System Automation z/OS V3.3
The Latest and Greatest

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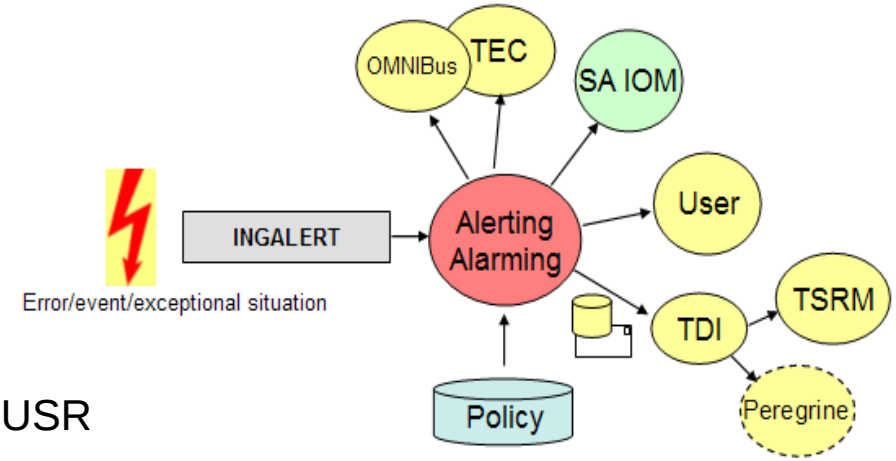
Release Themes...

- Integration with other Tivoli Products building Service Center
  - Integration with OmniBus & TSRM
- Consumability Improvements
  - Improved handshaking with GDPS when shutting down system
  - Automatic Generation of Message Revision Table
  - Rolling Recycle
  - New Relationships
- Product Automation
  - Standard (base) functions used to automate CICS regions
  - Modernized DB2 Connection Monitoring
  - DB2 Light Start supported via MOVE Group
  - IMSPLEX Support
- Focus on Customer Needs / Requirements
  - Message Capturing
  - INGEXEC Command
  - CDEMATCH Enhancements

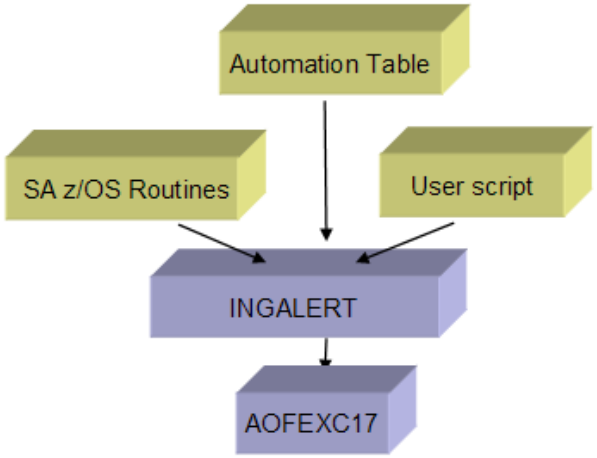
Pre-Reqs
- z/OS 1.9
- NetView 5.2

Service Center Integration

Alerting Infrastructure



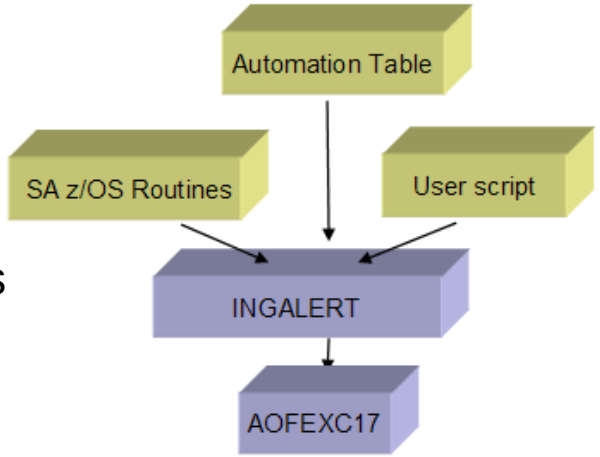
- Predefined set of alert points
- INGALERT command for
  user messages
- Multiple Recipients supported
  - Controlled via InformList ➔ IOM, EIF, TTT, USR
- Customization per Resource and/or Alert point
- Single class ING_EVENT
  - No format specification or BAROC file changes



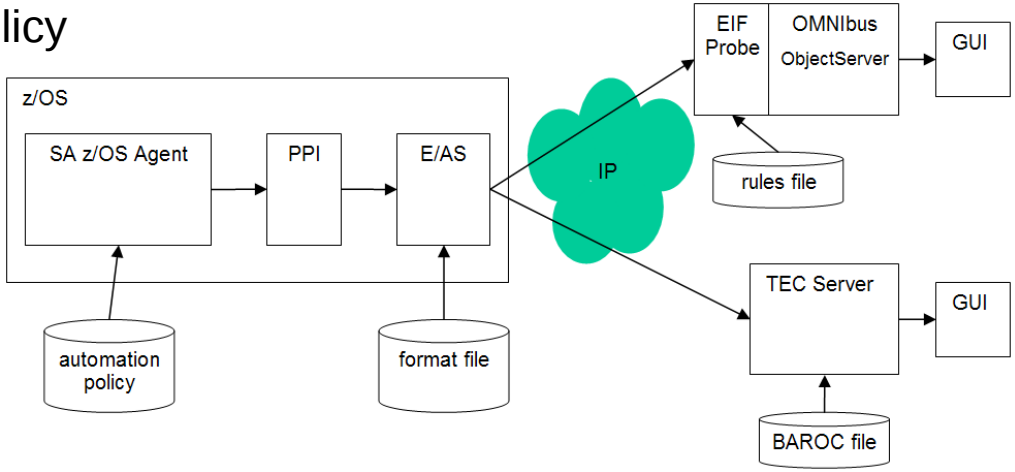
- Installation Exit AOFEXC17 used to
  - Modify alert text
  - Suppress alert
  - Add user data to alert structure
    - User fields: USER1 – USER9

Sending Events to TEC/OMNIBus

- Based on the Alerting support Infrastructure
  - Same set of pre-defined alert-points
- User defined Events via INGALERT command
  - Events can be issued for APLs, MVC, MTRs, APGs
    - „sysplex“ events only processed by one agent



- Support for clearing events for given resource
- Clear single event or all events
  - Automatic clearing of events for APLs + MTRs
  - Highly customizable via policy
- Support for User Fields

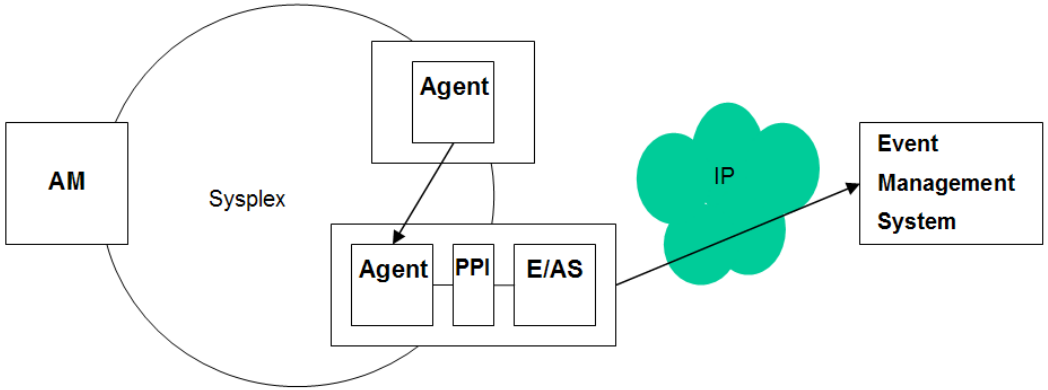


Sending Events to TEC/OMNIBus... (2)

