



# Increase Availability and Productivity with Integrated Service Management Automation

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System z - Business Unit Executive  
Z Champion

March 15, 2011



# How are you taking advantage of Automation on your System z today?

Workload Scheduling

System Automation

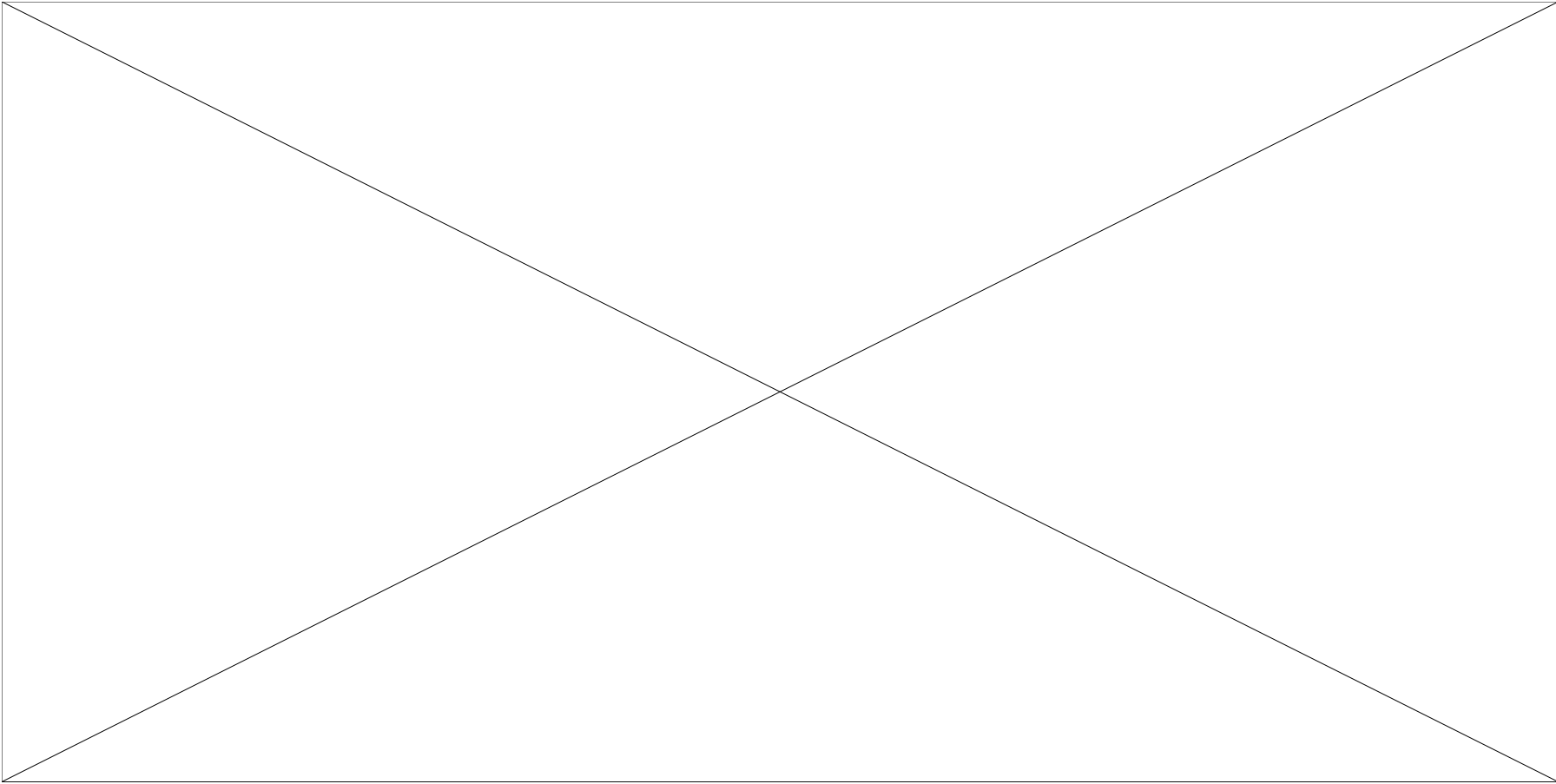
Batch Modernization

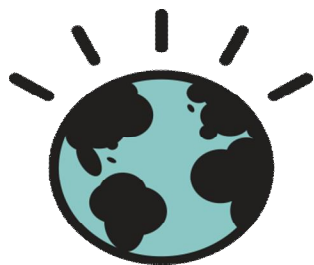
Combination

None of these



How are you taking advantage of Automation on your System z today?





# IBM Tivoli System Automation: Keeping the Smarter Planet Highly Available and Resilient

**Smart is:** Maintaining *continuous business and IT operations* while rapidly adapting and responding to risks and opportunities with high availability and business resiliency

**SMART IS:** Always open for business in a 24/7 world.



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



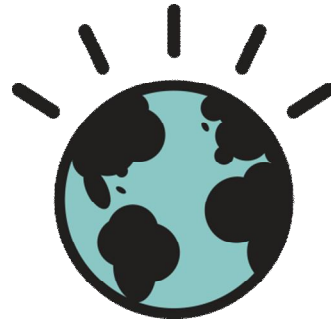
**SMART IS:** Managing risk with enterprise-wide resiliency strategy



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



# Automation is Essential to Businesses Success



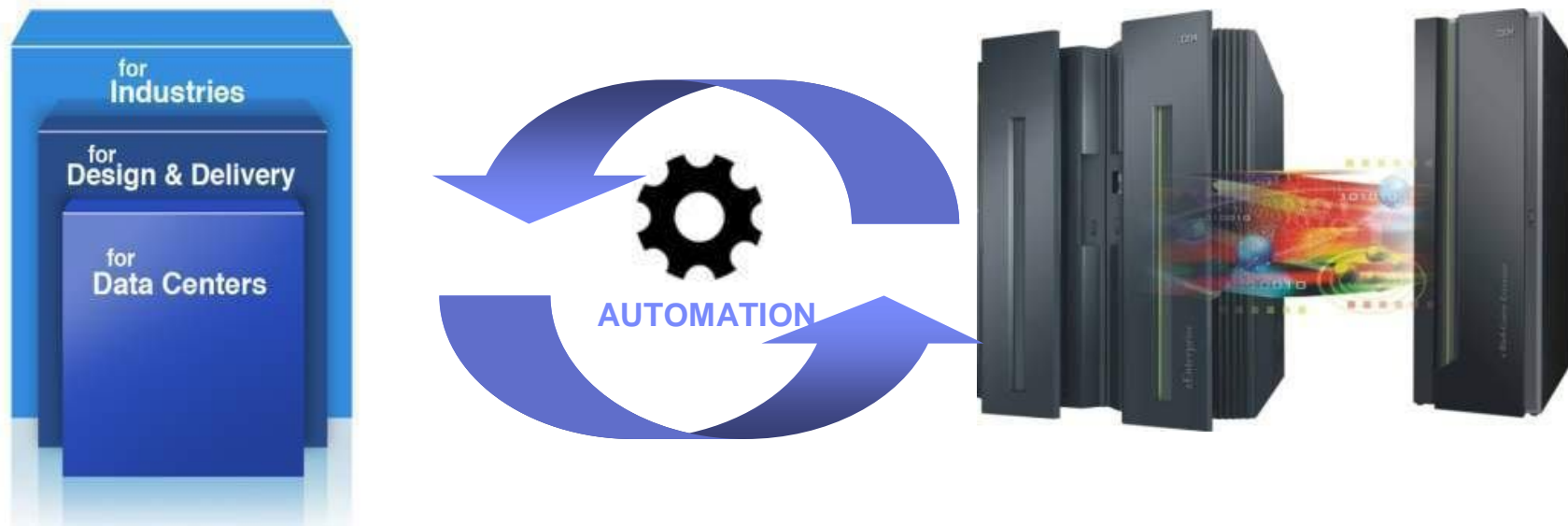
“Technology has outpaced the ability to manage it manually in every large enterprise and many smaller ones. Failure to build and evolve a well-integrated automation technology portfolio will almost guarantee catastrophic failure of the organization as it tries to expand virtualization’s footprint. Automation is no longer an optional luxury; it is now a mandate.”

