Installing RACF for the First Time

*For z/VM 5.4 and 6.1*

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Introduction

The RACF Security Server for z/VM

• A priced, optional, pre-installed feature of z/VM
  • For all current releases - 5.4 and 6.1
• Licensed under International Program License Agreement (IPLA) terms and conditions
• Pricing is based on engine-based Value Units and is available for both IFL and standard processor configurations.
• RACF releases are specific to the release of z/VM
  • The level of RACF and CP must be the same
Configuration guidelines

• What RACF settings and options do you enable?
• What needs to be controlled and audited in z/VM?
• Who decides this? Do you?
  • Answer: Probably not you.

• Use your company security policy
  • It is the overall guideline for IT security in your company
  • You decide how RACF is configured based on its requirements
  • In other words – you are not the policy maker
    • You implement the policy
Installation

- No need – it is pre-installed!
- But, it is disabled by default
  - You enable it if you have a license
- The program directory is the main guide
  - Please read it!
- This presentation does not cover all topics
- More background about configuration in the RACF documentation
  - See z/VM: RACF Security Server Security Administrator’s Guide

- This presentation is mainly to prepare first time installers
  - But – if you have it already installed, don't leave!
  - I make some choices that you may want to do on your system
User ids defined for RACF/VM

These are predefined on a new z/VM system installation

- **RACFVM**
  - The main production security server
- **RACMAINT**
  - Test the installation of RACF
  - Test applied service
- **5VMRAC40 or 6VMRAC10**
  - Name is derived from the z/VM version and release
  - Owns all the minidisks that hold RACF code
  - In this presentation, any reference to 6VMRAC10 can be replaced with 5VMRAC40 for z/VM 5.4 systems
User ids defined for RACF/VM

- **RACFSMF**
  - Management of RACF audit log files
- **IBMUSER**
  - Used for the initial setup of RACF
- **SYSADMIN**
  - Sample security administration user
- **MAINT**
  - Maintenance of all z/VM components
- **BLDRACF**
  - Used to rebuild CST, the special version of CMS used by RACF
Overview

• If you will also activate DIRMAINT:
  • I prefer to activate and configure RACF first

• Prepare your system for RACF
  • Use RACF utilities to migrate definitions from the CP directory

• Enable RACF
  • This will create a new CP Nucleus with RACF enabled

• Shutdown and IPL z/VM from parm disk 2

• Start RACF in maintenance mode and initialize

• Configure RACF

• Start RACF in production mode
Prepare your VM directory

- Check your VM directory. Look for:
  - Duplicate user ids, if you have more than one VM system
    - In case you share the RACF database
    - The same user id must be owned by the same person
  - Unacceptable characters in user ids
    - No dash (-), plus (+), colon (:), or underscore (_).
  - Group names on POSIXGROUP statements
    - RACF does not support mixed case group names
    - The RACF utility automatically handles the VM default names
  - ACIGROUP statements
    - If you have these, read the RACF program directory
  - NICDEF statements
    - You must define and give permission manually
Prepare your VM directory, continued

- My suggestion: Update user 6VMRAC10
  - Add OPTION LNKNOPAS
  - This will make it easier to activate RACF
- If DIRMAINT will be activated later
  - Change password of NOLOG to a real password
    - Userids: DIRMAINT, DATAMOVE, DIRMSAT
- Consider adding user ids for security roles
  - For example, SYSAUDIT for the system auditor
    - Sample id SYSADMIN already exists for the security administrator
- Run DIRECTXA to put these changes online
Migrate CP directory data to RACF

- Logon to the 6VMRAC10 user id
  - Access your source CP directory:
    - VMLINK MAINT 2CC
  - Access the RACF utilities
    - ACC 505 E
- Run RPIDIRCT EXEC to scan the source directory
  - RPIDIRCT USER DIRECT
    - Accept the default group ID of “SYS1”
    - Reads the CP directory source file, creates RACF commands
- Output file is RPIDIRCT SYSUT1
  - No database changes are made by RPIDIRCT
  - We will examine and edit this file
Editing RPIDIRCT SYSUT1

• You can make alterations to this file
  • Add definitions and permissions that are missing
  • Remove definitions and permissions that you don't want
  • Alter initial passwords