- Only 1 agent needs to run an Event/Automation Service
  - Message automatically forwarded to agent running E/AS
  - At least one agent needs connectivity to target destination (TEC/OMNIBus)
- Generic format for all events
  - No separate Automation Table
  - Eliminates need to maintain baroc file

```
ING_Event
source
SAZOS
origin
sub_origin
msg
severity
adapter_host
date
hostname
ing_event_key
ing_event_type
ing_event_node
ing_event_date
ing_event_time
ing_event_resource
ing_event_jobname
```

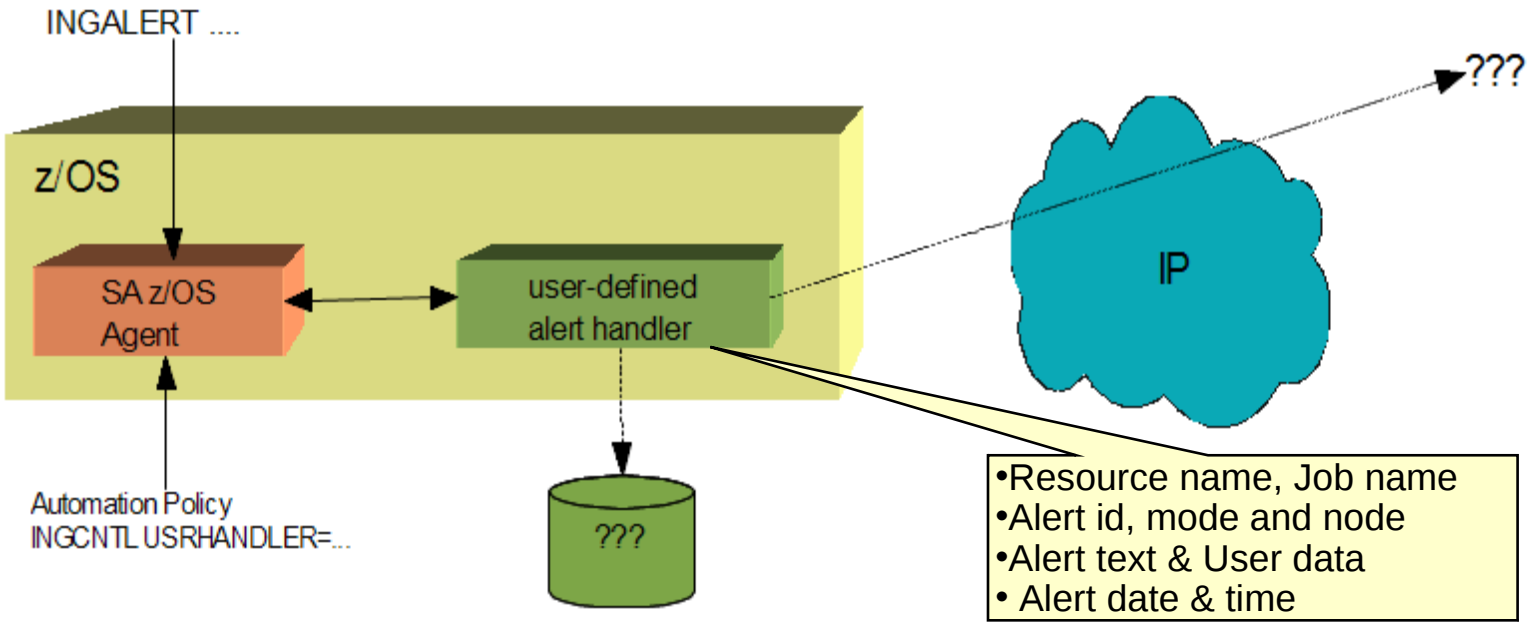
Support of User fields



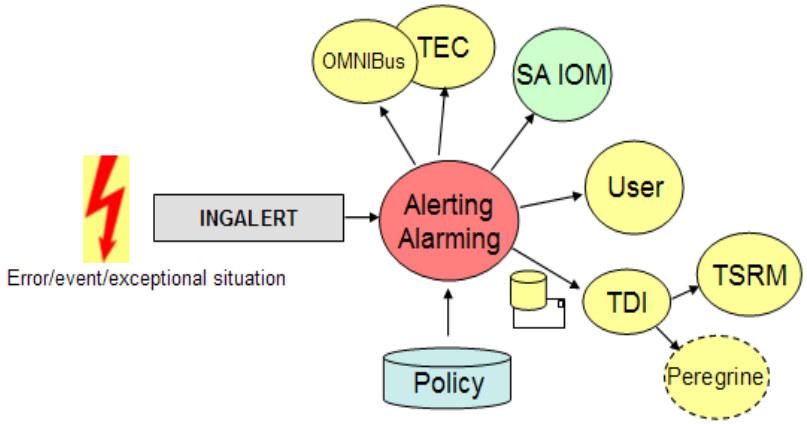
- Support for clearing events for given resource
  - Clear single event or all events
  - Automatic clearing of events for APLs + MTRs

Sending Events to User Destination

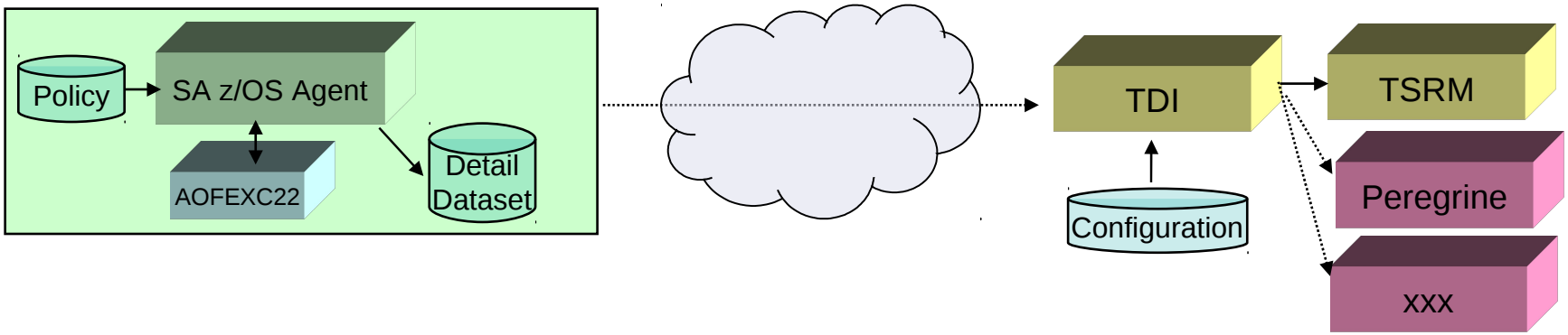
- Triggered via notification target USR in InformList
- Same Alerting infrastructure
  - Predefined alert points
- Up to the Installation what to do with the event
  - Sample exit AOFEXALT provided by SA z/OS



