IBM Education Assistance for z/OS V2R2

Item: Multiple, for “New and updated health checks in V2R2”
Element/Component: BCP Health Checker / various IBM components

Material current as of May 2015

Agenda

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Trademarks

- See url http://www.ibm.com/legal/copytrade.shtml for a list of trademarks.
- The term Health Checker is used as short form of “IBM Health Checker for z/OS” in this presentation.
- The term “health check” or just “check” is used as short form of “health check for the IBM Health Checker for z/OS” in this presentation.

Presentation Objectives

- Very briefly describe what Health Checker, a health check, and a migration check is
- Present an overview of new and changed health checks developed in z/OS V2R2

Overview

- **Problem Statement / Need Addressed:**
  - Continued need for programmatic approach to ensuring component best practices and to providing migration assistance
- **Solution:**
  - Provide additional health checks for existing and new best practices, and for migration actions
- **Benefit:**
  - Improved system health and smoother release migration

Overview – What is Health Checker?

- IBM Health Checker for z/OS is a system component that **identifies potential problems before they impact your installation's availability** or, in worst cases, would cause outages.
- It checks the currently active settings and definitions for a system and **compares the values to those suggested** by IBM or defined by you.
- It produces output in the form of **detailed messages** to let you know of both **potential problems** and **suggested actions** to take.

Overview – What are health checks?

- A health check is doing the actual “inspection of settings…”, as a “plug-in” to the Health Checker framework
- There are health checks from different sources
  - from individual IBM components, ISVs, and general users
  - each check is supposed to focus on one scenario only
- Health checks are named (*CheckOwner*, *CheckName*)
  - *CheckOwner* is typically *CompanyName_ComponentName*
  - *CheckName* is typically *ComponentName_CheckPurpose*
- For example: (IBMASM, ASM_PLPA_COMMON_USAGE)
  - An IBM Auxiliary Storage Manager (ASM) check, which "Looks at the slot usage of the PLPA and Common page data sets"

Overview – What are migration checks?

- Migration checks are health checks which help with the task of identifying the need for migration actions
- Migration checks are shipped inactive and are manually activated on demand, typically before an actual migration
- A common naming convention for migration checks is (*CheckOwner*, ZOSMIGxyz_*RestOfCheckName*) and ICSF (Cryptographic Facility) also uses ICSFMIG as prefix. The xyz can be
  - VxRy, for migration actions required for a specific release (“V2R2”)
  - VxRy_NEXT and VxRy_NEXT2, for recommended migrations which will be come required in one or two releases after VxRy
  - “REC”, for recommended migration actions without a specific release for the foreseeable future
  - (“REQ”, for recommended actions which become required soon, but which have no release attached to them yet)
- For example:
  - (IBMCNZ, ZOSMIGV1R13_CNZ_Cons_Oper_Mode)
  - (IBMZFS, ZOSMIGREC_ZFS_RM_MULTIFS)

Overview – List of new (or updated) health checks in V2R2

- (IBMCATALOG, CATALOG_ATTRIBUTE_CHECK)
- (IBMCS, ZOSMIGV2R1_CS_LEGACYDEVICE)
- (IBMCS, ZOSMIGV2R2_NEXT_CS_SENDMAILCLIEN)
- (IBMCS, ZOSMIGV2R2_NEXT_CS_SENDMAILDAEMN)
- (IBMCS, ZOSMIGV2R2_NEXT_CS_SENDMAILMSA)
- (IBMCS, ZOSMIGV2R2_NEXT_CS_SENDMAILMTA)
- (IBMCS, ZOSMIGV2R2_NEXT_CS_SMTPDDAEMON)
- (IBMCS, ZOSMIGV2R2_NEXT_CS_SMTPDMTA)
- (IBMCTRACE, CTRACE_DEFAULT_OR_MIN)
- (IBMDMO, DMO_REFUCB)
- (IBMHWAM, HWAM_ZEDC_DEVICE_AVAILIBILITY)

Overview – List of new (or updated) health checks in V2R2

- (IBMICSF, ICSFMIG77A1_COPROCESSOR_ACTIVE)
- (IBMICSF, ICSFMIG77A1_TKDS_OBJECT)
- (IBMICSF, ICSFMIG77A1_UNSUPPORTED_HW)
- (IBMICSF, ICSF_KEY_EXPIRATION)
- (IBMIOS, IOS_DYNAMIC_ROUTING)
- (IBMJES2, JES2_UPGRADE_CKPT_LEVEL_JES2) (renamed & updated)
- (IBMJES3, JES3_DATASET_INTEGRITY)
- (IBMJES3, JES3_DOT_POOL_USAGE)
- (IBMJES3, JES3_JET_POOL_USAGE)
- (IBMJES3, JES3_OST_POOL_USAGE)
- (IBMJES3, JES3_SEE_POOL_USAGE)
- (IBMPFA, PFA_PRIVATE_STORAGE_EXHAUSTION)

Overview – List of new (or updated) health checks in V2R2, cont...