• RACF commands found in this file
  • ADDUSER - Defines a user to RACF
  • RDEFINE - Defines a resource
  • PERMIT - Allows a user access to a resource

• Resources defined by this file
  • VMMDISK - VM Minidisks
  • VMBATCH - Alternate userid
  • VMRDR - Ability to SPOOL TO the user
Handling of passwords from your directory

RPIDIRCT SYSUT1 defines your users to RACF

• User's initial password is the one in their directory entry
  • The password is temporary and must be changed at the first logon
  • No special password handling
    • NOLOG users have an initial password of ”NOLOG”!
    • However – z/VM prevents logon and spooling to NOLOG users

• Special password processing for directory password of “UNLOG”
  • Defined with password of “UNLOG” and the user is REVOKED
  • A revoked user cannot logon to the system

• Potential problem: What if “NOLOG” is removed from a user's CP directory entry?
  • Someone could log in using password of NOLOG!
  • We will fix this on a later step... after a small detour
Introduction to Generic resources

- Resources defined by the RPIDIRCT file are specific
  - Owned by a single userid
  - For minidisks – a specific virtual address
  - In RACF terms – a “discrete profile”

- RACF also supports generic resources
  - A lot like wildcard matching of file names
  - Permissions to discrete profiles have priority, however

- Example
  - Define a generic resource which is “all of MAINT's minidisks”
    - RAC RDEFINE VMMDISK MAINT.* OWNER(MAINT) UACC(NONE)
  - Give a user read/write access to all of MAINT's disks
    - RAC PERMIT MAINT.* CLASS(VMMDISK) ID(MAINT2) ACCESS(CONTROL)
Generic resources

• Enabled via RACF options (SETROPTS command)
  • GENCMD(classes)
    • Allows generic profiles to be specified in commands
    • You can create generic profiles before making them active
  • GENERIC(classes)
    • Activates generic profile checking for specified classes
    • Also allows generic profiles in commands
• Not enabled on any classes by default
  • Due to extra searching, and not part of old RACF systems
• This can make managing your system easier!
  • Fewer resources to define and manage
  • Some resources only need controls for the exceptions
Candidates for Generic Resources

VMRDR (spooling)

- To send a file to another user, you must be permitted in RACF to “update” their reader
  - i.e. SPOOL PUN TO user, SPOOL PRT TO user, TRANSFER TO user, CLOSE TO user
- Without permission, the command fails
- A security policy may not require this control for most users
- Use a single generic resource instead of a definition per user
- If there are exceptions -- create specific resources for control
- Example: Service machine that accepts commands via reader files
  - Deny access to everyone by default with a generic permission
  - Create specific permissions allowing access as needed
Generic Resources, continued

VMBATCH (set alternate user)

- These days, mostly used by FTPSERVE, the VM ftp server
- Allows FTPSERVE to access your resources on your behalf – e.g. when you “log in” via FTP
  - Instead of giving FTPSERVE explicit permission to your resources
- FTPSERVE uses Diag D4 to ask CP to set its alternate user to your user id
  - If FTPSERVE has permission from RACF to your VMBATCH resource, CP allows it to be set
  - Now FTPSERVE can access any resource you have permission for
- Maybe a single generic resource is a good idea here?
  - ...instead of a permit needed for each user on the system
- Exceptions for critical users such as MAINT can be defined
Now back to RPIDIRCT SYSUT1 !!

- References to VMBATCH and VMRDR in file
  - Use a generic resource for each one instead
    The actual resources will be defined later
  - Remove the file lines that reference VMBATCH and VMRDR

- References to users with a password of NOLOG
  - The utility sets the RACF password to “NOLOG”
    - It is better to not set a password at all
  - Change references of PASSWORD(NOLOG) to NOPASSWORD

- Edit the file and make these changes
  - Now is the best time to do it!
  - If you have AUTOONLY or LBYONLY users – consider making
    the same change to NOPASSWORD
Edit RPIDIRCT SYSUT1

Use XEDIT to make these changes

- Xedit RPIDIRCT SYSUT1
- case upper ignore
- change /password(nolog)/nopassword/* *
- Remove references to vmbatch
  - top
  - all /rdefine vmbatch/
  - delete *
  - top
  - all /class(vmbatch)/
  - delete *
- Repeat these commands for vmrdr instead of vmbatch
- file
Enable processing of SMF records

