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“Is user a member of a group” – REXX function

The REXX function presented here determines whether the user invoking the function is a member of the RACF group specified as an argument. REXRACFG should be invoked from within an MVS REXX EXEC. The function accepts a single argument, namely the RACF group. This argument is mandatory. The function returns ‘true’ or ‘false’, and the variable, SYSREASON, will contain a character string providing more information, unless severe problems occur (lack of storage, etc).

In keeping with standard REXX practices, the group specified may be a variable. The value of the group must be from 1 to 8 bytes in length, and may be in upper or lower case.

The function returns an integer. This integer will indicate success or failure. An example of the function being invoked is as follows:

RC = REXRACFG(MVSSUPRT)

The different values that may be returned are as follows:

- -2 – IRXEXCOM; lack of storage
- -1 – IRXEXCOM; error condition
- 0 – NORMAL; false
- 1 – NORMAL; true.

If the return value is normal, the variable, SYSREASON, will contain a character string. The SYSREASON values are as follows:

- When RC = 1: user connected to group
- When RC = 0: user not connected to group
- Group name not 1 to 8 bytes
- Incorrect number of arguments
- No RACF profile for user
- IRXEXCOM error.
An example of the function being used is shown below.

```rexx
/* REXX ******************************************************/
say "Enter group";
pull GROUP;
if rexracfg(GROUP) then
    say SYSREASON GROUP;
else
    do;
        say "For group:" GROUP;
        say SYSREASON;
    end;
exit;

REXRACFG
TITLE 'REXX FUNCTION TO VALIDATE CONNECTION TO RACF GROUP'
PRINT NOGEN
*
* PROGRAM:      REXRACFG
* VALIDATE THAT THE USER IS CONNECTED TO A
* SPECIFIC RACF GROUP
*
* ATTRIBUTES:
* REENTRANT
* AMODE: 31
* RMODE: ANY
* AUTHORIZATION: NONE
*
* ABSTRACT:
* REXX FUNCTION REQUIRES A SINGLE ARGUMENT - THE RACF GROUP.
* THE FUNCTION WILL CHECK WHETHER THE USER IS CONNECTED TO THAT
* GROUP
* THE FUNCTION WILL RETURN TWO VALUES:
* THE STANDARD RETURN CODE
* STRING VARIABLE NAMED SYSREASON
*
* USAGE:
* RET_CODE = REXRACFG(GROUP_NAME);
*
* RET_CODE VALUES:
* -2                     . IRXEXCOM - LACK OF STORAGE
* -1                     . IRXEXCOM - ERROR CONDITION
* Ø                      . NORMAL - CHECK REASON CODE
* 1                      . NORMAL - CONNECTED
*
* SYSREASON (REASON CODE) VALUES:
* Ø                      . User connected to group
* 4                      . User NOT connected to group
```
* 8 . Group name NOT 1 to 8 bytes
* 12 . Incorrect number of arguments
* 16 . No RACF profile for user
* 2Ø . IRXEXCOM error

TITLE 'EQUATES, MACROS && CONTROL BLOCKS USED'

RØ EQU 0
R1 EQU 1
R2 EQU 2
R3 EQU 3
R4 EQU 4
R5 EQU 5
R6 EQU 6
R7 EQU 7
R8 EQU 8 . RETURN CODE
R9 EQU 9 . MESSAGE CODE/REASON CODE
R1Ø EQU 1Ø . BAS RETURN REGISTER
R11 EQU 11
R12 EQU 12 . CSECT BASE REGISTER
R13 EQU 13 . -> DYNAMIC AREA
R14 EQU 14 . -> RETURN
R15 EQU 15 . -> ENTRY POINT
*

* CALLED ROUTINES:
* IRXEXCOM . REXX VARIABLE ACCESS ROUTINE
*

* MACROS AND CONTROL BLOCKS USED:
* DELETE . DELETE LOADED PROGRAM
* ICHPCGRP . MAP CONNECT GROUP TABLE
* IHAACEE . ACCESSOR ENVIRONMENT ELEMENT
* IHAASCB . ADDRESS SPACE CONTROL BLOCK
* IHAASXB . ASCB EXTENSION
* IHAPSA . PREFIXED SAVE AREA
* IKJTCB . TASK CONTROL BLOCK
* IRXARGTB . MAP ARGUMENT TABLE
* IRXEFPL . MAP EXTERNAL FUNCTIONS PLIST
* IRXEVALB . MAP EVALUATION BLOCK
* IRXSHVB . MAP SHARED VARIABLE BLOCK
* LOAD . LOAD PROGRAM
* STORAGE . STORAGE ACQUIRE AND RELEASE

TITLE 'MAIN CSECT PROCESS'

REXRACFG CSECT
REXRACFG AMODE 31
REXRACFG RMODE ANY

LA R14,Ø(R14) . VALIDITY OF R14
BSM R14,RØ . CURRENT ADDRESSING MODE
BAKR R14,R0 . ESTABLISH LINKAGE
LR R12,R15 . 12 -> EPA
USING REXRACFG,R12 . CSECT ADDRESSABILITY
STORAGE OBTAIN, . ACQUIRE DYNAMIC AREA
ADDR=(R13),
LENGTH=DYNLEN,
SP=Ø
MVC 4(4,R13),=C'FISA'
USING DYNAREA,R13
XC @IRXEXCOM,@IRXEXCOM
SLR R8,R8
ST R8,RETCODE
SLR R9,R9
BAS R1Ø,REXXVECT
BAS R1Ø,ARGUMENT
LTR R9,R9
BNZ AØØØ1
CLC RETCODE,=F'Ø'
BNE AØØØ1
BAS R1Ø,CHECKGRP
AØØØ1 EQU *

bas R1Ø,TERMINAT
STORAGE RELEASE,
ADDR=(R13),
LENGTH=DYNLEN,
SP=Ø
SLR R15,R15
PR
TITLE 'REXX VECTOR PROCESSING'
* process the two arguments passed to REXX functions
* the address of the REXX environment block (optional)
* the address of the external function parameter list
* register usage
* Ø . -> environment block
* 1 . -> external function plist
* 2 . -> parsed parameter list
REXXVECT EQU *
* ereg RØ,R1 . extract caller's registers
st RØ,REXX . save REXX environment block ->
st R1,EFPL . save external function plist
using EFPL,R1 . IRXEFPL DSECT addressability
l R2,EFPLARG . 2 -> parsed argument list
st R2,ARGTAB . save
l R2,EFPLEVAL . 2 -> evaluation block vector
l R2,Ø(.R2) . 2 -> evaluation block
st R2,EVALBLK . save
drop R1 . DSECT not required
* br R1Ø . return
TITLE 'PROCESS INPUT ARGUMENT'
* PROCESS ARGUMENT - VALIDATE ETC.
* ONE MANDATORY ARGUMENT - MAX EIGHT, MIN ONE BYTE
* LOAD REXX SERVICE ROUTINE IRXEXCOM
* SET UP PARAMETER LIST FOR IRXEXCOM
* INVOKE IRXEXCOM TO DROP VARIABLE
*
* REGISTER USAGE
*
* 1                             . ARGUMENT COUNT
* 2                             . -> CURRENT ARG TABLE ENTRY
* 3                             . WORK
* 4                             . -> CURRENT ARGUMENT VALUE
* 5                             . CURRENT ARGUMENT LENGTH
* 6                             . -> SAVED VALUE
* 7                             . WORK
* 8                             . ARGUMENT LENGTH
* 9                             . RETURN CODE
* 10                            . REASON CODE
*
ARGUMENT EQU   *
*
SLR   R1,R1                   . 1 - ZERO (ARGUMENT COUNT)
ICM   R2,15,@ARGTAB           . 2 -> ARGUMENT TABLE
BZ    C0002                    . BRANCH IF ZERO
USING ARGTABLE_ENTRY,R2       . DSECT ADDRESSABILITY
*
*                                      . 4 -> ARGUMENT STRING
*                                      . 5 - ARGUMENT STRING LENGTH
LM    R4,R5,ARGTABLE_ARGSTRING_PTR
LTR   R5,R5                   . Q. LENGTH NEGATIVE OR ZERO?
BM    C0002                    . A. YES - NEGATIVE
BZ    C0003                    . A. YES - ZERO
LA    R1,1(,R1)               . INCREMENT ARGUMENT COUNT
CH    R5,=Y(L'GROUP)          . Q. VARIABLE NAME TOO GREAT?
BH    C0003                    . A. YES - ERROR
MVC   GROUP,SPACES            . INITIALIZE SAVED GROUP VALUE
LA    R6,GROUP                . 6 -> SAVED GROUP VALUE
LR    R7,R5                   . LENGTH OF GROUP
 *
C0001  EQU   *
*
MVC   Ø(1,R6),Ø(R4)           . MOVE BYTE TO SAVE GROUP
LA    R4,1(,R4)               . 4 -> NEXT BYTE OF GROUP
LA    R6,1(,R6)               . 6 -> NEXT BYTE OF SAVED GROUP
BCT   R5,C0001                 . LOOP THROUGH GROUP
ST    R7,#GROUP               . SAVE LENGTH
BCTR  R7,R0                    . DECREMENT FOR EXECUTE
LA    R4,GROUP                . 4 -> GROUP
EX    R7,OCUP                  . CONVERT TO UPPER-CASE
* . 2 -> NEXT ARGUMENT DATA
LA R2, ARGTABLE_NEXT-ARGTABLE_ENTRY(R2)
* . 4 -> ARGUMENT STRING
* . 5 -> ARGUMENT STRING LENGTH
LM R4, R5, ARGTABLE_ARGSTRING_PTR
LTR R5, R5
BM C0004
LA R9, 12
B C0004