- (IBMRACF, RACF_CSFKEYS_ACTIVE)
- (IBMRACF, RACF_CSFSERV_ACTIVE)
- (IBMRACF, RACF_ENCRYPTION_ALGORITHM)
- (IBMRACF, RACF_PASSWORD_CONTROLS)
- (IBMRACF, RACF_RRSF_RESOURCES)
- (IBMRACF, RACF_SENSITIVE_RESOURCES) (updated)
- (IBMSUP, SUP_SYSTEM_SYMBOL_TABLE_SIZE) (updated)
- (IBMTSOE, TSOE_OPERSEWAIT_SETTING)
- (IBMUSS, USS_KERNEL_PVTSTG_THRESHOLD) (updated)
- (IBMUSS, USS_KERNEL_RESOURCES_THRESHOLD)
- (IBMUSS, USS_KERNEL_STACKS_THRESHOLD) (updated)

Overview – List of new (or updated) health checks in V2R2, cont...

- (IBMXCF, XCF_CF_SCM_UTILIZATION)
- (IBMXCF, XCF_CF_STR_MAXSCM)
- (IBMXCF, XCF_CF_STR_MAXSPACE)
- (IBMXCF, XCF_CF_STR_SCM_UTILIZATION)
- (IBMXCF, XCF_CF_STR_SCMMAXSIZE)
- (IBMXCF, XCF_CF_STR_SCM_MINCOUNTS)
- (IBMXCF, XCF_CF_STR_SCM_AUGMENTED)
- (IBMZFS, ZFS_CACHE_REMOVALS)
- (IBMZFS, ZFS_VERIFY_CACHESIZE) (updated)
- (IBMZMIG, ZOSMIG_HTTP_SERVER_DOMINO_CHECK)

Usage & Invocation

- Most checks are shipped ACTIVE and do not require manual interaction to run. Just monitor their output in form of check exception messages and with further details in a check's message buffer (inspect it for example via the SDSF CK panel).
- Migration checks are a set of checks which are shipped INACTIVE.
  - Look for them on the SDSF CK panel or via operator command, for example MODIFY HZSPROC,DISPLAY,CHECK(*,*MIG*)
  - Activate them for example via SDSF or operator commands like MODIFY HZSPROC,UPDATE,CHECK(*,*MIGV2R2*),ACTIVE

Interactions & Dependencies

- Software Dependencies
  - Have Health Checker started. Note that while Health Checker starts automatically (in z/OS V2R1 and up), and while most checks will run without further intervention, ensure you followed the recommended Health Checker customization steps to take full advantage of all health checks.
- Hardware Dependencies – None
  - Checks which are hardware dependent will detect the active hardware automatically and will disable themselves when not applicable or they will not even be registered by the owning product
  - Some checks which target new hardware might be presented separately (outside of the T3), depending on announce dates
- Exploiters
  - Operators and System Programmers

Migration & Coexistence Considerations

- Updated/Changed checks are typically shipped with a new DATE
  - The DATE is used as a “version” ID
  - You will have to re-evaluate any HZSPRMxx parmlib member POLICY statements for those changed checks
  - After inspecting a POLICY for possibly required changes, update the POLICY statement's DATE to avoid continued rejection as “outdated” by Health Checker
- Look for a new DATE in particular for:
  - `(IBMRACF, RACF_SENSITIVE_RESOURCES)`
  - `(IBMSUP, SUP_SYSTEM_SYMBOL_TABLE_SIZE)`
  - `(IBMUSS, USS_KERNEL_PVTSTG_THRESHOLD)`
  - `(IBMUSS, USS_KERNEL_STACKS_THRESHOLD)`
  - `(IBMZFS, ZFS_VERIFY_CACHESIZE)`

Migration & Coexistence Considerations, continued...

- Some checks have been rolled back to previous releases
  - Check for HOLDDATA/PTFs tagged with SMP/E FIXCAT IBM.Function.HealthChecker
- Look in particular for the following pre-V2R2 APARs:
  - OA40747 (check for PE correcting supersedes)
    - CHECK(IBMXCF, XCF_CF_SCM_UTILIZATION)
    - CHECK(IBMXCF, XCF_CF_STR_MAXSCM)
    - CHECK(IBMXCF, XCF_CF_STR_MAXSPACE)
    - CHECK(IBMXCF, XCF_CF_STR_SCM_UTILIZATION)
    - CHECK(IBMXCF, XCF_CF_STR_SCMMAXSIZE)
    - CHECK(IBMXCF, XCF_CF_STR_SCM_MINCOUNTS)
    - CHECK(IBMXCF, XCF_CF_STR_SCM_AUGMENTED)

Migration & Coexistence Considerations, continued...