• This is the next step in the program directory
  • SMF processing is not discussed in today's presentation!
  • It is not necessary to set it up to get RACF working
    • It can be done later
  • However, it is important to set up this processing for your production system

• Come to my Thursday presentation!
  • Session 9455, Thursday, August 11: 3:00 PM-4:00 PM
  • Advanced Configuration and Auditing with RACF on z/VM

• We are done with 6VMRAC10
  • You may now log off
Enable the RACF/VM product

- The RACF product must be enabled
  - Updates to the SYSTEM CONFIG file
- CP must be rebuilt with the RACF modules included
- The SERVICE EXEC does all this for you
  - Log on to MAINT
  - Enter SERVICE RACF ENABLE
  - Check for errors using command VMFVIEW SERVICE
- The rebuilt CP nucleus is ready for testing
  - Placed on the secondary parm disk (MAINT CF2)
  - SYSTEM CONFIG updated to enable RACF/VM on all parm disks
RelIPL your system

- IPL using parameter disk 2
  - Shutdown your system
  - Bring up the Load screen on the HMC
    - Specify the address of the IPL volume
    - Specify a console address to show the stand alone loader
      - *This is the Load Parm*
      - *Use SYSG to use the integrated 3270 HMC console*
  - When the Standalone Loader screen appears
    - Change the “Extent” to 2
    - Specify a load parm of PROMPT
    - Optionally specify a console address
    - Press PF10 to load
Sample Load screen
Sample Standalone Loader screen

STAND ALONE PROGRAM LOADER: z/VM VERSION 6 RELEASE 1.0

DEVICE NUMBER: 8138    MINIDISK OFFSET: 00000000    EXTENT: 2

MODULE NAME: CPLOAD    LOAD ORIGIN: 2000

--------------------------IPL PARAMETERS--------------------------
prompt_

--------------------------COMMENTS--------------------------

9= FILELIST 10= LOAD 11= TOGGLE EXTENT/OFFSET
Sample VM startup

10:41:22 z/VM V6 R1.0 SERVICE LEVEL 0901 (64-BIT)
10:41:23 SYSTEM NUCLEUS CREATED ON 2010-02-22 AT 10:05:47, LOADED FROM 610RES
10:41:23
10:41:23 **************************************************************
10:41:23 * LICENSED MATERIALS - PROPERTY OF IBM*                    *
10:41:23 *                                                        *
10:41:23 * 5741-A07 (C) COPYRIGHT IBM CORP. 1983, 2009. ALL RIGHTS   *
10:41:23 * RESERVED. US GOVERNMENT USERS RESERVED RIGHTS - USE,       *
10:41:23 * DUPPLICATION OR DISCLOSURE RESTRICTED BY GSA ADP SCHEDULE *
10:41:23 * CONTRACT WITH IBM CORP.                                 *
10:41:23 *                                                         *
10:41:23 * * TRADEMARK OF INTERNATIONAL BUSINESS MACHINES.          *
10:41:23 **************************************************************
10:41:23
10:41:23 HCPZC06718I Using parm disk 2 on volume 610RES (device 8138).
10:41:23 HCPZC06718I Parm disk resides on cylinders 159 through 278.
10:41:23 Start [(Warm|Force|COLD|CLEAN) (D Rain) (D Iable) (N ODIRECT)
10:41:23 (NOAUTOlog)] or (SHUTDOWN)

