IBM Systems magazine

IBM

Improve Availability and Productivity with Pro-active Automation

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Joachim Schmalzried
Certified IT Specialist,
IBM Software Group

Agenda

- Cloud, mobile, and big data require high availability and disaster recovery
- High automation degree can decrease costs and risks
- Pro-active automation with System Automation for z/OS and OMEGAMON
- Integrate scheduling with automation

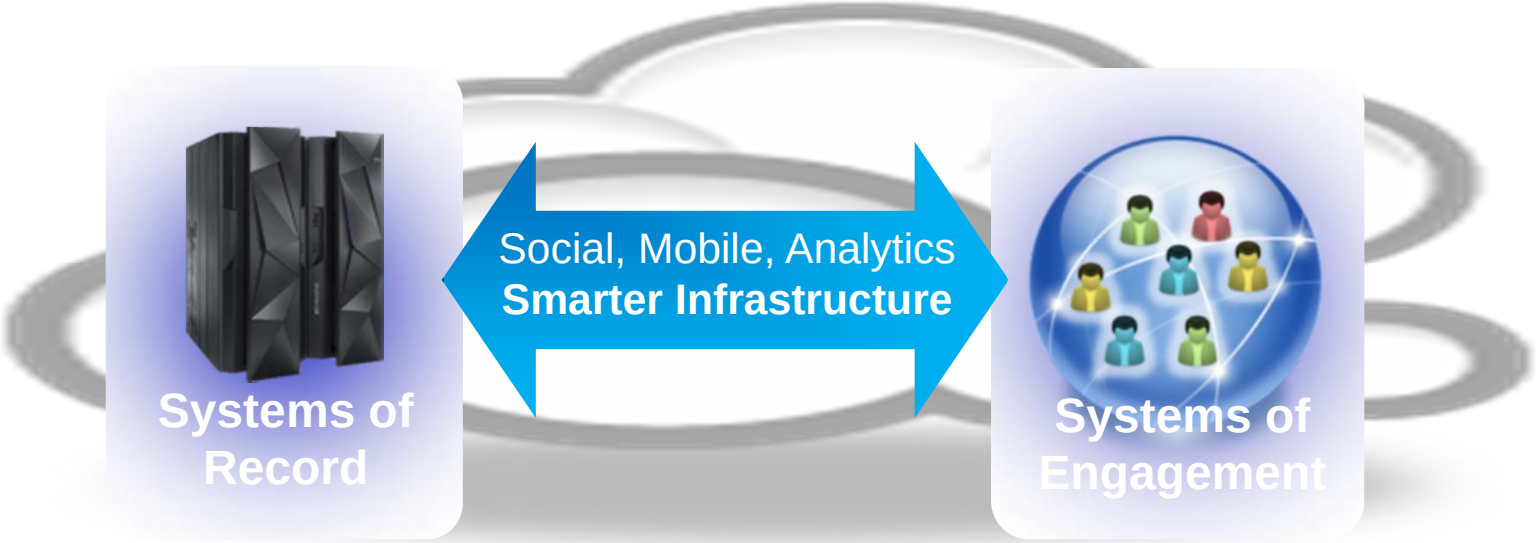
Increasingly complete System Automation solution can improve availability across entire enterprise

Key Takeaways

1. IBM provides System z Service Management leadership supporting Mobile, Big Data and Cloud
2. Integrated monitoring and automation with OMEGAMON and System Automation together provides better availability and performance than standalone products
3. IBM's complete solution extends across System and Workload Automation for improved scheduling and management

Rapid growth of next generation technologies supported seamlessly on zEnterprise

System z scaling model and security to manage and optimize both



- Business Transactions
- Quality of Service
- Command & Control
- Facts and data “source of truth”
- z/OS

- Mobile and Social
- Dynamic
- Interactions and Collaboration
- Insight, trends, analytics
- Linux on System z

System z proven platform to seamlessly address challenges for cloud, mobile, and big data workloads

Mobile

- Mobile Business workloads require security and high availability
- Increased mobile business data access and complexity
- Drives Scale-up and Scale-out Enterprise challenges

Cloud

- Performance, security, high availability and disaster recovery
- Data protection and regulatory compliance
- Ability to quickly and easily provision and orchestrate

Big Data/Analytics

- Complex, non-traditional data require enterprise-wide data management
- Analytics requires fast, easy heterogeneous data access

New technologies of cloud, mobile, and big data require enhanced, integrated visibility and automation

IT requires ability to quickly correlate and fix problems across end-to-end applications and services