- OA42011
  - CHECK(IBMICSF, ICSFMIG77A1_COPROCESSOR_ACTIVE)
  - CHECK(IBMICSF, ICSFMIG77A1_TKDS_OBJECT)
  - CHECK(IBMICSF, ICSFMIG77A1_UNSUPPORTED_HW)
- OA44696
  - CHECK(IBMRACF, RACF_CSFSERV_ACTIVE)
  - CHECK(IBMRACF, RACF_CSFKEYS_ACTIVE)
  - CHECK(IBMRACF, RACF_SENSITIVE_RESOURCES)
- OA45608
  - CHECK(IBMRACF, RACF_PASSWORD_CONTROLS)
  - CHECK(IBMRACF, RACF_ENCRYPTION_ALGORITHM)
- OA43308, OA43309
  - CHECK(IBMIOS,IOS_DYNAMIC_ROUTING)
- V1R13: OA44669, PI12977, V2R1: OA44671, PI12981
  - CHECK(IBMCS, ZOSMIGV2R1_CS_LEGACYDEVICE)

Installation

- Most IBM health checks are automatically installed with their associated product or component, or are shipped with the base operation system for the new release
- In addition, some checks, in particular migration checks, will have APARs available for previous releases
  - (Note the one “odd” ZOSMIG_HTTP_SERVER_DOMINO though)

Check Details – (IBMCATALOG, CATALOG_ATTRIBUTE_CHECK)

- Looks for catalogs with inconsistent share options
- Non-shared Catalogs (SHAREOPTIONS(3,3)) that reside on shared DASD will become damaged if accessed by multiple systems
- Shared catalogs (SHAREOPTIONS(3,4)) on non-shared DASD may see performance degradation due to unnecessary serialization activity

- INTERVAL is 720:00 (30 days), SEVERITY is LOW
- References: Lineitem FP0609.6, DCR# SM22CAT000

Check Details – (IBMCS, ZOSMIGV2R1_CS_LEGACYDEVICE)

- Looks for TCP/IP profile statements for legacy device types
- Support for the DEVICE and LINK profile statements will be eliminated in V2R2 for:
  - ATM (Asynchronous Transfer Mode)
  - CDLC (Channel Data Link Control)
  - CLAW (Common Link Access to Workstation)
  - HYPERchannel
  - SNALINK (LU0 and LU6.2)
  - X.25
- Note: This check should have been named ZOSMIGV2R1**_NEXT**_CS_LEGACYDEVICE, but it was released before this naming convention was available and before V2R2 was announced
- Recommendation: Migrate to a later interface type, such as OSA-Express QDIO or HiperSockets.
- INTERVAL is 24:00 (hours), SEVERITY is LOW, shipped as INACTIVE
- References: APARs OA44669, PI12977 for V1R13,
  and OA44671, PI12981 for V2R1, and ICN 1281

Check Details – (IBMCS,ZOSMIGV2R2_NEXT_CS_SENDMAILCLIEN)

- Looks for use of the **sendmail client** on z/OS
- Support for the sendmail client is planned to be withdrawn in the release after the V2R2 IBM z/OS Communications Server
- IBM suggests to migrate to the CSSMTP daemon that was introduced in z/OS V1R11.

- INTERVAL is 24:00 (hours), SEVERITY is LOW, shipped as INACTIVE
- References: Lineitem RFSSHLTC

Check Details – (IBMCS,ZOSMIGV2R2_NEXT_CS_SENDMAILDAEMN)

- Looks for use of the **sendmail daemon** on z/OS
- Support for the sendmail daemon is planned to be withdrawn in the release after the V2R2 IBM z/OS Communications Server
- IBM suggests to migrate to the CSSMTP daemon that was introduced in z/OS V1R11 or to migrate the dependent function to other operating system platforms that continue to support sendmail functions, such as Linux on System z.

- INTERVAL is 24:00 (hours), SEVERITY is LOW, shipped as INACTIVE
- References: Lineitem RFSSHLTC

Check Details – (IBMCS,ZOSMIGV2R2_NEXT_CS_SENDMAILMSA)

- Looks for use of the **sendmail mail submission agent (MSA)** on z/OS
- Support for the MSA function is planned to be withdrawn in the release after the V2R2 IBM z/OS Communications Server
- If MSA is still needed IBM suggests to migrate the dependent function to other operating system platforms that continue to support MSA functions, such as Linux on System z.