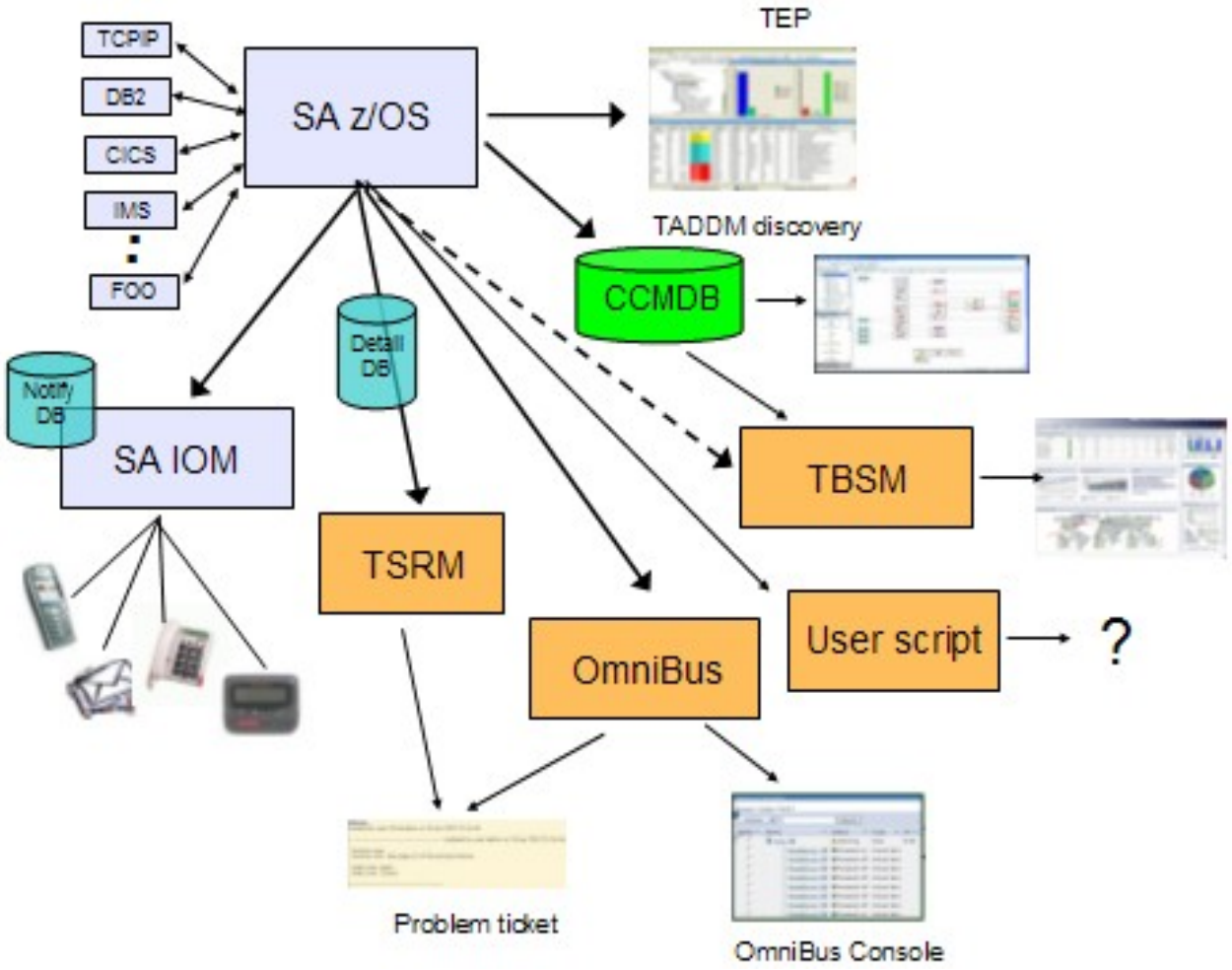
Opening a Trouble Ticket...



- Based on the Alerting Infrastructure
- Enabled/Disabled via INGCNTL cmd
- Resource dependent context data automatically gathered at point of error
  - Similar to INGLKUP REQ=COLLECT
  - Data stored in Detail Dataset (automatically allocated)
  - Exit AOFEXC22 used to collect user specific data



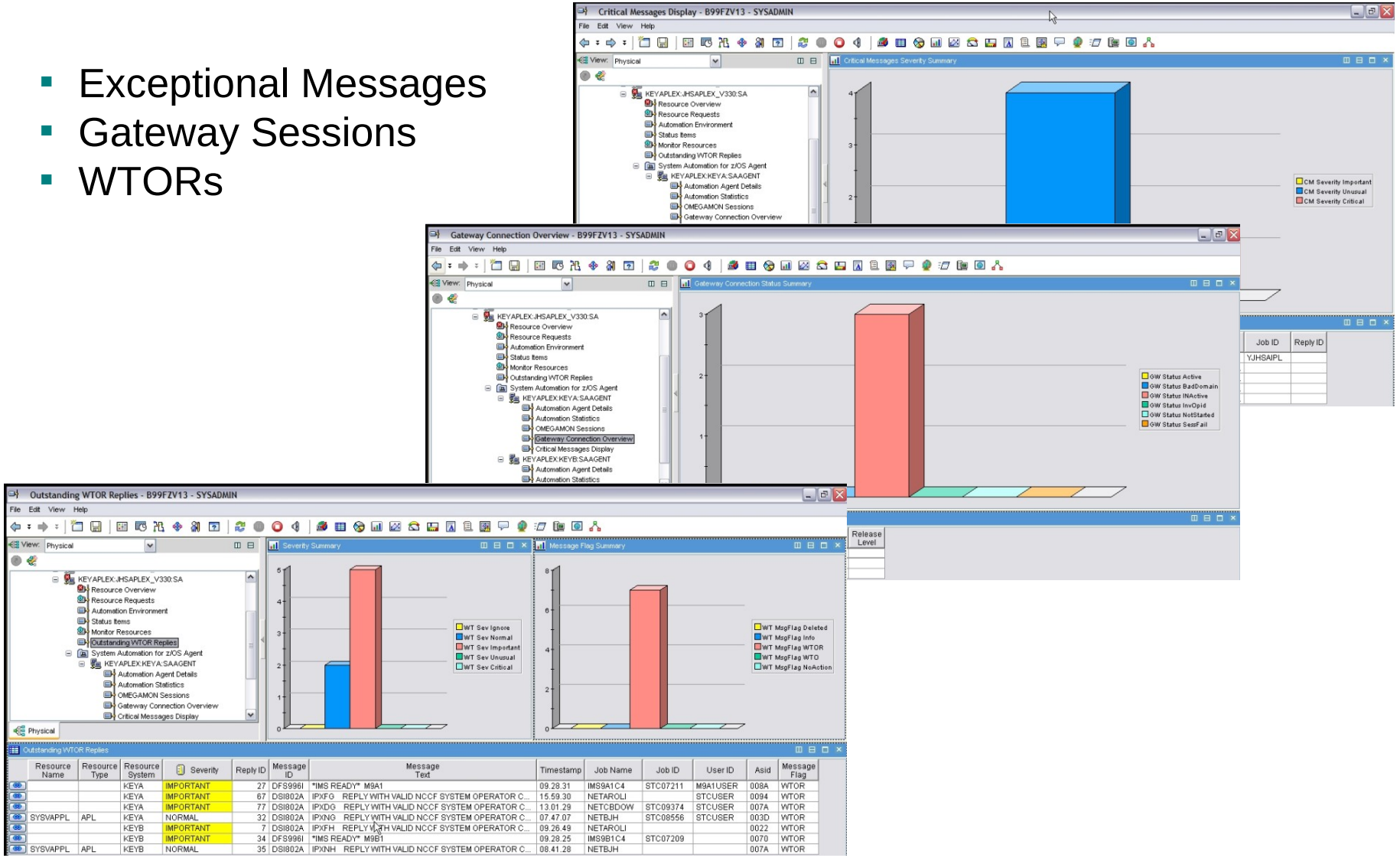
Scenario: Service Management Center



- Alerting of subject matter experts
- Trouble Tickets
- Notifying event console operator
- Impact Analysis

New TEP Workspaces...