C0002 EQU *

* 
CH R1, =H'1'
BE C0004
LA R9, 12
B C0004

C0003 EQU *

* 
LA R9, 8

C0004 EQU *

* 
ST R9, REASCODE
DROP R2
LOAD EP=IRXEXCOM
ST R0, @IRXEXCOM
LA R2, SHVVARBLK
XC Ø(L'SHVVARBLK, R2), Ø(R2)
USING SHVBLOCK, R2
* 
MVI SHVCODE, SHVDROPV
LA R3, SYSREAS
ST R3, SHVNAMA
MVC SHVNAML, SYSREASL
* 
LA R3, CIRXEXCOM
ST R3, @CSTR
XC @DUMMY1(L'@DUMMY1+L'@DUMMY2), @DUMMY1
ST R2, @SHVB
OI @SHVB, X'80'
* 
L R0, @REXX
LA R1, PIRXEXCOM
L R15, @IRXEXCOM
BASSM R14, R15
* 
LTR R15, R15
BM C0005
CH R15, =H'28'

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* C0005 EQU *

DROP R2                     . DSECT NOT REQUIRED
LA  R9,20                   . SET REASON/MESSAGE CODE
ST  R15,RETCODE             . SAVE 15
BR  R10

OCUP  OC **-**(*-,R4),SPACES . EXECUTED UPPER CASE CONV
TITLE 'DETERMINE CONNECTED GROUPS'
* ACCESS THE CONNECTED GROUP NAME TABLE
* THIS IS OBTAINED BY:
*   THE PREFIXED SAVE AREA -> TASK CONTROL BLOCK
*   IF ACEE PRESENT, USE IT ELSE
*   THE TASK CONTROL BLOCK -> ASCB
*   THE ADDRESS SPACE CONTROL BLOCK -> ASCB EXTENSION
*   THE ASCB EXTENSION -> ACCESSOR ENVIRONMENT ELEM
*   THE ACEE -> CONNECTED GROUP NAME TABLE
*   PROCESS THE ENTRIES IN THE TABLE LOOKING FOR A MATCH
*
* REGISTER USAGE
*  2                             . -> PSA
*  3                             . -> CONNECTED GROUP ENTRY
*  4                             . -> TCB
*                                     . -> ASCB
*                                     . -> ASXB
*                                     . -> CGRP HEADER
*  4                             . -> ACEE
*                                     . # CONNECTED GROUPS
*

CHECKGRP EQU *
*
SLR  R2,R2                   . 2 - ZERO
USING PSA,R2 . MAP PREFIX SAVE AREA
L   R3,PSATOLD . 3 -> CURRENT TCB
USING TCB,R3 . MAP TASK CONTROL BLOCK
ICM  R4,15,TCBSENV . 4 -> TASK ACEE
*
BNZ  D0001                   . A. YES
DROP  R3                     . TCB NOT REQUIRED
L   R3,PSAAOLD . 3 -> CURRENT ASCB
USING ASCB,R3 . MAP ADDRESS SPACE CONTROL BLK
DROP  R2                     . PSA NOT REQUIRED
L   R3,ASCBASXB . 3 -> EXTENSION
DROP R3
USING ASXB,R3
ICM R4,15,ASXBSENV

* BZ D0004
DROP R3

* D0001 EQU *

* USING ACEE,R4
L R3,ACEEFCGP
USING CGRP,R3
DROP R4
LH R4,CGRPNUM
LA R2,CGRPENT
USING CGRPENTD,R2
DROP R3

* D0002 EQU *

* CLC CGRPNAME,GROUP
BE D0003
LA R2,L'CGRPENT(,R2)
BCT R4,D0002
LA R9,4
B D0005
DROP R2

* D0003 EQU *

* LA R8,1
B D0005

* D0004 EQU *

* LA R9,16

* D0005 EQU *

* ST R8,RETCODE
ST R9,REASCODE
BR R10

TITLE 'TERMINATION ROUTINE'
* SET UP REXX FUNCTION RETURN CODE
* PUT RETURN VALUE INTO REXX EVALUATION BLOCK
* DEVELOP VARIABLE SYSREASON
* DELETE IRXEXCOM IF LOADED
*
* REGISTER USAGE
* 1
* 2 . WORK
* . -> RETURN VALUE
* . -> EVAL BLOCK
* 3 . BINARY RETURN VALUE
* . EVAL BLOCK SIZE
* 4 . LENGTH OF EDITED RETURN VALUE

TERMINATE EQU *

SLR R1,R1 . 1 - ZERO
LA R2,RETDATA . 2 -> OUTPUT DATA
MVC RETDATA,SPACES . INITIALIZE OUTPUT
L R3,RETCODE . 3 - RETURN CODE
LTR R3,R3 . Q. RETURN CODE NEGATIVE?
BNM EØØØ1 . A. NO
MVI Ø(R2),C'-' . OUTPUT NEGATIVE SIGN
LA R1,1(.R1) . INCREMENT BYTES OUTPUT
LA R2,1(.R2) . 2 -> NEXT OUTPUT BYTE

EØØØ1 EQU *

CVD R3,DWORD . PACK IT
MVC VARWORK,MASK8 . MOVE EDIT MASK TO WORK AREA
ED VARWORK,DWORD+4 . EDIT THE DATA
LA R3,VARWORK . 3 -> EDITED DATA
LA R4,L'VARWORK . 4 - LENGTH OF EDITED DATA

EØØØ2 EQU *

CLI Ø(R3),C' ' . Q. SIGNIFICANT?
BNE EØØØ3 . A. YES
LA R3,1(R3) . 3 -> NEXT BYTE
BCT R4,EØØØ2 . LOOP

EØØØ3 EQU *

MVC Ø(1,R2),Ø(R3) . MOVE OUT BYTE
LA R1,1(.R1) . INCREMENT BYTES OUTPUT
LA R2,1(.R2) . 2 -> NEXT OUTPUT BYTE
LA R3,1(.R3) . 3 -> NEXT INPUT BYTE
BCT R4,EØØØ2 . LOOP
ST R1,#RETDATA . NUMBER OF BYTES

L R2,@EVALBLK . 2 -> EVAL BLOCK
USING EVALBLOCK,R2 . DSECT ADDRESSABILITY
L R3,EVALBLOCK_EVSIZE . 3 - LENGTH
CH R3,='H'3' . Q. AT LEAST THREE DOUBLES?
BL EØØØ4 . A. NO
MVC EVALBLOCK_EVDATA(4),RETDATA . SET RESULT
MVC EVALBLOCK_EVLEN(4),#RETDATA

DROP R2

EØØ4 EQU *

CLC RETCODE,=F'0'  . Q. RETURN CODE ZERO?
BE EØØ5  . A. YES
CLC RETCODE,=F'1'  . Q. RETURN CODE ONE?
BNE EØØ6  . A. NO

EØØ5 EQU *

LA R4,SHVARBLK  . 4 -> SHARED VARIABLE BLOCK
XC Ø(L'SHVARBLK,R4),Ø(R4)  . INITIALIZE IT
USING SHVBLOCK,R4  . DSECT ADDRESSABILITY
MVI SHVCODE,SHVSYSSET  . SPECIFY ACTION
LA R1,SYSREAS  . 1 -> VARIABLE NAME
MVC SHVNAML,SYSREASL  . LENGTH OF VARIABLE NAME
ST R1,SHVNAMA  . SAVE IN DSECT
LA R1,REASARR  . 1 -> MESSAGE CODE -> ARRAY
LA R1,Ø(R9,R1)  . 1 -> SPECIFIC MESSAGE ->
L R1,Ø(.R1)  . 1 -> SPECIFIC MESSAGE
LH R2,Ø(.R1)  . 2 - VALUE LENGTH
ST R2,SHVVALL  . SAVE IN DSECT
LA R2,2Ø(.R1)  . 2 -> VALUE
ST R2,SHVVALA  . SAVE IN DSECT
DROP R4

L RØ,@REXX  . Ø -> REXX ENVIRONMENT BLOCK
LA R1,PIRXEXCOM  . 1 -> PARAMETER LIST
L R15,@IRXEXCOM  . 15 - EPA IRXEXCOM
BASSM R14,R15  . INVOKE IRXEXCOM

LTR R15,R15  . Q. RETURN CODE ZERO?
BZ EØØ6  . A. YES - CONTINUE
CH R15,=H'1'  . Q. RETURN CODE ONE?
BZ EØØ6  . A. YES - CONTINUE
ST R15,REASCODE  . SAVE IRXEXCOM RETURN
LA R9,2Ø  . SET MESSAGE/REASON CODE