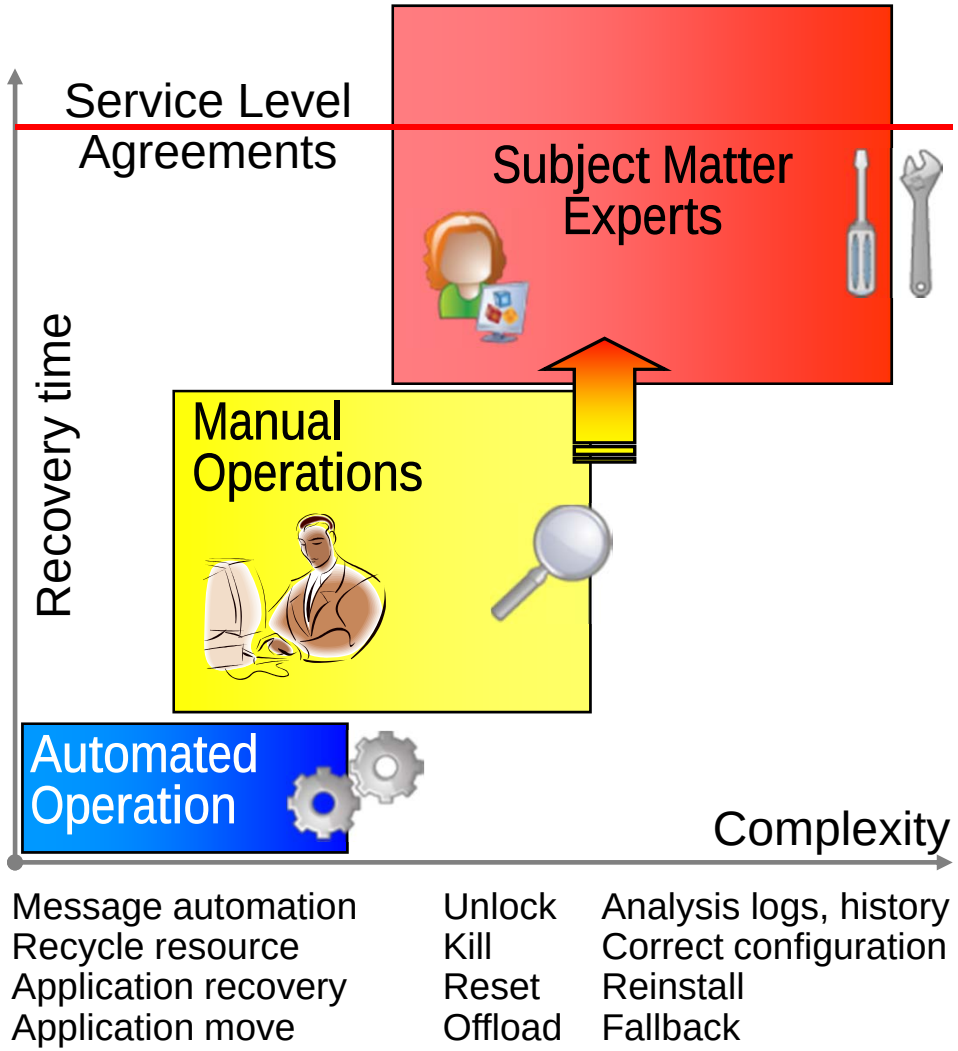
Islands of monitoring and automation lead to potentially more outages and higher costs

- Low automation degree
- Problems crossing monitors hard to diagnose due to lack of correlation or drill down

Customer challenges

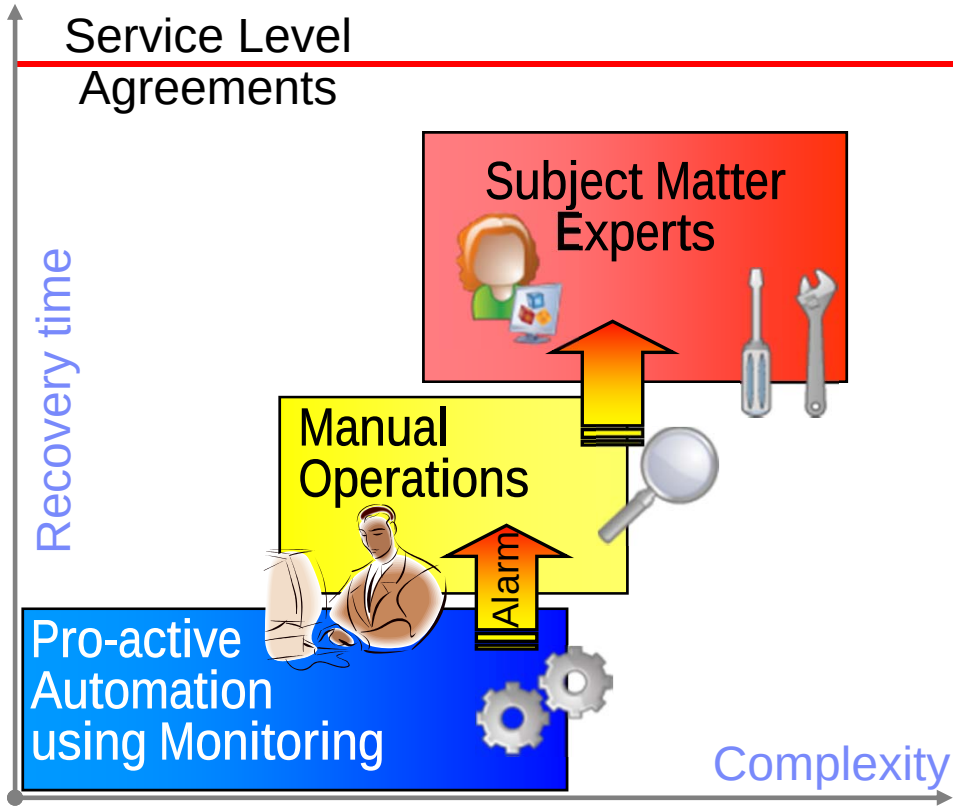
- Performance number values – what is good vs bad
- How to find correct thresholds
- Problems detected in time vs flooded with exceptions
- Identify problems before they cause an outage

