the application consists of

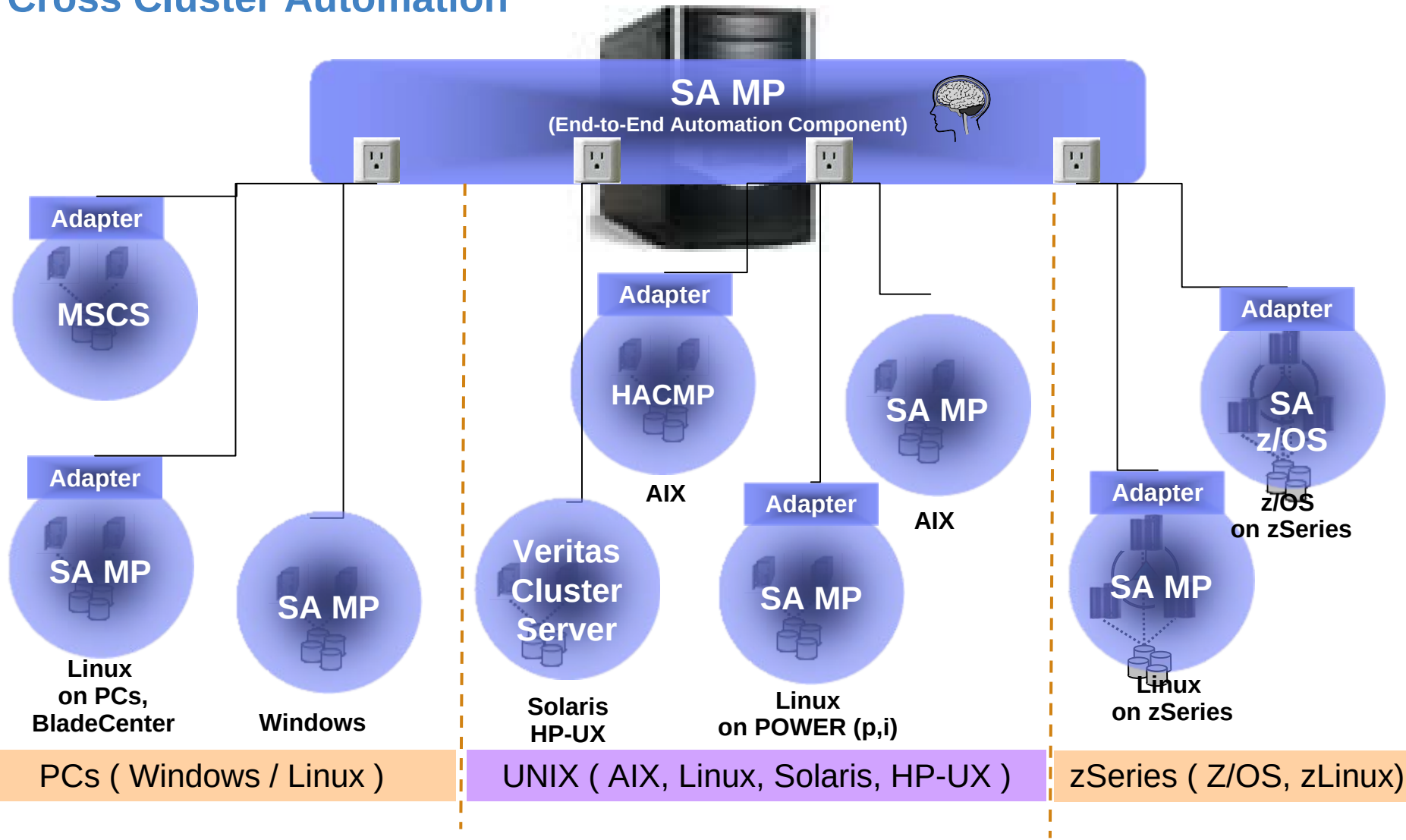
TSA AM Automation Web based GUI (ISC based)



Main features

- **Monitoring and problem analysis: Show…**
  - Operational status, location, resource details
    - Actively show status changes
  - Problems with resources
  - Resource dependencies
  - Topology
    - Clusters and systems
    - Group membership trees
  - Operator instructions per resource
  - Automation logs per domain (cluster)
  - Filtered views …
    - matching a specified name filter
    - located on a specific system
    - with errors or warnings
    - with operator requests

SA MP (End-to-End Automation Component) -
Cross Cluster Automation



Pre-canned Automation Policy Templates (Linux / AIX)

Move to SA MP section

- **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
- **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

