IBM Tivoli System Automation

Protecting Business and IT Services with the End-to-End High Availability and Automation of Tivoli System Automation

September 10, 2009

Topics

- **Moving Beyond Event Automation**
- **Expanding Resiliency for the Enterprise**
  - Notification, Alerting, and Reporting
  - Automation Across Platforms
  - Automation of Complex Applications
  - Integration to Expand Automation
- **More Information**
  - IBM Tivoli System Automation Family
  - Links and Reference Material

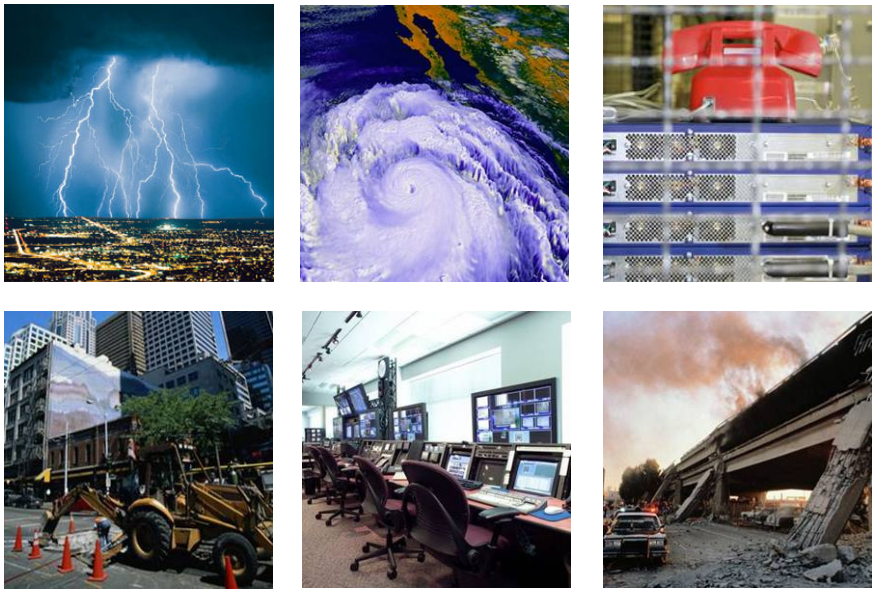
Automation Helping Enterprise Service and Continuity

- IT challenges
  - Downtime unaffordable
  - Heterogeneous environments
  - Complexity
- Customer pressures
  - Application availability
  - Operations complexity and costs
  - Automation implementation and maintenance costs
  - Education requirements related
  - Rapid change of IT infrastructure
- Reasons for planned downtime
  - Maintenance
  - Tests
- Reasons for unplanned downtime
  - Operator errors
  - Application failures
  - Environmental failures

- **Loss** of business
- **Loss** of customers – the competition is just a mouse click away
- **Loss** of credibility, brand image and stock value

Using Automation to Mitigate Risks

- High availability to provide for continuous application processing in the event of an unplanned outage
- Enterprise-wide continuous availability that accommodates planned outages with minimal to no impact to the business
- Recovery from disasters that may be caused by nature, deliberate attack, or human error



Repeatable and reliable recovery times

Affordable and frequent testing

Large scalability

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Reporting for Effective and Efficient Automation

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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	26sec
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	26sec
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

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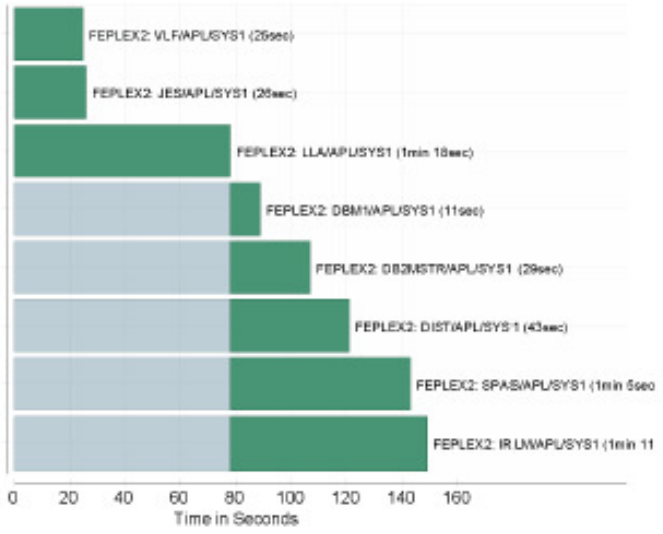
Times shown in graph are the cumulative average startup times. If a resource has startup dependencies, the average cumulative startup time of this dependency chain and the resources own average startup time are displayed in parentheses. The times displayed are formatted like this: Cumulative Startup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



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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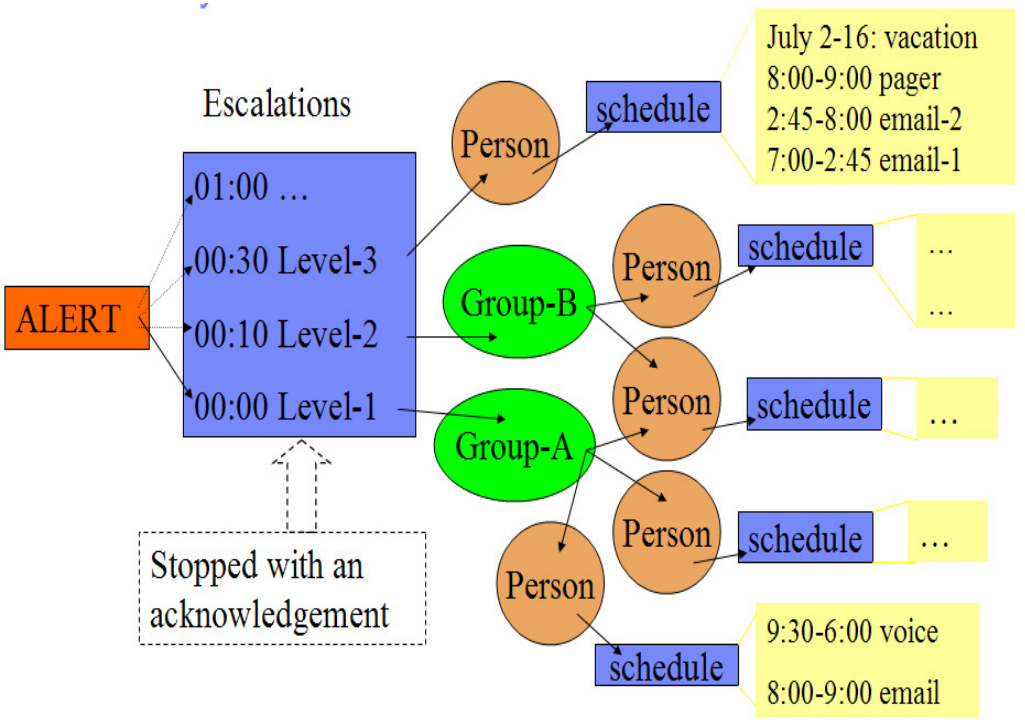
Alerts and Notification to Enhance Automation