cp read zvmv6r10
warm noautolog
Sample VM startup - continued

10:42:07 WARM NOAUTOLOG
10:42:07 NOW 10:42:07 EST MONDAY 2010-02-22
10:42:07 Change TOD clock (Yes|No)
10:42:08 NO
10:42:08 The directory on volume 610RES at address 8138 has been brought online.
10:42:10 HCPWRS2513I
10:42:10 HCPWRS2513I Spool files available 44
10:42:11 HCPWRS2512I Spooling initialization is complete.
10:42:11 DASD 8139 dump unit CP IPL pages 21220
10:42:11 HCPAAU2700I System gateway ZVMV6R10 identified.
10:42:13 z/VM Version 6 Release 1.0, Service Level 0901 (64-bit),
10:42:13 built on IBM Virtualization Technology
10:42:13 There is no logmsg data
10:42:13 FILES: NO RDR, 0004 PRT, NO PUN
10:42:13 LOGON AT 10:42:13 EST MONDAY 02/22/10
10:42:13 GRAF 400C LOGON AS OPERATOR USERS = 1
10:42:13 HCPIOPI952I 3G system storage
10:42:13 FILES: 0000011 RDR, 0000005 PRT, NO PUN
10:42:13 HCPCRC8082I Accounting records are accumulating for userid DISKACNT.
10:42:13 HCPCRC8082I EREP records are accumulating for userid EREP.

xautolog racmaint_
Start up VM

• At the startup prompt, enter:
  • WARM NOAUTOLOG
  • This prevents any other guests from starting

• Once the system is up, enter:
  • XAUTOLOG RACMAINT

• RACF is now started with its initial database
  • A small set of basic profiles

• Disconnect from the Operator
  • DISC
Initialize the RACF database

- Only user IBMUSER is defined
  - User has full RACF authority “SPECIAL”
  - Already links to 6VMRAC10 191, to read RPIDIRCT SYSUT1
  - We use this user to build the database

- Logon to IBMUSER
  - Password is SYS1
  - The password is expired, you must change it.
    - Enter `newpass/newpass` when prompted
  - Ignore error messages from RACF
Load the initial RACF Database

- Access the RACF code disks
  - ACCESS 305 C
    - This is 6VMRAC10 505 – Test code for server
  - ACCESS 192 B
    - This is 6VMRAC10 191 – Contains RPIDIRCT SYSUT1
  - ACCESS 29E D
    - This is 6VMRAC10 29E – Test code for general users
- Run RPIBLDDS
  - This reads RPIDIRCT SYSUT1 B
    - Enter: RPIBLDDS RPIDIRCT
    - Clear the screen several times
- Your database is initialized!
Define the security admin and auditor

• Best practice is to separate these duties
  • Security Administrator: SYSADMIN
    • RACF attribute: SPECIAL
    • Included in the initial z/VM directory for this role
  • Security Auditor: SYSAUDIT, RACAUDIT, or AUDITOR
    • RACF attribute: AUDITOR
    • Note: AUDITOR exists in the initial z/VM directory, but is intended to run the AUDITOR monitoring utility. The others are not defined and you would have to add one of them to your system.
• This can easily be changed later on
• The role of MAINT is to maintain the RACF/VM code
  • And of course, the other components of z/VM
Still using IBMUSER

- Define the roles to RACF
  - Note: Using a RACF command session started with the RACF command
  - RACF
    - ALTUSER SYSADMIN SPECIAL
    - ALTUSER SYSAUDIT AUDITOR
    - ALTUSER MAINT OPERATIONS
    - ALTUSER BLDSEG OPERATIONS
  - END
  - Notes:
    - The OPERATIONS attribute allows MAINT to access resources without a PERMIT
    - User BLDSEG is part of the service process
- We are now done with IBMUSER
  - LOGOFF from this id
Revoke access to IBMUSER

- IBMUSER has no further purpose
  - But this id cannot be deleted from the RACF database
- Log on to your security administrator id
  - LOGON SYSADMIN
    - You will have to set a new password during logon
  - LINK 6VMRAC10 29E 29E RR
  - ACCESS 29E D
    - The RACF code is not on the production Y disk yet
- Make IBMUSER unusable
  - Note: Using the RAC command to enter a single RACF command
    - The RAC command is the recommended command interface
  - RAC ALTUSER IBMUSER REVOKE
  - RAC ALTUSER IBMUSER NOOPERATIONS NOSPECIAL
Setting RACF options

• The **SETROPTS** command sets RACF options
  • There are a lot of options!