EØØ6 EQU *

ICM R2,B'1111',@IRXEXCOM  . Q. IRXEXCOM LOADED?
BZ EØØ7  . A. YES
DELETE EP=IRXEXCOM  . DECREMENT RESPONSIBILITY

EØØ7 EQU *

BR R1Ø
DROP R13
TITLE 'DYNAMIC AREA'
DYNAREA  DSECT
   DS   18F
DWORD   DS   D                     . FOR CVD
@ARGTAB  DS   F                    . -> ARGUMENT TABLE
@EFPL   DS   F                    . -> REXX EXT FUNCTION PLIST
@EVALBLK   DS   F                  . -> EVAL BLOCK
@IRXEXCOM   DS   F                 . -> ENTRY POINT IRXEXCOM
@REXX   DS   F                    . -> REXX ENVIRONMENT BLOCK
#RETDATA   DS   F                  . LENGTH OF RETURNED DATA
#GROUP   DS   F                    . LENGTH OF GROUP NAME
RETCODE   DS   F                   . RETURN CODE
REASCODE   DS   F                  . REASON CODE
* PIRXEXCOM   DS   ØF               . IRXEXCOM PARAMETER LIST
@CSTR   DS   F                    . -> CHARACTER STRING IRXEXCOM
@DUMMY1   DS   F                   . -> DUMMY ARGUMENT
@DUMMY2   DS   F                   . -> DUMMY ARGUMENT
@SHVB   DS   F                     . -> FIRST SHARED VARIABLE BLOCK
* GROUP   DS   CL8                  . GROUP NAME
RETDATA   DS   CL8                  . RETURN DATA
VARWORK   DS   CL8                  . VARIABLE NUMBER WORK
   DS   ØF
SHVARBLK   DS   CL(SHVBLEN)        . SHARED VARIABLE BLOCK AREA
DYNLEN   EQU    *-DYNAREA
TITLE 'IBM SUPPLIED DSECTS'
ICHPCGRP                        . CONNECT GROUP
IHAACCE                          . ACCESS CONTROL ENVIRONMENT
IHAASCB DSECT=YES                . ASCB
IHAASXB DSECT=YES                . ASCB EXTENSION
IHAPSA DSECT=YES                 . PREFIXED SAVE AREA
IKJTCB DSECT=YES                 . TASK CONTROL BLOCK
IRXARGTB                         . ARGUMENT TABLE
IRXEFPFL                         . EXTERNAL FUNCTION PARAM LIST
IRXEVALB                         . EVALUATION BLOCK
IRXSHVB                          . SHARED VARIABLE REQUEST BLOCK
TITLE 'CONSTANTS'
REXRACFG CSECT
 * CIRXEXCOM DC   C‘IRXEXCOM’          . NAME OF REXX SERVICE ROUTINE
 MASK8 DC   X‘40202020202120’         . EDIT MASK
 SPACES DC   BC’ ’                    . SPACES FOR INITIALIZATION
 * DS   ØF
SYSREASL DC   AL4(L’SYSREAS)        . REASON CODE SYMBOL
SYSREAS   DC   C’SYSREASON’
 * REASARR   DS   ØF                . MESSAGE/REASON CODE ARRAY
   DC   A(REASØL)
   DC   A(REAS4L)

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“Which groups does user belong to” – REXX function

The REXX function presented here returns, in a stem variable, the RACF group names to which the user is connected. REXRACFS should be invoked from within an MVS REXX EXEC. It accepts a single argument, namely the stem name to be used. This argument is mandatory. The function returns a value and the stem variable. The stem variable with the .0 suffix will, as is common in REXX, contain a count of the number of connected groups.

The stem name must be a valid REXX name and be terminated with a period.

The function returns an integer. This integer will indicate success or failure. An example of the function being invoked is shown below.

RC = REXRACFS(GROUPS.);

The different values that may be returned are as follows:

• -2 – IRXEXCOM; lack of storage
• -1 – IRXEXCOM; error condition
• 0 – NORMAL.

An example of the function being used is shown below.

/* REXX ******************************************************/
rexracfs(GROUP.);
do I = 1 to GROUP.Ø;
    say GROUP.I;
end;
exit;

I appreciate that the output of the TSO ‘listuser’ (lu) command may be trapped and then parsed to obtain the same data, but this function:

• Uses about a fifth of the CPU time.
• Returns the groups in sequence.
• Uses a lot less storage.
REXRACFS

TITLE 'REXX FUNCTION PROCESSING RACF GROUPS'
PRINT NGEN

*        PROGRAM:     REXRACFS
*                     RETURN IN A STEM VARIABLE THE GROUPS THE USER
*                     IS CONNECTED TO
*
*        ATTRIBUTES:
*                     REENTRANT
*                     AMODE:  31
*                     RMODE: ANY
*                     AUTHORIZATION:  NONE
*
*        ABSTRACT:
*        REXX FUNCTION THAT DETERMINES THE GROUPS THE USER IS
*        CONNECTED TO.
*        THE STEM.Ø WILL BE INITIALIZED TO THE NUMBER OF RECORDS
*        RETURNED.
*
*        USAGE:
*        RETURN_CODE = REXRACFS(STEM.);
*
*        RETURN_CODE VALUES:
*        -2                            . IRXEXCOM - LACK OF STORAGE
*        -1                            . IRXEXCOM - ERROR CONDITION
*        Ø                             . NORMAL
*        8                             . STEM NAME SPECIFIED > 32 BYTES
*        12                            . NO PERIOD AT END OF STEM NAME
*        16                            . STEM NAME INVALID CHARACTERS
*        2Ø                            . INVALID NUMBER OF ARGUMENTS

EJECT

TITLE 'EQUATES, MACROS && CONTROL BLOCKS USED'
RØ   EQU Ø
R1   EQU  1
R2   EQU  2
R3   EQU  3
R4   EQU  4
R5   EQU  5
R6   EQU  6
R7   EQU  7
R8   EQU  8
R9   EQU  9
R1Ø  EQU 10
R11  EQU 11
R12  EQU 12                . CSECT BASE REGISTER
R13  EQU 13                . -> DYNAMIC AREA
CALLED ROUTINES:
* IRXEXCOM . REXX VARIABLE ACCESS ROUTINE

MACROS USED:
* DELETE . DECREMENT USE OF LOADED MODULE
* ICHPGRP . MAP CONNECT GROUP TABLE
* IHAACEE . ACCESSOR ENVIRONMENT ELEMENT
* IHAASCB . ADDRESS SPACE CONTROL BLOCK
* IHAASXB . ASCB EXTENSION
* IHAPSA . PREFIXED SAVE AREA
* IKJTCB . TASK CONTROL BLOCK
* IRXARGTB . MAP ARGUMENT TABLE
* IRXEFPL . MAP EXTERNAL FUNCTIONS PLIST
* IRXVALB . MAP EVALUATION BLOCK
* IRXSHVB . MAP SHARED VARIABLE BLOCK
* LOAD . DYNAMICALLY LOAD MODULE
* STORAGE . STORAGE ACQUIRE AND RELEASE

TITLE 'MAIN CSECT PROCESS'
REXRACFS CSECT
REXRACFS AMODE 31
REXRACFS RMODE ANY

LA R14,Ø(R14) . VALIDITY OF R14
BSM R14,R0 . CURRENT ADDRESSING MODE
BAKR R14,R0 . ESTABLISH LINKAGE
LR R12,R15 . 12 -> EPA
USING REXRACFS,R12 . CSECT ADDRESSABILITY
STORAGE OBTAIN, . ACQUIRE DYNAMIC AREA
ADDR=(R13),
LENGTH=DYNLEN,
SP=Ø
MVC 4(4,R13),=C'F1SA' . INDICATE FORMAT OF SAVE AREA
USING DYNAREA,R13 . DSECT ADDRESSABILITY
XC @IRXEXCOM,@IRXEXCOM . INDICATE IRXEXCOM NOT LOADED
BAS R10,REXXVECT . REXX VECTOR PROCESSING
BAS R10,ARGUMENT . PROCESS ARGUMENTS
LTR R8,R8 . Q. ARGUMENTS VALID?
BNZ AØØØ1 . A. NO
BAS R10,STEMDEL . DELETE STEM
BAS R10,PROCGRPS . PROCESS GROUPS

AØØØ1 EQU *

BAS   R1Ø,TERMINAT          . TERMINATION
STORAGE RELEASE.          . RELEASE DYNAMIC STORAGE *
ADD=(R13),                *
LENGTH=DYNLEN,            *
   SP=Ø
SLR   R15,R15             . 15 - RETURN CODE
PR                             . ADIOS
EJECT  
TITLE 'REXX VECTOR PROCESSING'
*     PROCESS THE TWO ARGUMENTS PASSED TO REXX FUNCTIONS
*     THE ADDRESS OF THE REXX ENVIRONMENT BLOCK (OPTIONAL)
*     THE ADDRESS OF THE EXTERNAL FUNCTION PARAMETER LIST
*  
*     REGISTER USAGE
*     Ø                          . -> ENVIRONMENT BLOCK
*     1                          . -> EXTERNAL FUNCTION PLIST
*     2                          . -> PARSED PARAMETER LIST
* 
REXXVECT EQU   *
*      EREG  RØ,R1             . EXTRACT CALLER'S REGISTERS
      ST   RØ,REXX             . SAVE REXX ENVIRONMENT BLOCK ->
      ST   R1,EFPL             . SAVE EXTERNAL FUNCTION PLIST
      USING EFPL,R1            . IRXEFPL DSECT ADDRESSABILITY
      L    R2,EFPLARG          . 2 -> PARSED ARGUMENT LIST
      ST   R2,ARGTAB           . SAVE
      L    R2,EFPLEVAL         . 2 -> EVALUATION BLOCK VECTOR
      L    R2,Ø(,R2)           . 2 -> EVALUATION BLOCK
      ST   R2,EVALBLK          . SAVE
      DROP R1                   . DSECT NOT REQUIRED
      BR   R1Ø                  . RETURN
EJECT  
TITLE 'PROCESS INPUT ARGUMENT'
*     PROCESS ARGUMENT - VALIDATE ETC.
*     ONE ARGUMENT EXPECTED AND REQUIRED
*     1. STEM VARIABLE - MUST END IN PERIOD
*     NAME MUST BE VALID FORMAT
*  
*     REGISTER USAGE
*     1                        . ARGUMENT COUNT
*     2                        . -> CURRENT ARG TABLE ENTRY
*     3                        . WORK
*     4                        . -> CURRENT ARGUMENT VALUE
*     5                        . CURRENT ARGUMENT LENGTH
*     6                        . -> SAVED VALUE
*     7                        . WORK
*     7                        . LENGTH OF STEM NAME
* 8 . ERROR VALUE
* 10 . RETURN
*
ARGUMENT EQU *
*
L R2,@ARGBTAB . 2 -> ARGUMENT TABLE
USING ARGBTABLE_ENTRY,R2 . DSECT ADDRESSABILITY
SLR R1,R1 . 1 - ZERO (ARGUMENT COUNT)
*
* . 4 -> ARGUMENT STRING
* . 5 - ARGUMENT STRING LENGTH
LM R4,R5,ARGBTABLE_ARGSTRING_PTR
LTR R5,R5 . Q. LENGTH NEGATIVE?
BM R1,1(R1) . A. YES - LAST ARGUMENT
LA R8,8 . SET ERROR CODE
CH R5,=Y(L'STEM) . Q. VARIABLE NAME TOO GREAT?
BH C0003 . A. YES - ERROR
LA R6,0(R5,R4) . 6 -> AFTER LAST BYTE OF NAME
LA R8,12 . SET ERROR CODE
BCTR R6,R0 . 6 -> LAST BYTE OF STEM NAME
CLI 0(R6),'. ' . Q. PERIOD PRESENT?
BNE C0003 . A. NO - ERROR
LA R8,16 . SET ERROR CODE
MVC STEM,SPACES . INITIALIZE SAVED STEM VALUE
LA R6,STEM . 6 -> SAVED STEM NAME VALUE
SLR R7,R7 . LENGTH OF STEM NAME
*
C0001 EQU *
*
SLR R3,R3 . 3 - ZERO
IC R3,0(R4) . 3 - BYTE OF STEM VARIABLE
LA R3,TRTABLE(R3) . 3 - CHARACTER FROM TABLE
CLI 0(R3),X'00' . Q. VALID CHARACTER?
BE C0003 . A. NO
MVC 0(1,R6),0(R4) . MOVE BYTE TO SAVE STEM
LA R4,1(R4) . 4 -> NEXT BYTE OF STEM NAME
LA R6,1(R6) . 6 -> NEXT BYTE OF SAVED NAME
LA R7,1(R7) . INCREMENT BYTES IN STEM NAME
BCT R5,C0001 . LOOP THROUGH STEM NAME
ST R7,#STEM . SAVE LENGTH
*
* . 2 -> NEXT ARGUMENT DATA
* . 4 -> ARGUMENT STRING
* . 5 - ARGUMENT STRING LENGTH
LM R4,R5,ARGBTABLE_ARGSTRING_PTR
SLR R8,R8 . VALID RETURN
LTR R5,R5 . Q. LENGTH NEGATIVE?
BM C0003 . A. YES
LA R8,20 . SET ERROR CODE
B C0003 . OUT OF HERE

