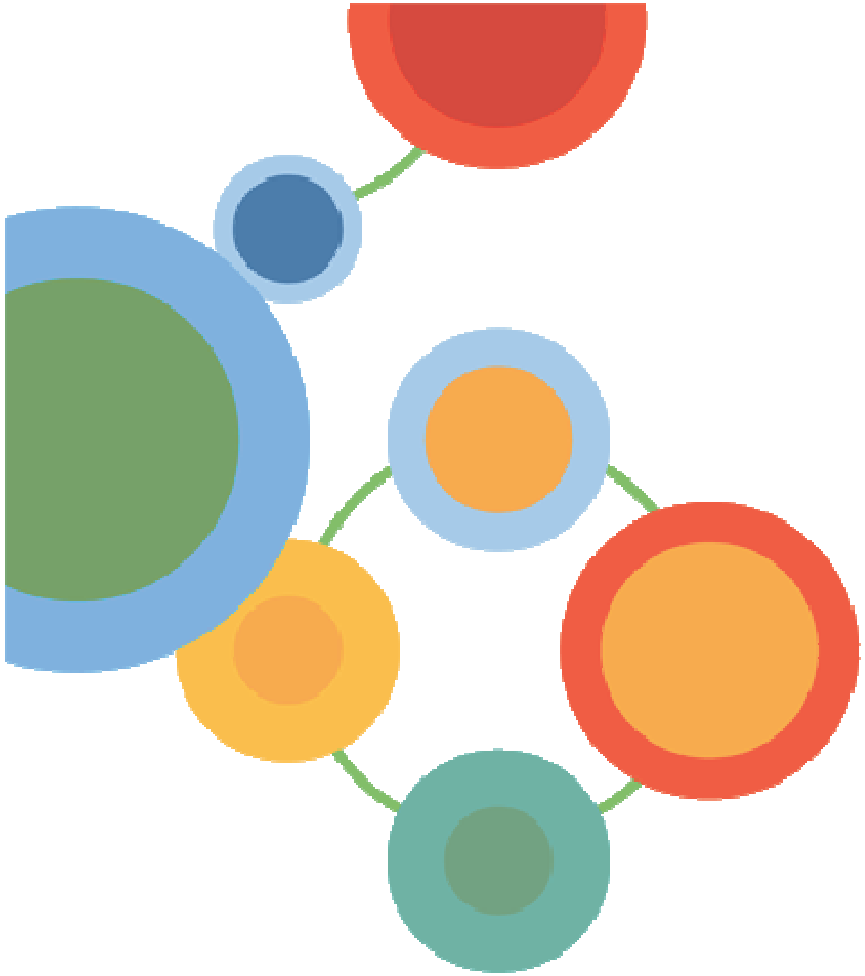
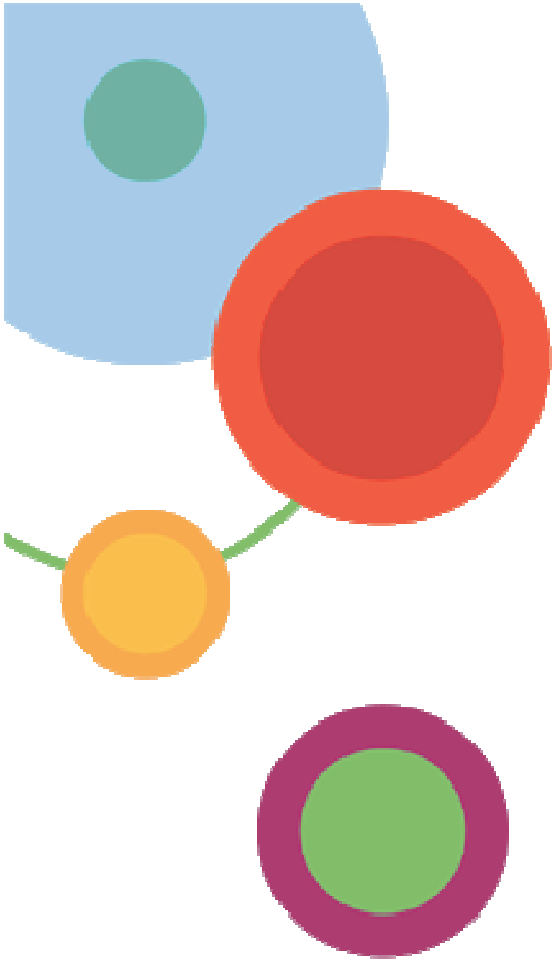


