Automated Shutdowns using
… either SA for z/OS
… or GDPS

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Agenda

• Easy Setup of SA/GDPS environment
• What are the problems in planned system shutdown?
  • Shutting down GDPS systems via GDPS
    Only 'STOPAPPL' is terminated
    several important address spaces (e.g. OMVS) are 'crashed'
  • Shutting down GDPS systems via SA z/OS
    INQREQ ALL stops whole system, but planned shutdown is treated as a 'disaster' by GDPS

• What is the solution?
• How does it work?
Easy setup of SA/GDPS environment

- Define TOWER statement in CNMSTYLE
  - TOWER.SA=GDPS
  - TOWER.SA.GDPS=PPRC KSYS (for GDPS/PPRC and controlling system)
  - TOWER.SA.GDPS=PPRC PROD (for GDPS/PPRC and productions systems)
  - for more see sample INGSTGEN delivered with SA z/OS

- Sample environment provided via add-on PDB *GDPS
Easy setup of SA/GDPS environment

- Sample GEOPLEX DOMAIN and GEOPLEX OPTION provided via add-on PDB *GDPS
- Provide YOUR installation specific GDPS scripts via SA z/OS customization dialog
- Anything else needed? => NO!
  - automatic invocation of GDPS initialization exit VPCEINIT
  - automatic load of the AT(s) required by GDPS (depended on the specified product)
  - automatic creation of the required SA autooperators (if ADDAUTOOPER=YES)
  - System automation initialization members provided for production sysplex and multiple controlling systems (&SYSCLONE used as XCF group ID)
  - correct initialization members selected due to TOWER statement
Problem - Shutting down GDPS Systems

• What does not work?
  • Shutdown can not be triggered from outside GDPS (=> Disaster)
  • OMVS can not be terminated cleanly
  • Pre-emptive move does not work
  • No complete system shutdown upto Z EOD command
Solution – System Shutdown phases triggered by SA z/OS

- System Shutdown process restructured
  - INGREQ command invokes new Termination Routine INGRTERM
  - INGRTERM injects stop command for the 'STOPAPPL' resource
  - Allows installation to issue additional commands as defined in policy
    - Phase0 – stop commands for jobs before STOPAPPL is stopped
    - Phase1 – stop commands for OMVS, RACF, etc.
    - Phase2 – final termination commands, such as z EOD, etc.
  - Waits till OMVS has been shutdown
Solution – System Shutdown phases triggered by GDPS

K-System

SA z/OS

Automation Manager

1. INGREQ ... REQ=STOP

2. Event Observer

3. INGRGDDS

4. VPCEFLIP

5. Vary XCF, OFF

Shutdown xyz

Reply GEO043A
# Solution – System Shutdown Phases Definitions

<table>
<thead>
<tr>
<th>SYSTEM_SHUTDOWN</th>
<th>Pass/Selection</th>
<th>Task/*</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHASE0</td>
<td></td>
<td></td>
<td><strong>INGREQ IMS/APG REQ=STOP OUTMODE=LINE</strong></td>
</tr>
<tr>
<td>PHASE1</td>
<td></td>
<td></td>
<td><strong>MVS F OMVS,SHUTDOWN</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>INGREQ LOOKASIDE/APG/&amp;SYSNAME. REQ=STOP OUTMODE=LINE</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>INGRCHCK RACF/APL/&amp;SYSNAME. OBSERVED=(SOFTDOWN HARDDOWN)</strong></td>
</tr>
<tr>
<td>PHASE2</td>
<td></td>
<td></td>
<td><strong>MVS Z EOD</strong></td>
</tr>
</tbody>
</table>

**Message ID for MVS component**

- **commands executed before STOPAPPL is terminated**
- **commands executed after STOPAPPL has terminated**
- **commands executed after takeover file is disabled**
- **Wait until the resource reaches the wanted status**
Solution – System Shutdown Phases Sequence

The System Shutdown phases:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Processing of all commands defined in PHASE0 of SYSTEM_SHUTDOWN</td>
</tr>
<tr>
<td>1</td>
<td>Shutting down of 'STOPAPPL' application and its children</td>
</tr>
<tr>
<td>2</td>
<td>Processing of all commands defined in PHASE1 of SYSTEM_SHUTDOWN</td>
</tr>
</tbody>
</table>
| 3     | Moving of PAM to another system if possible  
|       | Disabling of takeover file |
| 4     | Termination of OMVS and all automation managers running locally |
| 5     | Processing of all commands defined in PHASE2 of SYSTEM_SHUTDOWN |
| 6     | Final shutdown processing  
|       | - Inform GDPS about nearly termination of system |
How does it work?

Environment: SAMA – controlling system
SAMB – production system
How does it work?

Special Message ID SYSTEM_SHUTDOWN with PHASE1 and PHASE2 commands defined in MVS Components

- **PHASE1-** shutdown everything not handled via STOPAPPL

- **PHASE2-** final cleanup to be done before V XCF, OFF
How does it work?