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

Resource Startup and Shutdown Times Report

Tivoli IBM

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

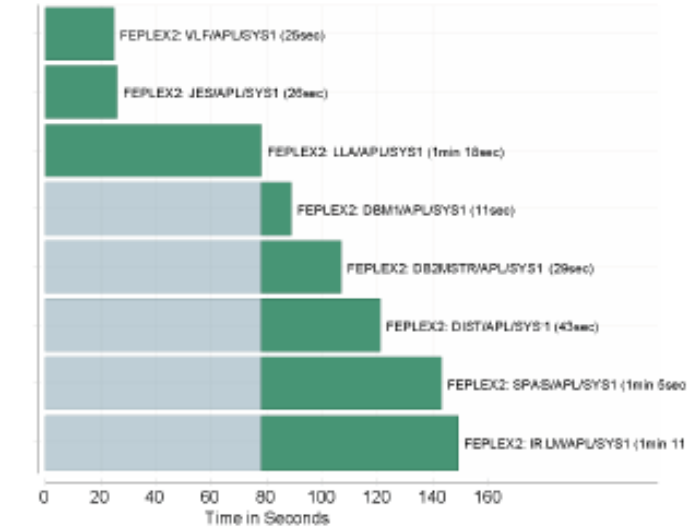
Startup times

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 dependencies, 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)



	Cumulative startup time (including dependencies)			Startup time			
Resource Name	Minimum	Maximum	Average	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