Forrester Consulting: “Virtualization Management and Trends” January 2010

# ISM for System z: Automate and Optimize Delivery of Business and IT Services

**Automation:** Integrates people, operational processes and tools across organizational silos to optimize the delivery of business-critical services

## Integrated Service Management



End-to-end business service automation based on policies

# Optimize Availability and Resiliency of Multi-Tier, Composite Application Environments

## Tivoli Application Resilience for System z

### Key capabilities

- Single end-to-end point of control for resource automation throughout zEnterprise
- Aggregate and centrally manage cross-enterprise, heterogeneous workloads to support business goals and service levels
- Automated High Availability and Disaster Recovery to meet business service level requirements

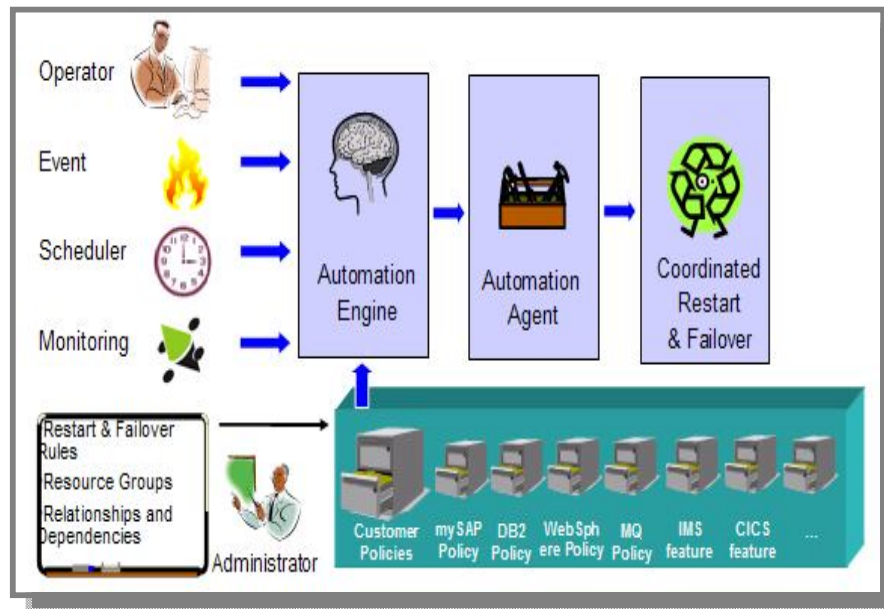
### Provided by

- System Automation for z/OS, Multiplatforms, Application Manager
- System Automation for Integrated Operations Management
- Tivoli Workload Scheduler



# IBM Tivoli System Automation Provides Enterprise Automation and Resiliency

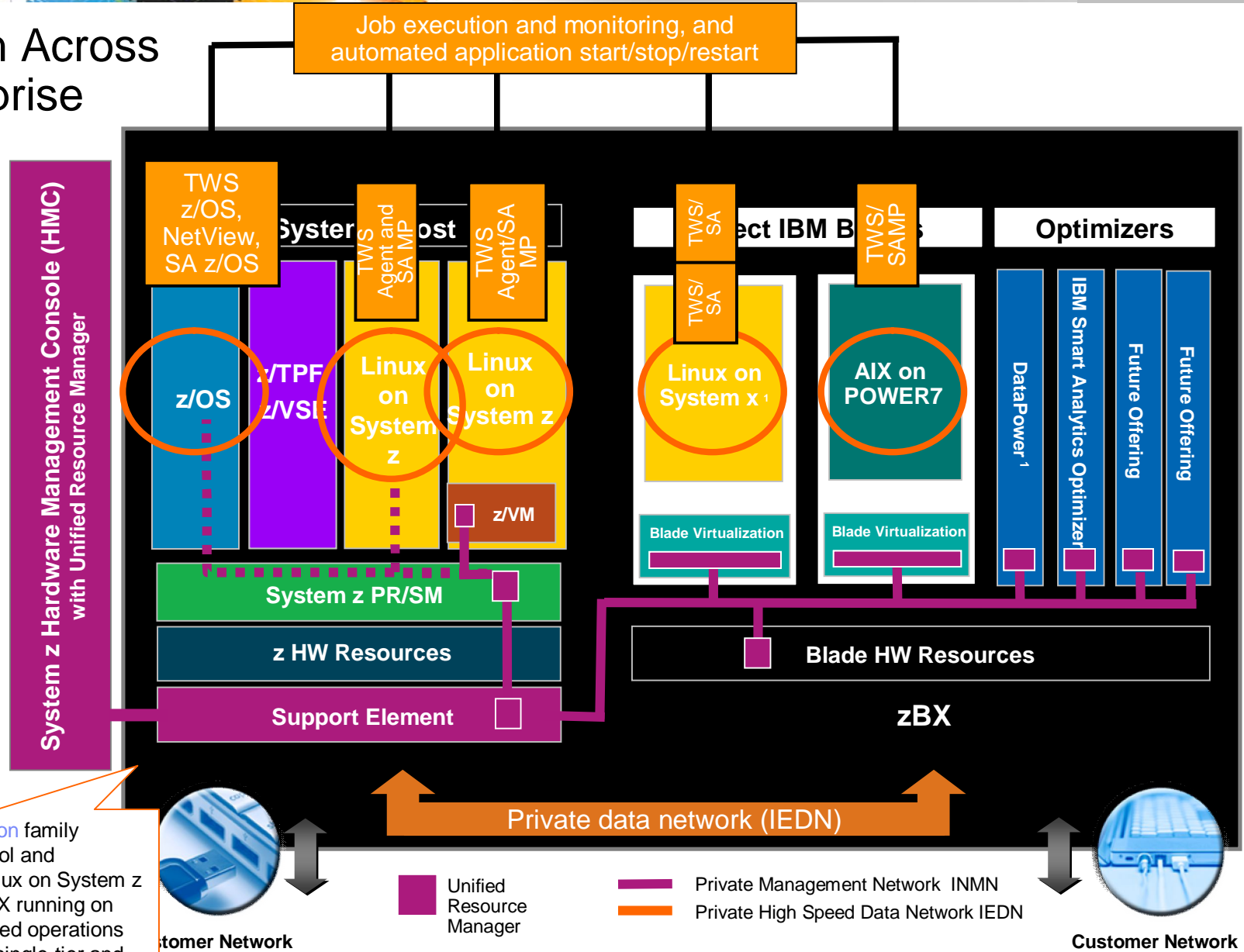
Supporting heterogeneous distributed and z environments