- INTERVAL is 24:00 (hours), SEVERITY is LOW, shipped as INACTIVE
- References: Lineitem RFSSHLTC

Check Details – (IBMCS,ZOSMIGV2R2_NEXT_CS_SENDMAILMTA)

- Looks for use of the **sendmail mail transfer agent (MTA)** on z/OS
- Support for the MTA function is planned to be withdrawn in the release after the V2R2 IBM z/OS Communications Server
- If MTA is still needed IBM suggests to migrate the dependent function to other operating system platforms that continue to support MTA functions, such as Linux on System z.

- INTERVAL is 24:00 (hours), SEVERITY is LOW, shipped as INACTIVE
- References: Lineitem RFSSHLTC

Check Details – (IBMCS,ZOSMIGV2R2_NEXT_CS_SMTPDMTA)

- Looks for use of the **SMTPD mail transfer agent (MTA)** on z/OS
- Support for the SMTPD MTA function is planned to be withdrawn in the release after the V2R2 IBM z/OS Communications Server
- If SMTPD MTA is still needed IBM suggests to migrate the dependent function to other operating system platforms that continue to support MTA functions, such as Linux on System z.

- INTERVAL is 24:00 (hours), SEVERITY is LOW, shipped as INACTIVE
- References: Lineitem RFSSHLTC

Check Details –(IBMCS,ZOSMIGV2R2_NEXT_CS_SMTPDDAEMON)

- Looks for use of the **SMTP Daemon** on z/OS
- Support for the SMTPD is planned to be withdrawn in the release after the V2R2 IBM z/OS Communications Server
- IBM suggests to migrate to the CSSMTP daemon that was introduced in z/OS V1R11 to send mail from the z/OS JES spool. Customers who currently use or plan to use SMTP for purposes other than sending mail from the z/OS JES spool, are encouraged to migrate those mail functions to other operating system platforms that continue to support full email functionality, such as Linux on System z.

- INTERVAL is 24:00 (hours), SEVERITY is LOW, shipped as INACTIVE
- References: Lineitem RFSSHLTC

Check Details – (IBMCTRACE, CTRACE_DEFAULT_OR_MIN)

- Looks for active component traces that are tracing with more than the default or minimum options for extended amount of time.
- Tracing with extra options for longer times can cause degraded system performance.
- Check parameter 'TIME(DAYS,dd)', with a default of 7 days, or 'TIME(HOURS,hh)' allows to adjust the time threshold.

- INTERVAL is 4:00 (hours), SEVERITY is LOW
- References: Lineitem LI3511

Check Details – (IBMDMO, DMO_REFUCB)

- Looks for the enablement status of the REFUCB function.
- Enabling the REFUCB function is recommended to maintain VTOC integrity with shared DASD.
- Check parameter 'ENABLE(**YES**|NO)' allows to customize the desired enablement status to check for.
- INTERVAL is ONETIME, SEVERITY is LOW

Check Details – (IBMHWAM, HWAM_ZEDC_DEVICE_AVAILIBILITY)

- Looks at the current zEDC (zEnterprise Data Compression) device configurations.
- Reports an exception if the available devices are in the same failure domain (single point of failure) or if fewer than expected devices are available and active.
- Check parameters DEVTHRESH_HIGH/_MED/_LOW/_NONE(*n*) allow to adjust the minimum number of devices expected to be available before a check exception for a given dynamic severity is issued. Defaults are DEVTHRESH_HIGH(1) and DEVTHRESH_MED(2).
- INTERVAL is ONETIME, SEVERITY is dynamic
- References: Lineitem FP1231

Check Details – (IBMICSF, ICSFMIG77A1_COPROCESSOR_ACTIVE)

- Detects cryptographic coprocessors that will not become active when starting HCR77A1 or later.
- ICSF FMID HCR77A1 changed to not activate a coprocessor that has master keys that do not match the master key verification pattern (MKVP) in the CKDS (cryptographic key data set) and or the PKDS (PKA key data set).

- INTERVAL is 24:00 (hours), SEVERITY is LOW, shipped as INACTIVE
- References: APAR OA42011

Check Details – (IBMICSF, ICSFMIG77A1_TKDS_OBJECT)

- Detects any TKDS (token data set) object that is too large to allow the TKDS to be read into storage during initialization of ICSF in HCR77A1 or later.
- ICSF HCR77A1 introduces a new common KDS record format for CCA key tokens and PKCS #11 tokens and objects, adding new fields for key utilization and metadata. Because of the size of the new fields, some PKCS #11 objects in the TKDS may cause ICSF to fail to start, for example due to large User Data fields.

- INTERVAL is ONETIME, SEVERITY is LOW, shipped as INACTIVE
- References: APAR OA42011

Check Details – (IBMICSF, ICSFMIG77A1_UNSUPPORTED_HW)

- Detects if the system is supported by ICSF FMID HCR77A1.
- ICSF FMID HCR77A1 does not support IBM zSeries 800 and 900 systems.