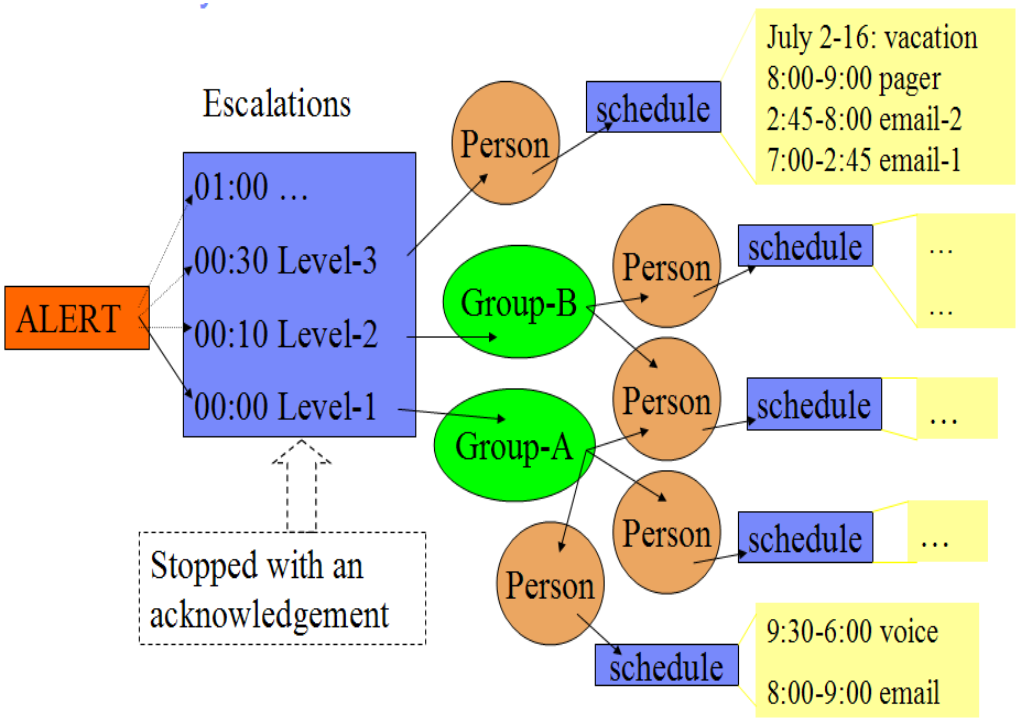
May 7, 2008 6:20:38 PM GMT+02:00 2 / 6

SA IOM Alerts and Notification to Enhance Automation

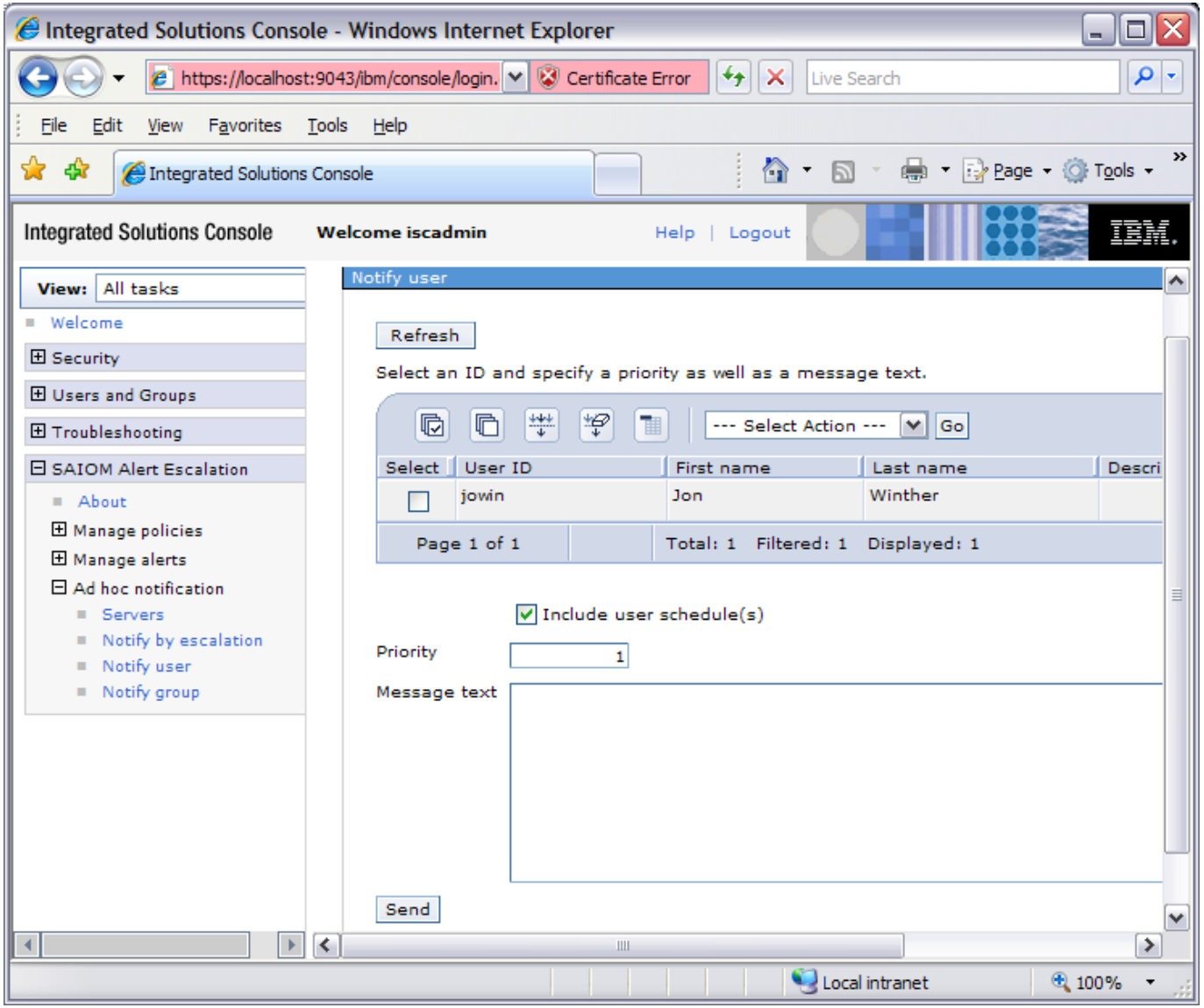
- **Flexible model for scheduling call outs**
- **Allows individual notification preferences**

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

- **Can be used to activate a blackout period for a given escalation ID (to prevent alert flooding)**



SA IOM Ad-Hoc Notification



At-A-Glance Status of Notifications

Event history

Refresh

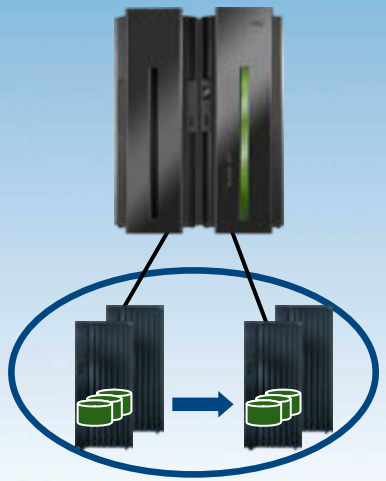
--- Select Action --- Go

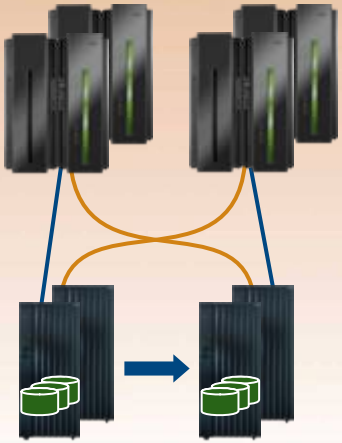
Select	Time stamp	Alert ID	Esc. ID	Esc. L...	Event type	Info
	Filter	= 4,797	Filter	Filter	Filter	Filter
○	19.03.2007 15:38:48	4797	SMS_ESCALATION	1	Status change	new status=exhausted
○	19.03.2007 15:38:48	4797	SMS_ESCALATION	1	Escalation end	total notifications: 2
○	19.03.2007 15:38:48	4797	SMS_ESCALATION	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	