- Maximize the financial benefit and positive business reputation by maintaining the availability of customer facing applications
- Provide automation and application high availability regardless of platform or environment
- Minimize application interruptions or outages and substantiate benchmarks and service levels for application availability
- Reduce budgetary pressure while accepting additional workload by providing consistent actions/build organizational knowledge



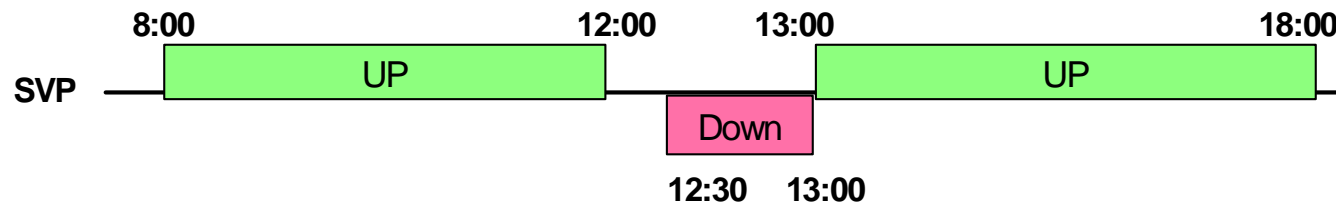
# Automation Across the zEnterprise



Tivoli System Automation family provides visibility, control and automation of z/OS, Linux on System z as well as Linux and AIX running on IBM blades for automated operations and high availability of single-tier and multi-tier applications across the entire zEnterprise system

# Goal Based Automation Keeps the Enterprise Available

- 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 keeps 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

# Policies: Building Blocks for Automation Best Practices

- Capture best practice knowledge for automation
- Provide a structured starting point for automation efforts
- Are building blocks that are easily configured to meet the needs of business critical applications
- Focus on solutions that are typically deployed in the cloud
- Sample policies are provided for these areas and many more:



# Pre-canned Automation Policy Templates

- Data Management

- DB2 v9 (ESE, ESE DPF, HADR)
- (Note: SA MP is shipped with DB2 on Linux and AIX)
- DB2 BCU
- DB2 8.x (ESE, ESE DPF, HADR)
- DB2 7.x WE, EE
- Oracle 9i
- Oracle 8i



- Tivoli Products

- Tivoli Provisioning Manager 7.1
- Tivoli Provisioning Manager 5.1
- ITM 6.2
- CCMDB V7.1
- TADDM 7.1
- CCMDB V1.1.1  
(this includes TADDM, WebSphere Application Server, WebSphere Portal Server, DB2, IBM HTTPS, and TDS)
- Tivoli System Automation for Multiplatforms (SA MP)  
(note: for the End-to-End Automation Component)
- Tivoli Workload Scheduler
- Tivoli Storage Manager (TSM)  
(includes Client, Server and Admin Server)
- Tivoli Enterprise Console



- SAP

- SAP Replicated Enqueue environment
- SAP Application Server
- SAPDB
- (Note: SA MP is shipped with DB2 on SAP DVD and integrated in SAP's installation procedure)

- Virtualization Support

- AIX WPARs
- SUN Solaris Zones

- WebSphere

- WebSphere Application Server 6.0
- WebSphere MQ

- Shared File Systems

- NFS Server
- NFS Client
- Samba



- Groupware

- Sendmail 8.11



- Replication

- GLVM (AIX)
- Metro Mirror with DS4000

- Web Servers

- Apache Web Server
- IBM HTTP Server

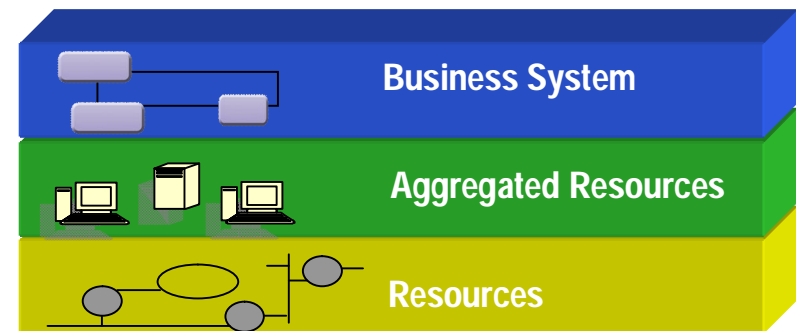


Please also refer to OPAL

# The Power of Automation Policies for Service Management

## Easier definition through 'fill in the blanks' application

- Pre-defined automation for common applications
- Faster time-to-value
- Elimination of coding errors
- Easy to build 'business view'
- More efficient use of scarce 'people' resources



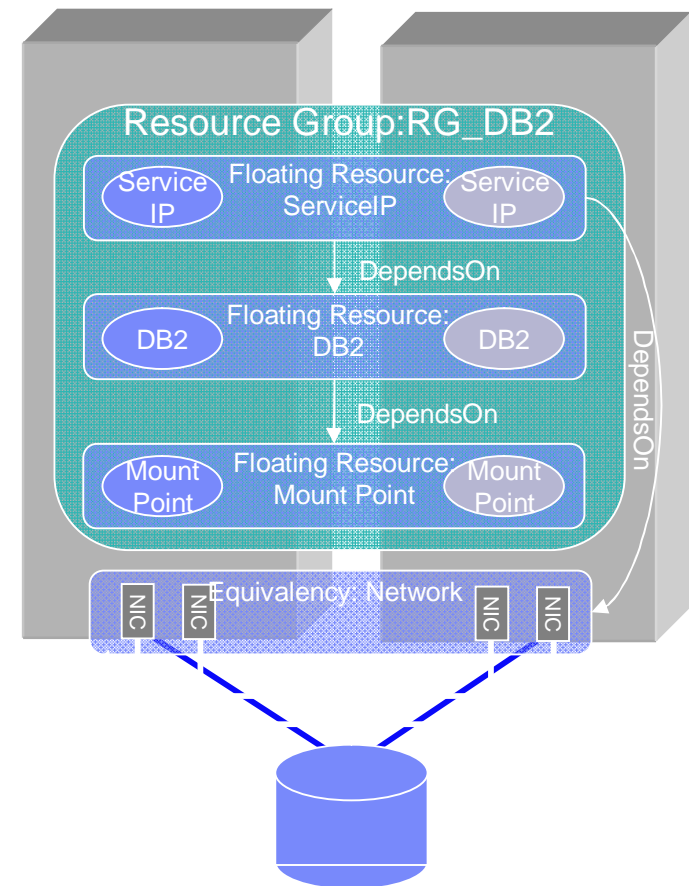
## Consistent, reliable, automation actions

- Testing of abnormal condition actions is difficult and sometimes incomplete with 'programming' solutions
- Policy definitions can be re-used, copied and cloned for similar requirements elsewhere in the enterprise
- Management of entire business applications, rather than individual resources