z/OS Product Maintenance Recommendations

Session Number IMS-1244

John Butterweck, IBM

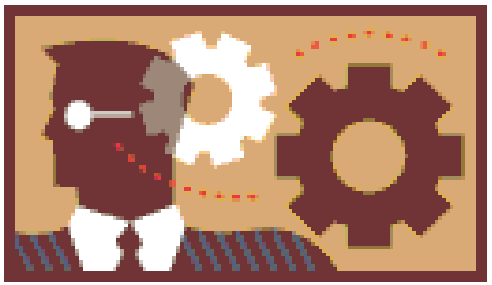
IBM Software
Information On Demand 2011



Maintenance Considerations

Objectives

- Provides guidelines that, when implemented, are intended to produce a more stable environment
- Discuss common problems that customers encounter
  - How to avoid them
  - How to resolve them when they do occur
- Some IMS specifics, but applicable to z/OS SMP/E based products



Product Maintenance Recommendation Overview

- This general product maintenance recommendation provides guidelines that, when implemented, are intended to produce a more stable environment

- Risk assessment should be carefully considered. Numerous factors can be involved, some of which include:
  - The quality level of the test environment
  - Business cycle

System Integrity / Stability Factors

- The following are factors that cause system Integrity/Stability issues:
  - Yet-to-be-discovered code defect
    - Simulate production as closely as possible in a test environment
  - Service implemented on the system that contains a code defect
    - PE management (*Discussed later in this section*)
  - Missing service that addresses a problem that can cause integrity/stability issues
    - HIPER APAR management (*Discussed later in this section*)
  - Service required for compatibility with z/OS or other products
    - PSP bucket – Cross-Product Dependency Section (*Discussed later in this section*)

General Maintenance Recommendations

- The general maintenance recommendation for a production system:
  - Initial production system base implementation service level
    - Service levels 6 months behind current level for planned migration date
    - All HIPER PTFs fixes 3 months behind the planned migration date
    - PE resolution
    - A 3 month test cycle is recommended prior to production implementation

- NOTE: Because maintenance will continue to be distributed during the test cycle, these recommendations along with those on the following page should be included in the initial production base system implementation

General Maintenance Recommendations *continued*

- Ongoing production system service level
  - Fully tested fixes for significant** software problems encountered
  - Fully tested HIPER SYSMODs that are of direct applicability to the specific environment and deemed significant**
  - Fully tested SYSMODs, which resolve PEs that are directly applicable to the specific environment and deemed significant**
- Review the associated PSP bucket UPGRADE and associated subsets
  - Important product-related information is continually added to these buckets and may require action
  - Program Directory provides UPGRADE and SUBSET names
- NOTE: The recommendations outlined above should be followed on an ongoing basis, and should also be included as part of the initial production implementation (See prior page)

***A fix is considered "significant" when consequences that could not be tolerated might be encountered without the application of that fix*

PE Defined

- PTF in Error (PE) – Designation assigned to PTFs that were provided to correct a problem, but either have not corrected the problem, or have introduced a new problem
  - These PTFs are known as *exception SYSMODs* and are managed in SMP/E through ++HOLD and ++RELEASE statements (HOLDDATA)
    - Introduced via the SMP/E RECEIVE command