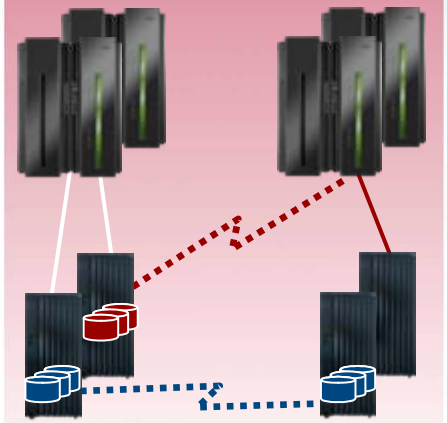
Page 1 of 1 Total: 10 Filtered: 10 Displayed: 10

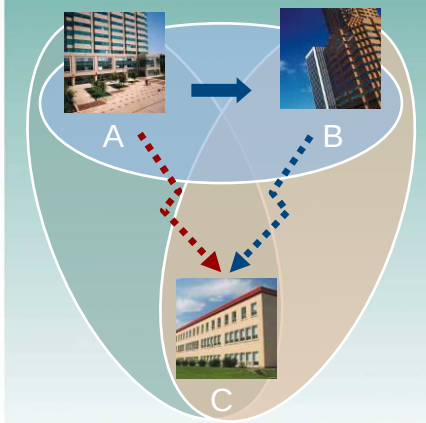
GDPS: The Right Level of Protection for Your Business