- INTERVAL is ONETIME, SEVERITY is LOW, shipped as INACTIVE
- References: APAR OA42011

Check Details – (IBMICSF, ICSF_KEY_EXPIRATION)

- Examines the key validity end date of each record in each active KDS (key data set)
- Lists the record label, if the end date is set and is “soon” to expire.
- Check parameter 'DAYS(ddd)', with a default of 120 days, allows to adjust the expiration time threshold.
- INTERVAL is 24:00 (hours), SEVERITY is MEDIUM
- References: Lineitem FP0808

Check Details – (IBMIOS,IOS_DYNAMIC_ROUTING)

- Identifies any inconsistencies in the dynamic routing support for I/O requests within the storage area network (SAN)
- When dynamic routing is enabled within the fabric, the processor and controllers involved in the communication must be able to support dynamic routing

- INTERVAL is ONETIME (and on demand), SEVERITY is MEDIUM
- References: Lineitem LI3619, APARs OA43308, OA43309

Check Details – (IBMJES2, JES2_UPGRADE_CKPT_LEVEL_JES2)

(renamed & updated)

- Checks the status of the JES2 $ACTIVATE level
- Issues a low severity check exception if required pre-conditions for upgrading to the most current checkpoint level (z22) are not met yet
  - For example, z22 mode requires the activation of CYL_MANAGED ("EAV support")
- Issues a medium severity check exception if all pre-conditions have been met, but the most current mode (z22) has not been activated yet
- Is a *renamed and updated* version of previous CHECK(IBMJES2, JES2_**Z11**_Upgrade_CK_JES2)
- INTERVAL is 168:00 (= one week), SEVERITY is LOW/MEDIUM
- References: Lineitems FP0268, FP0269, FP0407

Check Details – (IBMJES3, JES3_DATASET_INTEGRITY)

- Determines if DSI or NODSI has been specified on the JES3 entries in the Program Properties Table (PPT).
- Specifying DSI enables Data Set Integrity for JES3 data sets allocated via DYNALLOC statements.
- IBM recommends that you use DSI so there is an ENQUEUE outstanding on all its data sets (major name=SYSDSN, minor name=dsname) while JES3 is up and running, to avoid corruption and cold starts.
- Parameter DSI(**YES**|NO) allows to customize what the check is supposed to interpret as a “success”: DSI (YES) or NODSI (NO).
- INTERVAL is ONETIME, SEVERITY is LOW
- References: Lineitem FP0567

Check Details – (IBMJES3, JES3_DOT_POOL_USAGE)

- Checks the utilization of the JES3 DOT (Dataset Output Table) cellpool as a percentage of the pool's total capacity.
- Generates an exception message when current usage exceeds a specified threshold.
- Exhausting this finite resource can cause JES3 ABENDs or termination.
- Parameters THRESHOLD_HIGH/MED/LOW/NONE(pp%) allow to customize the warning thresholds at different, dynamic severities. Default values are: THRESHOLD_HIGH(85%),THRESHOLD_MED(70%)
- INTERVAL is 00:10 (minutes), SEVERITY is dynamic
- References: Lineitem FP0565

Check Details – (IBMJES3, JES3_JET_POOL_USAGE)

- Checks the utilization of the JES3 JET (JDS (Job Dataset) Entry Table) cellpool as a percentage of the pool's total capacity.
- Generates an exception message when current usage exceeds a specified threshold.
- Exhausting this finite resource can cause JES3 ABENDs or termination.
- Parameters THRESHOLD_HIGH/MED/LOW/NONE(pp%) allow to customize the warning thresholds at different, dynamic severities. Default values are: THRESHOLD_HIGH(85%),THRESHOLD_MED(70%), and THRESHOLD_LOW(60%)
- INTERVAL is 00:10 (minutes), SEVERITY is dynamic
- References: Lineitem FP0565

Check Details – (IBMJES3, JES3_OST_POOL_USAGE)

- Checks the utilization of the JES3 OST (OSE (Output Scheduling Element) Summary Table) cellpool as a percentage of the pool's total capacity.
- Generates an exception message when current usage exceeds a specified threshold.
- Exhausting this finite resource can cause JES3 ABENDs or termination.