• Most resource classes are inactive until activated
  • The CLASSACT subcommand of SETROPTS activates classes
    • RAC SETROPTS CLASSACT(class)

• Some classes are always active
  • USER (allows LOGON and XAUTOLOG commands)
  • TERMINAL (allows you to log in via a terminal)

• The next chart lists some of the classes
  • The complete list is in Appendix B of the Language Reference
## Most common classes on z/VM

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMBATCH</td>
<td>Allows use of DIAG D4 (alternate userid)</td>
</tr>
<tr>
<td>VMCMD</td>
<td>Certain CP commands and other requests</td>
</tr>
<tr>
<td>VMLAN</td>
<td>Permission to connect to VSWITCH and Guest LANs</td>
</tr>
<tr>
<td>VMMDISK</td>
<td>Minidisks</td>
</tr>
<tr>
<td>VMNODE</td>
<td>Allows you to target other VM nodes via RSCS</td>
</tr>
<tr>
<td>VMRDR</td>
<td>Allows you to target other users via spooling commands</td>
</tr>
<tr>
<td>VMSEGMT</td>
<td>Allows access to restricted saved segments</td>
</tr>
<tr>
<td>VMXEVENT</td>
<td>Event profiles for commands and auditing</td>
</tr>
<tr>
<td>FACILITY</td>
<td>Allows a virtual machine to use the RACROUTE interface.</td>
</tr>
<tr>
<td>SURROGAT</td>
<td>Shared user ids (LOGON BY)</td>
</tr>
</tbody>
</table>
Activating classes

- The classes I need active on my system are:
  VMMDISK, VMLAN, VMCMD, VMRDR, VMBATCH
  - SETROPTS CLASSACT(VMMDISK VMLAN VMCMD VMRDR VMBATCH)
  - I will activate VMXEVENT and FACILITY also later on

- VMCMD, VMRDR and VMBATCH are discussed later

- VMMDISK resources were created via the RPIDIRCT file

- VMLAN resources control connections to a vswitch
  - A resource must be created for each one and permissions granted
  - Examples:
    - RDEFINE VMLAN SYSTEM.VSWITCH1 UACC(NONE)
    - PERMIT SYSTEM.VSWITCH1 CL(VMLAN) ID(TCPIP) AC(UPDATE)
    - PERMIT SYSTEM.VSWITCH1 CL(VMLAN) ID(LINUX1) AC(UPDATE)
    - Note that VMLAN resources also apply to restricted guest lans
## VMCMD class

Resources protected by the VMCMD class

<table>
<thead>
<tr>
<th>VMCMD Profile Name</th>
<th>What It Protects</th>
</tr>
</thead>
<tbody>
<tr>
<td>STORE.C</td>
<td>STORE HOST command</td>
</tr>
<tr>
<td>TRSOURCE</td>
<td>TRSOURCE command</td>
</tr>
<tr>
<td>DIAG0E4</td>
<td>Diagnose code X'E4' (Minidisk query and define)</td>
</tr>
<tr>
<td>XAUTOLOG.&lt;userid&gt;</td>
<td>XAUTOLOG command by a class G user</td>
</tr>
<tr>
<td>DIAG088</td>
<td>Diagnose code X'88' (all subcodes) (DMSPASS)</td>
</tr>
<tr>
<td>DIAG0A0.HRTSTORE</td>
<td>Diagnose code X'A0' Subcode X'34' (security labels)</td>
</tr>
<tr>
<td>DIAG0A0.QUERYSEC</td>
<td>Diagnose code X'A0' Subcode X'30' (query label)</td>
</tr>
<tr>
<td>DIAG0A0.VALIDATE</td>
<td>Diagnose code X'A0' Subcodes X'04' and X'3C' (Validate userid and password or pass phrase)</td>
</tr>
<tr>
<td>RAC</td>
<td>RAC command processor</td>
</tr>
<tr>
<td>RACF</td>
<td>RACF command session</td>
</tr>
</tbody>
</table>
VMCMD examples

- No VMCMD resources are defined by default
  - Exception: RAC and RACF commands are UACC(READ)
    - Everyone is allowed to use them
  - The default settings defer permission checking to CP
  - CP uses directory entries or privilege classes for permission
- To control commands, define a resource then give permission
  - Example: protecting STORE HOST
    - RDEFINE VMCMD STORE.C UACC(NONE)
    - Allow MAINT to use this command
      - PERMIT STORE.C CLASS(VMCMD) ID(MAINT) ACCESS(READ)
  - Example: allow a general user to use XAUTOLOG
    - RDEFINE VMCMD XAUTOLOG.LINUX UACC(NONE)
    - PERMIT XAUTOLOG.LINUX CLASS(VMCMD) ID(BRUCE) AC(READ)
Allowing DIAG 88 for TCPIP servers