Lack of automation can increase costs and risks



- Many shops only automate IPL, messages, and shutdown
- Recovery automated only for single resources without dependencies
- Complex recovery or moves done by operators leads to higher effort and recovery time
- Operators not alerted about monitor or automation exceptions
- Performance problems not solved by automation

High degree of automation can decrease costs and risks



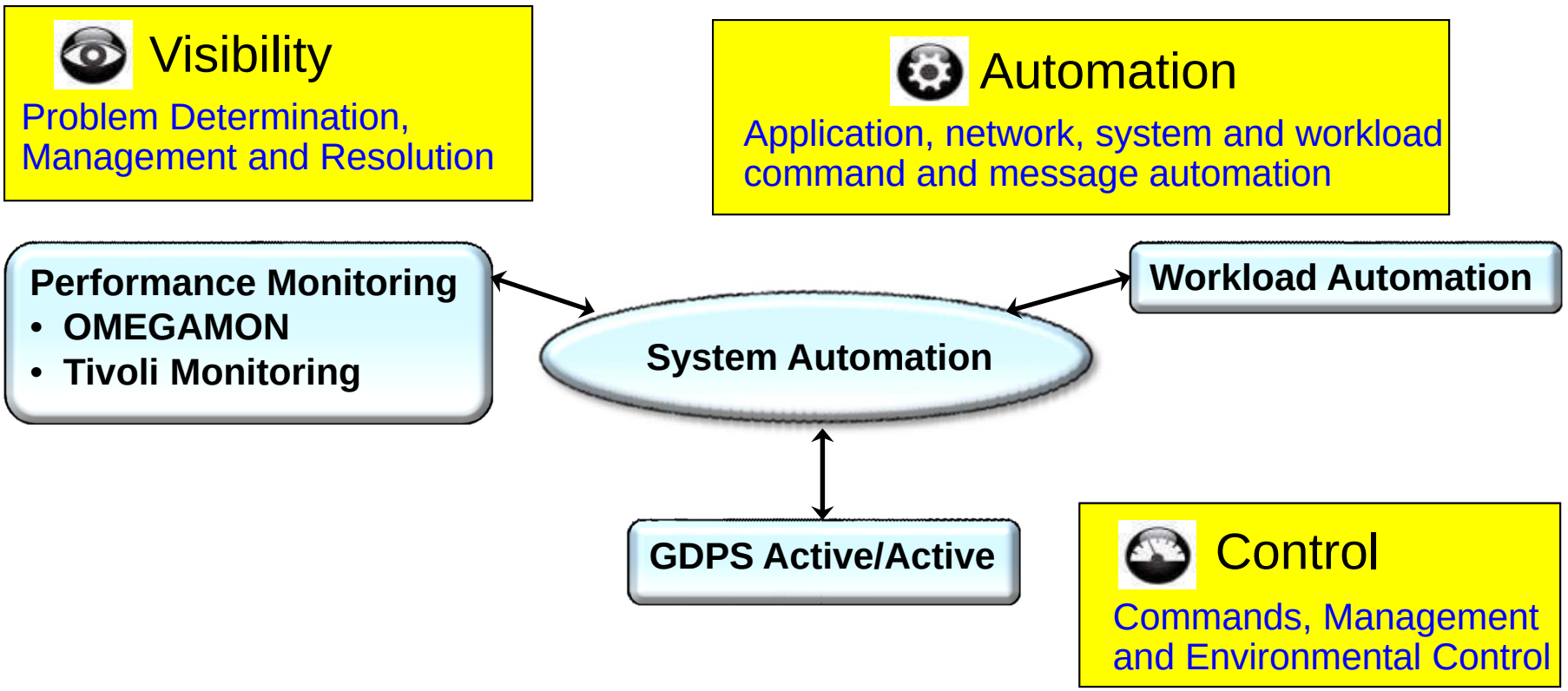
Message automation
Recycle resource
Application recovery
Application move