HIPER APAR Qualification

- All APARs that address issues containing one or more of the following conditions are marked HIPER:
  - Causes an IPL or recycle of the system or subsystem
  - FLAG: SYSTEMOUTAGE/Y ServiceLink: RESTART/BOOT/IPL
  - Destruction and/or contamination of customer data
  - FLAG: DATALOSS/Y ServiceLink: DATALOSS
  - Causes major loss of function to the system
  - FLAG: FUNCTIONLOSS/Y ServiceLink: FUNCTIONLOSS
  - Causes severe impact to system performance/throughput
  - FLAG: PERFORMANCE/Y ServiceLink: PERFORMANCE

- HIPERs flagged as follows:
  - FLAG: HIPER/Y ServiceLink: HIPER
- Has the potential to affect many customers
  - FLAG: PERVASIVE/Y ServiceLink: PERVASIVE
  - NOTE: Another HIPER symptom must also be identified along with PERVASIVE to qualify for HIPER classification

PE and Hiper Exposure Identification

- Use Enhanced HOLDDATA to identify exposures to HIPER and PE PTFs
  - Ensure that a current copy of the Enhanced HOLDDATA has been RECEIVEd in SMP/E
  - Use SMP/E REPORT ERRSYSMODS to identify all missing PE and HIPER service
- Examine each identified APAR to determine susceptibility to the environment
  - Initial applicability can be determined by using the 'USERS AFFECTED'
  - portion of the APAR text
- For each APAR deemed applicable to your environment, decide which are significant enough that they need to be processed
  - Read 'Problem Description' in APAR text for technical details
    - Contact IBM support for additional information
- Weigh the decision to run without the latest PE and HIPER maintenance versus the risk of discovering a PE with that piece of maintenance

Enhanced Holddata

- ++HOLD statements for PE, HIPER and FIXCAT
  - Downloadable and provided with install/service order
  - Entire z/OS platform is covered in a single set of HOLDDATA
  - REPORT ERRSYSMODS to identify HIPER service not currently installed as well as any PE PTF installed without resolving SYSMOD

    SET BOUNDARY (GLOBAL) .

    REPORT ERRSYSMODS ZONES(tzone) .
  - For complete descriptive information see **Enhanced HOLDDATA for z/OS and OS/390 at:**
  - *http://service.boulder.ibm.com/390holddata.html*

Enhanced Holddata - Example

This is an example of a job that can be used to download and RECEIVE a current copy of the enhanced holddata:

```
//FTPSTEP  EXEC PGM=FTP,REGION=64M,
//            PARM='service.boulder.ibm.com (EXIT'
//SYSPRINT DD  SYSOUT=*
//OUTPUT   DD  SYSOUT=*
//INPUT    DD  *
anonymous
yourid@xxx.com
cd s390/holddata
locsite CY PRI=15 SEC=5 REC=FB LR=80 BLK=16000
ascii
lcd ‘SYSTEM'
get  full.txt ENH.HOLDDATA (replace
quit
//RECEIVE  EXEC PGM=GIMSMP,PARM='PROCESS=WAIT',DYNAMNBR=120
//SMPCSI   DD DISP=SHR,DSN=‘PRODUCT.GLOBAL.CSI'
//SMPCNTL  DD *
  SET    BOUNDARY (GLOBAL) .
  RECEIVE  HOLDDATA  .
//SMPHOLD  DD DISP=SHR,DSN=SYSTEM.ENH.HOLDDATA
```


Perform Risk Assessment of Applicable PTFs

- Perform risk assessment on processed PEd PTFs for which the system is susceptible
  - Courses of action can include:
    - Remove PTF in error if not already ACCEPTed
    - Leave the PTF in place if the reported PE symptom is not significant
    - Put in place operator procedures to restrict access to reported areas of exposure
    - Apply corrective APAR/PTF fix if available
    - Request a FIXTEST for the reported problem from software service
    - Request a USERMOD code bypass for the reported problem from software service

PSP Upgrade/Subset

- Each UPGRADE level includes SUBSET entries for each FMID within that release. The SUBSET for each installed FMID needs to be examined separately.
  - Program Directory provides Upgrade and Subset names
  - Key areas for review within each SUBSET entry include:
    - Opening Text
    - Change Summary
    - Service Recommendation Summary
    - Installation Information - Section 1
    - Documentation Changes - Section 2
    - General Information - Section 3
    - Service Recommendations - Section 4
    - Cross Product Dependencies - Section 5
- Available at:

  http://www14.software.ibm.com/webapp/set2/psearch/search?domain=psp

IMS 12 PSP Bucket Names

- IMS release 12.1 UPGRADE name = IMS1200
- The SUBSET names (IMS related FMIDs):