- Exceptional Messages
- Gateway Sessions
- WTORs

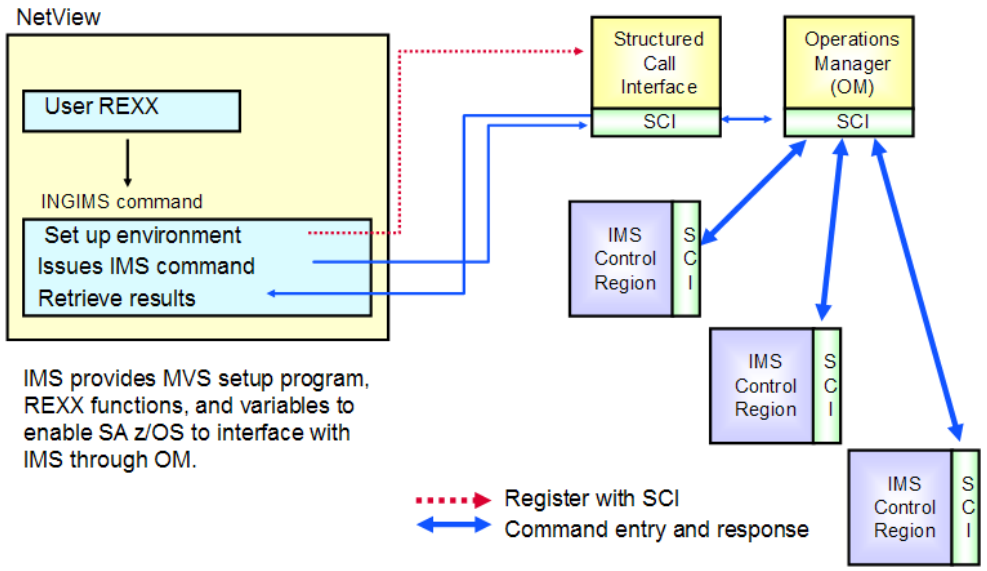


IMSPlex Support

- INGIMS command enhanced to provide an API for IMS commands
  - Type 1 IMS commands (/cmd ...)
    - Type-1 command output is in message format, encapsulated within XML tags
      - SA z/OS does not format Type-1 command output
  - Type 2 IMSplex commands (QRY, INIT, TERM, DEL, UPD, CRE)
    - Command Response returned in XML format
    - Automatically translated to display format

Advantage
Commands can be entered to one or more IMS systems in an IMSplex

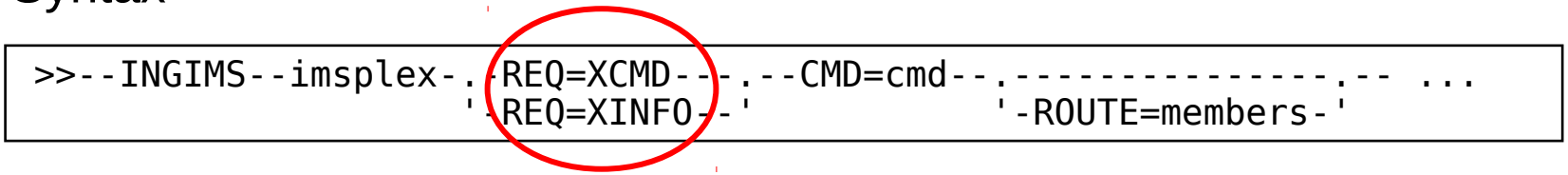
- Routes commands to IMSplex members registered for the command
- Consolidates command responses from individual IMSplex members into a single response to present to the command originator



INGIMS Command Enhancements

- Allows type-1 and type-2 commands to be send to IMSplex
- Allows sending of commands to one/multiple/all members in IMSplex
- INGIMS as API
  - One consolidated response
  - Easy to process in PIPE
  - Same format for type-1 and type-2 commands
- INGIMS fullscreen panel
  - One consolidated response
  - As table
  - Displayed in NetView WINDOW
- Syntax

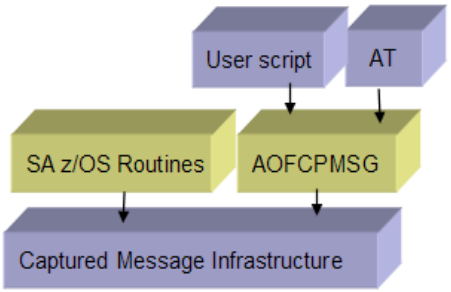
Requires CSL address spaces in place (SCI, OM, RM)



- New way must be excplicity specified via XCMD or XINFO
  - No fallback to „old“ way in case of errors

Message Capturing

Message Capturing Function

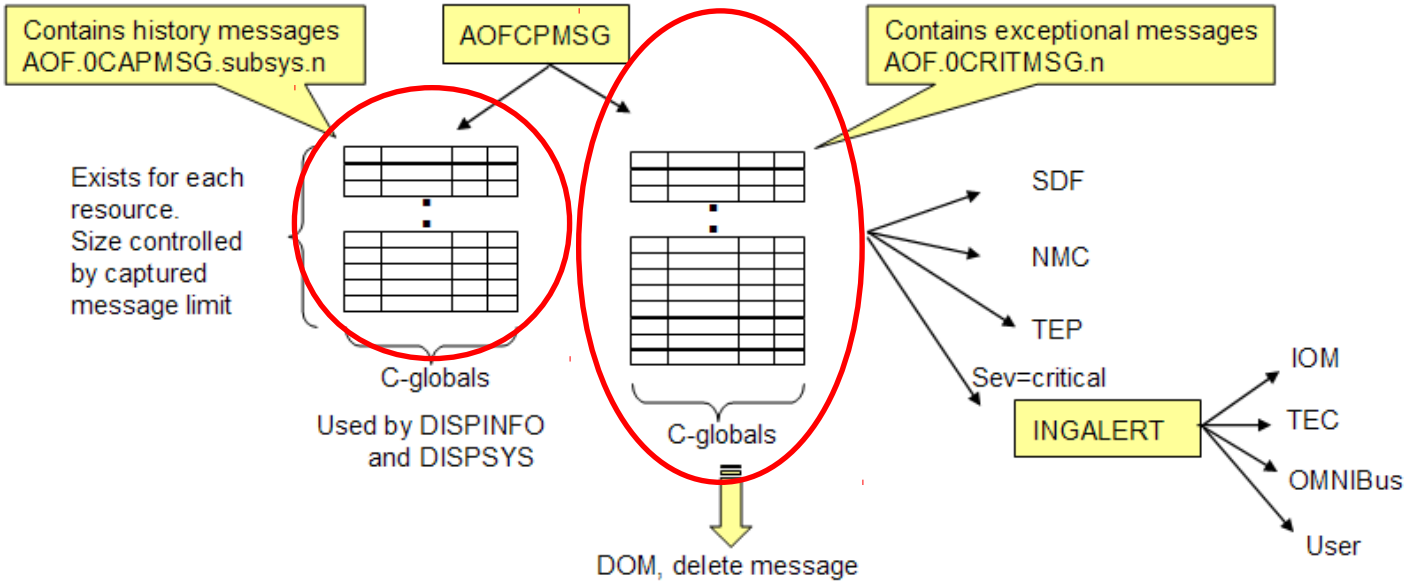


- Enables installation to trap „important“ messages and to make them visible in the message history of the associated resource
  - Optionally forwarded to SDF and NMC
  - But several shortcuts done to update SDF/NMC directly
- Restructured to be central „portal“ for any kind of message forwarding to final destination
  - Maintains central place for all exceptional messages
  - Message automatically removed from the exception table when the condition is no longer true
    - Message deleted by operator
    - Message deleted by SA user
    - By SA recovery/automation routine (eg CHKTHRES)
  - Forwarded to SDF, NMC, TEP, SA IOM, TEC/OMNIBus
    - Controlled by INFORM attribute of resource
- New INGMSGS command to display all „exceptional“ messages
  - Excpetional message have severity UNUSUAL, IMPORTANT, CRITICAL

Message Capturing Function... (2)