Unlock
Kill
Reset
Offload

Analysis logs, history
Correct configuration
Reinstall
Fallback

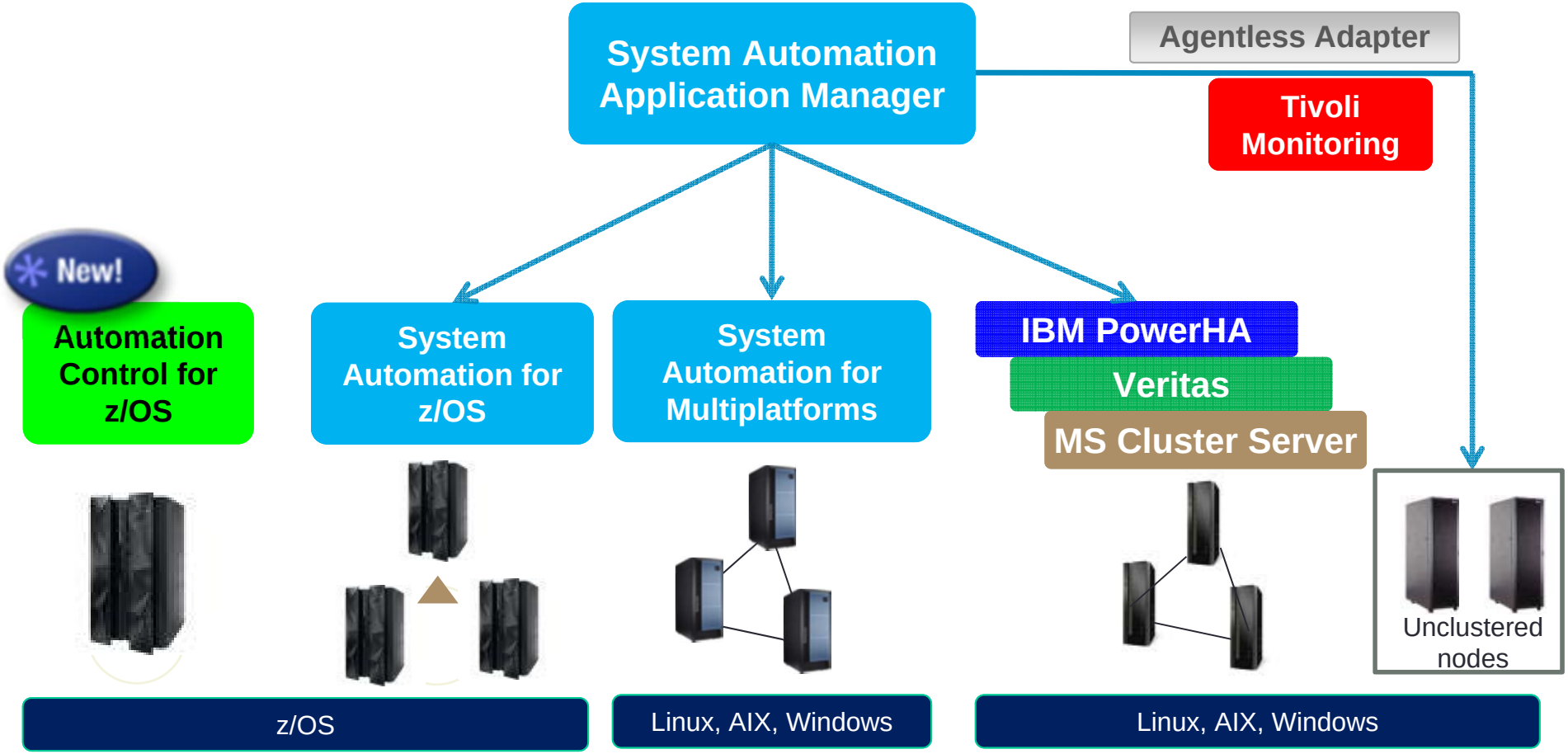
- Complex recovery or moves done by automation – fast and reliably
- Operators alerted about monitor or automation exceptions
- Pro-active automation using monitoring can resolve performance problems before they cause outages
- Operators and SMEs can solve problems faster by using automation to manage applications

IBM's pro-active automation integrated solution includes a number of key components



IBM System Automation family works together to provide enterprise-wide cost savings with increased availability

IBM only vendor to provide end-to-end, cross-platform automation



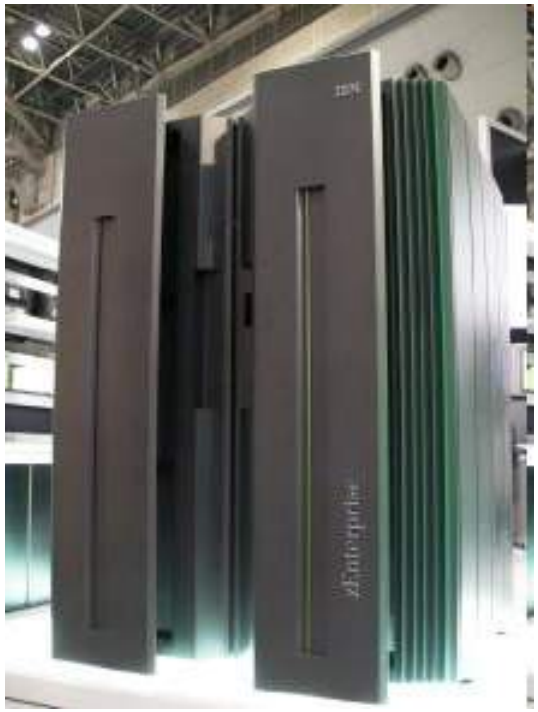
IBM System Automation capabilities on System z enable simplification across hardware and software