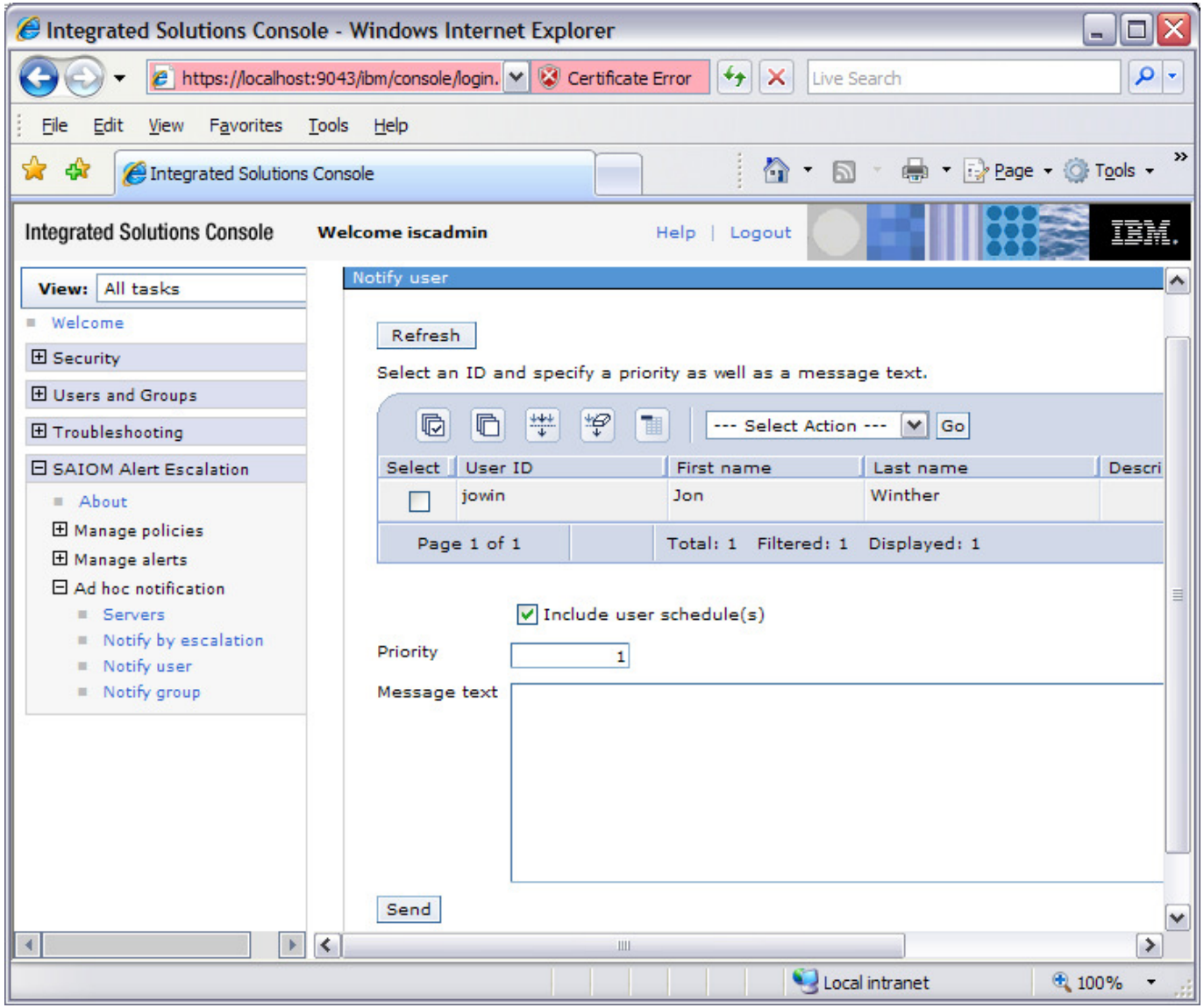
- Flexible model for scheduling call outs
- Allows individual notification preferences

```
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)



Ad-Hoc Notification



At-A-Glance Status of Notifications

Event history

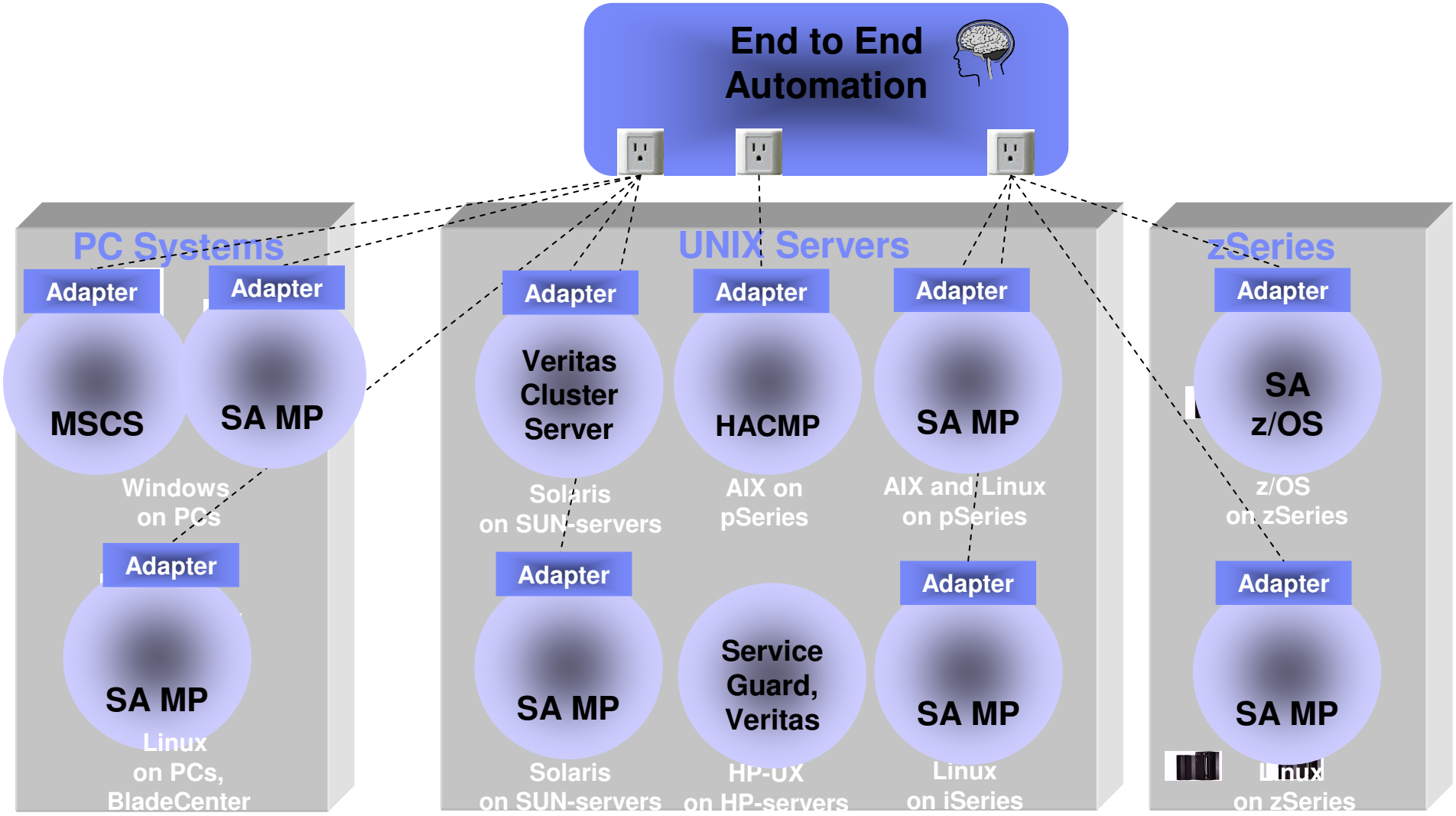
Refresh

--- Select Action --- Go

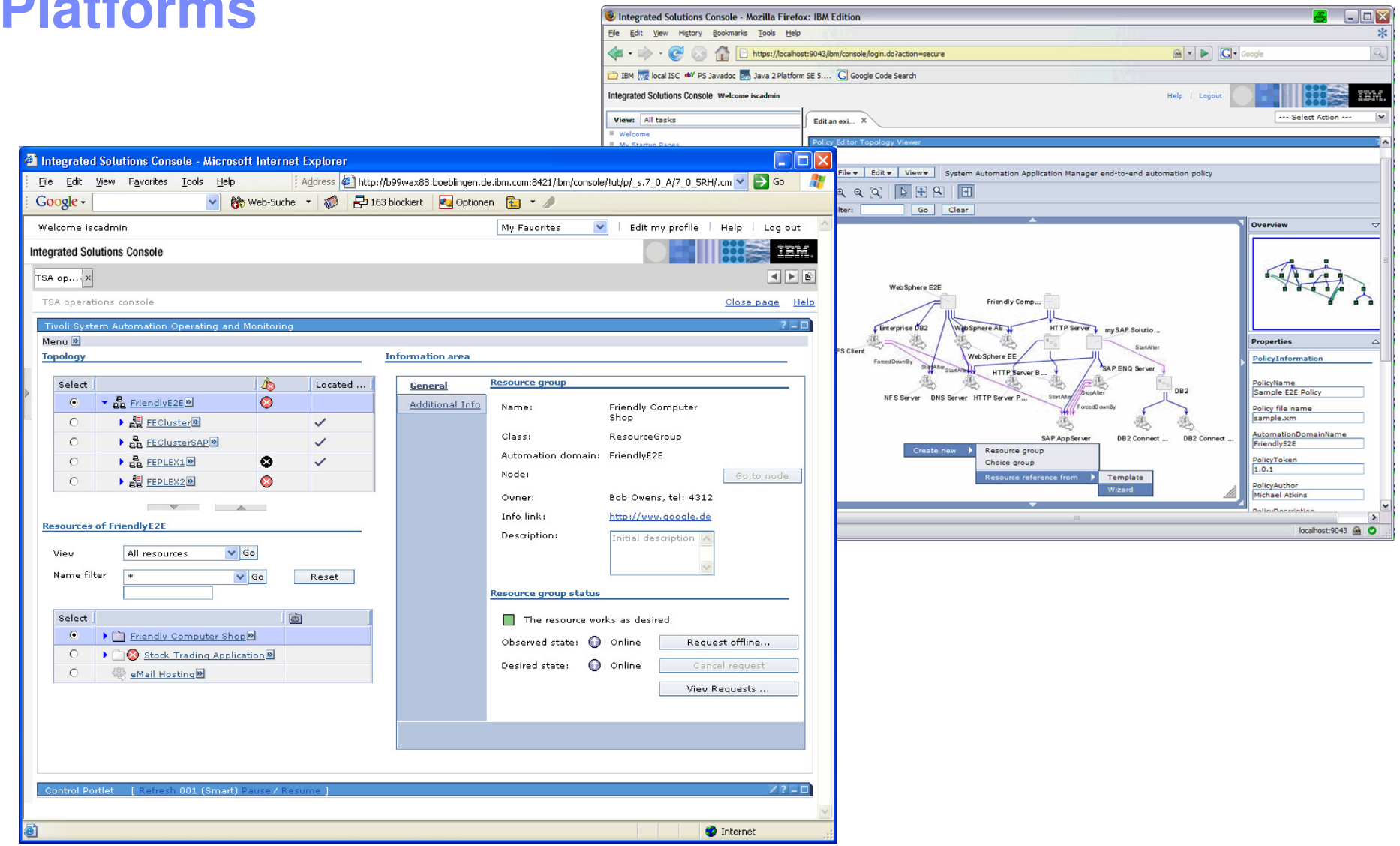
Select	Time stamp	Alert ID	Esc. ID	Esc. L...	Event type	Info
	Filter	= 4,797	Filter	Filter	Filter	Filter
○	19.03.2007 15:38:48	4797	SMS_ESCALATION	1	Status change	new status=exhausted
○	19.03.2007 15:38:48	4797	SMS_ESCALATION	1	Escalation end	total notifications: 2
○	19.03.2007 15:38:48	4797	SMS_ESCALATION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