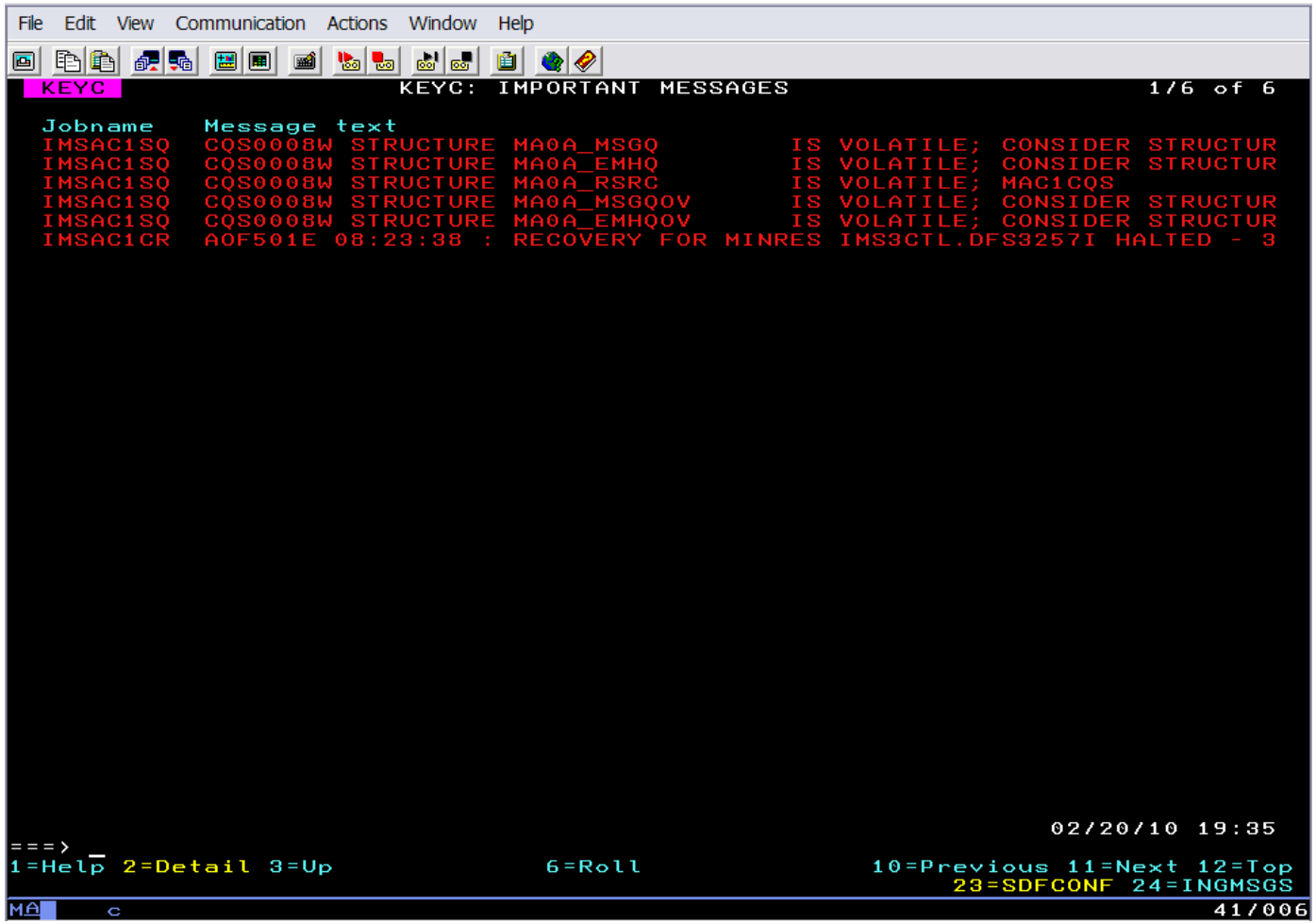
- Message History Table
  - Exists for each resource (APL, APG, MTR) and MVSESA
    - Contains all messages associated with resource
- Exceptional message table
  - contains messages with severity: Unusal, Important and Critical
  - Holds up to 1020 messages; maximum is installation defined
  - Is the source for sending message to target destinations: SDF, NMC, TEP

new



Captured Messages in SDF...

- Supports multiple instances of the same message id
- Mesages are unique by message arrival timestamp (STCK)



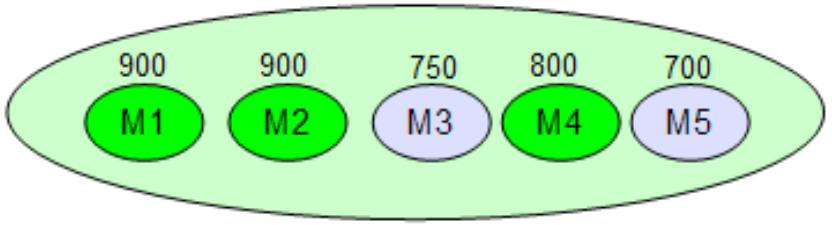
New Automation Functions

Rolling Recycle

- Stops and Restarts members of server groups minimizing impact of application availability
  - Single action to initiate the rolling recycle via INGGROUP command
  - Provision to abort the rolling recycle
  - Rolling recycle continues across an Automation Manager fail over

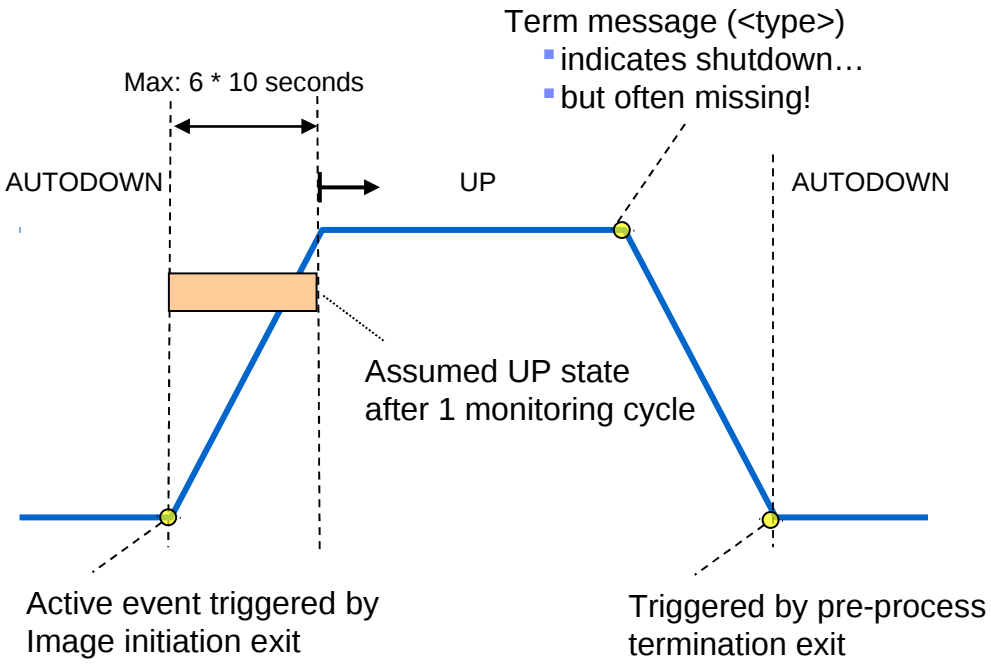
```
>>--INGGROUP-- group_name -- ACTION={RECYCLE|CANCEL} ---- ... --->
```

- INGGROUP/INGINFO command shows rolling recycle Status
  - Requested, Cancelled, Complete
- Currently active number of members maintained
  - Active members are recycled one after the other
  - Inactive members are untouched
- Usefull for resources that must be recycled daily for hygiene reasons



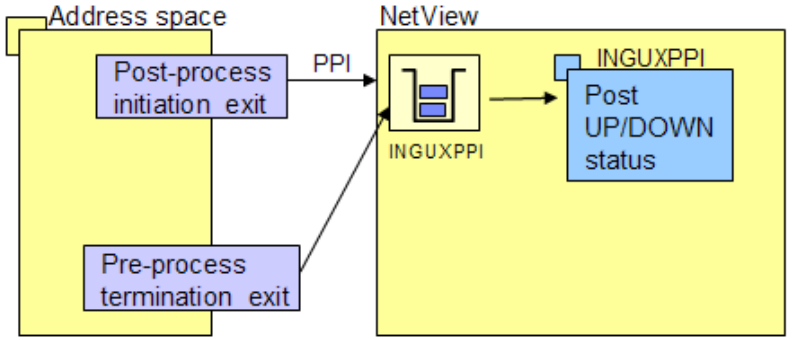
Enhanced Monitoring of USS Resources

Typical UNIX process life cycle:



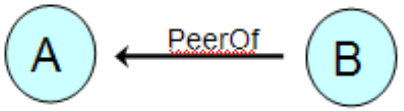
- Addresses the dilema that most processes dont issue messages.
- Enables immediate feedback when Process is started or stopped
- Eliminates the need to wait 2 times the startup monitoring interval

- USS exits introduced
  - Process image initiation exit
  - Pre-process termination exit
- Automatically activated when USS resource is found in Policy

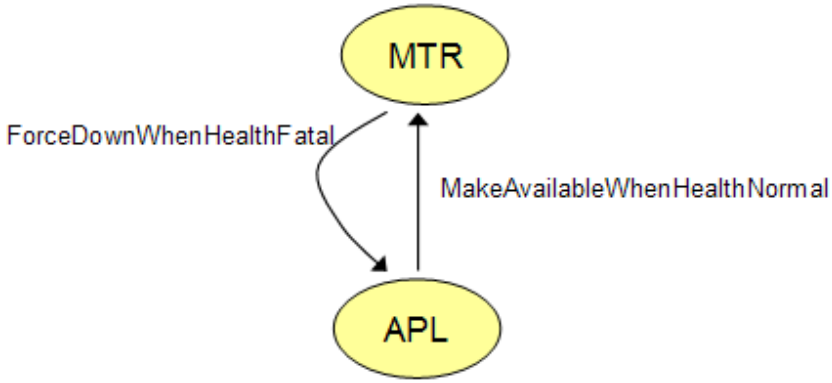


New Relationships...