CHG/INDEX	HMK1200	JMK1201	JMK1202
JMK1203	JMK1204	JMK1205	JMK1206
HIR2220/1020	*HMK1200/GA*	*JMK1201/GA*	*JMK1202/GA*
JMK1203/GA	*JMK1204/GA*	*JMK1205/GA*	*JMK1206/GA*
HIR2230/1031			

IMS 11 PSP Bucket Names

- IMS release 11.1 UPGRADE name = IMS1100
- The SUBSET names (IMS related FMIDs):

CHG/INDEX	HMK1100	JMK1101	JMK1102
JMK1103	JMK1104	JMK1105	JMK1106
HIR2220/0830	HMK1100/GA	JMK1101/GA	JMK1102/GA
JMK1103/GA	JMK1106/GA	JMK1106/GA	JMK1106/GA
HIR2220/1020	*HMK1100/1109*	*JMK1101/1109*	*JMK1102/1109*
JMK1103/1109	*JMK1104/1109*	*JMK1105/1109*	*JMK1106/1109*

Consolidated Service Test (CST)

- Goal: Enhance the way service is tested and delivered for z/OS, by providing a single coordinated service recommendation
  - Provides cross-product testing for participating products
  - List of products tested is continually expanding
  - This is in addition to testing that was already being performed
  - Standardize maintenance recommendation on z/OS platform
  - See *http://www.ibm.com/servers/eserver/zseries/zos/servicetst/* for additional information

Consolidated Service Test - 2

- All APARS included, regardless of severity
- Testing of quarterly RSUs:
  - Three 30-day test cycles exercised
  - System upgraded every 30 days to include the next monthly RSU
    - HIPERs, PE fixes, security, integrity, pervasive and fixes to CST problems
  - Stress and saturation testing, failure and recovery testing, and rolling IPL maintenance test of previous Quarterly RSU to current Quarterly RSU
  - Done prior to availability *of RSUyymm SOURCEID being assigned*
    - Some products are not included in the CST testing, but they still get marked RSU based on calendar rules set up for RSU
  - Testing covers integrated workloads across all participating z/Series and S/390 products
    - Provides one clear consistent recommendation for the platform
    - Workloads continue to evolve
- Also available monthly
  - 30 days of tested Hiper/PE, security/integrity and pervasive APARs between quarterly testing

Consolidated Service Test - 3

- Quarterly CST reports available consisting of:
  - CST hardware environment
  - Software environment including maintenance levels
  - Rollout recommendations
  - Highlights for the QTR
  - Problems encountered
  - Excluded maintenance list
- After service has passed CST testing
  - Marked with RSU (Recommended Service Upgrade) RSUyymm SOURCEID notation
    - QTRLY = RSUyy03, RSUyy06, RSUyy09, RSUyy12
    - Monthly = RSUyy01, RSUyy02, RSUyy04, etc.
    - The following points to SOURCEID assignments for RSUyymm and PUTyymm:
      - *ftp://service.boulder.ibm.com/s390/assigns/*

RSU Contents

- Quarterly
  - RSU1012 - Available January 2011
    - All service through the end of September 2010 not already marked RSU. PE resolution and HIPER/Security/Integrity/Pervasive PTFs and their associated requisites and supersedes through November 2010
- Monthly
  - RSU1101 - Available February 2011
    - Based upon the quarter above, this addendum contains PE resolution and HIPER/Security/Integrity/Pervasive PTFs and their associated requisites and supersedes through December 2010
- Monthly
  - RSU1002 - Available March 2011
    - Based upon the quarter above, this addendum contains PE resolution and HIPER/Security/Integrity/Pervasive PTFs and their associated requisites and supersedes through January 2011