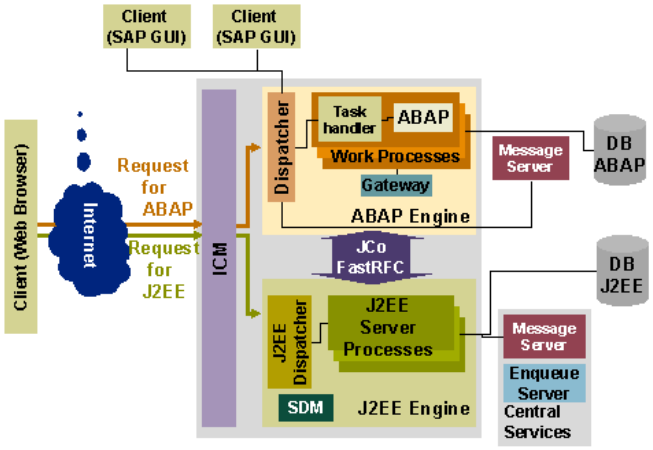
Automation Across Diverse Platforms



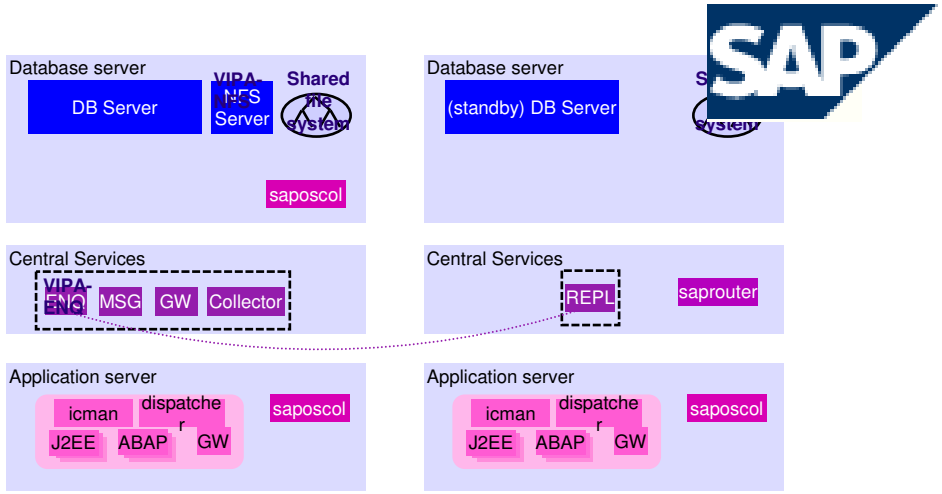
Graphical Interface to Automating Distributed Platforms



High Availability for Business Critical Applications



SAP system is complex



SAP operation is complex

- Policy-based, "out of the box" support, with powerful grouping and relationships – no coding required
- TSA provides continuous availability for critical mySAP components by:
  - Start, stop, restart, failover, and monitoring
  - Supporting new mySAP replication server to
    - Enhance performance
    - Avoid single point of failure and data loss
    - Reducing planned outages (e.g. enable rolling 'kernel' upgrade)

SAP Certified Integration