C0002 EQU *

CH R1,=H'1' . Q. VALID NUMBER OF ARGUMENTS?
BE C0003 . A. YES
LA R8,20 . SET ERROR CODE

C0003 EQU *

DROP R2 . DSECT NOT REQUIRED
ST R8,RETCODE . SAVE RETURN CODE
BR R10
EJECT

TITLE 'DELETE ANY EXISTING STEM VARIABLE'
* LOAD REXX SERVICE ROUTINE IRXEXCOM
* SET UP PARAMETER LIST FOR IRXEXCOM
* INVOKE IRXEXCOM TO DROP STEM VARIABLE
*
* REGISTER USAGE
* 0 . MACRO - EPA IRXEXCOM
* 1 . -> PARAMETER LIST
* 2 . -> SHARED VARIABLE BLOCK
* 3 . WORK
* 10 . RETURN
* 14 . CALL
* 15 . CALL
*
STEMDEL EQU *
*
LOAD EP=IRXEXCOM . LOAD IRXEXCOM
ST R0,.@IRXEXCOM . SAVE EPA
LA R2,.SHVARBLK . 2 -> SHARED VARIABLE BLOCK
XC 0(L'.SHVARBLK,R2),0(R2) . INITIALIZE
USING SHVBLOCK,R2 . DSECT ADDRESSABILITY
*
MVI SHVCODE,SHVDROPV . SPECIFY ACTION
LA R3,.STEM . 3 -> STEM NAME
ST R3,.SHVNAMA . SAVE IN DSECT
MVC SHVNAML,#STEM . LENGTH OF STEM NAME
*
LA R3,.CIRXEXCOM . 3 -> CHARACTER STRING IRXEXCOM
ST R3,.@CSTR . SAVE IN PARAMETER LIST
XC @DUMMY1(L'@DUMMY1+L'@DUMMY2),@DUMMY1
ST  R2,@SHVB      . -> SHARED VARIABLE REQ BLOCK
OI  @SHVB,X'80'  . FLAG END OF ARGUMENTS

*  
L  R0,@REXX       . Ø -> REXX ENVIRONMENT BLOCK
LA  R1,PIRXEXCOM  . 1 -> PARAMETER LIST
L  R15,IRXEXCOM   . 15 - EPA IRXEXCOM
BASSM R14,R15     . INVOKE IRXEXCOM

*  
LTR R15,R15       . Q. RETURN CODE LESS THAN ZERO?
BM  DØØØ1        . A. YES - ERROR
CH  R15,=H'28'    . Q. RETURN CODE 28?
BE  DØØØ1        . A. YES - ERROR
CH  R15,=H'32'    . Q. RETURN CODE 32?
BE  DØØØ1        . A. YES -ERROR
CLI SHVRET,SHVCLEAN . Q. EXECUTION OKAY?
BER R1Ø          . A. YES - EXIT
CLI SHVRET,SHVNEWV . Q. NON-EXISTENT STEM?
BER R1Ø          . A. YES - EXIT

*  
DØØØ1 EQU *

*  
DROP R2          . DSECT NOT REQUIRED
ST  R15,RETCODE  . SAVE 15
BR  R1Ø
EJECT

TITLE 'PROCESS CONNECTED GROUPS'
*
INITIALIZE STORAGE
*
SET UP PARAMETERS FOR IRXEXCOM
*
ACCESS THE CONNECTED GROUP NAME TABLE
*
  THIS IS OBTAINED BY:
  *  
    THE PREFIXED SAVE AREA -> TASK CONTROL BLOCK
    *  
      IF ACEE PRESENT, USE IT ELSE
      *  
        THE TASK CONTROL BLOCK -> ASCB
    *  
      THE ADDRESS SPACE CONTROL BLOCK -> ASCB EXTENSION
    *  
      THE ASCB EXTENSION -> ACCESSOR ENVIRONMENT ELEM
    *  
      THE ACEE -> CONNECTED GROUP NAME TABLE
*
FOR EACH GROUP
*
  FORMAT STEM VARIABLE
*
  SAVE COUNT OF GROUPS IN STEM.Ø
*
*
REGISTER USAGE
*
  1       . WORK
  2       . -> PSA
  *  
    . -> CONNECTED GROUP ENTRY
  3       . -> TCB
  *  
    . -> ASCB
  *  
    . -> ASXB
(* CONNECTED GROUPS *)

PROCGRPS EQU *

ST R1Ø,ESAVE
ZAP #VARS,="P'+Ø'

LA R5,SHVARBLK
XC 0('L'SHVARBLK,R5),0(R5)

MVI SHVCODE,SHVSYSET

LA R1,NEWSTEM
ST R1,SHVNAMA

LA R1,L'GROUP
ST R1,SHVVALL
ST R1,GROUP

SLR R2,R2
USING PSA,R2
L R3,PSATOLD
USING TCB,R3
ICM R4,15,TCBSENV

BNZ EØØØ1
DROP R3
L R3,PSAAOLD
USING ASCB,R3
DROP R2
L R3,ASCBASXB
DROP R3
USING ASXB,R3
ICM R4,15,ASXBSENV

BZ EØØØ4
DROP R3

EØØØ1 EQU *

USING ACEE,R4
L R3,ACEEFCGP
USING CGRP,R3

EQU *

GET ACEE DATA

MAP THE ACEE

MAP THE CGRP HEADER

ACEE NOT REQUIRED
LH R4,CGRPNUM . NUMBER OF TABLE ENTRIES
LA R2,CGRPENT . 2 -> FIRST GROUP ENTRY
USING CGRPENTD,R2 . MAP GROUP ENTRY
DROP R3 . HEADER NOT REQUIRED

** EØØØ2 EQU *
** MVC GROUP,CGRPNAME . MOVE GROUP
** AP #VARS,=-P'+1' . INCREMENT VARIABLES PROCESSED
** BAS R10,BLDVARNM . BUILD VARIABLE NAME
** MVC SHVNAML,#NEWSTEM . LENGTH OF VARIABLE NAME
L R0, @REXX . Ø -> REXX ENVIRONMENT BLOCK
LA R1,PIRXEXCOM . 1 -> PARAMETER LIST
L R15, @IRXEXCOM . 15 - EPA IRXEXCOM
BASSM R14,R15 . INVOKE IRXEXCOM

** LTR R15,R15 . Q. RETURN CODE ZERO?
BZ EØØØ3 . A. YES - CONTINUE
CH R15, =H'1' . Q. RETURN CODE ONE?
BZ EØØØ3 . A. YES - CONTINUE
ST R15, RETCODE
B EØØØ7

** EØØØ3 EQU * . PROCESS NEXT GROUP
** LA R2, L'CGRPENT(,R2) . 2 -> NEXT GROUP ENTRY
BCT R4,EØØØ2 . CHECK IT OUT
DROP R2

** . PREPARE COUNT FOR STEM.Ø

** EØØØ4 EQU *
** MVC VARWORK,MASK8 . MOVE EDIT MASK TO WORK AREA
ED VARWORK,#VARS . EDIT THE DATA
LA R1, VARWORK . 1 -> EDITED DATA
LA R2, L'VARWORK . 2 - LENGTH OF EDITED DATA