# Resource Types and Policy Elements

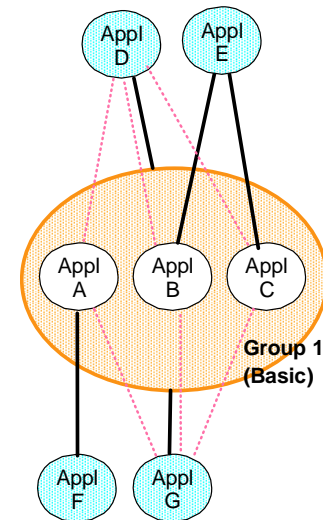
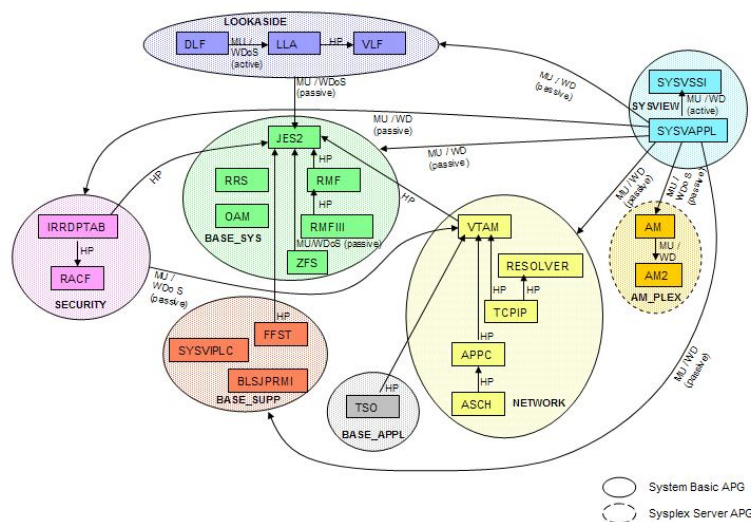
- „Simple“ Resources
  - Serial **fixed** resource
  - Serial **floating** resource
- Resource Group
  - Is a collection of resources which are treated as one logical instance
  - Is used to start, stop, and monitor
  - Group status is an aggregation of its members's status
  - Members can be Resources and Resource Groups
- Equivalency
- Relationships
  - For start/stop sequence: StartAfter, StopAfter
  - For dependend resources: DependsOn, DependsOnAny, and ForcedDownBy
  - For placement constraints: Collocated, AntiCollocated, Affinity, AntiAffinity, IsStartable

„Everything is a resource“

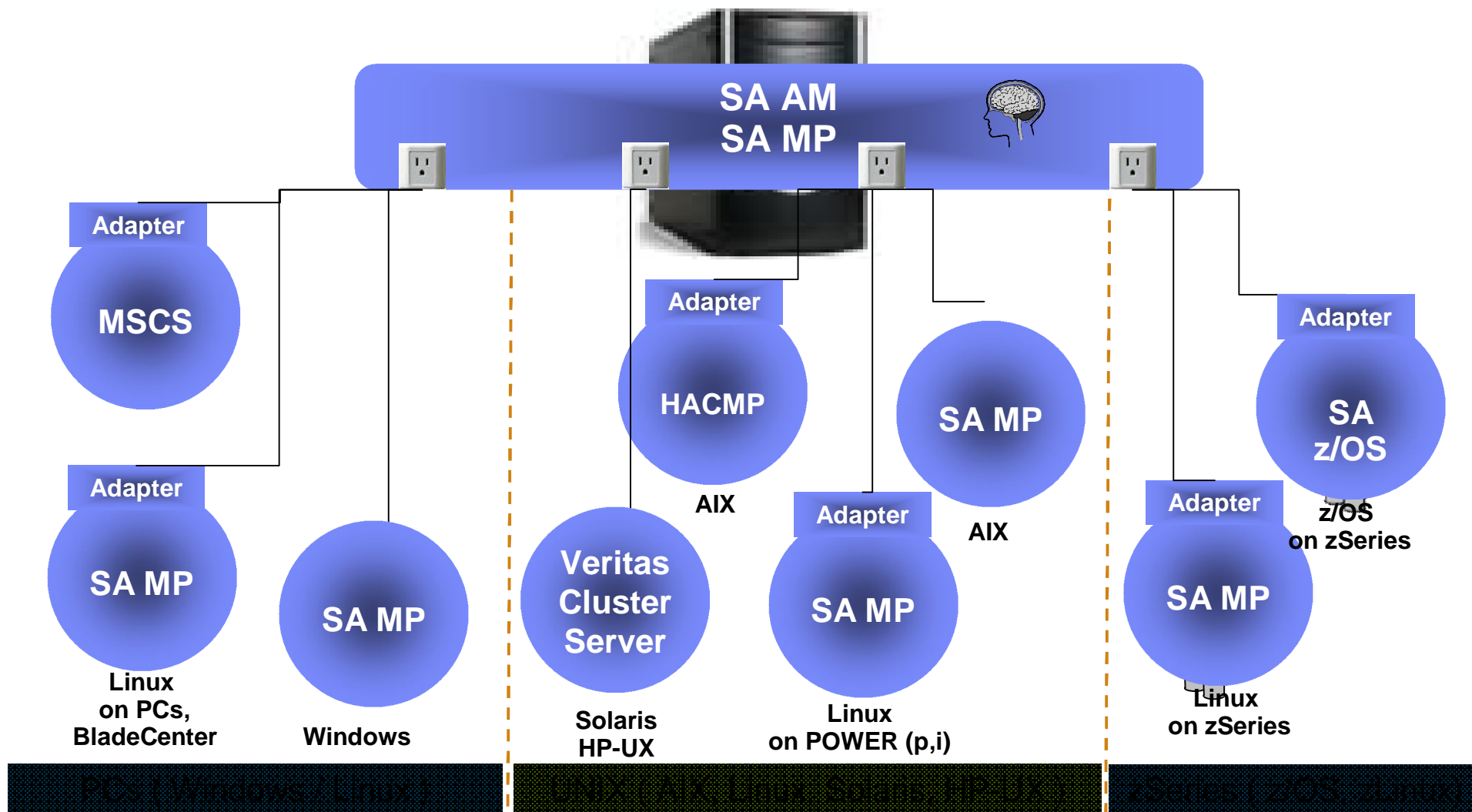


# Using System Automation Relationships and Groups to Manage the Health of Business Applications

- Relationships define the connection and dependency between resources, allowing automation actions to occur transparently
- Disparate resources required by a business application can be collected into a group, allowing automation to manage the health of a complete business application as a single entity
- Relationships, groups, and health-based automation make it simple to keep business applications always available and resilient to failure while taking advantage of the transparency and maximizing the use of available resources



# Automation for High Availability and Resiliency Across Platforms



SA: System Automation Application Manager; SA MP: System Automation for Multiplatforms



# SA MP Operations Console / Policy Editor

**Integrated Solutions Console - Microsoft Internet Explorer**

Address: [http://b99wax88.boeblingen.de.ibm.com:8421/ibm/console/tut/p/\\_s\\_7\\_0\\_A/7\\_0\\_SRH/cm](http://b99wax88.boeblingen.de.ibm.com:8421/ibm/console/tut/p/_s_7_0_A/7_0_SRH/cm)

Welcome iscdadmin | My Favorites | Edit my profile | Help | Log out

**Integrated Solutions Console**

TSA operations console

Tivoli System Automation Operating and Monitoring

**Menu**

**Topology**

Select		Located ...
<input checked="" type="radio"/>	FriendlyE2E	<input checked="" type="checkbox"/>
<input type="radio"/>	FECluster	<input checked="" type="checkbox"/>
<input type="radio"/>	FEClusterSAP	<input checked="" type="checkbox"/>
<input type="radio"/>	FEPLEX1	<input checked="" type="checkbox"/>
<input type="radio"/>	FEPLEX2	<input checked="" type="checkbox"/>

**Resources of FriendlyE2E**

View: All resources | Go

Name filter: \* | Go | Reset

Select	
<input checked="" type="radio"/>	Friendly Computer Shop
<input type="radio"/>	Stock Trading Application
<input type="radio"/>	eMail Hosting