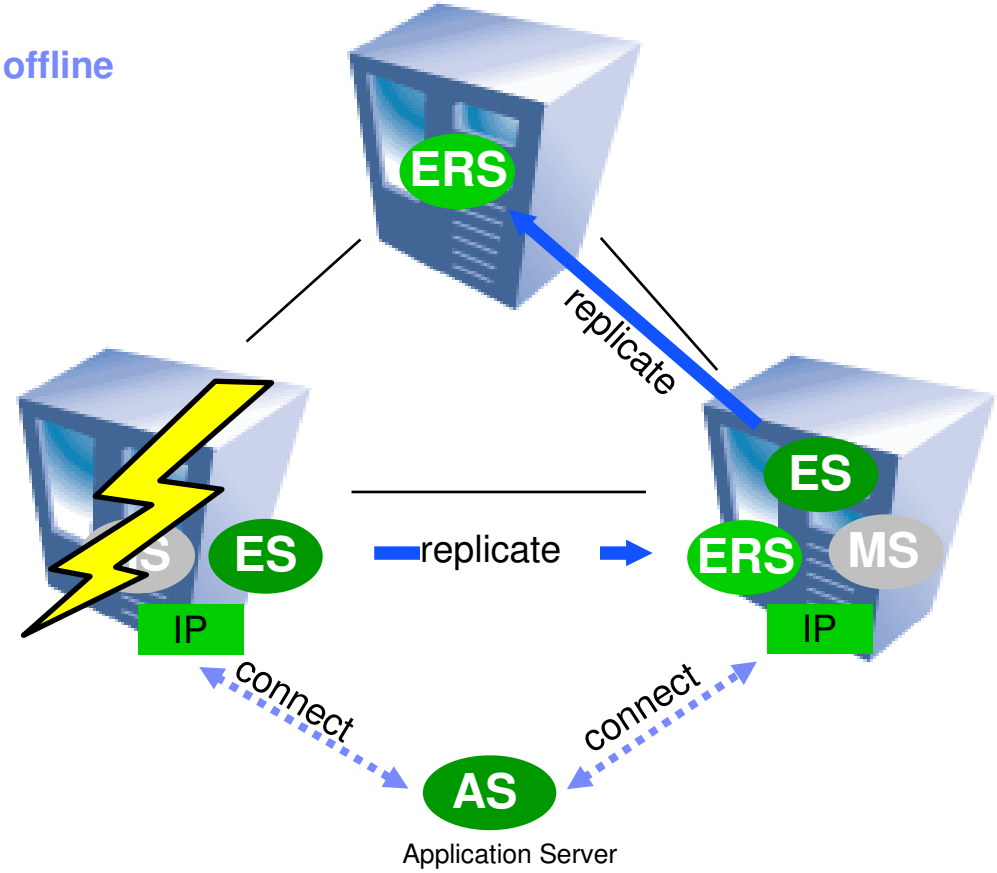
Automating Recovery of an SAP Enqueue Server

Rules are defined in the automation policy

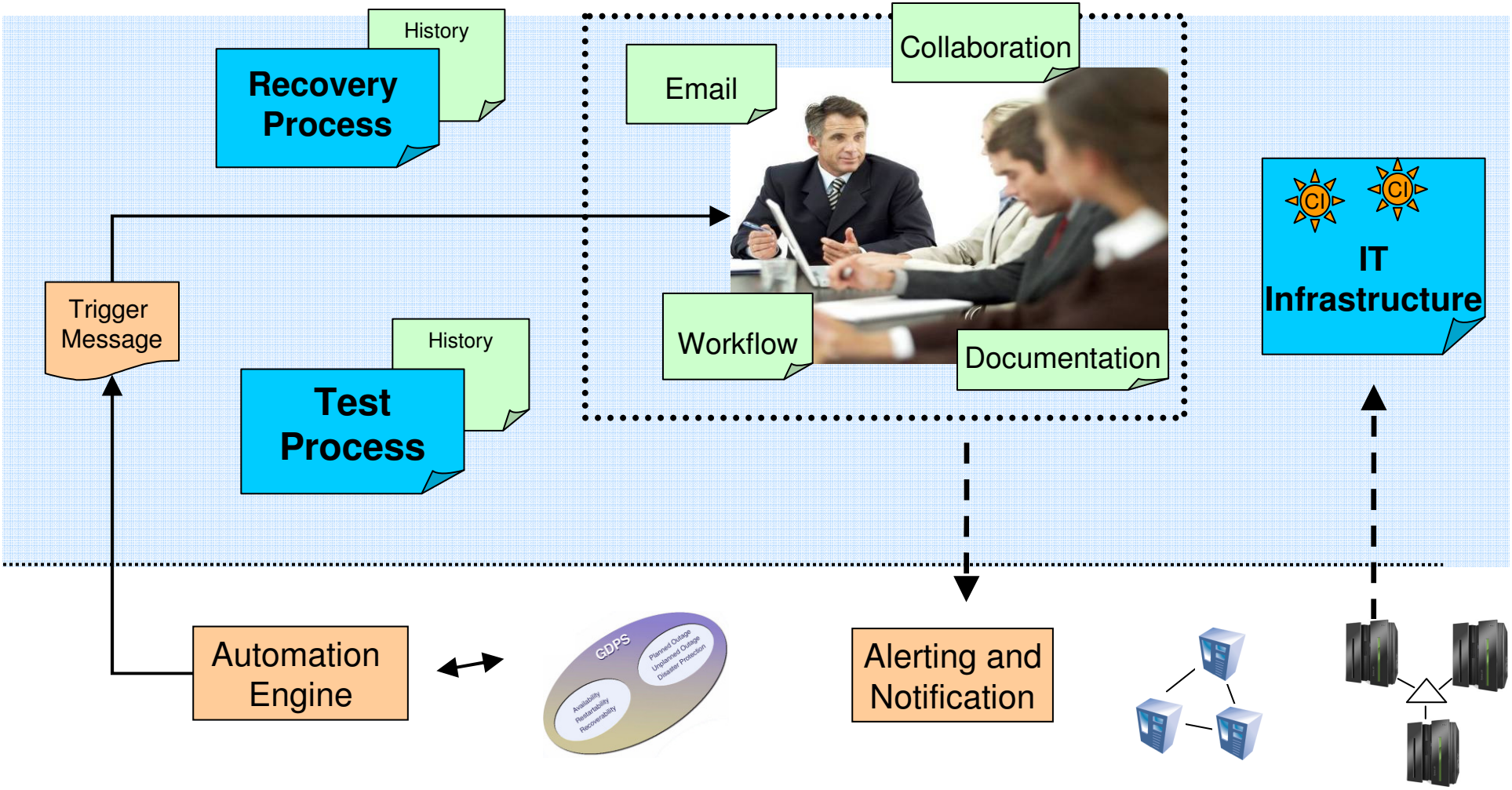
- **Enqueue Server, Message Server and IP are collocated**
- **Enqueue Replication Server starts after ES**
- **ERS is anti-collocated to ES**
- **ES collocated to ERS if online and ES offline**

Tivoli System Automation Actions:

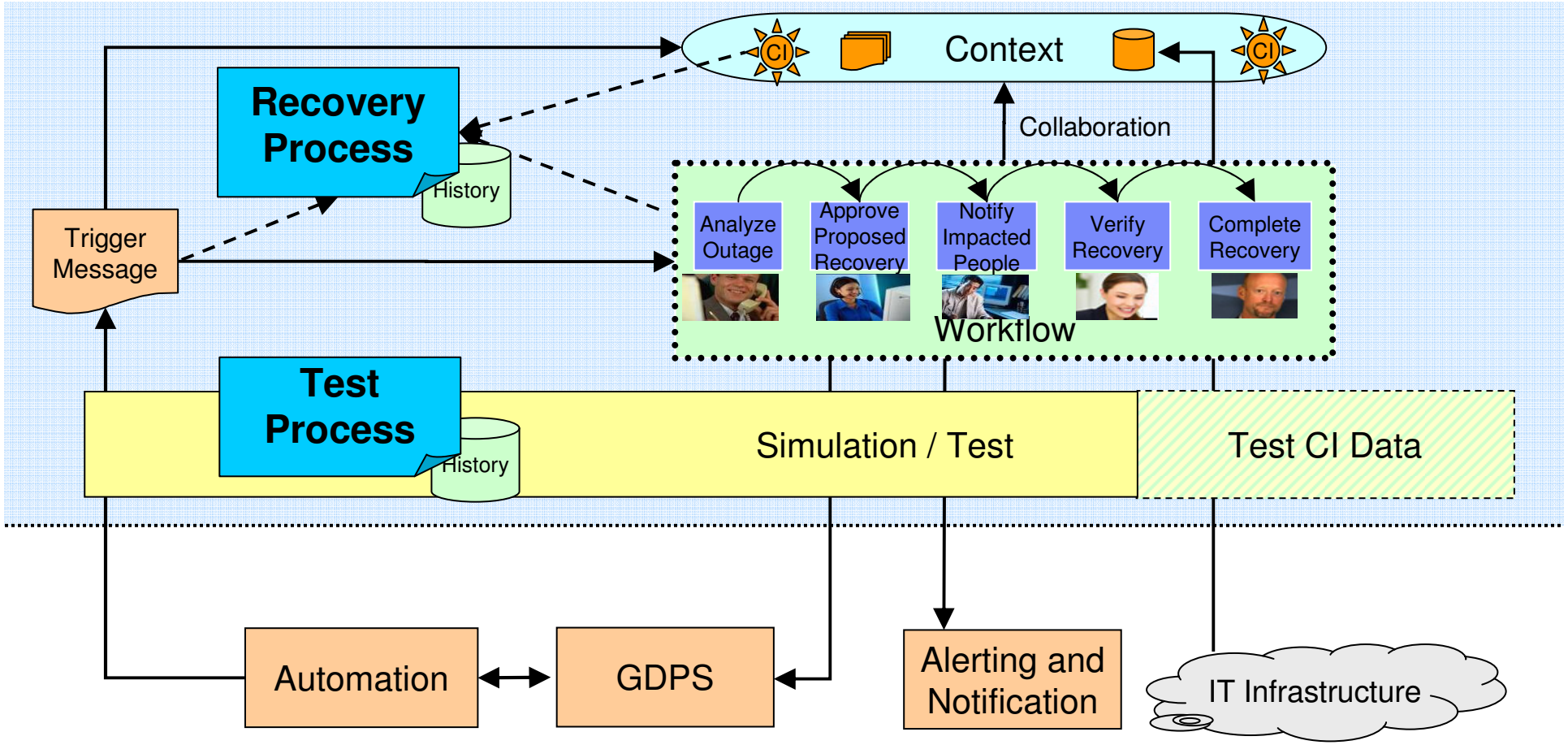
1. **Ensure correct start-up sequence / node of ES and its prerequisites**
2. **Ensure correct start-up sequence / node of ERS**
3. **Recognize Node 1 failure**
4. **Failover ES and its prerequisites to Node 2**
5. **Connect the SAP application server to VIPA on Node 2**
6. **Wait for information transfer from ERS to ES through shared memory**