** EØØØ5 EQU *
** CLI Ø(R1), C' ' . Q. SIGNIFICANT?
BNE EØØØ6 . A. YES
LA R1, 1(,R1) . 1 -> NEXT BYTE
BCT R2,EØØØ5 . LOOP

** EØØØ6 EQU *

ST R2,SHVWALL . LENGTH OF COUNT
ST R1,SHVWALLA . -> COUNT
ZAP #VARS,=P'+Ø' . INSTANCE NUMBER
BAS R1Ø,BLDVARNM . BUILD VARIABLE NAME
MVC SHVNAML,#NEWSTEM . LENGTH OF VARIABLE NAME
DROP R5 . DSECT NOT REQUIRED

* 
L RØ,@REXX . Ø -> REXX ENVIRONMENT BLOCK
LA R1,PIRXEXCOM . 1 -> PARAMETER LIST
L R15,@IRXEXCOM . 15 - EPA IRXEXCOM
BASSM R14,R15 . INVOKE IRXEXCOM

* 
LTR R15,R15 . Q. RETURN CODE ZERO?
BZ EØØØ7 . A. YES - CONTINUE
CH R15,=H'1' . Q. RETURN CODE ONE?
BZ EØØØ7 . A. YES - CONTINUE
ST R15,RETCODE

EØØØ7 EQU *

* 
L R1Ø,ESAVE 
BR R1Ø 
EJECT

TITLE 'DEVELOP STEM NAME'
* CREATE STEM NAME FOR VARIABLE ABOUT TO BE ADDED
* TAKE SPECIFIED STEM AND APPEND THE OCCURRENCE NUMBER
*
* REGISTER USAGE
* 1 . -> INSTANCE NUMBER
* 6 . LENGTH OF STEM
* 7 . -> NEW STEM (COMPOUND)
* 8 . LENGTH OF NEW STEM
* 8 . LENGTH OF INSTANCE NUMBER

BLDVARNM EQU *

* 
MVC STEMQUAL,MASK8 . MOVE EDIT MASK TO WORK AREA
ED STEMQUAL,#VARS . EDIT THE DATA
LA R1,STEMQUAL . 1 -> EDITED DATA
LA R8,L'STEMQUAL . 8 - LENGTH OF EDITED DATA

FØØØ1 EQU *

* 
CLI Ø(R1),C' ' . Q. SIGNIFICANT?
BNE FØØØ2 . A. YES
LA R1,1(.R1) . 1 -> NEXT BYTE
BCT R8,FØØØ1 . LOOP

*
F₀₀₀₂  EQU  *
*  
MVC  NEWSTEM,SPACES          . INITIALIZE NEW STEM
L   R6,#STEM                . NUMBER OF BYTES IN STEM
LR  R7,R6                   . 7 - SAME
BCTR R6,R0                  . DECREMENT FOR EXECUTE
EX  R6,MVCSTEM              . MOVE STEM INTO NEW STEM
LA  R6,NEWSTEM              . 6 -> NEW STEM
LA  R6,Ø(R7,R6)             . 6 -> AFTER STEM IN NEW STEM

F₀₀₀₃  EQU  *
*  
MVC  Ø(1,R6),Ø(R1)           . MOVE COUNT BYTE BY BYTE
LA  R1,1(,R1)               . 1 -> NEXT BYTE OF COUNT
LA  R6,1(,R6)               . 6 -> NEXT BYTE OF NEW STEM
LA  R7,1(,R7)               . INCREMENT LENGTH
BCT R8,F₀₀₀₃                . LOOP
ST  R7,#NEWSTEM             . SAVE LENGTH
BR  R1₀

MVCSTEM  MVC  NEWSTEM(*-*) ,STEM
EJECT

TITLE 'TERMINATION ROUTINE'
*  
DELETE IRXEXCOM IF LOADED
*  
SET UP REXX FUNCTION RETURN CODE
*  
PUT RETURN VALUE INTO REXX EVALUATION BLOCK
*  
*  
REGISTER USAGE
*  
  1                             . LENGTH OF RETURN VALUE
*  
  2                             . -> RETURN VALUE
*  
  3                             . -> EVAL BLOCK
*  
  4                             . BINARY RETURN VALUE
*  
  5                             . EVAL BLOCK SIZE
*  
  6                             . LENGTH OF EDITED RETURN VALUE
*  

TERMINAT  EQU  *
*  
ICM  R8,B'1111',@IRXEXCOM    . Q. IRXEXCOM LOADED?
BZ   G₀₀₀₁                   . A. YES
DELETE EP=IRXEXCOM           . DECREMENT RESPONSIBILITY

G₀₀₀₁  EQU  *
*  
SLR  R1,R1                   . 1 - ZERO
LA  R2,RCDATA                . 2 -> OUTPUT DATA
MVC  RCDATA,SPACES           . INITIALIZE OUTPUT
L   R3,RETCODE               . 3 - RETURN CODE
LTR  R3,R3                   . Q. RETURN CODE NEGATIVE?

BNM GØØØ2 . A. NO
MVI Ø(R2),C'-' . OUTPUT NEGATIVE SIGN
LA R1,1(.R1) . INCREMENT BYTES OUTPUT
LA R2,1(.R2) . 2 -> NEXT OUTPUT BYTE

* GØØØ2 EQU *

* CVD R3,DWORD . PACK IT
MVC VARWORK,MASK8 . MOVE EDIT MASK TO WORK AREA
ED VARWORK,DWORD+4 . EDIT THE DATA
LA R3,VARWORK . 3 -> EDITED DATA
LA R4,L'VARWORK . 4 - LENGTH OF EDITED DATA

* GØØØ3 EQU *

* CLI Ø(R3),C' ' . Q. SIGNIFICANT?
BNE GØØØ4 . A. YES
LA R3,1(R3) . 3 -> NEXT BYTE
BCT R4,GØØØ3 . LOOP

* GØØØ4 EQU *

* MVC Ø(1,R2),Ø(R3) . MOVE OUT BYTE
LA R1,1(R1) . INCREMENT BYTES OUTPUT
LA R2,1(R2) . 2 -> NEXT OUTPUT BYTE
LA R3,1(R3) . 3 -> NEXT INPUT BYTE
BCT R4,GØØØ4 . LOOP
ST R1,#RCDATA . NUMBER OF BYTES

* L R2,@EVALBLK . 2 -> EVAL BLOCK
USING EVALBLOCK,R2 . DSECT ADDRESSABILITY
L R3,EVALBLOCK_EVSIZE . 3 - LENGTH
CH R3,=H'3' . Q. AT LEAST THREE DOUBLES?
BL GØØØ5 . A. NO
MVC EVALBLOCK_EVDATA(4),RCDATA . SET RESULT
MVC EVALBLOCK_EVLEN(4),#RCDATA
DROP R2

* GØØØ5 EQU *

* BR R1Ø

TITLE 'DYNAMIC AREA'

DYNAREA DSECT
DS 18F
DWORD DS D . FOR CVD
ESAVE DS F . REGISTER SAVE AREA
@ARGTAB DS F . -> ARGUMENT TABLE
@EFPL DS F . -> REXX EXT FUNCTION PLIST
@EPAREA DS F . -> EXTERNAL PARAMETER AREA
@EVALBLK DS F . -> EVAL BLOCK
@IRXEXCOM DS F . -> ENTRY POINT IRXEXCOM
@REXX DS F . -> REXX ENVIRONMENT BLOCK
#NEWSTEM DS F . LENGTH OF NEW STEM NAME
#RCDATA DS F . LENGTH OF RETURN CODE
#STEM DS F . LENGTH OF STEM VARIABLE NAME
RETCODE DS F . RETURN CODE
*
PIRXEXCOM DS ØF . IRXEXCOM PARAMETER LIST
@CSTR DS F . -> CHARACTER STRING IRXEXCOM
@DUMMY1 DS F . -> DUMMY ARGUMENT
@DUMMY2 DS F . -> DUMMY ARGUMENT
@SHVB DS F . -> FIRST SHARED VARIABLE BLOCK
*
RCDATA DS CL8 . RETURN CODE DATA
RSNCODE DS CL2 . REASON CODE
*
NEWSTEM DS CL44 . NEW STEM NAME
STEM DS CL32 . STEM NAME ARGUMENT VALUE
#VARS DS PL4 . NUMBER OF INSTANCES OF STEM
STEMQUAL DS CL8 . STEM QUALIFIER WORK
*
GROUP DS CL8 . OUTPUT DATA AREA
*
VARWORK DS CL8 . VARIABLE NUMBER WORK
DS ØF
SHVARBLK DS CL(SHVBLEN) . SHARED VARIABLE BLOCK AREA
*
DYNLEN EQU *-DYNAREA
TITLE 'IBM SUPPLIED DSECTS'
ICHPCGRP . CONNECT GROUP
IHAACEE . ACCESS CONTROL ENVIRONMENT
IHAASCB DSECT=YES . ASCB
IHAASXB DSECT=YES . ASCB EXTENSION
IHAPSA DSECT=YES . PREFIXED SAVE AREA
IKJTCB DSECT=YES . TASK CONTROL BLOCK
IRXARGTB . ARGUMENT TABLE
IRXEPFL . EXTERNAL FUNCTION PARAM LIST
IRXEVALB . EVALUATION BLOCK
IRXSHVB . SHARED VARIABLE REQUEST BLOCK
TITLE 'LIST FORM MACROS, CONSTANTS'
REXRACFS CSECT
*
MASK8 DC X'4Ø2Ø2Ø2Ø2Ø212Ø' . EDIT MASK - IRXEXCOM
SPACES DC ØC' ' . SPACES FOR INITIALIZATION
CIRXEXCOM DC C'IRXEXCOM' . NAME OF REXX SERVICE ROUTINE
Leaving? You don’t have to give up **RACF Update**

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Security implications with z

On 3 October 2000, most IBM hardware systems and operating systems were renamed. But there were more than just new names for old products; there were also some new or improved security features for the (formerly-named) VM and OS/390 environments where RACF runs.