- New Peerof Relationship
  - Starts/Stops „peers“ in parallel
  - Allows to manage „peers“ as one entity
  - Eliminates need for artificial Basic Group



- New Relationship conditions
  - Conditions:
    - WhenHealthAssumedNormal
    - WhenHealthFatal
    - WhenHealthNeitherNormalNorFatal
    - WhenHealthNormal
    - WhenHealthNotFatal
  - Valid for
    - MakeAvailable, PrepAvailable
    - MakeUnavilable, PrepUnavailable
    - ForceDown



CDEMATCH Command Enhancements

- Support of Comparators
  - @EQ (=), @GT (>) , @GE (>=), @LT (<), @LE (>=), @NE ➔ numeric comparison
  - $EQ (=), $GT (>) , $GE (>=), $LT (<), $LE (>=), $NE ➔ text comparison

FOO	@GT 95		CRITICAL
FOO	@GE 75		WARNING
ABC	$NE XXXX		NORMAL

Watch sequence

Must be numeric

- Enhanced Wildcard support

FOO*			CRITICAL
*FOO			WARNING
F%%O*			NORMAL

Placeholder for 1 character

SDF Enhancements

Making it easier for you in V3.3....

- Dynamic Panel Generation
  - &SDFROOT. Replaced at generation time

```
P(&SDFROOT.SUB,*,80,SYSTEM,&SDFROOT.MAIN, , , )
TF(01,02,07,PINK,REVERSE)
TT( &SYSNAME.)
TF(01,26,49,WHITE,NORMAL)
TT(&SDFROOT.: SUBSYSTEM-STATUS)
BODY(&SDFROOT..SUBSYS,04,*-5,4,5)
CELL(03,13,N,C)
PFK3(UP)
PFK13('EXPLAIN &COMP,TARGET=&SNODE')
  :
PFK24('INGINFO &COMP/APL/&ROOT,TARGET=&SNODE')
IF(*-2,1)
TF(*-1,01,06,T,NORMAL)
TT(1=Help)
TF(*-1,08,15,Y,NORMAL)
  :
TF(*,13,79,Y,NORMAL)
TT(17=SETSTATE 18=INGVOTE 19=INGREQ          23=INGLIST 24=INGINFO)
```

Supports any screen size
- 24/32/43 * 80
- 27 * 132
- 62 * 160

Making it easier for you in V3.3.... (2)

More lines

Position of Input line

More room for PF-keys

```
KEYC                    KEYC: SUBSYSTEM-STATUS                    1/53 of 53


  OMVS                IMS3MP1
  VTAM                IMS3FP
  ZFS                 IRRDPTAB
  TCPIP               IMS1FDBR
  RACF                TEST3
  VLF                 IMS3FDBR
  SNB3IRLM            USSTEST1
  LLA                 SNB2LITE
  SNB3DIST            TEST4
  DLF                 SNB1LITE
  SNB3DBM1            TAILTEST
  RRS                 MQMSTR
  JES2                AM2
  ASCH                VOSTTRAN
  SYSVAPPL            MQCHIN
  TSO                 VOSTPERM
  RESOLVER            TEST5
  APPC                TEST2
  SNB3MSTR
  SYSVSSI
  AM
  WASTEST4
  TEST1
  WASTEST3
  WASTEST1
  WASTEST2
  IMSIRLM
  IMSCQS
  IMSSCI
  IMSOM
  IMSRM
  IMS3DBRC
  IMS3DLS
  IMS3CTL
  IMS2FDBR

                                                        09/29/09 14:28
===>
1=Help  2=Detail  3=Up                  6=Roll          10=Previous 11=Next  12=Top
13=EXPLAIN  17=SETSTATE  18=INGVOTE  19=INGREQ          23=INGLIST 24=INGINFO
MA      a                                                           41/006
```

Generating SDF Panels

- SDF panels automatically genned for local & focal point system
  - Based on setting of AAO -> **AOF_AAO_SDFROOT_LIST**
  - Contains local system name as default
  - Should contain list of systems for focal point

```
GLOBAL VARIABLE NAME:                GLOBAL VARIABLE VALUE:
---------------------                ----------------------
AOF_AAO_SDFROOT_LIST                 KEYA KEYB KEYC KEYD AOCA AOCB AOCC
```

- AOFPNLS contains indicator whether or not the panel(s) should be genned using the system names in the list
  - Variable &SDFROOT. replaced by system name

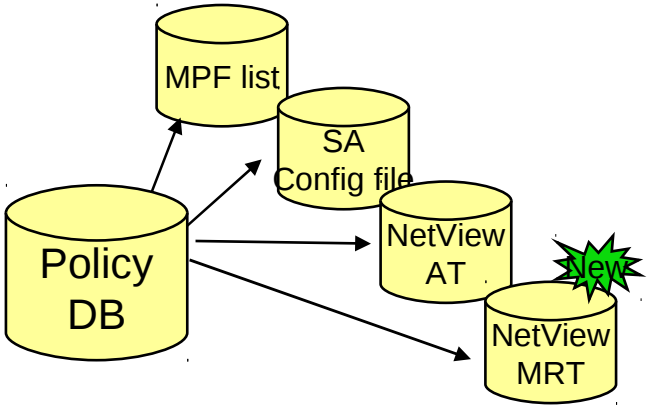
```
AOFPNLS
/*       member          option
%INCLUDE(INGPTOP)      STATIC
%INCLUDE(INGPMAIN)     DYNAMIC
%INCLUDE(INGPAPL)      DYNAMIC
%INCLUDE(INGPAPG)      DYNAMIC
%INCLUDE(INGPMTR)      DYNAMIC
    :
```

```
P(&SDFROOT.APG,*,80,SYSTEM,&SDFROOT.MAIN)
TF(01,02,07,PINK,REVERSE)
TT( &SYSNAME.)
TF(01,26,49,WHITE,NORMAL)
TT(&SDFROOT.: APPLGROUP-STATUS)
SF(KEY1.GROUPS,04,44,54,N,,,Q1)
SF(KEY1.GROUPS,05,44,54,N,,,Q2)
SF(KEY1.GROUPS,06,44,54,N,,,Q3)
```

Customization Dialog

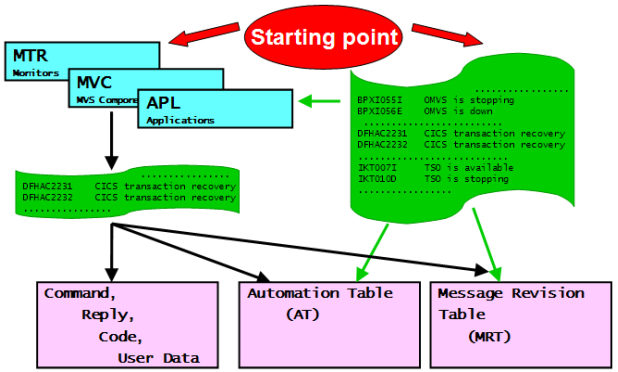
Generation of Message Revision Table (MRT)