**Information area**

**General**

**Resource group**

Additional Info

Name: Friendly Computer Shop

Class: ResourceGroup

Automation domain: FriendlyE2E

Node:

Owner: Bob Owens, tel: 4312

Info link: <http://www.google.de>

Description: Initial description

**Resource group status**

The resource works as desired

Observed state:  Online

Desired state:  Online

System Automation Application Manager end-to-end automation policy

Clear

**Overview**

PolicyInformation

PolicyName: Sample E2E Policy

Policy file name: Sample.xml

AutomationDomainName: FriendlyE2E

PolicyToken: 1.0.1

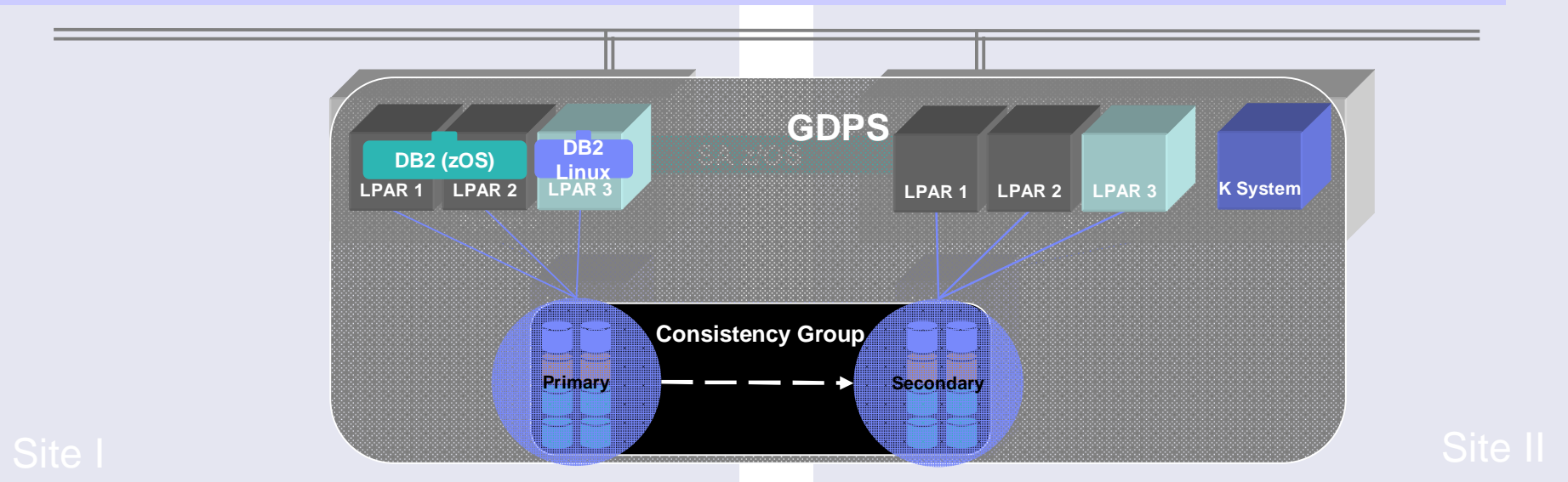
PolicyAuthor: Michael Atkins

PolicyDescription:

localhost:9043

## xDR: SA MP's Integration with GDPS Metro Mirror

- **GDPS/Metro Mirror Multi Platform Resiliency for System z (xDR)**
  - xDR extends GDPS to not only support z/OS but also Linux on System z (both on z/VM and on LPARs)
  - SA MP is the foundation of xDR
  - xDR provides for Linux on System z:
    - Disk error detection, Heartbeat for sanity checks, Re-IPL in place, coordinated site takeover, coordinated Hyperswap



# Integration with Monitoring for Improved Performance

**Request Summary:**  
See the priority of resource status requests at a glance

**Compound Status Summary:**  
Quickly see the health of resources

**Resource List Table:**  
See more detailed information about each monitored resource

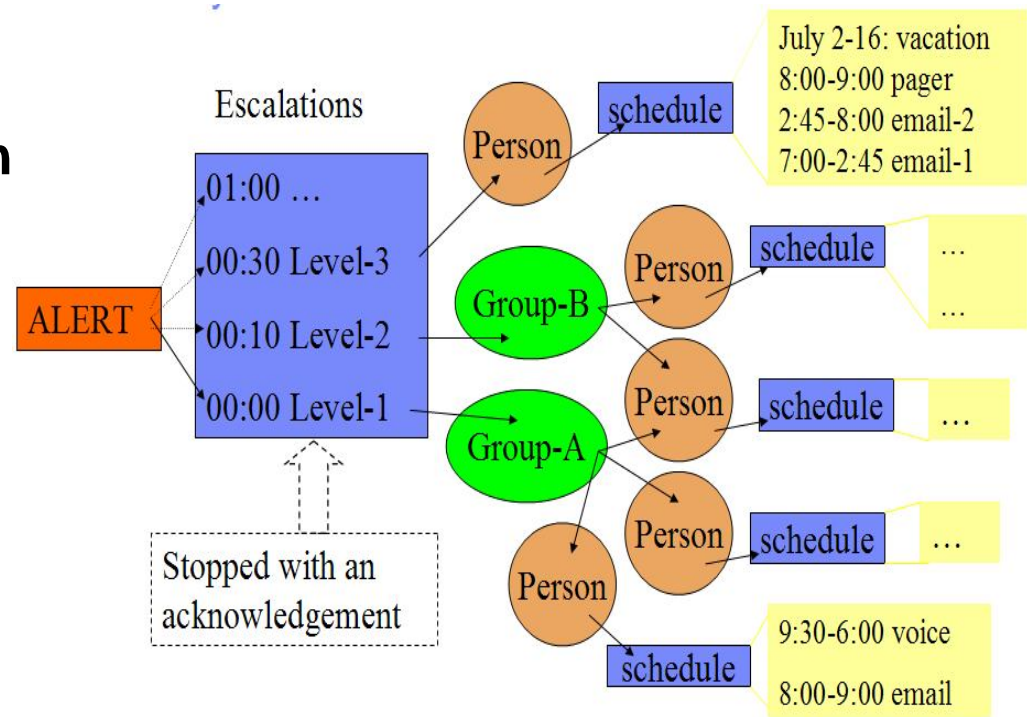
Name	Type	System	Status	Status	Status	Status	Status	Status	Flag	Flag	Description
JES2MON	MTR	TIVED1	Awaiting	Available	Unavailable	NA	Idle	Yes	No	Monitor for JES2	
JES2MON	MTR	TIVED2	Awaiting	Available	Unavailable	NA	Idle	Yes	No	Monitor for JES2	
SWPCMON	MTR	TIVED2	Degraded	Available	Available	Critical	Idle	Yes	No	SA z/OS MTR for OMEGAMON SWPC exceptions	
XREPMON	MTR	TIVED2	Degraded	Available	Available	Warning	Idle	Yes	No	MTR for OMEGAMON XREP exceptions	
SYSPLEX	GRP		Inhibited	Starting	Available	NA	Internal	Yes	No	SA Sample Sysplex	
RV_MOVE	APG		Inhibited	SoftDown	Available	NA	Internal	Yes	No	MOVE Group for RV appl	
MTRIP	MTR	TIVED2	Satisfactory	Available	Available	Normal	Idle	Yes	No	Monitor for TCP/IP Resources	
MTRIP	MTR	TIVED1	Satisfactory	Available	Available	Normal	Idle				
TSOGROUP	APG		Satisfactory	Available	Available	NA					
VTAM	APL	TIVED2	Satisfactory	Available	Available	NA	Idle				
VTAM	APL	TIVED1	Satisfactory	Available	Available	NA	Idle				
VLF	APL	TIVED2	Satisfactory	Available	Available	NA	Idle				