But first, the new names.

NEW NAMES AND OLD

The affected hardware systems have been renamed IBM eserver ?Series, where ‘?’ is one of four letters:

- **z** for *zero downtime*, zSeries, replacing System/390 mainframes.
- **i** for *integration*, iSeries 400, replacing AS/400.
- **p** for *performance*, pSeries, replacing RS/6000.
- **x** for *X architecture*, xSeries replacing Netfinity’s Intel-based Windows servers that increasingly support Linux.

And the ‘e’ in eserver is circled, like the ‘a’ in the at sign (‘@’).

Most mainframe operating systems have also inherited a ‘z’. z/OS replaces OS/390 (MVS), and z/VM replaces VM/ESA. Both provide support for z/architecture, including:

- 64-bit architecture
- FICON (FIbre CONnections) channels.

As well, z/OS uses workload priorities to automatically manage resources across LPARs with the new Intelligent Resource Director (IRD), and further refines the workload pricing model for software.

Just the month before, Version 2.5 of VSE/ESA was announced and became available, and remains unchanged by the October announcements. Likewise, OS/400 and AIX are still around.
THE HARDWARE

As for the hardware itself, the zSeries 900 family has 26 air-cooled models, including Model 100, a stand-alone Coupling Facility (CF). All support z/Architecture and can be combined to create a 32-way sysplex with 512 processors performing workload and up to 128 performing system and back-up functions. Models 1C1-1C9 provide a 20%-30% capacity increase over the corresponding System/390 9672 Z17-Z97 model.

It’s all based on the z900 MultiChip Module (MCM), the world’s densest chip module, with:

- 20 microprocessors
- 2.5 billion transistors.
- 0.18 micron copper interconnections
- 85,000 C4 (Controlled Collapse Chip Connection) joints
- 4,224 I/Os.

The z900 MCM is a five-inch-square ceramic substrate consisting of 101 layers of glass ceramic and six layers of thin film wired with one kilometre of wire. Power consumption is 1 kilowatt.

The z900 Central Processor (CP) chip runs as a seven-stage pipeline, but measures only 17.9 by 9.9 millimetres. In that space, 47M transistors are packed using CMOS 8S bulk technology with copper interconnections.

z/OS SECURITY

z/OS 1.2 is planned for October 2001 availability. Its Intrusion Detection Services (IDS) works with network-based IDS sensors and scanners to do what firewalls cannot: protect against internal and external attacks using end-to-end encryption.

Kerberos application services and a credential server will be enhanced with stronger encryption, Kerberos registry administration, automated
restart across TCP/IP network outages, and improved parallel sysplex performance. Support for Kerberos third-party authentication will be added to LDAP (Lightweight Directory Access Protocol), ftp, telnet, and rsh (remote shell). At the same time, the outdated V4 Kerberos support will be removed from Communications Server.

SSL will:

- Be added to ftp clients and servers.
- Include dynamic Transaction Layer Security (TLS).
- Use PKI for X.509V3 (PKIX) to check for revoked digital certificates.
- Allow dynamic modification to its configuration parameters without disrupting existing sessions.

tn3270 will permit client access software, such as Host On Demand (HOD), to use a single digital certificate to sign on to multiple SNA applications without even defining a password on the target system(s).

There’s also cryptographic support for VISA and Europay, and the functions needed for ZKA (Zentraler Kredit Ausschuss) certification, smartcard personalization, and even creating your own functions on zSeries and System/390 cryptographic processors.

As a first step towards generalized certificate authority functions in z/OS, existing RACF-defined users can be given authorization to request a client digital certificate through a Web-based application.

z/VM SECURITY

The first release of z/VM is Version 3 Release 1. RACF for VM 1.10.0 is supported, with APAR VM62958 required for 64-bit processing. A new SSL server is supplied with z/VM, with support for 40-, 56-, and 128-bit encryption. A Kerberos Data Encryption Standard (DES) providing 128-bit encryption has been integrated into the TCP/IP feature of z/VM.
zSERIES SECURITY

The zSeries CMOS Cryptographic Coprocessor has been redesigned since System/390. It’s now a single-chip module mounted on the processor board, with each chip individually serviceable.

Unlike System/390, the PCI Cryptographic Coprocessor (PCICC) zSeries feature includes a pair of PCICCs. At maximum configuration – eight PCICC features installed and two CMOS Cryptographic Coprocessors active – a z900 server with z/OS can support up to 2000 SSL transactions per second.

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Jon E Pearkins
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Need help with a RACF problem or project?

Maybe we can help:

- If it’s on a topic of interest to other subscribers, we’ll commission an article on the subject, which we’ll publish in RACF Update, and which we’ll pay for – it won’t cost you anything.
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Visit the RACF Update Web site


and follow the link to RACF-related problems or Opportunities for RACF specialists.
RACF/security education – Internet-based training

As a special feature this issue, we look at many of the outside sources of education for RACF and security-related topics. There are five articles in all, each covering a different aspect:

• This article, which covers Internet-based training
• Other self-study courses
• Classroom courses
• Training directories
• Conferences.

More new Internet-Based Training (IBT) is being introduced each month than any other type of education. IBT has the potential to be as effective as the best forms of training available today, yet should cost little more than borrowing and reading a book from the library.

You may see IBT referred to in the marketplace as ‘on-line training’, ‘Web-based training (WBT)’, and, occasionally, ‘computer-based training (CBT)’. But ‘IBT’ is more precise, excluding even hosting on an intranet and download and play off the Internet.

ISSUES

All forms of CBT, even download and play, languish behind IBT in one area: compatibility. Just ask the application software vendors. They know that getting their software to run on millions of client workstations worldwide is practical only when client code runs through a Web browser.

As with all forms of education, it is accuracy, breadth of topic coverage, and training methods that determine effectiveness. But, with IBT, speed is also a key factor, otherwise the student’s concentration is broken and the IBT course’s effectiveness declines significantly.
MINDLEADERS

I have singled out MindLeaders for in-depth coverage because (as DPEC) it pioneered widely-available, low-cost, unlimited access to large numbers of IBT courses. I have not attempted to list any of MindLeaders’ worldwide distribution network of 1,000 ISP and 300 affinity channel partners. Most that stay current with the latest courses and revisions have stopped hosting the courses themselves; instead, MindLeaders hosts the courses for them. Although distributors using this approach will gain more flexibility in the future, the current pricing structure is the same wherever you go.

As well as using distributors, MindLeaders now sells all of its courses directly to individuals and organizations. In the near future, individuals will be able to use their credit card to license a course series directly from the company’s Web site. Until then, you can call (800) 223 3732 or (614) 781 7300, or fax (614) 781 6510.

Mainframe courses are priced at $100 for a series, which is one to five courses covering a single technology. Non-mainframe-specific courses are usually sold in larger series, often at lower prices. Volume discounts are available to organizations training ten or more individuals – contact a MindLeaders sales representative rather than ordering through the Web site.

MindLeaders’ course catalogue is available at:

http://www.mindleaders.com/products/catalog.html

There, you’ll find that its computing courses are divided into seven categories, of which those with relevant RACF and security courses are shown in Figure 1.

IBT available from other vendors is shown in Figures 2-7, categorized according to the price of an average course, as listed on their Web sites.

Distributors have been listed only where the IBT company’s Web site does not include course and/or ordering information, but UK readers may also be interested in http://www.blueu.com which distributes DigitalThink, SkillSoft, and Click2Learn courses.
Technical mainframe
- **MVS.2 Fundamentals of MVS and JES** (MVS101, 7 hr). An overview course, mainly covering JES2, JES3, and system-managed storage (SMS). RACF is described briefly as a ‘related subsystem’ near the end of the course.
- **SQL: Database Maintenance** (SQL111, 6 hr). One of the topics is access control for tables using the GRANT and REVOKE commands.

Technical general
- **CCNA:14 Network Security and Control** (SCOC14, 4 hr). Access lists are the focus of this Cisco-specific course.
- **Data Warehousing: Management** (DWHC02, 4 hr). Ensuring security is one of the topics in the ‘Maintaining a Data Warehouse’ module.
- **Unix:5 System Administration II** (UNXTC6, 8 hr). ‘UNIX System Security’ is the last of the four modules in the course.
- **FOCUS: Getting Started** (FOC101, 6 hr). The first of 11 FOCUS courses covers data security while describing FOCUS Facilities for experienced users.

Technical MCSE
- **Windows 2000 Professional:3 Administering Resources** (WINP03, 3 hr). ‘Managing Security for Files and Folders’ is the last of the four modules in the course.
- **Networking Essentials:1 Terminology** (NESC01, 4 hr). ‘Network Security and Classifications’ is the third of five modules in the course.
- **Networking Essentials:5 Implementation** (NESC05, 4 hr). Showing the course’s age, ‘Implementing Security’ is discussed for Windows 95 and NT; disaster recovery planning (DRP) and RAID are also major topics.

Technical Web development:
- **E-Commerce:8 Customer Service and Payment** (ECOM08, 4 hr). ‘Payment Security’ is the last of five modules in this course.

End user desktop computing
- **Business Management: Computer Security Awareness** (COM201, 12 hr). Not just for managers; anyone using a computer would benefit from the broad cross section of security topics included in this course.
- **European Computer Driving License: Understanding Information Technology** (ECDL01, 4 hr). The last of the six modules in this new course is entitled ‘Security, Copyright and the Law’.

Other
- Also featured are product-specific security courses for Windows 2000 Professional and Server, NT 4.0, Exchange Server, Lotus Notes, Microsoft Internet Information Server (IIS), CGI/PERL, Oracle, SQL Server, NetWare, and Excel.