- Automatic Generation of Message Revision Table based on data stored on the Policy DB.
  - Highlighting of message (coloring)
  - Modifying of message text
    - Capitalization
  - Delete message
  - Suppress message



- No specific MRT syntax skill required
- Common build keeps all configuration files in sync
  - MRT loaded together with AT at configuration refresh
- All automation data in one source

New Message Policy

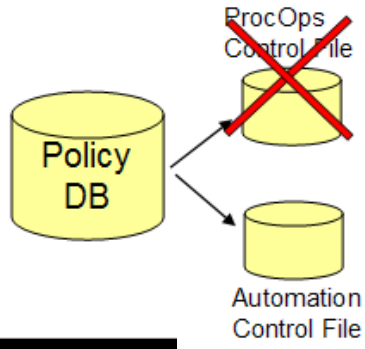


- Central access to all messages in the PDB
- Lists all messages (User + SA predefined)

- Allows specification of AT + MRT data
  - Provides preview of the generated AT & MRT entry
  - Allows you to overwrite predefined data
- Elimination of forced Message entries

```
COMMANDS  HELP
------------------------------------------------------------------------------
                          Message Definitions                  Row 125 of 640
Command ===> _                                                 SCROLL===> PAGE

PolicyDB Name : ACMECORP                Enterprise Name : ACMECORP

Make a selection ( S ) or use shortcuts ( WHU AC AS AO IG ).

Cmd Message id                Description                                MRT AT
____ CQS0205E                 IMS CQS structure full                       O
____ CQS0206I                 IMS CQS structure recovered                  O
____ CSAA000I                 OMIICSA subsystem is active                  A
____ CSAA001I                 OMIICSA subsystem up message                 A
____ CSAA997E                 OMIICSA abending                             A
____ CSAA998I                 OMIICSA terminating                          A
____ CSAA999I                 OMIICSA has ended                            A
____ CSL0020I                 IMS Common Service Layer is up               A
____ CSL0300I                 IMS Common Service Layer is terminating      A
____ CSQX022I                 MQ is available                              A
____ CSQY022I                 MQ is available                              A
____ CSQ3104I                 MQ has ended                                 A
____ CSQ3580E                 MQ is abending                               A
____ CSV210I                  LLA initialized                             CA
____ CSV218E                  LLA is abending                              A
____ CSV222I                  LLA is starting                              A
____ CTG6400I                 CICS TG Gateway initializing                 A
____ CTG6405E                 CICS TG Gateway has abended                  A
```

Processor Operations...



- No separate ProcOps Control File Build
  - All ProcOps specific data contained in ACF fragments
  - Special Build for downlevel ProcOps systems

```
 MENU  HELP
------------------------------------------------------------------------------
                              Build Parameters
Option ===>

  1 Build a complete enterprise
  2 Build sysplex group or stand alone system
      Sysplex / System name. . KEY1                  (*, ?, or name)
  3 Build entry type or entry name
      Entry Type. . . . . . . MTR                    (*, ?, or type)
      Entry Name. . . . . . . *                      (*, ?, or name)
  4 View build report
  9 Build Processor Operations (pre SA V3.3 and ONLINE only)
      ProcOps Control File. . .
```

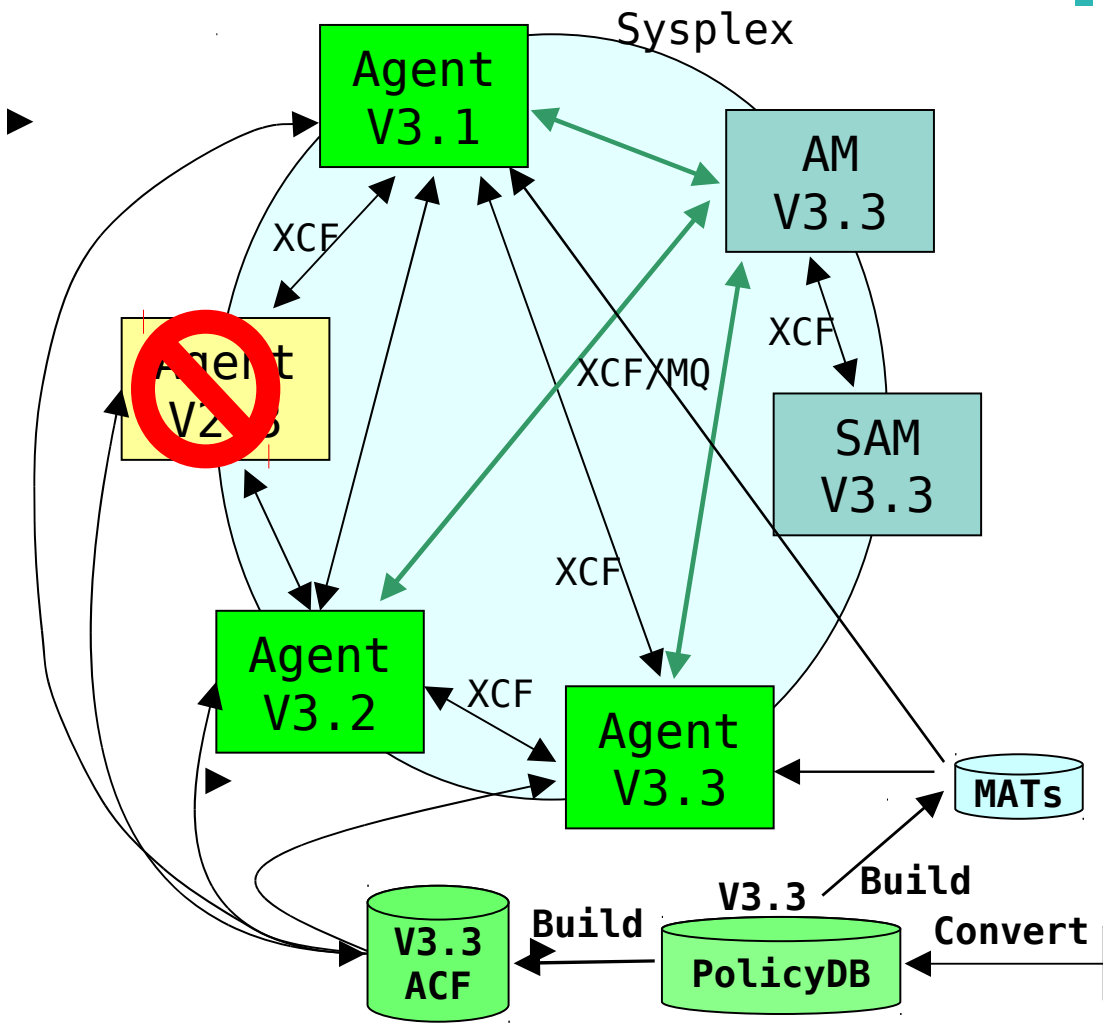
- Multiple Processor Protocols supported, eg INTERNAL + SNMP