INGLIST on SAMB – production system

<table>
<thead>
<tr>
<th>CMD Name</th>
<th>Type</th>
<th>System</th>
<th>Compound</th>
<th>Desired</th>
<th>Observed</th>
<th>Nature</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM</td>
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<td>AVAILABLE</td>
<td>SERVER</td>
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<td>AVAILABLE</td>
<td></td>
</tr>
<tr>
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<td>SAMB</td>
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<td>SAMB</td>
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<td>BASE_SUPP</td>
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<td>AVAILABLE</td>
<td>BASIC</td>
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<td>BASE_SYS</td>
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<td>AVAILABLE</td>
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<td>BASE_USP</td>
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<td>SAMB</td>
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<tr>
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<td>SAMB</td>
<td>SATISFACTORY</td>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
<td></td>
</tr>
<tr>
<td>E2E_ADPT</td>
<td>APL</td>
<td>SAMB</td>
<td>SATISFACTORY</td>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
<td>MOVED</td>
</tr>
<tr>
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<td>APL</td>
<td>SAMB</td>
<td>SATISFACTORY</td>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
<td></td>
</tr>
<tr>
<td>FFST</td>
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<td>SAMB</td>
<td>SATISFACTORY</td>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
<td></td>
</tr>
<tr>
<td>GDPS_HM</td>
<td>APL</td>
<td>SAMB</td>
<td>SATISFACTORY</td>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
<td></td>
</tr>
<tr>
<td>GEOXCST</td>
<td>APL</td>
<td>SAMB</td>
<td>SATISFACTORY</td>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
<td></td>
</tr>
<tr>
<td>GEOXHSWP</td>
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<td>SAMB</td>
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<td>GEOYHSWP</td>
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<td>SAMB</td>
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<td></td>
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<tr>
<td>IRRDPTAB</td>
<td>APL</td>
<td>SAMB</td>
<td>SATISFACTORY</td>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
<td></td>
</tr>
<tr>
<td>JES2</td>
<td>APL</td>
<td>SAMB</td>
<td>SATISFACTORY</td>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
<td></td>
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<tr>
<td>JES2MON</td>
<td>MTR</td>
<td>SAMB</td>
<td>SATISFACTORY</td>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
<td></td>
</tr>
</tbody>
</table>

Command ==> INGREQ ALL
How does it work?

INGREQ ALL on SAMB – production system

<table>
<thead>
<tr>
<th>Resource</th>
<th>SAMB/SYG/SAMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>SAMB</td>
</tr>
<tr>
<td>Request</td>
<td>STOP</td>
</tr>
<tr>
<td>Type</td>
<td>NORM</td>
</tr>
<tr>
<td>Scope</td>
<td>ALL</td>
</tr>
<tr>
<td>Priority</td>
<td>LOW</td>
</tr>
<tr>
<td>Expire</td>
<td></td>
</tr>
<tr>
<td>AutoRemove</td>
<td></td>
</tr>
<tr>
<td>Restart</td>
<td>NO</td>
</tr>
<tr>
<td>Override</td>
<td>NO</td>
</tr>
<tr>
<td>Verify</td>
<td>YES</td>
</tr>
<tr>
<td>Comment</td>
<td></td>
</tr>
<tr>
<td>ApplParms</td>
<td></td>
</tr>
</tbody>
</table>

A0F710A VERIFY/REVISE INPUT AND THEN PRESS ENTER

Command ==> PF1=Help PF2=End PF3=Return PF11=Next PF6=Roll PF12=Retrieve
How does it work?

INGREQ ALL on SAMB – after PF10 - GO
How does it work?

HMC on SAMB – production system – d a,l
How does it work?

HMC on SAMB – nearly all things down - except AM and NetView
How does it work?

HMC on SAMB – PHASE1 commands done, OMVS down, AM down
How does it work?

HMC on SAMB – PHASE2 to run – system varied offline
How does it work?

GDPS status after INGREQ ALL of SAMB

<table>
<thead>
<tr>
<th>Sysname</th>
<th>CA</th>
<th>Status</th>
<th>IPLtype</th>
<th>LPAR</th>
<th>IPLmode</th>
<th>Auto</th>
<th>L-addr</th>
<th>Loadparm</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITE1</td>
<td></td>
<td>SITE 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAMB</td>
<td>A</td>
<td>STOPPED</td>
<td>NORMAL</td>
<td>SAMB</td>
<td>NORMAL</td>
<td>YN</td>
<td>5010</td>
<td>410000M1</td>
</tr>
<tr>
<td>SITE2</td>
<td></td>
<td>SITE 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAMA</td>
<td>CA</td>
<td>MASTER</td>
<td>NORMAL</td>
<td>SAMA</td>
<td>NORMAL</td>
<td>YN</td>
<td>5010</td>
<td>410000M1</td>
</tr>
<tr>
<td>CF01</td>
<td></td>
<td>MANUAL</td>
<td>NORMAL</td>
<td>SAMACFE</td>
<td>NORMAL</td>
<td>NN</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

normal stop of SAMB indicated
Thank you very much for your attention

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## Monday
- **11:00** 11207: Automating your IMSplex with System Automation for z/OS  
  Platinum 7
- **1:30** 11832: What’s New with Tivoli System Automation for z/OS  
  Elite 1
- **3:00** 11886: Improve Service Levels with Enhanced Data Analysis  
  Elite 1

## Tuesday
- **9:30** 11792: What’s New with System z Monitoring with OMEGAMON  
  Elite 1
- **11:00** 11791: Tuning Tips To Lower Costs with OMEGAMON Monitoring  
  Platinum 8
- **1:30** 11900: Understanding Impact of Network on z/OS Performance  
  Grand Salon A

## Wednesday
- **9:30** 11835: Automated Shutdowns using either SA for z/OS or GDPS  
  Elite 1
- **1:30** 11479: Predictive Analytics and IT Service Management  
  Grand Salon E/F
- **1:30** 11899: Top 10 Tips for Network Perf. Monitoring w/ OMEGAMON  
  Platinum 9
- **4:30** 11836: Save z/OS Software License Costs with TADz  
  Elite 1

## Thursday
- **9:30** 11905: Using NetView for z/OS for Enterprise-Wide Mgmt and Auto  
  Grand Salon A
- **11:00** 11909: Get up and running with NetView IP Management  
  Grand Salon A
- **11:00** 11887: Learn How To Implement Cloud on System z  
  Grand Salon E/F

## Friday
- **9:30** 11630: Getting Started with URM APIs for Monitoring & Discovery  
  Elite 1

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