# 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)**



# At-A-Glance Status of Notifications

Event history

Refresh

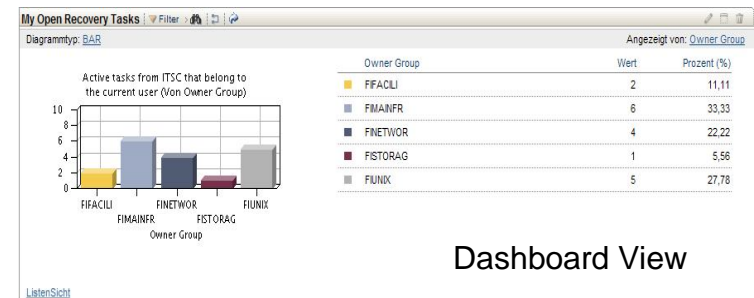
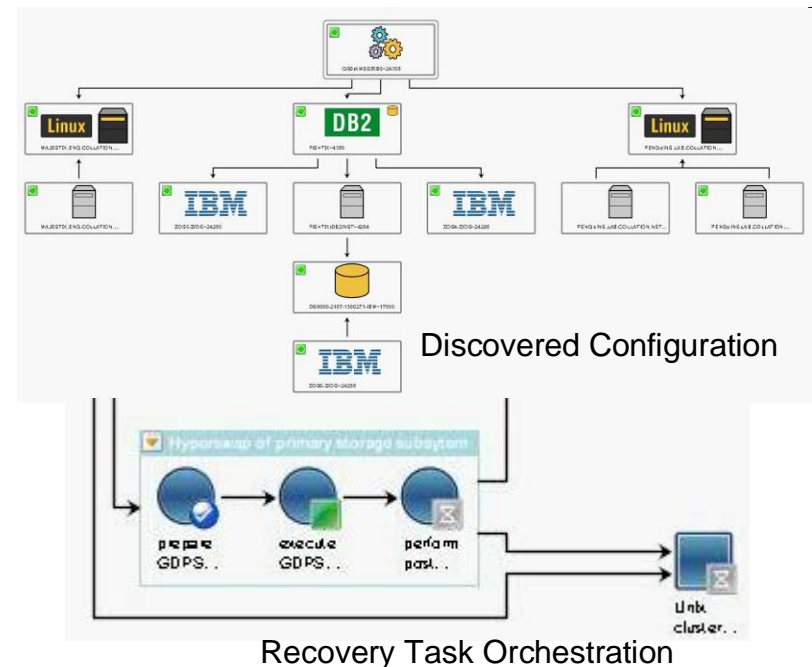
--- Select Action --- Go

Select	Time stamp	Alert ID	Esc. ID	Esc. L...	Event type	Info
	<a href="#">Filter</a>	<input checked="" type="checkbox"/> = 4,797	<a href="#">Filter</a>	<a href="#">Filter</a>	<a href="#">Filter</a>	<a href="#">Filter</a>
<input type="radio"/>	19.03.2007 15:38:48	4797	SMS_ESCALATION	1	Status change	new status=exhausted
<input type="radio"/>	19.03.2007 15:38:48	4797	SMS_ESCALATION	1	Escalation end	total notifications: 2
<input type="radio"/>	19.03.2007 15:38:48	4797	SMS_ESCALATION	1	Escalation level end	level expired
<input type="radio"/>	19.03.2007 15:33:49	4797	SMS_ESCALATION		Helper script end	result from NotifyEmail(5) result=OK desc=
<input type="radio"/>	19.03.2007 15:33:48	4797	SMS_ESCALATION	1	Helper script invoke	NotifyEmail.rex started with 2 recipients
<input type="radio"/>	19.03.2007 15:33:48	4797	SMS_ESCALATION	1	Person processing	user=Gunnar notification=email
<input type="radio"/>	19.03.2007 15:33:48	4797	SMS_ESCALATION	1	Person processing	user=Christa_eMail notification=email
<input type="radio"/>	19.03.2007 15:33:48	4797	SMS_ESCALATION	1	Escalation level start	duration=5 minutes
<input type="radio"/>	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
<input type="radio"/>	19.03.2007 15:33:47	4797	SMS_ESCALATION		Alert arrival	

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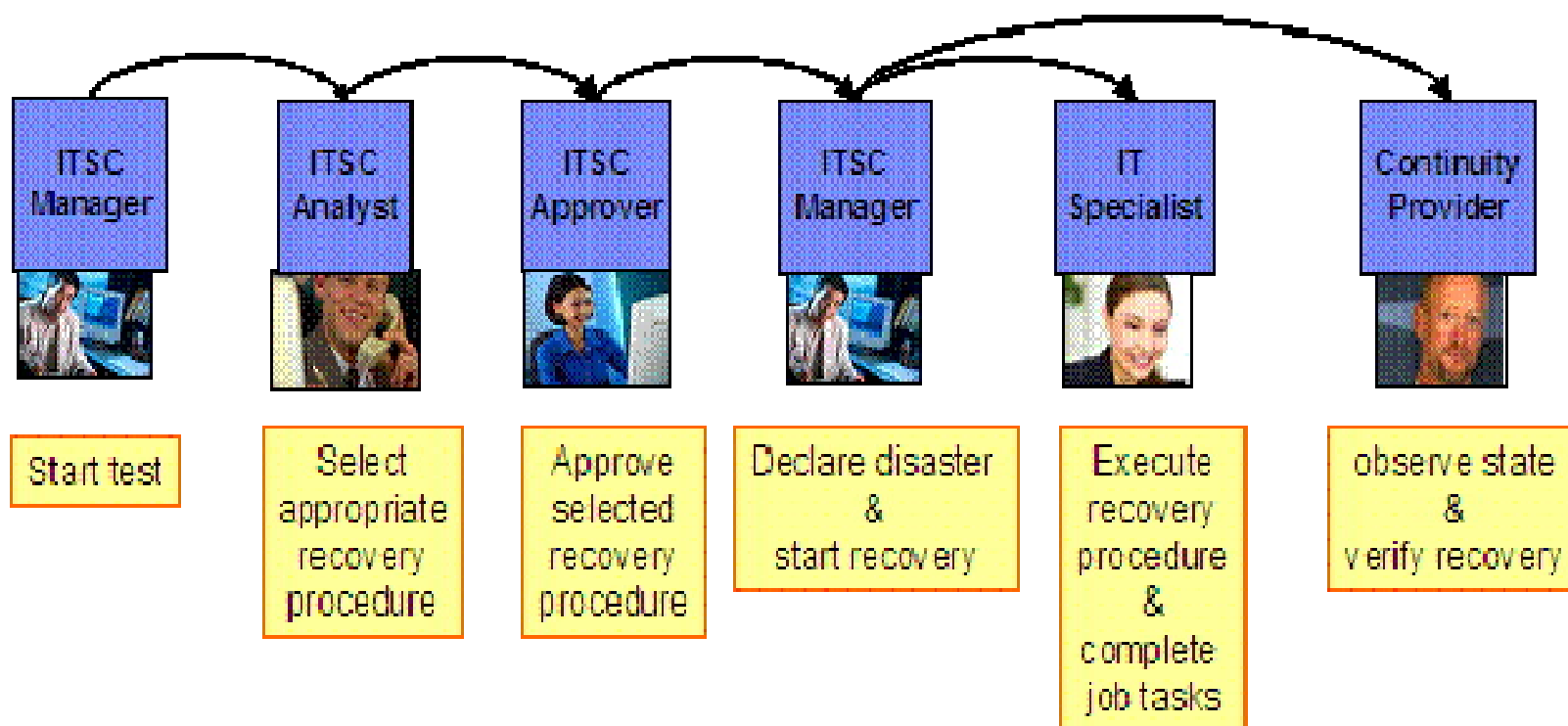
# Extending Automation to Continuity of Operations