7. **Move ERS to Node 3**
8. **Resume SAP operations**



Crisis Management Based on Documentation

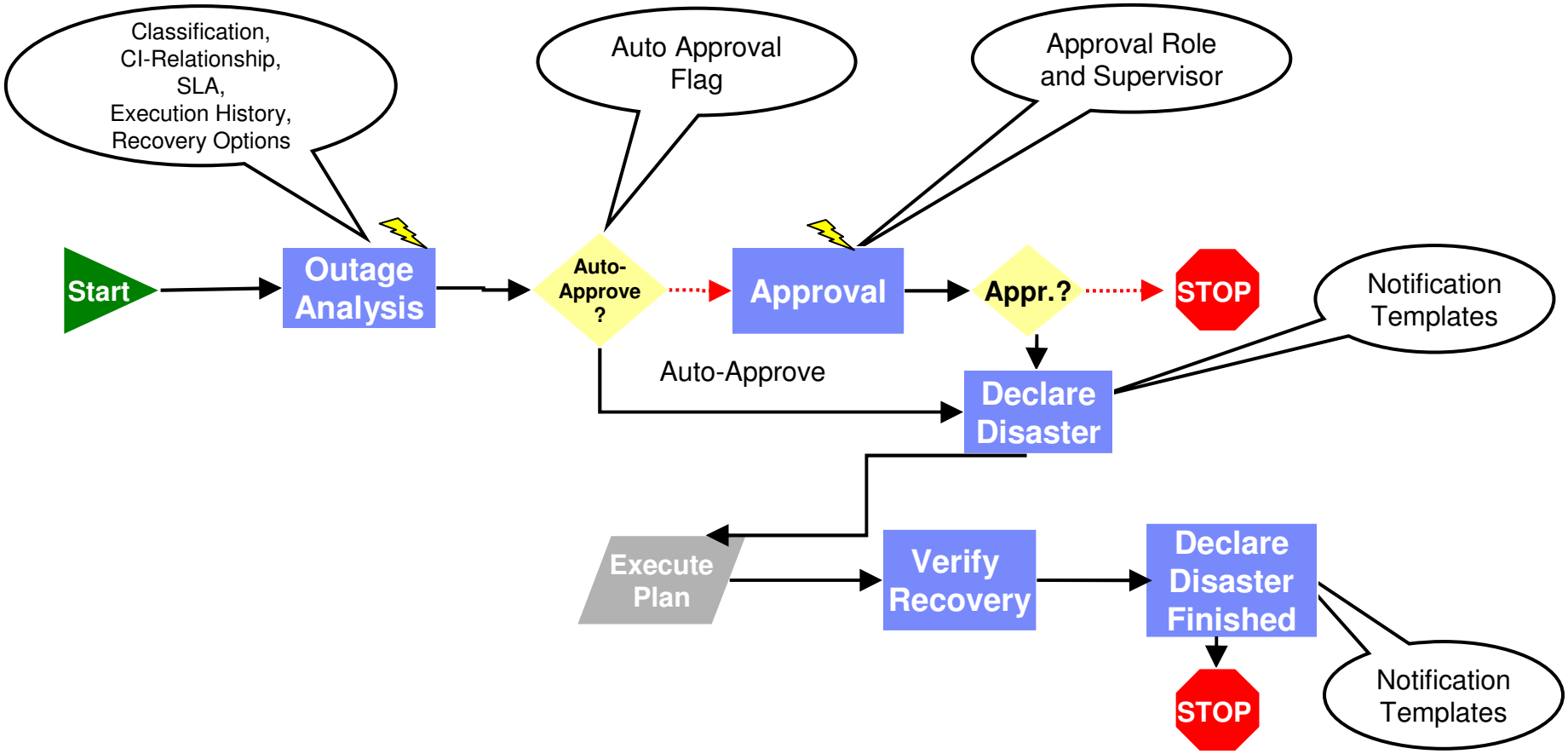


Continuity Management Based on BCPM Workflows



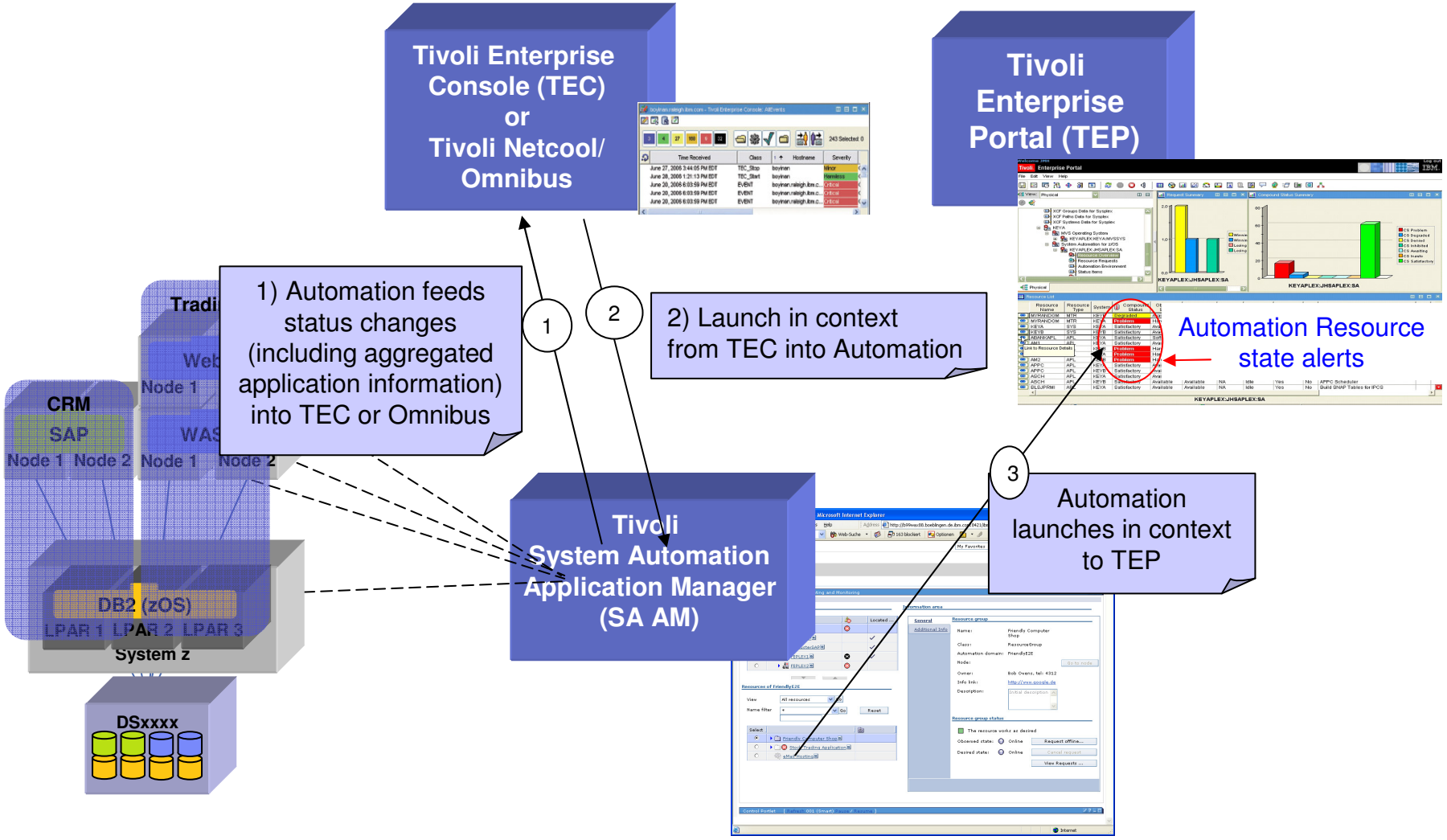
BCPM ensures successful recovery via pre-tested **ITIL compliant** automated processes

Recovery Plans and Testing Tailored to Your Business Needs

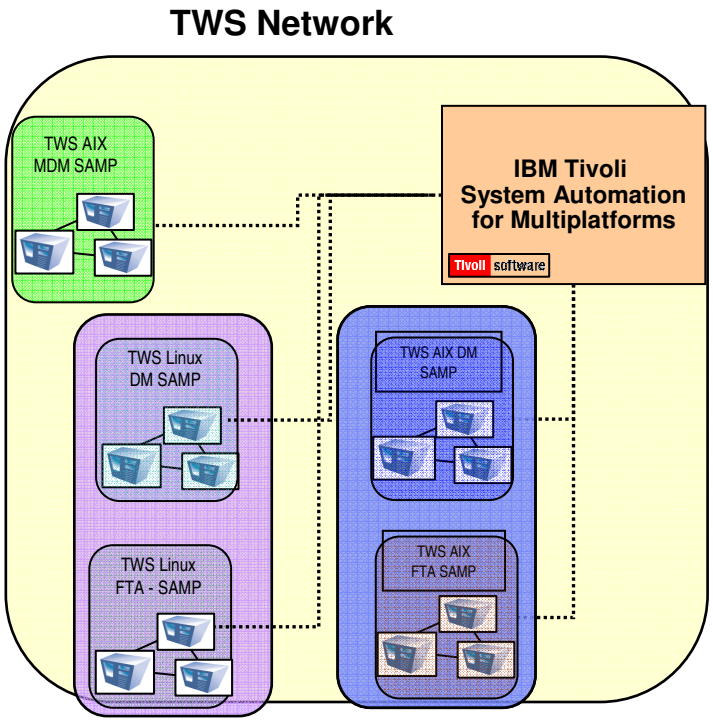


Integrating Automation with Monitoring and Business Service Management

with Tivoli Enterprise Console (TEC), Tivoli Netcool/Omnibus, and Tivoli Enterprise Portal (TEP)

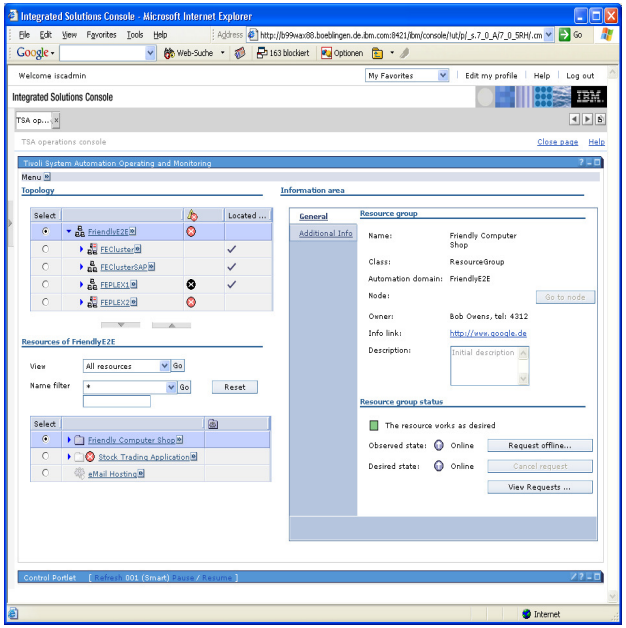


Integrating Workload and System Automation



Failover Scenario