- Parameters THRESHOLD_HIGH/MED/LOW/NONE(pp%) allow to customize the warning thresholds at different, dynamic severities. Default values are: THRESHOLD_HIGH(85%),THRESHOLD_MED(70%), and THRESHOLD_LOW(60%)
- INTERVAL is 00:10 (minutes), SEVERITY is dynamic
- References: Lineitem FP0565

Check Details – (IBMJES3, JES3_SEE_POOL_USAGE)

- Checks the utilization of the JES3 SEE (SAPI (SYSOUT Application Program Interface) exclusion elements) cellpool as a percentage of the pool's total capacity.
- Generates an exception message when current usage exceeds a specified threshold.
- Exhausting this finite resource can cause JES3 ABENDs or termination.
- Parameters THRESHOLD_HIGH/MED/LOW/NONE(pp%) allow to customize the warning thresholds at different, dynamic severities. Default values are: THRESHOLD_HIGH(85%),THRESHOLD_MED(70%)
- INTERVAL is 00:10 (minutes), SEVERITY is dynamic
- References: Lineitem FP0565

Check Details – (IBMPFA,PFA_PRIVATE_STORAGE_EXHAUSTION)

- Checks if there is a potential for private virtual storage to be exhausted by any address space in the future
- Three classes of private storage exhaustion are detected:
  - Spike, Leak, and Creep
- This check replaces the previously removed Slots & Frames check

- For more details see the separate PFA T3 session
- References: Lineitem FP0657

Check Details – (IBMRACF, RACF_CSFKEYS_ACTIVE)

- Checks if the CSF**KEYS** RACF resource class is active
- IBM recommends to protect cryptographic **keys** via profiles in this class

- INTERVAL is 24:00 (hours), SEVERITY is MEDIUM
- References: Lineitem FP0786, APAR OA44696

Check Details – (IBMRACF, RACF_CSFSERV_ACTIVE)

- Checks if the CSF**SERV** RACF resource class is active
- IBM recommends to protect cryptographic **services** via profiles in this class

- INTERVAL is 24:00 (hours), SEVERITY is MEDIUM
- References: Lineitem FP0786, APAR OA44696

Check Details – (IBMRACF, RACF_ENCRYPTION_ALGORITHM)

- Checks that a “secure” password authentication algorithm is in effect.
- The older algorithms are known to be less secure and anything but KDFAES will now result in a check exception.

- INTERVAL is 24:00 (hours), SEVERITY is MEDUM
- References: Lineitem FP0796, APAR OA45608, ICN 1339

Check Details – (IBMRACF, RACF_PASSWORD_CONTROLS)

- Examines password policies
- IBM recommends to
  - enable mixed-case passwords to extend the size of the key space
  - set the invalid password revocation count to three or less
  - set the maximum number of days a user's password/passphrase is valid to at most 90 days
  - enable the INITSTATS function, to enable other options which enhance logon security
- Check parameters allow to customize the different policies:
  - MIXEDCASE(**YES**|NO)
  - REVOKE(nnn), with nnn being the number of allowed consecutive unsuccessful logon attempts, with a default of **3**
  - INTERVAL(nnn), with nnn being the max number of days a password is valid, with a default of **90**
  - INITSTATS(**YES**|NO)
- INTERVAL is 24:00 (hours), SEVERITY is MEDIUM
- References: Lineitem FP0796, APAR OA45608

Check Details – (IBMRACF, RACF_RRSF_RESOURCES)

- Checks the security attributes of the INMSG/OUTMSG workspace data sets for the RRSF (RACF remote sharing facility) node
- The security attribute checking is functionally equivalent to that done by the RACF_SENSITIVE_RESOURCES data set checking. As its own check, this check can be marked disabled when the check is unable to retrieve RRSF node information due to an authority error when the Health Checker user ID does not have r_admin access

- INTERVAL is 4:00 (hours), SEVERITY is HIGH
- References: Lineitem FP0798

Check Details – (IBMRACF, RACF_SENSITIVE_RESOURCES)(updated)

- Now examines additional general resources:
  - The ICSF PKDS, CKDS, and TKDS data sets (if present)
  - Additional z/OS UNIX resources
    - In class FACILITY: BPX.FILEATTR.SHARELIB, BPX.JOBNAME, BPX.POE, BPX.SMF, BPX.STOR.SWAP, BPX.UNLIMITED.OUTPUT
    - In class UNIXPRIV: SUPERUSER.IPC.RMID, SUPERUSER.FILESYS.PFSCTL, SUPERUSER.FILESYS.QUIESCE, SUPERUSER.FILESYS.VREGISTER, SUPERUSER.SETPRIORITY
    - In class SURROGAT: BPX.SRV.userid
- INTERVAL is 4:00 (hours), SEVERITY is HIGH
- References: Lineitems FP0786, FP0796, FP0798, APAR OA44696 (ICSF)

Check Details – (IBMSUP, SUP_SYSTEM_SYMBOL_TABLE_SIZE)(updated)

- Checks to see whether the (used) size of the static system symbol table has exceeded a given threshold.
  - Minor update in V2R2 for increased max symbol table size

- Check parameter 'LIMIT(n|p%)', with a default of 85%, allows to adjust the threshold to a number of bytes, up to **57088** ~~32512~~, or a percentage (of those **57088** ~~32512~~ bytes).