- Adaptable process, recovery procedures, and role-based user interface allow you to exercise business continuity actions and workflow in their actual business environment
- Reliable, repeatable, and auditable actions minimize manual steps and human errors, and time to recover from service interruptions and application outages
- Reports and a common information data store allow efficient responses to internal and external regulatory and governance audit and reporting requirements
- Dashboard views and notification capabilities increase awareness of resiliency events, their ownership, and recovery status
- Standard processes support frequent testing of automation and training to reduce the effort required to maintain current automation processes and build collaboration and maintain organizational effective communication



Dashboard View

# A Customer Experience with BCPM



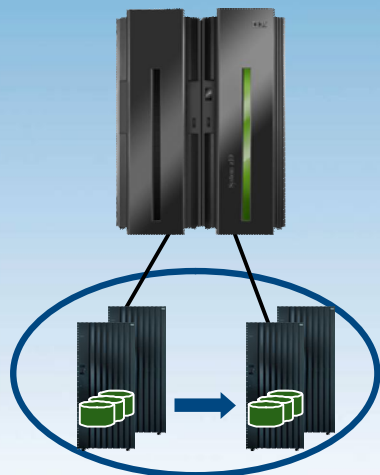
From business scenario to recovery plan  
in less than two weeks!

# Always Available Business with Automated Data Recovery

Continuous Availability of Data within a Data Center

Single Data Center Applications remain active

Near-continuous availability to data

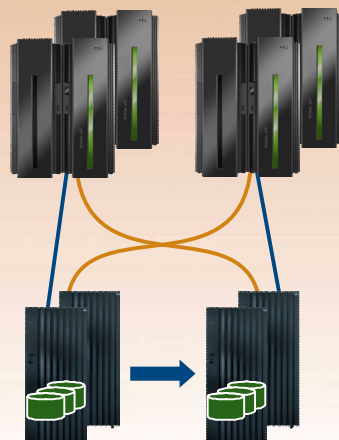


GDPS/PPRC HM

Continuous Availability & Disaster Recovery Metropolitan Region

Two Data Centers Systems remain active

Automated D/R across site or storage failure No data loss

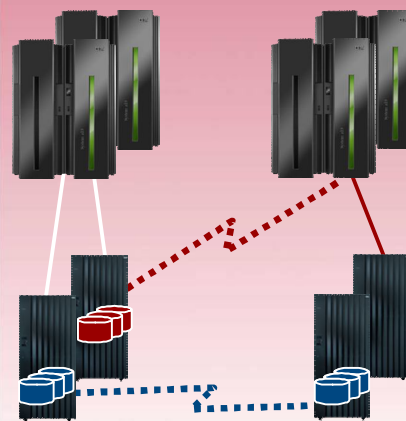


GDPS/ PPRC HM  
GDPS/PPRC

Disaster Recovery at Extended Distance

Two Data Centers

Automated Disaster Recovery "seconds" of Data Loss

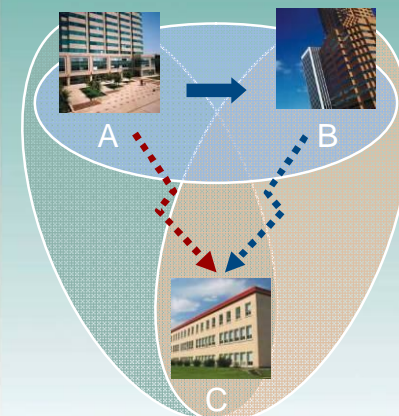


GDPS/GM (blue line)  
GDPS/XRC (red line)

Continuous Availability Regionally and Disaster Recovery Extended Distance

Three Data Centers

Data availability No data loss Extended distances

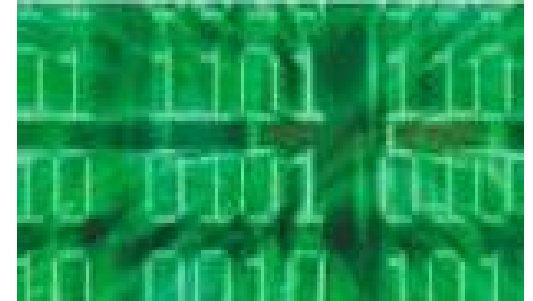


GDPS/MGM  
GDPS/MzGM



# Benefits of Integrated Service Management Automation

- **Virtual:** a “share all” approach to system resources for efficiency
- **Agility:** responding quickly and efficiently to meet the demands from users and data
- **Risk:** reduce risks through healthful, state-based automation, high availability, and business continuity
- **Availability:** 24x7x365 operation to keep the business always available to customers
- **Secure:** highly certified hardware security and role-based software security
- **Green:** Making the most effective use of resources to reduce energy consumption and avoid additional costs



# Automation Makes Money for the Banking Industry

## Business Challenges

- Ensure that customer facing applications and applications that support customer facing personnel are always available for business
- Improve the ability of systems to automatically heal configuration and usage issues
- Use system resources more efficiently to reduce costs to the business

## How Automation Helps

- Centralizes and improves consistency of repetitive and routine actions, reducing manual errors
- Ensures high availability and minimizes recovery time from planned and unplanned outages
- Enables accurate provisioning based on actual workload performance, reducing infrastructure costs
- Integrates monitoring for visibility, automation, and control of infrastructure performance, enabling faster response and better service during peak capacity usage



## Benefits

- Enhanced customer satisfaction with efficiency of order processing
- Decreased overhead expenses
- Improved business operations

# Automation Helps Medical Teams Improve Patient Care

## Business Challenges

- Regulate incoming calls
- Locate emergency teams
- Optimize and coordinate patient care
- Share and access the same patient information
- Optimize patient follow-up
- Improve exceptional situation management

## How Automation Helps

- High availability of the communication infrastructure
- Resiliency and continuity of healthcare applications



## Benefits

- Improved coordination of care enables better and faster treatment while reducing the risk of medical error
- Improved patient satisfaction with speed and robustness of care

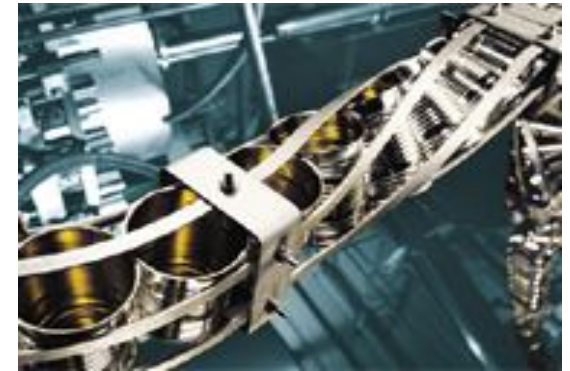
# System and Workload Automation Keep the Assembly Line Running Efficiently