When System Automation detects a failure (network, disk or application) on a TWS Master it automatically fail over to the TWS Standby Master in a matter of seconds.

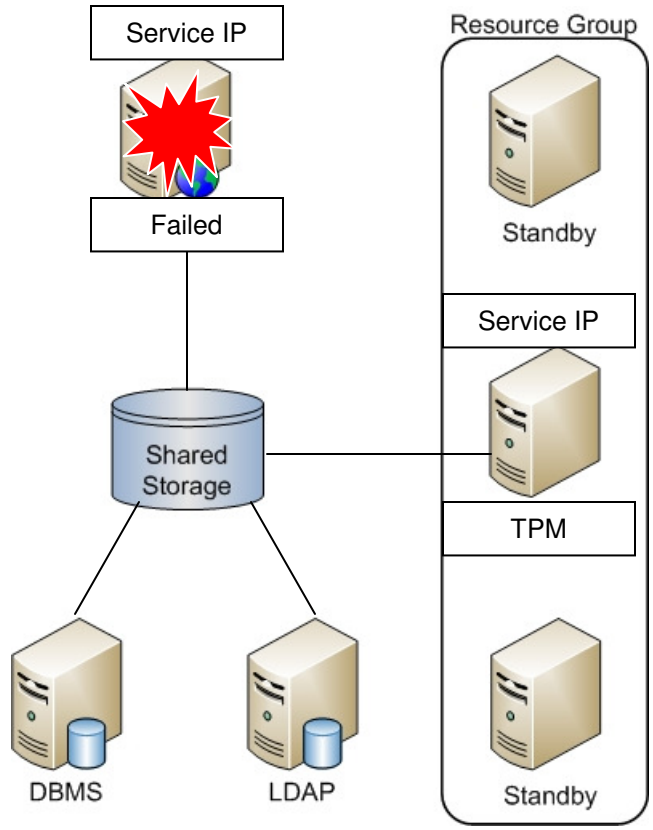


- Automatic and safe implementation of failover scenario
- High availability of workload automation
- Zero downtime

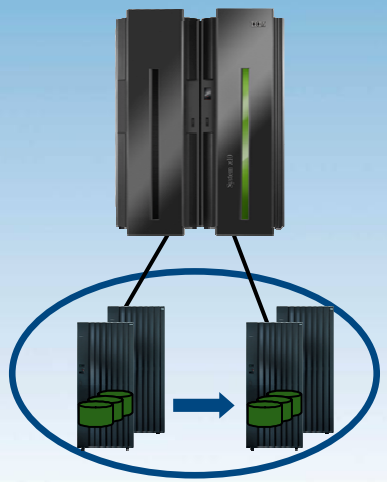
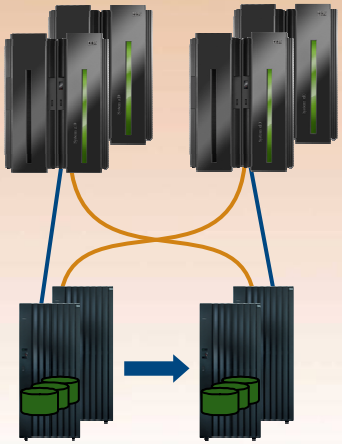
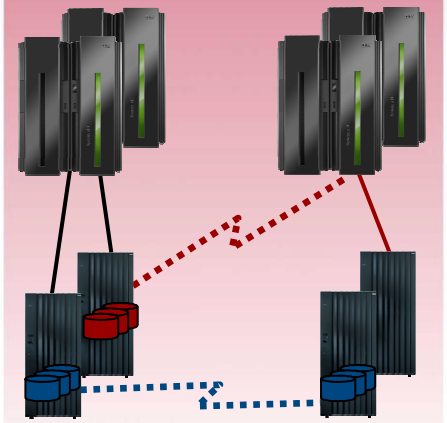
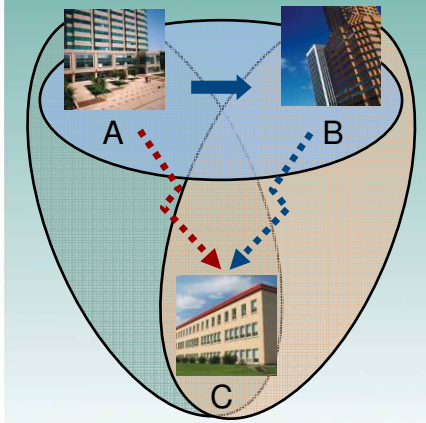
Tivoli Provisioning Manager High Availability Provided by Systems Automation

- System Automation provides:
  - Monitoring
  - Failover management
  - Dependency management
  - Service IP management
  - Resource group management

1. System Automation monitors the environment