- INTERVAL is ONETIME (and after successful SETLOAD xx,IEASYM)
- SEVERITY is LOW
- References: Lineitem FP0756

Check Details – (IBMTSOE, TSOE_OPERSEWAIT_SETTING)

- Examines the OPERSEWAIT setting from the IKJTSOxx (TSO/E commands and programs) parmlib member, if explicitly specified
- IBM recommends to not use OPERSEWAIT ON, which causes the OPERATOR SEND command to by default be issued with WAIT when no WAIT/NOWAIT is explicitly specified on the SEND
  - Depending on the resources and storage held by the SEND issuer a WAIT creates the potential for resource contention and storage shortages as the SENDers wait for the message to be delivered to an unresponsive user.
- This aligns with the default of OPERSEWAIT switching from ON to OFF in z/OS 2.2
- Check parameter '{**OFF**|ON}' allows to adjust the effective OPERSEWAIT state to check for
- INTERVAL is ONETIME, SEVERITY is LOW
- References: Lineitem FP0526

Check Details – (IBMUSS, USS_KERNEL_PVTSTG_THRESHOLD)(updated)

- Monitors availability of (***below the bar****) private storage in the kernel.
- Some UNIX System Services syscalls will fail if insufficient storage is available, which can result in an outage.
- Check parameter 'PVTSTG(*nn*%)' controls when the check signals an exception about private storage being used up to a certain percentage. Default is 85%.
  - Now also with ***dynamic severity**** PVTSTG_**HIGH**/PVTSTG_**MED**/PVTSTG_**LOW**/PVTSTG_**NONE**(pvtstg%)
- INTERVAL is 0:02 (minutes), default SEVERITY is LOW
- References: Lineitem FP0182

Check Details – (IBMUSS, USS_KERNEL_RESOURCES_THRESHOLD)

- Monitors the current usage of z/OS UNIX System Services kernel resources (and dependent items, like number of threads), when KERNELSTACKS(ABOVE) is active
- Running out of z/OS UNIX System Services kernel resources can cause system calls to start failing
- Check parameters KRES_HIGH, KRES_MED, KRES_LOW, and KRES_NONE allow to adjust the resource thresholds (in percent used) for the check's dynamic check exception severity with defaults KRES_HIGH(90%), KRES_MED(85%), KRES_LOW(80%)

- INTERVAL is 00:02 (minutes), SEVERITY is HIGH
- References: Lineitem FP0182

Check Details – (IBMUSS, USS_KERNEL_STACKS_THRESHOLD)(updated)

- Monitors the kernel supply of stack (autodata) cellpool cells.
- Some UNIX System Services syscalls will fail if insufficient storage is available, which can result in an outage.
- Check parameter 'STACKS(*nn*%)' controls when the check signals an exception about cellpool cells being used up to a certain percentage. Default is 85%.
- *Updated to be automatically **disabled*** when **KERNELSTACKS(ABOVE)** is active*

- INTERVAL is 0:02 (minutes), SEVERITY is LOW (dynamic)
- References: Lineitem FP0182

Check Details – (IBMXCF,XCF_CF_SCM_UTILIZATION)

- Informs an installation when CF SCM (coupling facility storage-class memory) has reached certain usage thresholds.
- This is to ensure that the system will still be able to provide additional CF capacity when needed during peak processing periods as well as to provide relief when CF real storage capacity becomes constrained.
- Check parameters SCM_NONE, SCM_LOW, SCM_MED, and SCM_HIGH allow to assign a dynamic check exception severity based on SCM usage percentage, with a default of SCM_MED(80%)
- INTERVAL is 01:00 (hour), default SEVERITY is MEDIUM
- References: Lineitem LI2069, APAR OA40747 (check for supersedes)

Check Details – (IBMXCF,XCF_CF_STR_MAXSCM)

- Compares the total SCM (storage-class memory) configured to the CF (coupling facility) to the sum of the SCM eligible to be assigned to allocated CF structures.
- Avoids possible over- commitment of SCM by the CF.

- INTERVAL is 08:00 (hours), SEVERITY is LOW
- References: Lineitem LI2069, APAR OA40747 (check for supersedes)

Check Details – (IBMXCF,XCF_CF_STR_MAXSPACE)

- Compare the resources (real storage...) available to the coupling facility to the sum of the maximum structure sizes and estimated augmented space values of allocated CF structure plus the total dump space.
- Avoids "over commitment" of real storage by the CF.