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



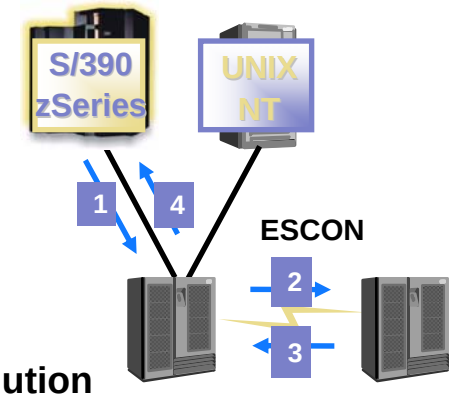




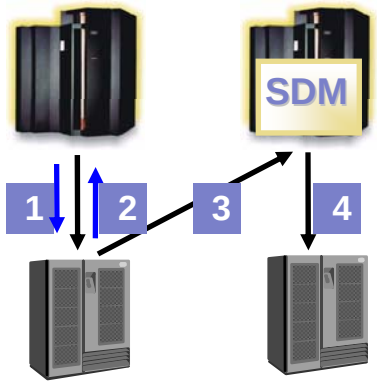


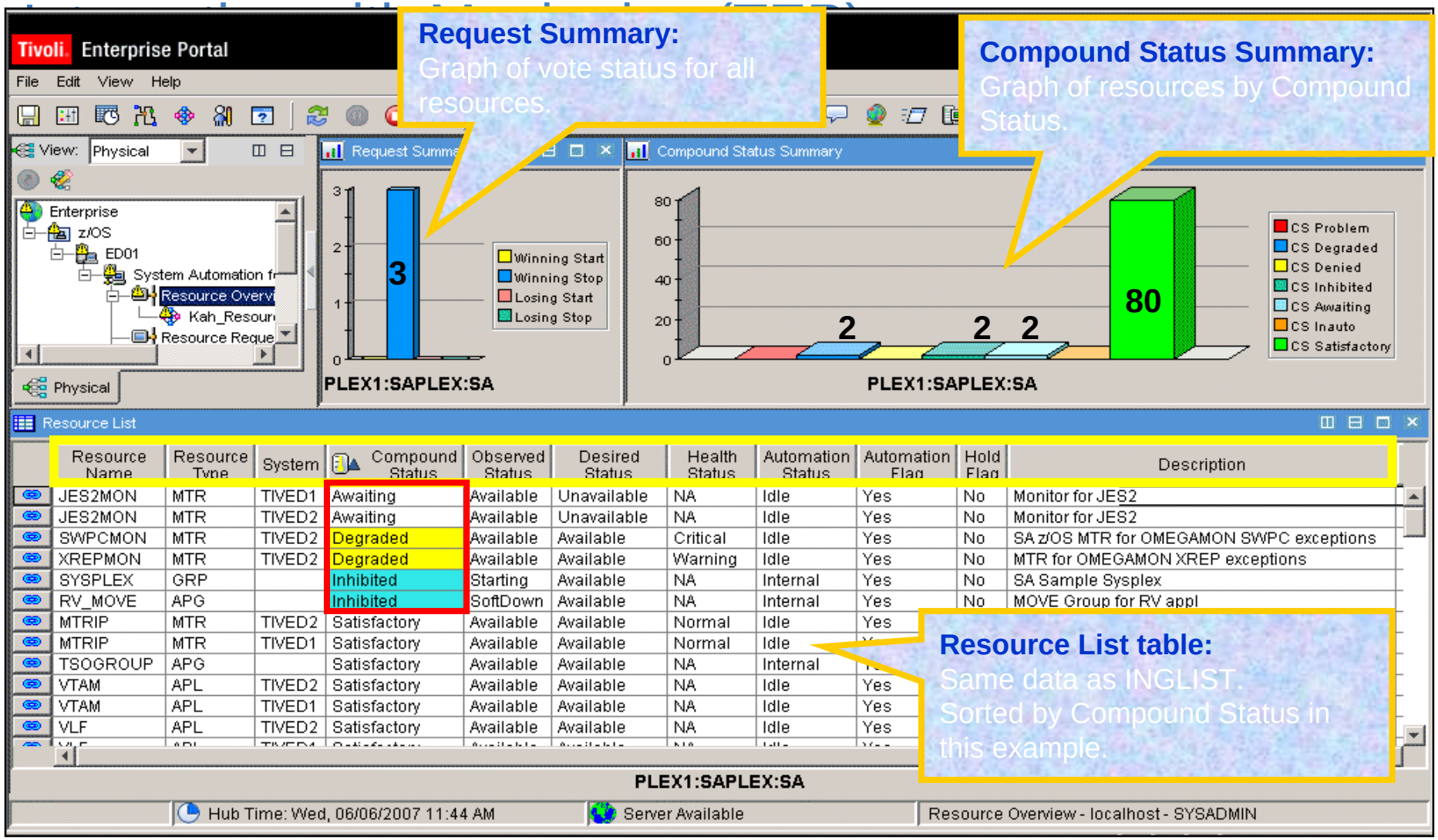
GDPS Supports Two Data Mirroring Technologies

- **Peer to Peer Remote Copy (PPRC)**
  - Synchronous data mirroring
- **GDPS manages secondary data consistency**
  - No or limited data loss in failover - user policy
- **Production site exception condition monitoring**
  - GDPS initiates and executes failover
- **Distance between sites up to 40 KM (fiber)**
- **Designed for Continuous Availability and Disaster Recovery solution**

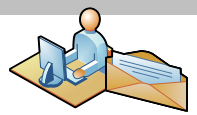


- **eXtended Remote Copy (XRC)**
  - Asynchronous data mirroring
  - Limited data loss to be expected in unplanned failover
- **XRC manages secondary data consistency**
- **GDPS executes Parallel Sysplex restart**
  - Limited user involvement
- **Designed to support unlimited distance**
- **Disaster Recovery solution**