Systems & Applications

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

Processor

- Automate and control hardware operations
- Power on/off and reset processors
- Perform system IPL for z/OS, Linux, z/VM, blades
- Automate LPAR settings like weights and capping



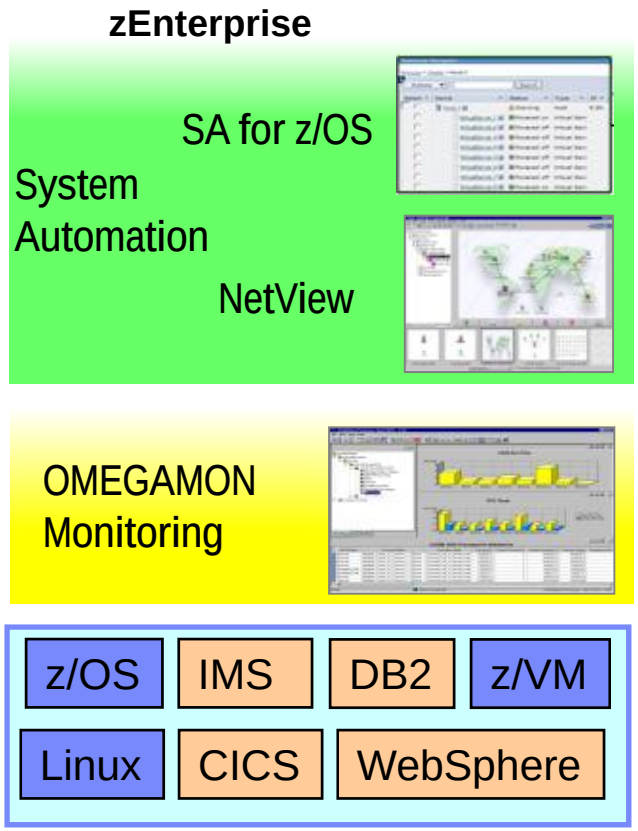
I/O Switches

- Change configuration on the fly
- Stay operational through system-integrated switching
- Manage ESCON and FICON directors

IBM has key automation technologies needed to support fast changing business requirements

- Best Practices **Policy-based, and Plug-and-Play automation** replaces slow, manual scripting
  - Faster time to value, less maintenance costs and human errors
- Business based **Goal driven automation** keeps applications in line with dependencies, configuration, and status
- Powerful **Sysplex-wide automation** and operations
- Quick and easy **Resource grouping** for reduced complexity and management at business application level
- Accelerated startup and shutdown, and correct recovery with **Defined relationships** between resources
- Easier operations through **management by state**, not by message
  - Health status included in state determination
- Integration with monitors and OMEGAMON for **pro-active automation**

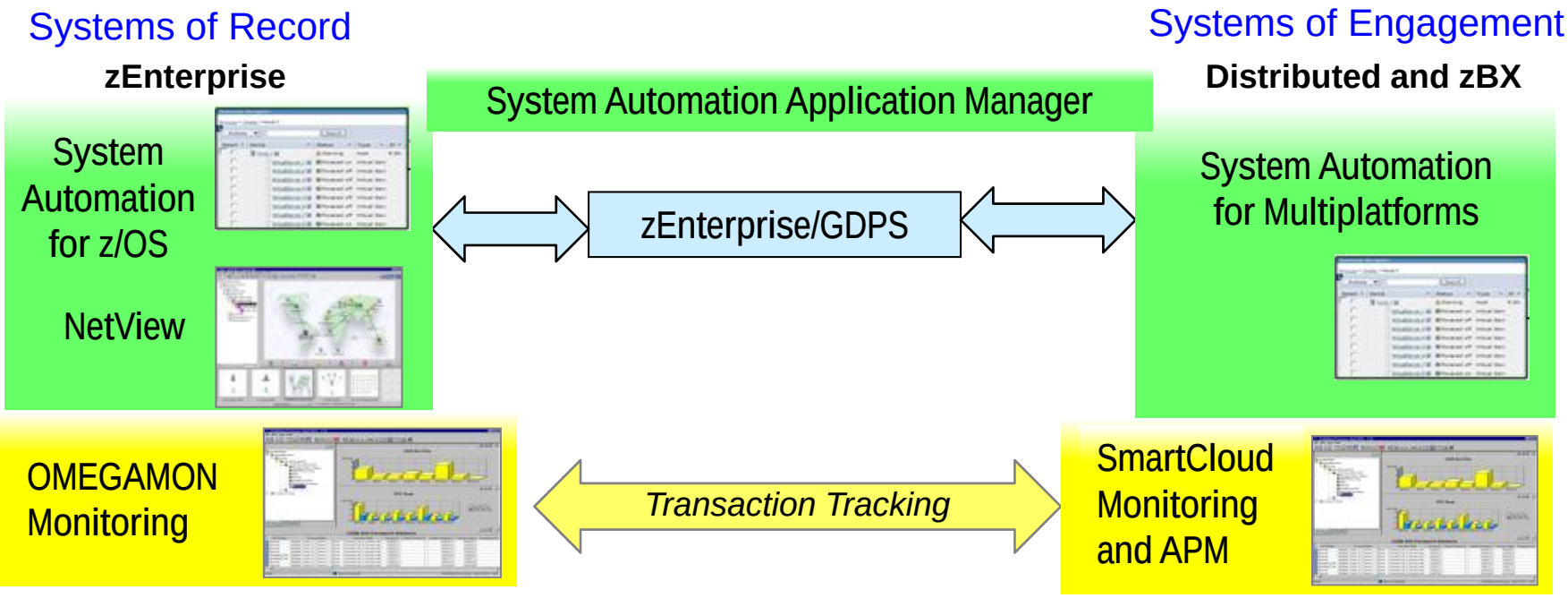
OMEGAMON and System Automation work together to improve availablity and simplify operations