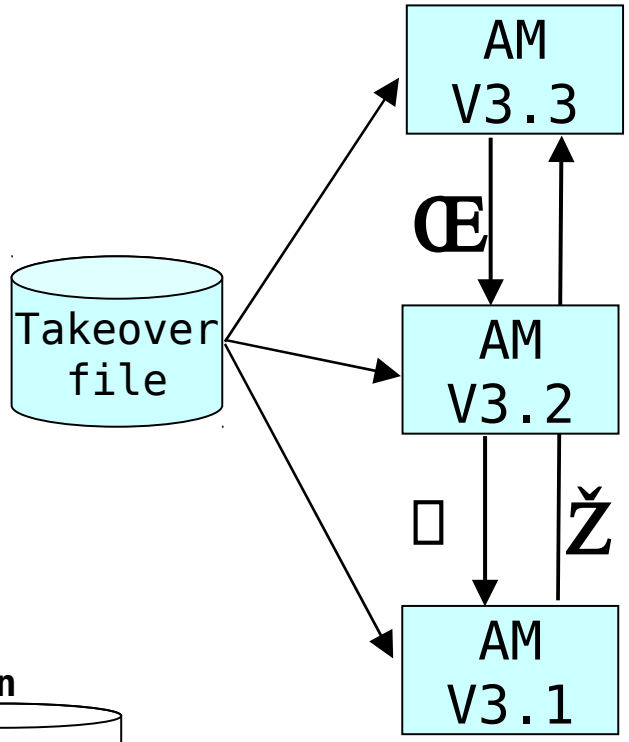
```
 COMMANDS  HELP
------------------------------------------------------------------------------
                           Processor Information
Command ===>

Entry Type      : Processor              PolicyDB Name    : ACMECORP
Entry Name      : P9672ESA               Enterprise Name  : ACMECORP

Processor Type  : Mainframe              Processor Mode   : ESA

  Connection Protocol . . . . . INTERNAL NVC    (INTERNAL SNMP NVC)
  CPC Name / NAU  . . . . . . . LU1234
  Network Name  . . . . . . . . CPCNET1
  Site/Location Name. . . . . .

The following specifications are for INTERNAL processors only:
  Auth Token. . . . . . . . . . AUTINTSN
```

Migration & Co-existence

Co-existence

- Automatic Policy Conversion
- Downlevel Support
  - APAR OA26007, OA27754

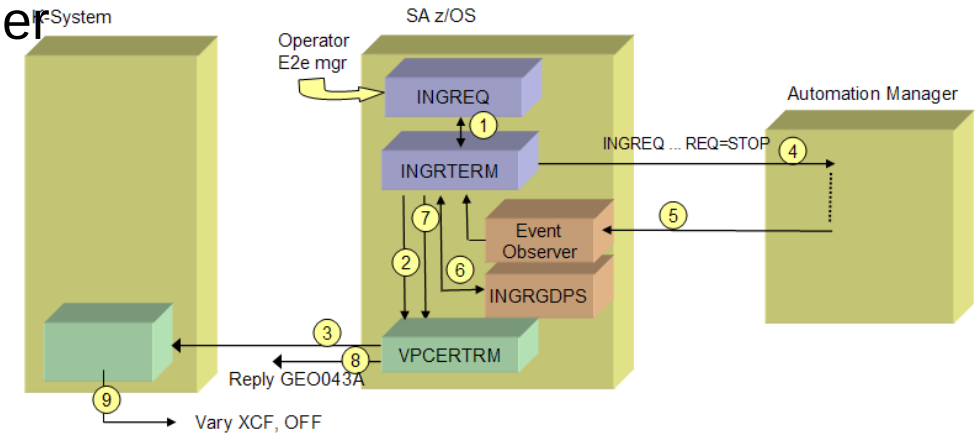




More Details

Improved Handshaking with GDPS

- Enables System Shutdown from outside GDPS
  - Via INGREQ ALL command or SA Appl Manager
  - From SA focal point
- Supports a complete system shutdown
  - Terminates GDPS‘s STOPAPPL resource first
  - OMVS, SA Automation manager, etc
- Supports pre-emptive Move
  - Applications moved to another system when application is terminated rather than at „system leave“ time
- GDPS varies off system



INGMSGS Command

- Shows all exceptional messages
  - Colors used to signal Importance of message
    - Same color mapping as in SDF
- Used to delete messages no longer relevent

Easy jump to the resource details with message history

Shows entire multi-line message

```
INGKYMSG                    SA z/OS  - Command Dialogs     Line  27    of 69
Domain ID   = IPSFP       -------- INGMSGS   ---------     Date = 02/11/09
Operator ID = WAS              System  = KEY4               Time = 17:22:40

CMD:  D Delete    F INGINFO/DISPSYS

CMD Timestamp           S Message
--- ------------------- - ------------------------------------------------
 _  2009-02-10 08:30:32 C SYSTEM=KEY4 RESOURCE=IMSCQS/APL/KEY4
                          CQS0008W STRUCTURE S941MSGQOV       IS VOLATILE; CONS
                          IDER STRUCTURE CHECKPOINT H941CQS
 _  2009-02-10 08:30:43 I SYSTEM=KEY4 RESOURCE=CICS1FOR/APL/KEY4
                          DFHSI1579D IPSAPCIE Module DFHSIPLT PLT program EVEST
                          ISP not found. Reply GO or CANCEL.
 _  2009-02-10 08:30:45 U SYSTEM=KEY4 RESOURCE=CICS1TOR/APL/KEY4
                          DFHSI1502I IPSAPCIH CICS startup is Warm.
 _  2009-02-10 09:51:13 C SYSTEM=KEY4 RESOURCE=IMS1CTL/APL/KEY4
                          AOF501E 09:51:13 : RECOVERY FOR MINRES IMS1CTL.PROG.E
                          VIRYPPI HALTED - 3 ERRORS SINCE 09:51:02 ON 02/10/200
                          9 - CRITICAL ERROR THRESHOLD EXCEEDED
```

More Enhancements...

- New AsIs Default Desired Status
  - Similar to OnDemand, but leaves Resource untouched when found active
  - Desired Status = Observed Status
  - Resource can be managed/controlled via external means
  - Alternative to Start after IPL = NOSTART

Changed Behavior...

Status File Restructure

- Status File has new Format
  - Time stamps are no longer stored in display format (14 chars)
    - Stored in compressed format (7 bytes)
    - All timestamps shown including seconds
  - Several obsolete fields removed
    - Reply ID, Jobname, Job number, Job type, Monitor, Date

DISPERRS
DISPASF

- New Conversion utility to bring the actual status file in the requested format – runs automatically on each ST start
  - V3.3 ←→V3.2 ←→V3.1 ←→V3.3
  - Caution: data loss possible
- ASF command can no longer be used as repository for installation data
  - Use ASFUSER command

```
          .-REQ=DISP,-.
>>--ASF--'-----------'--.-ID=resource--------------------.--><
                        '-FROM=resource--.--------------.-'
                                         '-,TO=resource-'
```

ACF Cache Removal

- NetView Save/Restore Database no longer used to hold config data for WARM start purposes
  - Cache does not contain AT related data
  - Necessary cleanup not done (eg. Unused timer IDs, obsolete hash entries)
- WARM Start is NOT faster than reading from disk
- COLD, WARM, REFRESH and SAVE are no longer valid as reply to the AOF603D WTOR.
- WARM/SAVE option removed from ACF command

```
>>--ACF-----.-COLD----.---------------------><
            '-REFRESH-'
```

AOF603D Prompt

- NOSTART does no longer place Resources in HOLD State
  - Agent placed in Suspend mode
  - Resources not started when doing explicit INGREQ ... REQ=UP cmd

```
HSAM1330I LOAD_ACF REQUEST COMPLETED SUCCESSFULLY ON AOC8.
 AOF767I AUTOMATION OPTIONS:
 . STOP    - CANCEL AUTOMATION
 . PAUSE   - SUSPEND AUTOMATION
 . NOSTART - DO NOT AUTOMATE SUBSYSTEM STARTUP
 . ENTER   - CONTINUE
*006 AOF603D ENTER AUTOMATION OPTIONS OR 'R' (RE-DISPLAY) – DOMAIN ..
```

- Replying DEBUG causes to turn on global debugging

End of Presentation

Thank you very much for your attention

Visit our home page at

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http://www-01.ibm.com/software/tivoli/products/system-automation-zos/index.html

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IBM Tivoli System Automation for Integrated Operations Management:

http://www-01.ibm.com/software/tivoli/products/sys-auto-iom/features.html?S_CMP=wspace

User forums

http://groups.yahoo.com/group/SAUSERS/

*The purpose of this group is to discuss technical issues related to **IBM Tivoli System Automation for z/OS** with your peers.*

http://groups.yahoo.com/group/SA4DIST/

*The purpose of this group is to discuss technical issues related to **IBM Tivoli System Automation** with your peers.*

This group is for distributed platforms like Linux and others, but not z/OS.