Achieving the Maintenance Recommendation

- Maintenance Upgrade Technique
  - Obtain current service
  - *Review PSP Buckets*
  - Obtain and RECEIVE current Enhanced Holddata
  - SMP/E processes the service
    - Select CST created RSUyymm SOURCEIDs
    - Resolve PEs and System HOLDs
  - *Obtain and RECEIVE current Enhanced Holddata again*
    - *Run SMP/E REPORT ERRSYSMODS to identify HIPER/PE exposure*
      - *Obtain applicable SYSMODS from ShopzSeries*
      - *Process SYSMODs that are applicable to your environment*
        - *Use product support website or PSP Buckets for APAR descriptions*
        - *Contact IBM Support Center for assistance as needed*
  - *Test the new maintenance level*
  - Repeat *italicized* items on an ongoing basis to remain current
    - As close to implementation as possible

Achieving the Maintenance Recommendation – IMS specifics

- Caution: SYSMODs in APPLY status could be regressed by SYSGEN
  - Either ACCEPT all PTFs in APPLY status prior to SYSGEN, or, after SYSGEN, reprocess APPLYed SYSMODs
    - Determine SYSMODs in APPLY-only status
      - SET BOUNDARY (targetzone)
      - LIST APAR PTF USERMOD NOACCEPT NOSUP
      - This will supply the list of APPLY only SYSMODs xxxxxxx
    - APPLY REDO NOJCLIN every SYSMOD in APPLY status

      APPLY REDO NOJCLIN SELECT(

      xxxxxxx

      xxxxxxx

      xxxxxxx)
      - ***NOTE: Only specify NOJCLIN for REDO processing*
  - Special handling might be required for SYSMODs in APPLY status that have holds requiring SYSGEN or *DELETE*

Fixcat

- z/OS Release 10 and SMP/E Release 3.5 introduce FIXCAT HOLDDATA to simplify identifying required service from PSP buckets
  - Toleration APAR IO07480 (PTF UO00700 for SMP/E V3.3 or UO00701 for V3.4) to allow those releases to silently ignore the FIXCAT HOLDDATA
  - The following contains all FIXCAT categories and their descriptions:
    - *http://www-03.ibm.com/systems/z/os/zos/smpe/fixcategory.html*
- Specify FIXCAT operand on the APPLY and ACCEPT command
- IMS specific categories
  - IBM.Coexistence.IMS.V10
    - Fixes that allow IMS V8 and V9 to coexist with, and fallback from, IMS V10
  - IBM.Coexistence.IMS.V11
    - Fixes that allow IMS V9 and V10 to coexist with, and fallback from, IMS V11
  - IBM.Coexistence.IMS.V12
    - Fixes that allow IMS V10 and V11 to coexist with, and fallback from, IMS V12
  - IBM.TargetSystem-RequiredService.IMS.V10
    - Fixes required on other IBM products to allow them to run with IMS V10
  - IBM.TargetSystem-RequiredService.IMS.V11
    - Fixes required on other IBM products to allow them to run with IMS V11
  - IBM.TargetSystem-RequiredService.IMS.V12
    - Fixes required on other IBM products to allow them to run with IMS V12

Fixcat - *continued*

- Examples of non-IMS-specific categories
  - IBM.ProductInstall-RequiredService
    - HIPER
  - IBM.Coexistence.z/OS.V1R12
  - IBM.Function.SYSPLEXDataSharing
  - IBM.Device.Server.z9-EC-2094.zAAP
  - IBM.Device.Disk.DS8000-2107

- SMP/E REPORT MISSING FIX command used to identify service not installed

Fixcat - Examples

- The following is an example of the REPORT MISSINGFIX command that can be used to determine which service is needed for coexistence with IMS 12 (run this pointing to an IMS 10 or IMS 11 target zone):

```
SET    BOUNDARY (GLOBAL) .
            REPORT MISSINGFIX ZONES  (targetzone)
                FIXCAT(
                    IBM.Coexistence.IMS.V12

                ) .
```