- Active or passive performance monitoring
  - Managed by automation
  - Integrated with monitor products
- Determine health state or exceeded thresholds
- Correlate with other monitors
- Send a notification to operator or owner
- Start/stop/move resources (work around)
- Expert level: Cure performance problem
  - At system, network, storage, or application level
  - Unlock, kill, reset, offload, add resources...
- Advanced: Change WLM policy or LPAR weights

Only IBM monitoring and automation seamlessly work across enterprise supporting cloud, mobile and big data

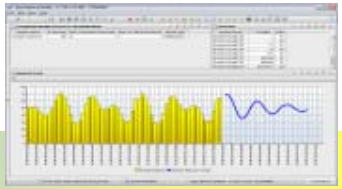
IBM end-to-end visibility, control and automation, including high availability



Benefits:

Ensure resiliency and availability of critical business workloads with recovery time objective of less than one minute

Decreased costs and increased flexibility with higher degree of automation through integration



Automation

Adaptive

Pro-active

Re-active

Self-learning
Correlation
History

Health based

Goal based
Policy based
Thresholds

Integrated Actions

Adaptive (tuning)
Capacity on demand
Move
Correct
Release
Escalation
Common GUI
Recovery
Restart

Forecasting
Anomaly Detection
Topology Correlation

Correlation Dynamic Thresholds
History
KPIs
Trace
Reaction Exceptions
Thresholds

Predictive

Adaptive

Advanced

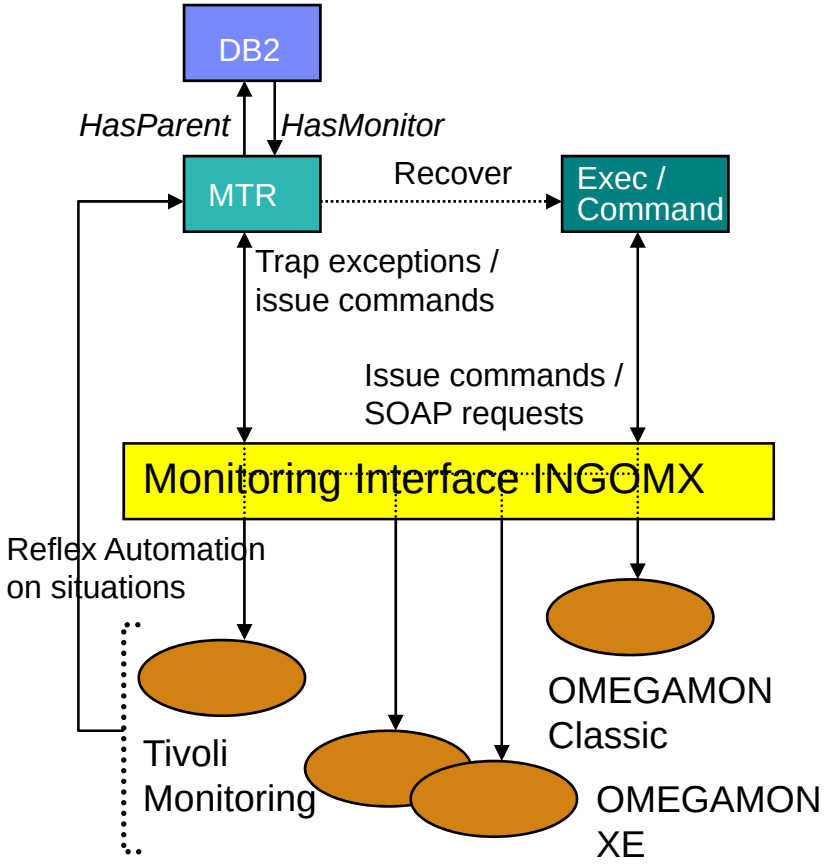
Active

Passive

Monitoring

System Automation integrated with OMEGAMON for bidirectional support with increased overall value