- Create DIAG088 resource in VMCMD class
  - RAC RDEFINE VMCMD DIAG088 UACC(NONE)
- Give servers permission to perform password validation using the CMS facility DMSPASS
  - RAC PERMIT DIAG088 CLASS(VMCMD) ID(FTPSERVE IMAP VMNFS REXECD) ACCESS(READ)
- Allow servers to use RACROUTE
  Permission to use RACROUTE is resource name ICHCONN in class FACILITY
  - RAC SETROPTS CLASSACT(FACILITY)
  - RAC RDEFINE FACILITY ICHCONN UACC(NONE)
  - RAC PERMIT ICHCONN CLASS(FACILITY) ID(FTPSERVE VMNFS REXECD) ACCESS(UPDATE)

- You must also read:
  Appendix A of *TCP/IP Planning and Customization*
Using Generic resources for some classes

- **Use for VMRDR and VMBATCH**
  - RAC SETROPTS CLASSACT(VMRDR VMBATCH)
  - RAC SETROPTS GENCMD(VMRDR VMBATCH)
  - RAC SETROPTS GENERIC(VMRDR VMBATCH)

- **VMRDR** – permit access to all virtual readers
  - RAC RDEFINE VMRDR * UACC(UPDATE)
    - Makes default permission “update”, which allows access

- **VMBATCH** – allow some servers to act for others
  - RAC RDEFINE VMBATCH * UACC(NONE)
    - Default permission defined as no access
  - RAC PERMIT * CLASS(VMBATCH) ID(FTPSERVE VMNFS REXECED) ACCESS(CONTROL)
    - Allow FTPSERVE, VMNFS, and REXECED to act on behalf of any user
Exceptions to generic resources (examples)

Remember that a discrete profile overrides a generic one

- Restrict reader access to a service machine
  - Define the resource with no default access allowed
    - RAC RDEFINE VMRDR OPERATOR UACC(NONE)
  - Allow an authorized user to send files
    - RAC PERMIT OPERATOR CL(VMRDR) ID(PERFSVM) AC(UPDATE)

- Restrict FTP server's access to MAINT's resources
  - A discrete permission (PERMIT) overrides a generic permission or universal access (UACC)
  - An access permission of NONE overrides any higher permission
    - RAC RDEFINE VMBATCH MAINT UACC(NONE)
    - RAC PERMIT MAINT CLASS(VMBATCH) ID(FTPSERVE) ACCESS(NONE)
Define your password rules

- **SETROPTS PASSWORD**(options)
  - Many options to chose from
    - Reuse of old passwords (HISTORY)
    - Maximum time before change (INTERVAL)
    - Mixed case allowed (MIXEDCASE)
    - Number of guesses (REVOKE)
    - Expiration warning messages (WARNING)
    - Password syntax rules (RULE)
  - Example: 90 day interval, 4 attempts, no repeat on last 4 passwords

  RAC SETROPTS PASSWORD(INTERVAL(90) HISTORY(4) REVOKE(4) NORULES)
Authorization Checking for z/VM Events

- VM may call RACF for authorization checking of certain z/VM events
- You may not require checking of some of these
  - It depends on your system security policy!
- Event profiles define the authorization checks
  - Profile for the entire system
  - Profiles for individual users (overrides system profile)
- By default, RACF checks all of these events
  - Listed on the next 2 charts
List of controlled events

<table>
<thead>
<tr>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COUPLE.G</td>
<td>Couple to restricted guest lan or VSWITCH</td>
</tr>
<tr>
<td>FOR.C</td>
<td>FOR command, IBMclass C</td>
</tr>
<tr>
<td>FOR.G</td>
<td>FOR command, IBMclass G</td>
</tr>
<tr>
<td>LINK</td>
<td>LINK command or directory statement</td>
</tr>
<tr>
<td>MDISK</td>
<td>Directory statement or LINK to own minidisk</td>
</tr>
<tr>
<td>STORE.C</td>
<td>STORE host memory command, IBMclass C</td>
</tr>
<tr>
<td>TAG</td>
<td>TAG command, for RSCS processing</td>
</tr>
<tr>
<td>TRANSFER.D</td>
<td>TRANSFER and CHANGE, IBMclass D</td>
</tr>
<tr>
<td>TRANSFER.G</td>
<td>IBMclass G spooling commands</td>
</tr>
<tr>
<td>TRSOURCE</td>
<td>TRSOURCE command</td>
</tr>
</tbody>
</table>
List of controlled events, continued