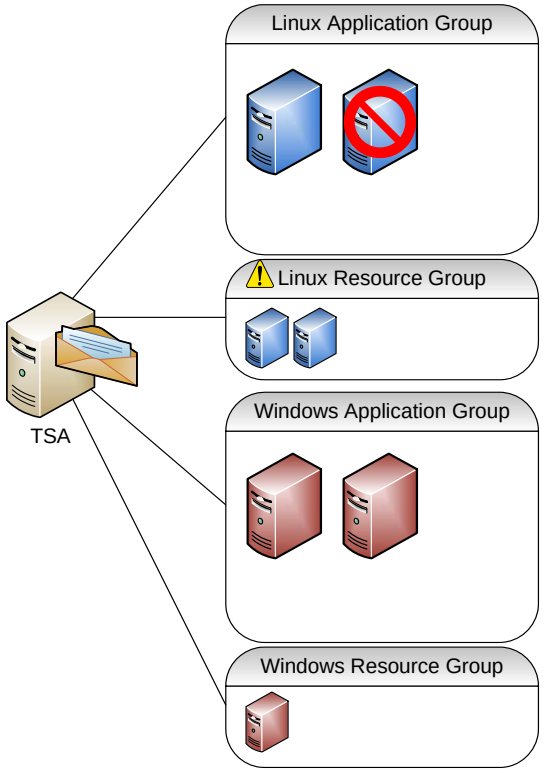




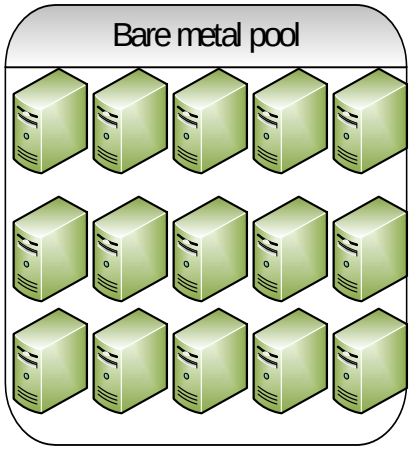
Smarter HA with TSA and TPM



- **TPM provides:**
  - Enterprise management of TSA
  - Dynamic high availability
  - HA Multiple OS's from the same pool
  - Same pool for HA and performance