UNKNOWN NORMAL WARNING MINOR CRITICAL FATAL



Uses performance and availability information

- Sources: z/OS, DB2, CICS, IMS, network, WebSphere MQ, storage monitoring

Provides APIs to

- Monitor OMEGAMON classic exceptions
- Monitor/manage situation status on Tivoli Enterprise Portal
- Get detailed performance data using 2-way SOAP interface to Tivoli Monitoring

Provides Monitor Resources with health state

- Obtained either periodically or based on an event
- NORMAL, WARNING, MINOR, CRITICAL, FATAL
- Propagated and aggregated
- Triggers actions, specified in the policy, to react and resolve exceptional conditions

Any metric captured by OMEGAMON may be analyzed via automation

Customer Case Study: OMEGAMON and System Automation track IMS subsystem response time

IT Commitment

- Ensuring IMS meets committed response time SLA target

Technical solution:

OMEGAMON XE for IMS

- IMS transaction queuing causing a response time problem detected and information sent to System Automation for z/OS.

System Automation for z/OS

- Starts another IMS Message Processing Region reducing queuing and therefore response time.
- Informs operations via Tivoli Enterprise Portal and TBSM
- If problem persists, alert IMS transaction owner and stakeholders

Steps needed for customers to gain value of integrated OMEGAMON and System Automation starting today

- Implement OMEGAMON automation using plug‘n play automation module

- Use SA z/OS Monitoring Agent to enhance Tivoli Enterprise Portal (TEP)
  - Display only, extendable by take actions for start, stop, etc.
  - Topology view can visualize complex configurations
  - Objects and attributes available e.g. for situations

- Exploit pro-active automation
  - Monitor resources include monitor commands, thresholds and actions
  - Health status aggregated into compound status and propagated
  - Exploit 2-way interface to monitoring
    - Situations update SA z/OS monitor resources
    - Retrieve any performance data from monitoring

Integrate monitoring and automation to create pro-active automation to find and resolve problems faster

Step 1: Exception display and simple actions

- Health message filtering
- Health message automation
- Monitor issues WTO to action automation
- OMEGAMON classic exceptions and automation
- OMEGAMON situations surfacing on Tivoli Enterprise Portal
- Execute take action for particular situations
- Escalate problems as needed

Step 2: Extend integration of monitoring and automation

- Manual correlation of problems across applications
- Exploit single user interface to enable seamless operations
- Escalation with extended information

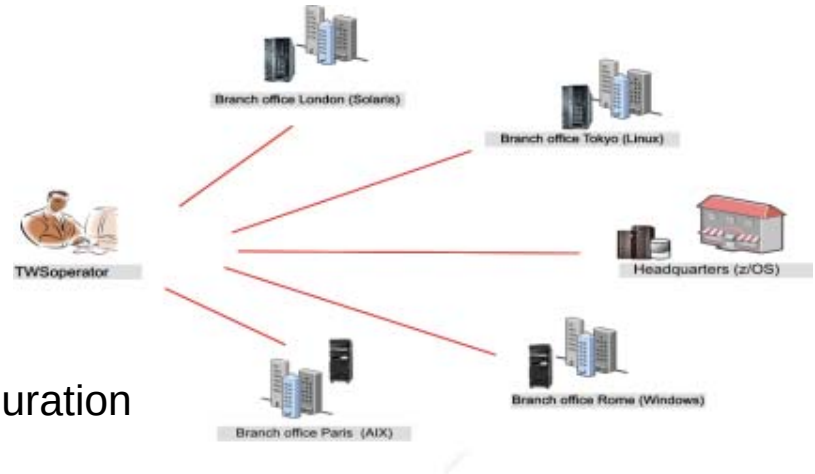
Step 3: Pro-active automation

- Correlate problems across applications
- Resolve problems or workaround
- Adaption of thresholds
- Switching on traces as needed avoids overhead

System Automation and Workload Scheduler together create reduced risk and costs

Tivoli Workload Scheduler and System Automation cooperate and communicate to provide integrated approach to all automation

– TWS does workload scheduling
  - Complex schedules
    - Holidays
    - First/last day stuff