**Figure 1: MindLeaders IBT courses**
ProsoftTraining – http://www.prosofttraining.com (but more easily available through a distributor, such as http://www.headlight.com/browse/catalog)
- Networking Fundamentals: Network Security Essentials (4-6 hr).
- Advanced Internet Business Fundamentals: Security and the Web (4-6 hr).

Barnes and Noble University – http://www.barnesandnobleuniversity.com
- Web Site Design and Management.
- The Internet: A Smart User’s Guide.

Figure 2: Other IBT courses – less than $13 US = £9 UK

- IBM OS/390 Security (4 hr). Overview level course on e-business security, security levels, RACF, DCE security, LDAP directory, firewall and VPN.
- Internet Security series (8 courses, 30 hr). Overview, cryptography, PKI, secure communications, secure Web commerce, Internet site security, firewall principles, and multi-tier virus protection.
- Internet and Intranet Skills: Web Site Security (4 hr).
- E-commerce: Security Considerations (4 hr).
- Java Enterprise Connectivity: Security Features (3 hr).
- Java Security, Networking, and the Internet (4 hr).
- Microsoft Visual InterDev: Web Security (3 hr).
- Networking Essentials: Data Security (3 hr). Part of MCSE.
- IBM DB2 Universal Database 5.0: Security and Instances (3 hr).
- PC Fundamentals: Safety and Security (1 hr).

Figure 3: Other IBT courses – $74-$140 US = £50-£100 UK (part one)
Learn2 – http://www.tutorials.com
• Securing Applications on the Internet.
• Understanding Internet Security.
• NT 4.0 Security.
• Learn2 Choose and Use a Password (2torial #0499, free)

NIIT – http://www.niit.com (but more easily available through a distributor, such as http://www.headlight.com/browse/catalog or http://www.vcampus.com/webuol/index.cfm?L2_id=21)
• Securing Applications on the Internet (6-8 hr).
• Understanding Internet Security (6-8 hr).

Figure 4: Other IBT courses – $74-$140 US = £50-£100 UK (part two)

Course Technology – http://www.course.com (but more easily available through a distributor, such as http://www.headlight.com/browse/catalog)
• OS/390 Security (4-6 hr).
• OS/390 e-Business (4-6 hr). ‘Planning Security Requirements’ is the fifth and final unit.
• Plus product-specific security courses for AS/400.

netg – http://www.netg.com
• OS/390 Unix Customization and Administration (13766, 10-12 hr).
• DB2 for Application Programmers (13754, 15 hr). Includes implementing simple level security for DB2 tables.
• IBM DB2 Universal Database V6.1 Fundamentals (13431, 6-8 hr). The first of four units concludes with a discussion of security level definitions, the authentication process, DB2 authorization levels, and using DCL to give a user database object privileges.
• e-Commerce Security (13185, 6-8 hr). The four units cover firewalls, encryption, authentication and authorization, and e-commerce payments security.
• Web Site Security: Internet and Intranet Management and Policies (85105, 6-8 hr).
• Web Site Security: Messaging, Servers, and Viruses (85106, 6-8 hr).
• i-Net+ Part 4: Internet Security and Business Concepts (13594, 6-8 hr).

Figure 5: Other IBT courses – $140-$200 US = £100-£140 UK (part one)
Networking Technologies Series: Network Security (12764, 6-8 hr).
Networking Essentials 2nd Edition, Part 3 (71443, 6-8 hr). Security plans and folder user/share level security are discussed near the end of the course.
Network+ Part 5: Network Security and Troubleshooting (82515, 6-8 hr). Including remote connectivity.
Plus product-specific security courses for Windows 2000, NT 4.0 Server, Cisco, Linux (including Red Hat), Lotus Notes and Domino, Access, Visual Basic with MTS and SQL Server, Microsoft Site Server, Oracle, IIS, AIX, Novell NetWare, Exchange Server, SQL Server, Sun, and SCO/SCR.
Non-English translations of some courses are also available.
SecureWorld Presentations (ESC02, free, 40 hr).
Web Site Security - Internet and Intranet Management and Policies (WN694, 8 hr).
Developing Secure Commerce Applications: Part I (Q128S, 20 hr).
Developing Secure Commerce Applications: Part II (Q129S, 20 hr).
Implementing Security for Web Sites: Part I (WN712, 8 hr).
Implementing Security for Web Sites: Part II (WN737, 8 hr).
Networking Technologies Series: Network Security (WN600, 8 hr).
Plus platform-specific security courses for ORACLE and AS/400.
Global Knowledge – http://www.mindfire.com
Implementing Security for Web Sites (280947).
e-Commerce Security (281974).
Security Basics (281733).
Network Security (280053).
Element K – http://www.elementtk.com
There are also network security lessons in the I-Net+ and Network+ certification programs.

Figure 6: Other IBT courses – $140-$200 US = £100-£140 UK (part two)
OTHER TYPES OF TRAINING

Note that, although many of the courses listed above are available in other forms, they are not listed elsewhere in this series of articles.

IBT is just one form of CBT. Other types of CBT and self-study are covered in the next article in this series, ‘Other RACF/security self-study courses’. What might well be considered another form of IBT is also included in that article, namely streaming audio and/or video seminars. The equivalent for conference sessions is listed at the end of ‘RACF/security conferences’.

The virtual classroom is also arguably IBT, although satellite-delivery can also be used. Both of these forms are listed in the last section of ‘RACF/security classroom courses’.

Editor’s note: if you know of any additional sources of RACF or security related education that have not been covered in this series of articles, please send details to the editor, Fiona Hewitt, at any of the addresses shown on page 2, or e-mail her at fionah@xephon.com

Chris Bruns
(Canada)
Other RACF/security self-study

Because Computer-Based Training (CBT) and other forms of self-study are listed here only if the same course is not offered as Internet-Based Training (IBT), this article is perhaps 80% shorter than it would have been as recently as a year ago. This reflects the fact that training companies are rapidly offering IBT versions of their traditional CBT. (See the previous article for full details of IBT courses.)

Figure 1 shows RACF- and security-related computer-based courses. Note that details vary, based on what’s provided on the Web site.

http://www.datatrain.net
- *How to Use RACF* (5-6 hr).
- *RACF Auditor.*
- *OS/390 Unix Customization and Administration* (10-12 hr). ‘Security Considerations’ is Module 7 of 13.

http://www.aavln.com
- *OS/390 e-Business* (CD-ROM, 4-6 hr). ‘Planning Security Requirements’ is the fifth and final unit.

http://www.ibm.com/services/learning/lsweb/search
- *OS/390 Security* (RM868, CD-ROM, 7 hr).
- *Java Security, Networking and the Internet* (DC007, download and play, 4 hr).
- Plus platform-specific security courses for Lotus Domino and Notes, Oracle, Microsoft Proxy Server, and AS/400.

http://www.tivoli.com
- ‘Tivoli Security Management Overview’ (6 hr).

http://www.gofcs.com
- *Understanding Internet Security* (NT1310, 7 hr).
- *Securing Applications on the Internet* (NT1320, 5 hr).
- *Securing Intranets* (NT1330, 6 hr).

http://www.learn2.com
- *Security on the Internet* (CD or video).
- *Linux Security* (2 volumes, video).
- Plus platform-specific courses for NetWare.

http://www.wavetech.com

*Figure 1: Computer-based courses*
There are not a lot of relevant RACF/security self-study courses left that have not evolved to some form of CBT from paper-based course materials in binders with bound student workbooks, or audio and video cassettes of classroom courses. In fact, there are so few that Figure 2 even includes a particularly useful White paper.

Chris Bruns  
(Canada)  
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Looking for a specific article?

If you keep hoping for an article on a particular topic, but we never publish one, please let us know what the subject is. If it’s likely to be of interest to other subscribers too, we’ll commission it and publish it in RACF Update.

Visit the RACF Update Web site


and follow the link to RACF-related problems.
RACF/security classroom courses

Classroom training still represents the majority of education spending by computing departments. This is partly because it is so expensive, but mostly because IBT is too new to be accepted by most managers.

Courses are listed only once. If they have been recently offered publicly anywhere worldwide, they are listed as ‘scheduled’ (see Figures 1-12). They can, of course, be privately booked (Figures 13-17), but are then charged on a per course basis, rather than per student. Within each category (‘scheduled’ and ‘privately-booked’), courses are listed by the area of the world where they are usually offered.

The ‘virtual classroom’ category (Figures 18) covers several new approaches to distance learning. For example, a classroom-style course may be offered via satellite or the Internet, offering one- or two-way communication, depending on whether the students can ask questions or otherwise interact. These courses may be offered live or on-demand, where students work at their own pace.

- See ‘North America’ section (below) for US
- See ‘UK’ section (below) for Britain.
- For all other countries, click on country name at above URL.

http://www.verhoef.com/outline.htm
- RACF Administration Workshop (5 days).
- AS/400 Security and Administration Workshop (5 days).

http://www.tivoli.com
- Tivoli Security Management 3.6 (2 days).
- Tivoli Security Management Implementation (5 days).
- SecureWay Policy Director Planning and Implementation (IN380, 4 days).
- SecureWay Policy Director Architecture and Solution Design (TR320, 4 days).
- SecureWay Policy Director System Administration (TR330, 4 days).
- Tivoli User Administration 3.6 (2 days).

http://www.candle.com
- MQSecure Workshop (MS110C, 3 days).
- MQSeries Security Workshop for MVS (MQS210S, 1 day).
- MQSeries Security Workshop for NT (MQS501S, 1 day).
- MQSeries Security Workshop for Unix (MQS500S, 1 day).