<table>
<thead>
<tr>
<th>Event Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPCPWVL</td>
<td>Used to verify passwords on APPC connect</td>
</tr>
<tr>
<td>DIAG088</td>
<td>Use of Diag 88 (Check auth and link minidisk)</td>
</tr>
<tr>
<td>DIAG0A0</td>
<td>Use of Diag A0 (Obtain ACI Groupname)</td>
</tr>
<tr>
<td>DIAG0D4</td>
<td>Use of Diag D4 (Set Alternate User ID)</td>
</tr>
<tr>
<td>DIAG0E4</td>
<td>Use of Diag E4 (Define Full-Pack Overlay)</td>
</tr>
<tr>
<td>DIAG280</td>
<td>Use of Diag 280 (Set POSIX security values)</td>
</tr>
<tr>
<td>RSTDSEG</td>
<td>Access to restricted saved segments</td>
</tr>
</tbody>
</table>
Creating event profiles

- To change the VM events checked by RACF, you must create an event profile
- The profiles have a dual purpose
  - Access checking
  - Auditing (not discussed here)
- Create a resource profile in the VMXEVENT class
  - The name can be anything you choose
  - More than 1 system profile can exist, but only 1 is active
  - Members are added to stop control of selected events
    - By default, all events are controlled
Resource profile for my system

• An example based on my needs for a lab system
  • *Note: Not based on IBM security policy!*

• I want RACF control of everything, except:
  • FOR command
    • Controlled by the SURROGAT profile. I only want to use SURROGAT for logon to shared user ids
  • TAG command
    • I have no restrictions on RSCS usage, no need to control TAG
  • Restricted segments
    • I will use the NAMESAVE authorization in the directory instead
  • User's own minidisks (in directory or via link command)
    • If it is yours, then no need for RACF to check your own access
RACF commands for my profile

• Create profile EVENTS1 in VMXEVENT

  RAC RDEFINE VMXEVENT EVENTS1
  RAC RALTER VMXEVENT EVENTS1 ADDMEM(FOR.C/NOCTL)
  RAC RALTER VMXEVENT EVENTS1 ADDMEM(FOR.G/NOCTL)
  RAC RALTER VMXEVENT EVENTS1 ADDMEM(TAG/NOCTL)
  RAC RALTER VMXEVENT EVENTS1 ADDMEM(RSTDSEG/NOCTL)
  RAC RALTER VMXEVENT EVENTS1 ADDMEM(MDISK/NOCTL)
  RAC SETROPTS CLASSACT(VMXEVENT)
  RAC SETEVENT REFRESH EVENTS1
Output from creating an event profile

• When profile is activated, default members are made active

SETEVENT REFRESH EVENTS1
RPISET113W TURNING CONTROL ON AUTOMATICALLY FOR: COUPLE
RPISET113W TURNING CONTROL ON AUTOMATICALLY FOR: LINK
RPISET113W TURNING CONTROL ON AUTOMATICALLY FOR: STORE.C
RPISET113W TURNING CONTROL ON AUTOMATICALLY FOR: TRANSFER.D
RPISET113W TURNING CONTROL ON AUTOMATICALLY FOR: TRANSFER.G
RPISET113W TURNING CONTROL ON AUTOMATICALLY FOR: TRSOURCE
RPISET113W TURNING CONTROL ON AUTOMATICALLY FOR: DIAG088
RPISET113W TURNING CONTROL ON AUTOMATICALLY FOR: DIAG0A0
RPISET113W TURNING CONTROL ON AUTOMATICALLY FOR: DIAG0D4
RPISET113W TURNING CONTROL ON AUTOMATICALLY FOR: DIAG0E4
RPISET113W TURNING CONTROL ON AUTOMATICALLY FOR: DIAG280
RPISET113W TURNING CONTROL ON AUTOMATICALLY FOR: DIAG290
RPISET113W TURNING CONTROL ON AUTOMATICALLY FOR: APPCPWVL
RPISET126I SETEVENT COMPLETED SUCCESSFULLY.