- INTERVAL is 08:00 (hours), SEVERITY is LOW
- References: Lineitem LI2069, APAR OA40747 (check for supersedes)

Check Details – (IBMXCF,XCF_CF_STR_SCM_UTILIZATION)

- Look for CF structures which exceed one of the specified storage-class memory (SCM) utilization thresholds.
- Exhausting structure assigned SCM may impact continuous availability, deplete additional structure capacity when needed during peak processing periods and provide relief when CF real storage allocated to the structure becomes constrained.
- Check parameters SCM_NONE, SCM_LOW, SCM_MED, and SCM_HIGH allow to adjust the thresholds for the dynamic check exception severity, with a default of SCM_LOW(1), SCM_MED(80), and the values being “percentage used”.

- INTERVAL is 00:15 (minutes), default SEVERITY is MEDIUM
- References: Lineitem LI2069, APAR OA40747 (check for supersedes)

Check Details – (IBMXCF,XCF_CF_STR_SCMMAXSIZE)

- Checks for the storage-class memory (SCM) available for assignment by a CF (coupling facility) to an allocated structure being equal to the SCMMAXSIZE value of a CFRM policy structure definition.

- INTERVAL is 08:00 (hours), SEVERITY is MEDIUM
- References: Lineitem LI2069, APAR OA40747 (check for supersedes)

Check Details – (IBMXCF,XCF_CF_STR_SCM_MINCOUNTS)

- Check that the number of structure objects allocated to a structure meets the required minimum for structures that can be duplexed according to the CFRM active policy.
- A minimum number of structure objects is required to allocate a structure with a non-zero SCMMAXSIZE. But once allocated, the coupling facility may initiate reapportionment in order to perform migration from SCM (storage-class memory). Such reapportionment may cause a structure object count to go below the minimum.
- When allocating a new structure instance to establish duplexing for a structure that does not currently meet the minimum for a non-zero SCMMAXSIZE, the new structure instance will be allocated with a zero SCMMAXSIZE – a value that is inconsistent with the CFRM policy SCMMAXSIZE value.
- INTERVAL is 04:00 (hours), SEVERITY is LOW
- References: Lineitem LI2069, APAR OA40747 (check for supersedes)

Check Details – (IBMXCF,XCF_CF_STR_SCM_AUGMENTED)

- Check for CF structures that have residual in-use augmented space (real storage) after all structure objects are removed from storage-class memory (SCM).
- Residual augmented space, which was required for SCM administration before, prevents alter processing from dynamically adjusting CF structure storage usage.

- INTERVAL is 04:00 (hours), SEVERITY is LOW
- References: Lineitem LI2069, APAR OA40747 (check for supersedes)

Check Details – (IBMZFS,ZFS_CACHE_REMOVALS)

- Looks for user specified zFS IOEFSPRM configuration options METABACK_CACHE_SIZE, CLIENT_CACHE_SIZE, and TRAN_CACHE_SIZE
- Client cache and transaction cache will no longer be supported in z/OS V2R2 and later.
- Metaback cache options are recommended to be removed since the metaback cache is combined with the meta data cache in V2R2
- Check parameters METABACK, CLIENT, and TRANS allow to specify if the check should succeed if the options are absent or exist, with the default being:
  METABACK(ABSENCE), CLIENT(ABSENCE),TRANS(ABSENCE).
- INTERVAL is ONETIME, SEVERITY is LOW
- Reference: Lineitem FP0190, ICN 1370

Check Details – (IBMZFS,ZFS_VERIFY_CACHESIZE)(updated)

- Checks the settings for IOEFSPRM configuration options META_CACHE_SIZE, METABACK_CACHE_SIZE and USER_CACHE_SIZE.
- Running with a very small cache size could affect zFS performance.
- *Updated* to take into account the new METABACK vs META cache size logic and the zFS storage management logic

- INTERVAL is ONETIME, SEVERITY is LOW
- Reference: Lineitem FP0190, ICN 1370

Check Details – (IBMZMIG, ZOSMIG_HTTP_SERVER_DOMINO)

- Checks which HTTP server is in use
- The “IBM HTTP Server Powered by Domino” is being removed in z/OS V2R2
- IBM recommends to migrate to the “IBM HTTP Server Powered by Apache”

- INTERVAL is 168:00 (one week), SEVERITY is MEDIUM
- Reference: http://www.ibm.com/systems/z/os/zos/installation/
  - Note: This check is not shipped with any z/OS product or APAR, but has to be downloaded from the above web site

Presentation Summary

- The list of “regular” health checks and migration checks is growing, helping to keep your system healthy and to ease the migration to new z/OS releases.

Appendix

- Related Publications
  - "IBM Health Checker for z/OS User's Guide" (SC23-6843)
    - Includes an inventory of all IBM health checks known at publication time
  - "Exploiting the Health Checker for z/OS infrastructure"
    - Redpaper 4590