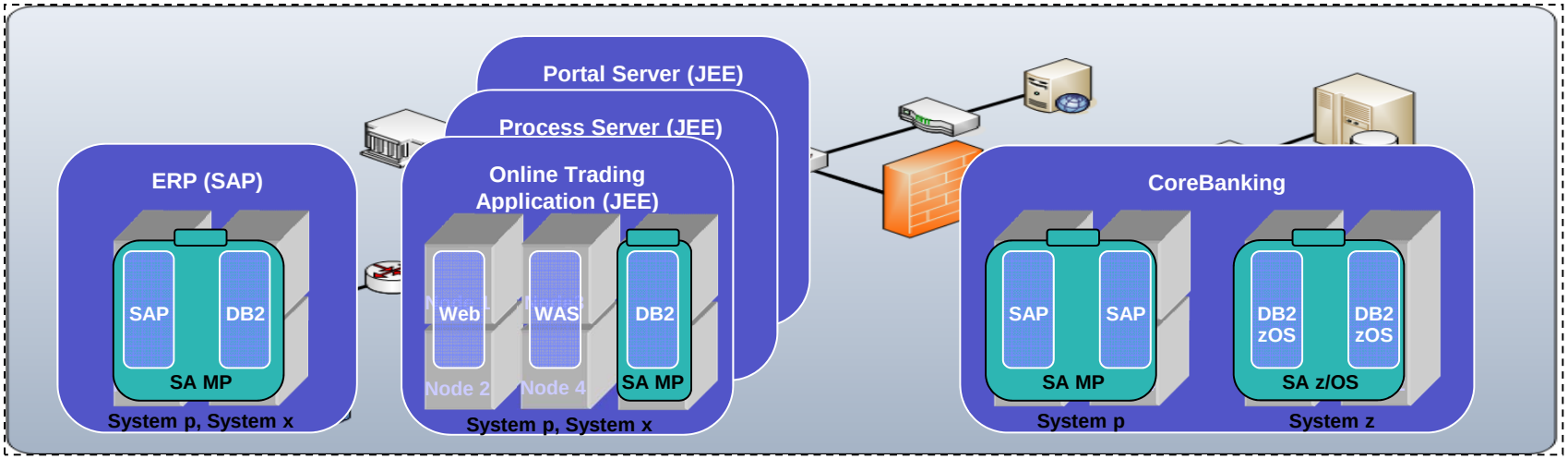


– SA z/OS does application starting and stopping
  - Predefined start/stop command sequences
  - Takes care of dependencies, goals, and configuration
  - Thresholding
  - Automated recovery

Together they provide single automation solution with higher automation degree

Why integrate scheduling with System Automation?

- Complex, heterogeneous environments, often clustered
- Scheduler unable to start/stop complex applications as required by production plan, leading to:
  - Low automation degree which leads to
  - Manual intervention and
  - Higher error rate



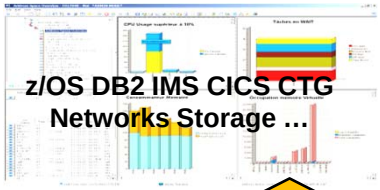
Workload Scheduler interfaces with System Automation to manage enterprise events and activities

- TWS provides multiple interfaces to send requests to System Automation (SA)
  - Request Interface
  - Batch Interface
    - Automation can be integrated into the batch flow
  - Command Interface

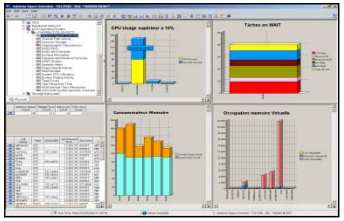
- SA provides feedback for TWS via status information
  - SA maintains TWS special resources with SA status info
    - If the SA resource is in an available state
    - If the resource is in an unavailable state
  - The TWS administrator can construct dependencies on them

Integrating SA z/OS, TWS and OMEGAMON

OMEGAMON



9. Error management



TEP

8. Exception(s) on the portal

13. View results

11. User query

10. CICS region Information

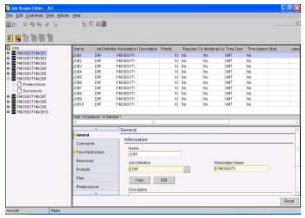
12 information

7. Release ABEND JOB

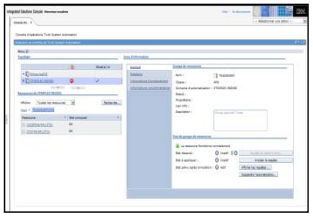
6. SA z/OS to TWS : CICS started successfully

5. Application START

4. TWS to SA z/OS : CICS START Request



TWS



SA z/OS

3. SA z/OS to TWS: CICS stopped successfully

2. Application STOP

1. TWS to SA z/OS : CICS STOP Request

Business success directly dependent on health of underlying IT systems, applications, and networks

- zEnterprise provides key capabilities to support Mobile, Big Data and Cloud for increased business flexibility
- IBM's integrated visibility, control and automation provides reduced cost and risk for end-to-end applications
- IBM System Automation for z/OS and OMEGAMON core to supporting increased availability and performance

Learn more about the individual capabilities of IBM's System Automation Solution

Mainframe Service Management	http://www-01.ibm.com/software/os/systemz/itsm/
Workload and System Automation	http://www-01.ibm.com/software/tivoli/solutions/system-workload-automation/
Tivoli Workload Scheduler	http://www-01.ibm.com/software/tivoli/products/scheduler/
IBM Tivoli Monitoring	http://www-01.ibm.com/software/tivoli/products/monitor/
OMEGAMON XE Family	http://www-01.ibm.com/software/tivoli/products/omegamonxeproductline/
Tivoli System Automation for z/OS	http://www-01.ibm.com/software/tivoli/products/system-automation-zos/
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