## Business Challenges

- Integrate the work of sales offices, corporate offices, and their suppliers
- Improve monitoring of the end-to-end supply chain
- Use system resources more efficiently

## How Automation Helps

- Simplifies management of systems and applications
- Simplifies application and subsystem monitoring
- Reduces infrastructure costs
- Increases the efficiency of scheduling efforts
- Eased the implementation of a disaster recovery solution



## Benefits

- Enhanced customer satisfaction with efficiency of order processing
- Decreased overhead expenses
- Improved business operations

# Automation is an Essential Element to Deliver Quality Integrated Service and Business Innovation



**Visibility:**  
*See your  
business*

**Respond faster and  
make better decisions**



**Control:**  
*Manage your  
business*

**Manage risk and  
compliance**



**Automation:**  
*Improve your  
business*

**Lower costs and  
build agility**

# The Value of IBM Tivoli System Automation for ISM

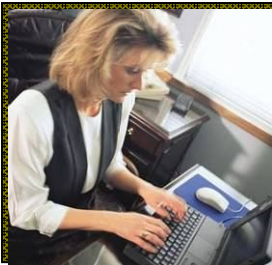
## Application Level Automation in Complex Environments

- 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 3<sup>rd</sup> party cluster technologies for customer investment protection and migration strategy
- Integration with Tivoli ISM portfolio to provide integrated solution extensions



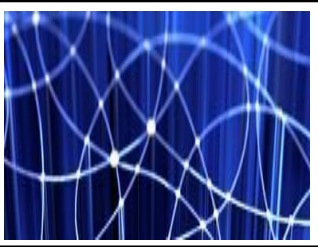



## Built on Proven Technologies

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



# System Automation High Availability and Resiliency Solutions

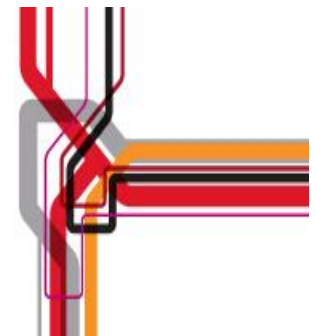
<p><b>Manage Risk</b></p>		<p><b>Business Continuity Process Manager</b> offers unique workflow automation, testing exercises, and recovery processes to bring <b>confidence</b> to how clients protect their business.</p>
<p><b>Increase Visibility</b></p>		<p><b>System Automation for Integrated Operations Management</b> raises <b>visibility</b> of issues to expedite responses and help avoid impact to customers.</p>
<p><b>Optimize the Business</b></p>		<p><b>System Automation Application Manager</b> gives your business applications <b>agility and speed</b> to satisfy business demands – allowing customers to interact with the business whenever and wherever.</p>
<p><b>Platform High Availability</b></p>		<p><b>System Automation for Multiplatforms</b> extends <b>automation</b> and <b>high availability</b> to additional resources</p>
<p><b>Improve Service</b></p>		<p><b>System Automation for z/OS</b> offers unrivaled <b>automation</b> and <b>high availability</b> to keep the business infrastructure always available.</p>

# IBM Tivoli Automation Resources

- **Automation Portfolio Landing Pages**
  - [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 Discussion Forums**
  - [SAUsers on Yahoo](#)
  - [SA IOM](#)
  - [System Automation for Multiplatforms](#)
- **Annual User Conference**
  - [AOTC'11 conference web site](#)
  - Subject specific presentations delivered by customers and IBM specialists
  - Excellent opportunity for interaction and discussion
- **Additional Automation Resources**
  - [System Automation for z/OS Bookshelf](#)
    - Publication Library and Redbooks
    - Presentations, Demonstrations, and Education
  - [Business Continuity Process Manager demo](#)
  - [System Automation for Multiplatforms demo](#)
  - [Tivoli Workload Scheduler demo](#)
- **System z Resources**
  - [IBM System z Advisor Newsletter](#)
  - [IBM System z Community](#)

**Pulse2011**  
The Premier Service Management Event

Optimizing the World's Infrastructure  
February 27–March 2 Las Vegas, Nevada



<http://www-01.ibm.com/software/tivoli/pulse/>



# Customer Experience Using Automation to Manage High Availability and Disaster Recovery

IBM asked 560 IT managers and CIOs in all types of companies all over the world about IT risk

**The 2010 IBM Global IT Risk Study.**  
[Download it now.](#)



[http://www-935.ibm.com/services/us/gbs/bus/html/risk\\_study.html](http://www-935.ibm.com/services/us/gbs/bus/html/risk_study.html)

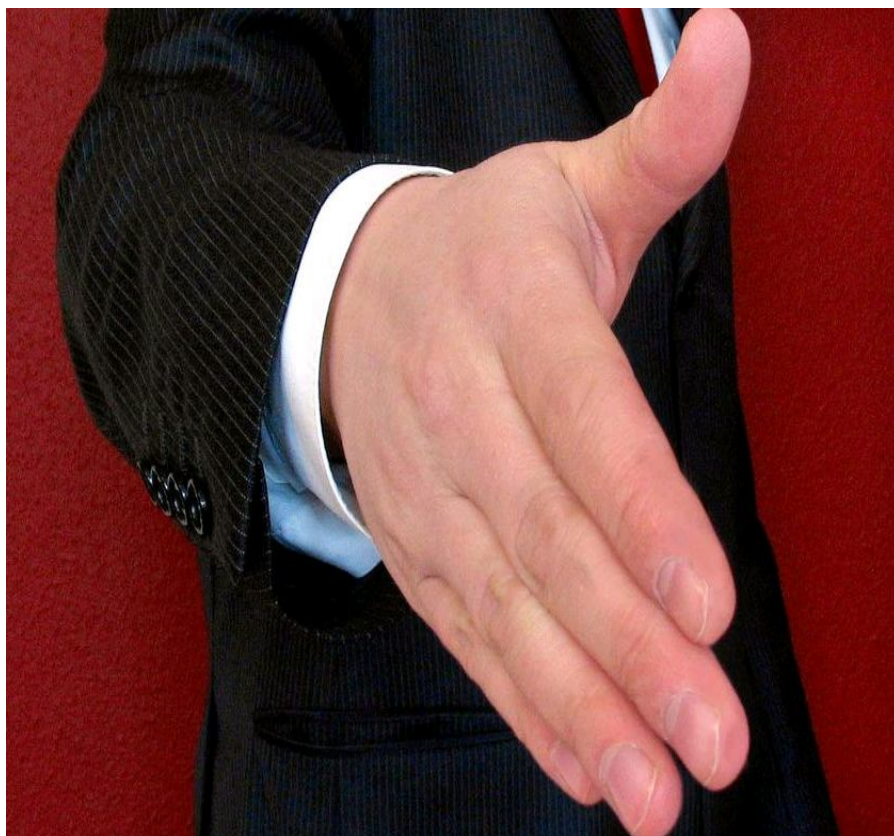
Using Cloud Computing for Disaster Recovery: Watch the Video

<http://www-935.ibm.com/services/us/gbs/bus/html/videos.html>

“The cloud opportunity meant that without adding infrastructure into my environment, without having to add support staff to my environment, I could actually do a nightly back-up through the cloud.”

**Jessica Carroll, Managing Director, Information Technologies, USGA**

# Thanks for Your Participation



## Need More Information?

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