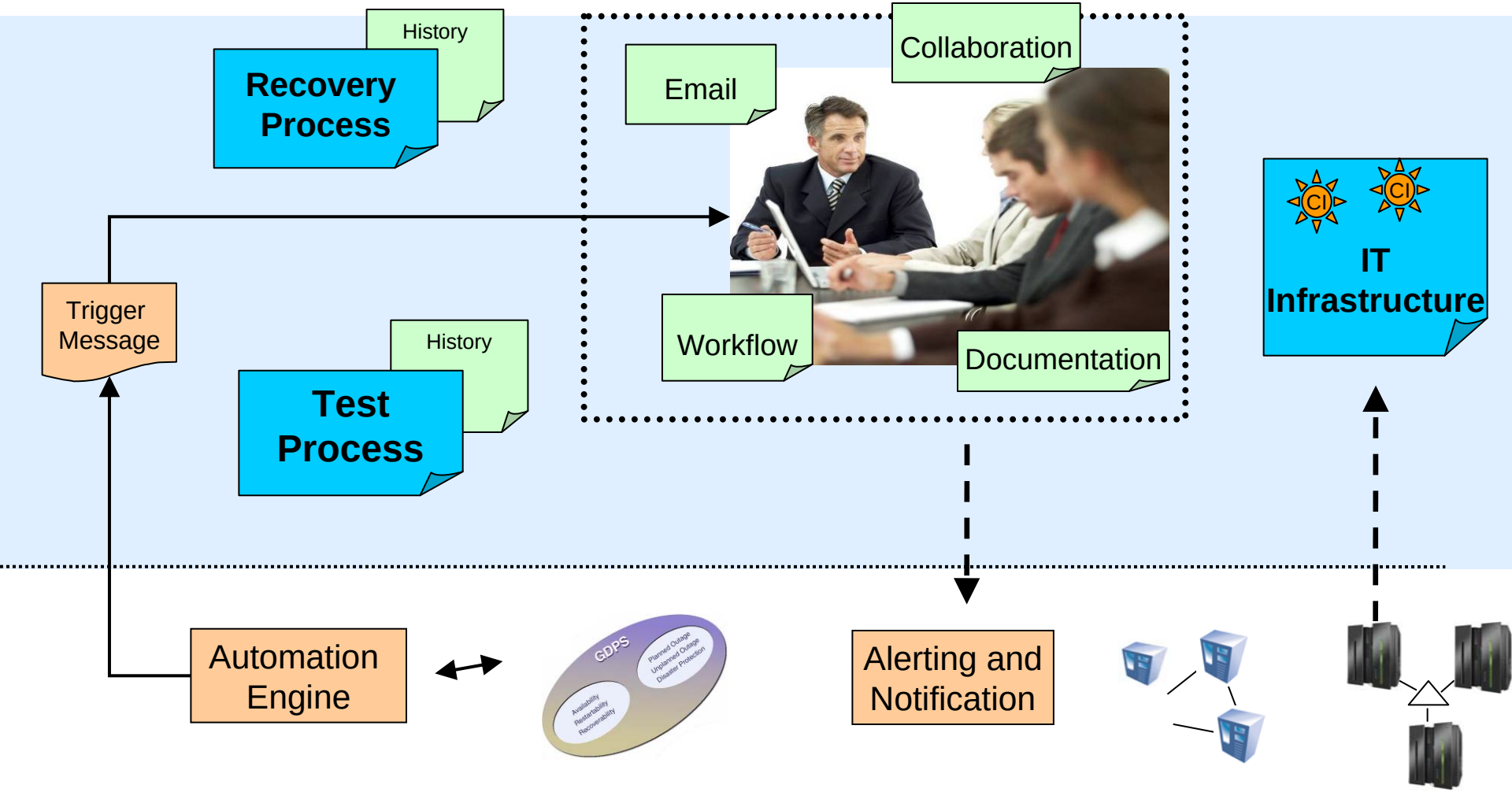


System z10 EC- TPM&DB2

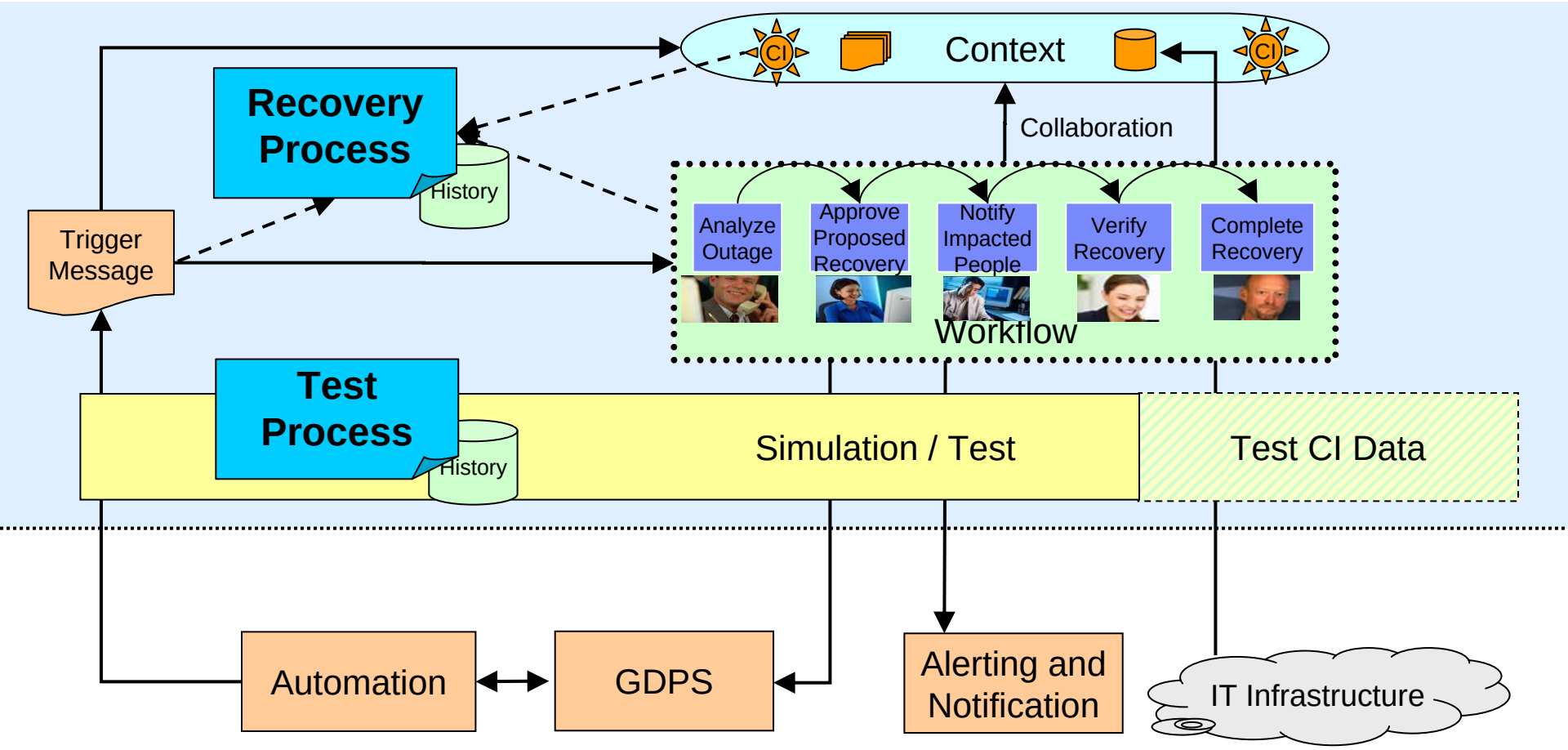


1. **Admin tells TPM to setup a new TSA cluster**
2. **Admin tells TPM to deploy two applications into the cluster**
3. **TSA detects a hardware failure on one of the application machines and fails over to a server in the failover resource group and notifies TPM that it needs more servers in the resource group**
4. **TPM adds servers to the resource group restoring the cluster to an HA state**