2. System Automation will detect failure and manage dependencies of the monitored elements
3. System Automation will restart monitored elements within the resource group based on the automation 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

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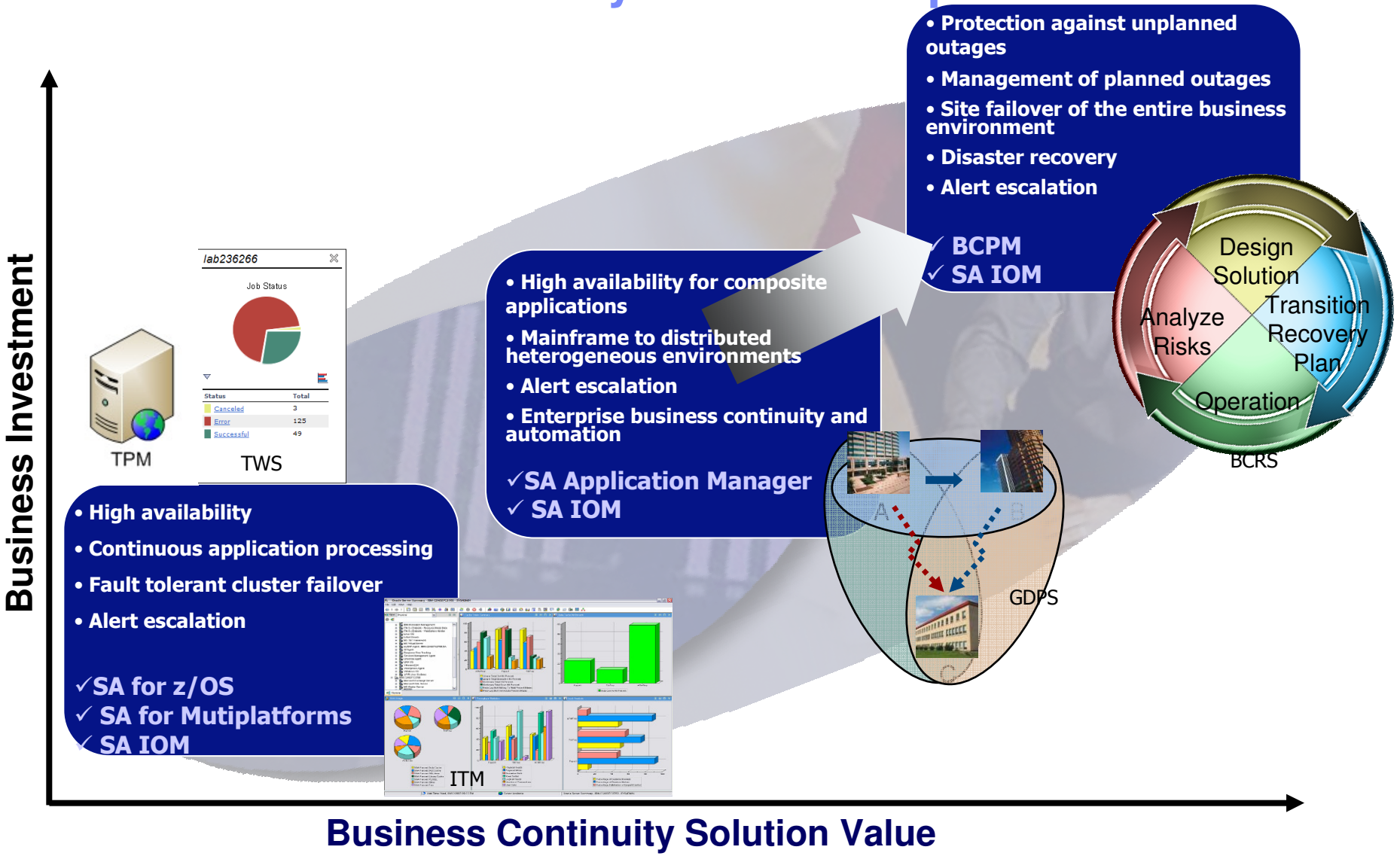
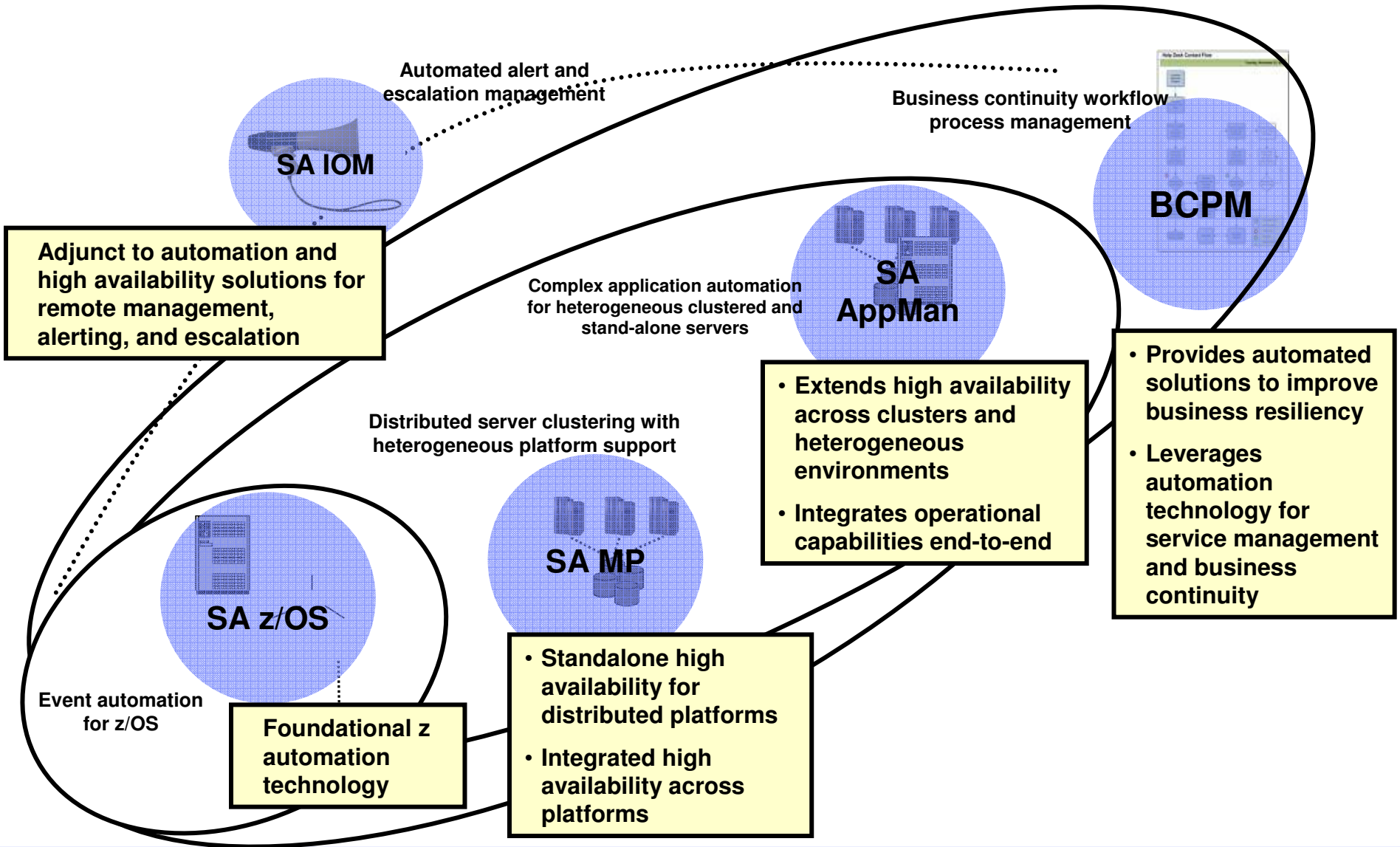
IBM Tivoli Automation Resources

- 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

IBM Tivoli's Business Continuity Strategy Delivers Automation and Resiliency to the Enterprise



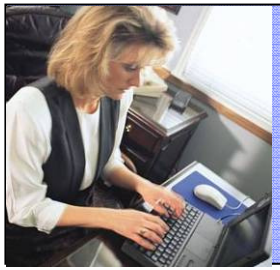
System Automation High Availability and Resiliency Solutions



IBM Tivoli System Automation Key Differentiators

Application Level Automation in Complex Environments

- **Policy** based management for ease of configuration
- Pre-defined policies to accelerate deployments



Enterprise-wide View for Resilient Resource Management

- Single point of Control across heterogeneous environments
- Minimize unique skills required to support various IT silos

Scalable, Flexible and Open to Meet Future Demands

- Unique capability to support 3rd party cluster technologies for customer investment protection and migration strategy
- Integration with Tivoli ISM portfolio to provide integrated solution extensions

Built on Proven Technologies

- IBM Cluster technology deployed in 1000s of Sysplex and distributed environments
- Leverage proven cluster technology for distributed automation engine