- The following is an example of the REPORT MISSINGFIX command that can be used to determine which service is needed for coexistence with z/OS V1.R12 (run this pointing to an IMS target zone):

```
SET    BOUNDARY (GLOBAL) .
            REPORT MISSINGFIX ZONES  (targetzone)
                FIXCAT(
                    IBM.Coexistence.z/OS.V1R12
                ) .
```

Maintenance Upgrade

- IMS service can be processed using the standard SMP/E RECEIVE, APPLY, ACCEPT processing, or
- SMP/E RECEIVE, *'ACCEPT BYPASS(APPLYCHECK)'* processing
  - Informational APAR II13024 contains the steps required when processing using this technique
  - These steps are also used when:
    - Removing features from a Gen'd system
    - Anything that requires rebuilding the target environment from the distribution environment
      - Resolves maintenance mismatch situations

- Requires ACCJCLIN set in the Distribution Zone *PRIOR* to accepting the FMIDs and service

SMP/E Generate

- SMP/E GENERATE command
  - Used to create JCL to build elements in target libraries from elements in distribution libraries
    - When run before *ANY* SMP/E JCLIN processing after sysgen, the JCL created is to build non-sysgen elements only
    - When run after *ANY* SMP/E JCLIN processing after sysgen, the JCL created is to build both non sysgen elements and sysgen elements
      - Will encounter errors indicating no DLIB for non-IMS macros
    - DFSJCLIN no longer necessary
    - Dependent on *ACCJCLIN* being set up in distribution zone *BEFORE* processing FMID's
    - Sample command:

      SET BDY(targlib) .

      GENERATE JOBCARD(CNTL,J) REPLACE .

      (NOTE: This sample requires DD CNTL to contain member 'J' which is a sample job card)
  - Used as part processing of service via ACCEPT BYPASS APPLYCHECK or when target environment needs to be rebuilt from the distribution environment
    - Not needed when processing using RECEIVE, APPLY, ACCEPT
    - See Informational APAR II13024

User Exits

- User Exits
  - Optional user exits now in SDFSSMPL
  - User exits created as ++SRC type part
    - Allows line updates during SMP/E processing of service as opposed to complete replacement
  - Corresponding ++MOD parts (Object Code) NOT shipped
    - No MOD to LMOD relationships are created during IMS install, so SMP/E will not automatically assemble and bind the parts during APPLY processing
    - If the user creates the MOD to LMOD relationship, then SMP/E APPLY processing will automatically assemble and bind these exits
  - Working toward having all user exits handled the same way

Sample User Exit Technique

The following is an example of a technique that can be used to have SMP/E Assemble and Bind one of the sample exits:

```
++ USERMOD (XYZUMOD) .
++ VER (P115)
   FMID(HMK1200) .
++ JCLIN.
//INJCLIN  JOB . . .
//LKED     EXEC PGM=IEWL,
//         PARM='('SIZE=(880K,64K)',RENT,REFR,NCAL,LET,XREF,LIST)
//ADFSLOAD DD DSN=IMS.ADFSLOAD,DISP=SHR
//SYSPUNCH DD DSN=IMS.OBJDSET,DISP=SHR
//SYSUT1   DD UNIT=(SYSDA,SEP=(SYSLMOD,SYSLIN)),SPACE=(1024,(200,20))
//SYSPRINT DD SYSOUT=A
//SYSLMOD  DD DSN=IMS.SDFSRESL,DISP=SHR
//SYSLIN   DD  *
  INCLUDE SYSPUNCH(DFSGMSG0)
  ENTRY DFSGMSG0
  NAME DFSGMSG0(R)
++ SRC   (DFSGMSG0) SYSLIB(SDFSSMPL) DISTLIB(ADFSSMPL) .
DFSGMSG0    TITLE 'DFSGMSG0 -- GREETING MESSAGES USER EXIT'
.   .   .
.   .   .
```

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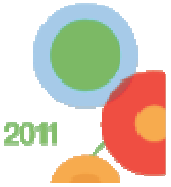

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