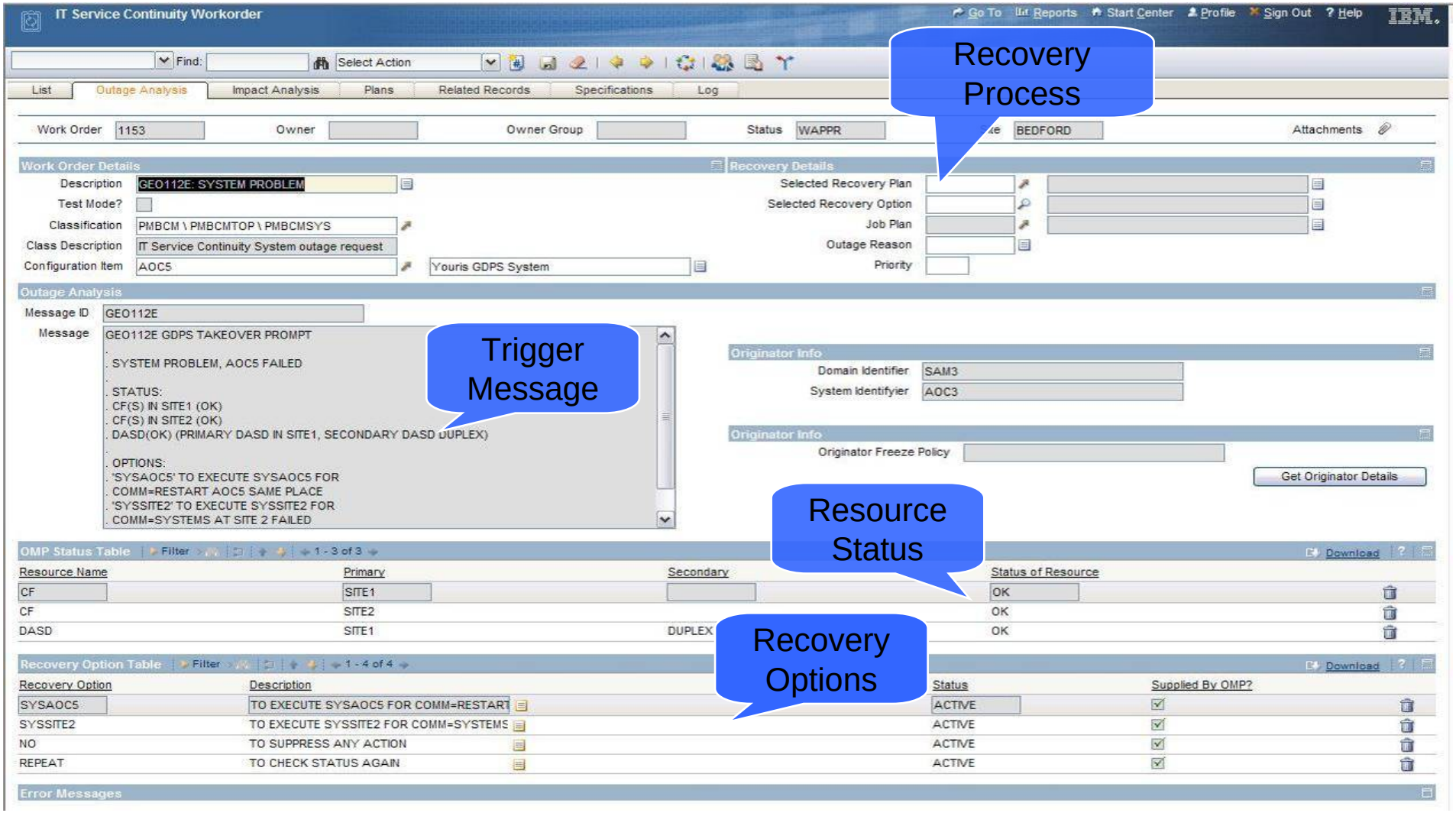
Crisis Management Based on Documentation



Crisis Management Based on BCPM Workflows



BCPM‘s Simple User Interface to Create Processes



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
- **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
- **Demonstrations**
  - Business Continuity Process Manager demo
  - System Automation for Multiplatforms demo
  - Tivoli Workload Scheduler demo

Demonstration Topics

- **Achieving end-to-end automation and operations with Tivoli System Automation Application Manager**

- **Introduction to distributed disaster recovery with Tivoli System Automation Application Manager**

To be revised; transition slide to demo

Need More Information?

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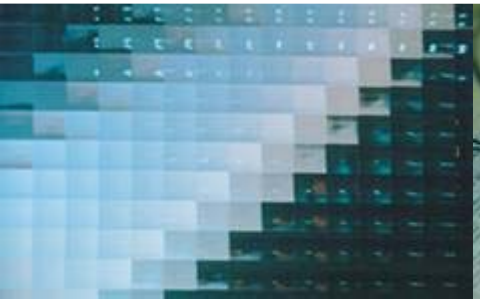

Thanks for Your Participation