• You can explicitly define these members in the profile for completeness

RALTER VMXEVENT EVENTS1 ADDMEM(COUPLE.G/CTL LINK/CTL)
Event profiles for specific users

- Profiles can be created to override the system profile for specific users
  - They are named USERSEL.userid in the VMXEVENT class
- If a user profile exists, none of the system profile is active for that user
  - Make sure you create a complete user profile
- They are created just like the system profile
  - RAC RDEFINE VMXEVENT USERSEL.DATAMOVE
  - RAC RALTER VMXEVENT USERSEL.DATAMOVE
    ADDMEM(LINK/NOCTL TAG/NOCTL MDISK/NOCTL)
  - RAC SETEVENT REFRESH USERSEL.DATAMOVE
  - etc.
Copy RACF files to production

- The initial configuration of RACF/VM is complete
  - Now we will put the code on the production disks
- Logon to MAINT
- Run PUT2PROD
  - Copies RACF code to production disks
    - This includes code to MAINT 19E for the user interface
      - *Also known as the “Y disk”*
  - Updates CP Parm disk 1 (MAINT CF1) from CP Parm disk 2
    - Copies the RACF enabled CPLOAD MODULE from parm disk 2
  - Check for errors when it completes
    - VMFVIEW PUT2PROD
- **LOGOFF** of MAINT
Initialize RACFVM

- Reconnect to OPERATOR
  - This task must be done from the OPERATOR user id
- Stop all RACF maintenance ids
  - Probably only RACMAINT is running, but just to be sure:
    - FORCE 6VMRAC10
    - FORCE MAINT
    - FORCE RACMAINT
- Start up the production RACF server
  - XAUTOLOG RACFVM
    - This will also XAUTOLOG AUTOLOG2 (see next page)
- Disconnect from OPERATOR
Set up AUTOLOG1 and 2 user ids

- AUTOLOG1 is started as part of the z/VM IPL sequence
  - This is the z/VM default configuration
  - The PROFILE EXEC is used to execute CP commands
  - Perform any system wide CP settings here (Class A commands)
  - We need RACFVM started before any other users
    - CP XAUTOLOG RACFVM
    - CP LOGOFF
- RACFVM initializes and connects to CP
  - When it is running, it executes XAUTOLOG AUTOLOG2
- AUTOLOG2 will XAUTOLOG all other SVMs
  - Basically, the SVM start ups previously done by AUTOLOG1
  - Copy PROFILE EXEC from AUTOLOG1 to AUTOLOG2
- Change AUTOLOG1 to only start RACFVM
RACF/VM is now operational

- You may start service machines for testing
  - To start all of them, just XAUTOLOG AUTOLOG2
  - Determine if any need access to additional resources
- Your last IPL was from the second parm disk
  - The PUT2PROD process has now updated parm disk 1
    - CPLOAD MODULE and SYSTEM CONFIG
  - It would be a good idea to test a normal system IPL using parameter disk 1
    - On OPERATOR:
      - SHUTDOWN REIPL EXTENT 1
The End

• Thank you for listening!
• Session 9456
• Contact information

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References

- VM home page
  - http://www.vm.ibm.com

- z/VM Security and Integrity Resources

- z/VM Statement of Integrity

- VM documentation center
Other tasks

• How to define a new user
  • ADDUSER userid NAME('A. User') PASSWORD(password)
  • Password is expired, must be changed during logon

• How to reset a user's password:
  • RAC ALTUSER BRUCE PASSWORD(TEMP4YOU)
  • Password is expired, must be changed during the next logon

• How to delete various things:
  • Users: DELUSER userid
    • This does not delete resources owned by the user!
  • Resources: RDELETE resourcename
    • Any permissions to the resource are deleted also
  • Permissions: PERMIT ..... DELETE

• Changing resources
  • Use the RALTER command
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Notes:
Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user’s job stream, the I/O configuration, the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.
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