Figure 1: Scheduled courses worldwide (part one)
http://www.bmc.com
- CONTROL-SA (4-5 days).

http://www.misti.com
- Internet and Web Security (3 days).
- Fundamentals of Internet Security and Control (2 days).
- Accessing and Testing Internet Security (3 days).
- Audit and Security of Electronic Commerce (2 days).
- Introduction to Network Security (3 days).
- SWITS Network Security Advanced Class (2 days).
- The Network Security Infrastructure (NISA) (2 weeks).
- Network Intrusion Detection (3 days).
- Protecting Your Networks with Firewalls (3 days).
- Testing Firewalls and Network Perimeter Security (2 days).
- Introduction to Audit and Security of Data Communications (3 days).
- Remote Access Services and Virtual Private Network Security (3 days).
- Securing TCP/IP Networks (4 days).
- Using CAs and PKIs to Protect Your Information (3 days).
- Controlling Client/Server Environments (3 days).
- How to Manage an Information Security Program (3 days).
- Developing and Writing Information Security Policies (2 days).
- Performing a Security Forensics Review (2 days).
- Intermediate IT Audit and Security (3 days).
- Advanced IT Audit and Security (3 days).
- Fundamentals of Information Security (3 days).
- Creating Information Security Awareness (2 days).
- Controlling and Securing Windows 2000 (4 days).
- Plus business risk, control analysis/review, fraud and HIPPA training, as well as many audit-only seminars and platform-specific education for Oracle Financials, PeopleSoft, NT Server 4.0, SAP R/3, AS/400, NetWare, Unix, and SQL Server.

http://www.learningtree.com
- Implementing Web Security (486, 4 days).
- Internet and Intranet Security: A Comprehensive Introduction (468, 4 days).
- Deploying Internet and Intranet Firewalls (488, 4 days).
- Deploying Intrusion Detection Systems (588, 4 days).
- Building Virtual Private Networks (375, 4 days).
- Public Key Infrastructure (PKI) in the Enterprise (586, 4 days).
- Implementing Windows NT Security (162, 5 days).
- Unix and Linux Security (433, 4 days).

Figure 2: Scheduled courses worldwide (part two)
http://www.isaca.org
- The Internet: Security, Audit and Control Concerns.
- Network Penetration Prevention Tools and Techniques.
- Telecommunications Security.
- Penetrating Windows NT Server 4.0.
- Windows NT: Security, Audit & Control.
- Plus various CISA exam review courses and several IT auditing courses.

http://www.lotus.com
- Domino Application Security and Workflow (2 days).

Figure 3: Scheduled courses worldwide (part three)

http://www.ibm.com/services/learning/lsweb/search
- Basics of OS/390 RACF Administration (H3917, 4.5 days).
- Effective RACF Administration (H3927, 4.5 days).
- Exploiting the OS/390 Security Server (RACF) (H4020, 3.5 days).
- Exploiting the Advanced Features of RACF (ES88A, 4.5 days).
- Implementing RACF Security for CICS/ESA and CICS TS for OS/390 (ES840, 4.5 days).
- Implementing IMS Security (CM431, 4 days).
- Ins and Outs of IMS Security (U3799, 2 days).
- CMOS Cryptography & ICSF Implementation (ES80A, 5 days).
- DCE Secure Core Concepts (Q1244, 2 days).
- DCE Secure Core System Administration (Q1247, 5 days).
- Enterprise IT Security for e-business (ES870, 3 days).
- Security Audit, Attacks and Threat Analysis (PS049, 2 days).
- Internet Security and Firewall Planning (N3202, 2 days).
- IBM Firewall for Windows NT (N3204, 3 days).
- Linux as a Firewall (QLX24, 5 days).
- IBM FirstSecure Boundary Server Workshop (IN350, 2 days).
- IBM Trust Authority Planning and Implementation (IN370, 3.5 days).
- Public Key Infrastructure and IBM Trust Authority Fundamentals (IN360, 1 day).
- Server-Side Scripting and Security (PS057, 3 days).
- Plus platform-specific security courses for AIX, AS/400, BizTalk Server, Lotus Domino, and Red Hat Linux.

Figure 4: Scheduled courses in North America (part one)
http://www.ekcinc.com
• RACF Orientation for Users (R05, 1 day).
• RACF Fundamentals of Daily Administration (R10, 3 days).
• RACF Advanced I: Identifying Exposures (R30, 3 days).
• RACF for Auditors (R35, 3 days).
• RACF: Security DB2 (R75, 2 days).
• RACF: Securing CICS (R55, 3 days).
• RACF Security for Unix System Services (R60, 2 days).
• CA-ACF2: Fundamentals of Daily Administration (A10, 3 days).
• CA-ACF2 Advanced I: Rule Writing Techniques (A20, 3 days).
• CA-ACF2 Advanced II: Identifying Exposures (A30, 4 days).
• CA-ACF2 Advanced III: Implementing Security Interfaces (A50, 3 days).
• CA-ACF2: Auditing the Security System (A35, 4 days).
• CA-ACF2: Database Cleanup and UID Conversion (A45, 2 days).
• CA-ACF2 Security for Unix System Services (A60, 3 days).
• CA-Top Secret: Fundamentals of Daily Administration (T10, 3 days).
• OS/390: Security Basics for an e-Business Environment (G60, 2 days).
• MVS: A Security Perspective (G30, 1 day).
• Basics of MVS Security (G10, 2 days).
• Understanding Security Administration (G20, 2 days).
• E-SRF: Access Analysis (E40-2, 3 days).
• E-SRF: RACF Event Reporting (E40-3, 1 day).
• E-SRF: ACF2 Event Reporting (E40-1, 1 day).
• ETF/A: Tools for CA-ACF2 (E10, 2 days).
• ETF/A: Practitioner’s Workshop (A100, 2 days).
• E-SRF: Impact Program (G100, 5 days).
http://www.computerassociates.com/education/
• RACF Administration (TK079, 5 days).
• CA-ACF2 MVS Basics (AC001, 5 days).
• CA-ACF2 MVS: Advanced Administration (AC002, 2 days).
• CA-ACF2 MVS: Advanced Technical (AC003, 2 days).
• CA-ACF2 CICS: Subsystem (AC004, 2 days).
• CA-Top Secret: Basics (TS001, 5 days).
• CA-Top Secret: MVS Advanced Administration (TS002, 3 days).
• CA-Top Secret: MVS Advanced Technical (TS003, 2 days).
• CA-Top Secret: Intermediate Administration (TS025, 3 days).
• CA-Top Secret: Preparing for a Successful Audit (TS120, 5 days).
• CA-IDMS/DB: Security (ID450, 2 days).
• Plus product-specific security training for SeOS, UniCenter TNG, and eTrust.

Figure 5: Scheduled courses in North America (part two)
http://www.stuhenderson.com
- Effective RACF Administration (HG04, 5 days).
- Advanced RACF Administration (HG05, 3 days).
- How to Be an Effective OS/390 Data Security Officer (HG17, 3 days).

http://www.protechpts.com
- RACF (4 days).
- ACF/2 Basic Administration (5 days).
- ACF/2 Advanced Administration (2 days).
- Internet Security and Firewall Systems (2 days).
- MQSeries Security and Systems Administration (2 days).

http://www.sysed.com
- RACF Administration (26, 4 days).
- Windows NT: Security (216, 3 days).

http://www.canaudit.com
- Hardening the Network for E-Commerce (2 days).
- Penetration Testing: Preemptive Network Security (2 days).
- The Ultimate Network Penetration Class (5 days).
- Control and Security of the Internet (2 days).
- Control and Security of Electronic Commerce (2 days).
- Control and Security of Firewalls and Intrusion Detection (2 days).
- Control and Security of Interconnected Networks (2 days).
- Control and Security of Windows 2000 (2 days).
- Control and Security of Windows NT Server (2 days).
- Control and Security of Unix (2 days).
- Enterprise Security Management: Tools, Contracts and Negotiation (2 days).
- Cyber Terrorism and Electronic Espionage.
- Fraud: Prevention, Detection and Prosecution (1 day).
- Plus audit-only courses and platform-specific courses for AS/400,
  RS/6000, AIX, and Oracle.

http://www.techknowledge.com/Public/public.html
- Internet Security and Firewall Preparation (INWDVISF, 2 days).

http://www.cait.wustl.edu
- Internet Security (TTTL78, 2 days).

http://www.compumaster.net
- Achieving Maximum Web Security (1 day).
- The Secrets to Effective Windows NT Security (2 days).

Figure 6: Scheduled courses in North America (part three)
http://www.stcc.cc.tn.us
• Electronic Business Security, Risk Management & Control (BN2450 & BN2620).

http://am.globalknowledge.com
• Designing Security Architectures (9860, 2 days).
• Network Security and Firewall Administration (9800, 3 days).
• Secure Communications and VPNs (9875, 3 days).
• Windows 2000 Security (6662, 3 days).
• Plus platform-specific courses for Cisco, Entrust, and Red Hat Linux.

• Computer System Security (CS455, 3 semester hours).
• Computer Privacy and Security (CS395, 3 semester hours).

http://www.gocsi.com
• Internet Security Tools and Techniques (2 days).
• How to Design a Security Architecture for e-Business (2 days).
• Management Essentials for e-Business Security and Continuity (2 days).
• Intrusion Techniques and Countermeasures (2 days).
• Firewalls and VPNs: Introduction and Best Practices (2 days).
• A Practical Guide to Encryption and Certificate Authorities (2 days).
• Point A to Point Z: A Primer on Data Communications Security (2 days).
• How to Perform a Technical Network Vulnerability Assessment (2 days).
• How to Manage a Network Vulnerability Assessment (2 days).
• Windows 2000 Security (2 days).
• Practical Forensics: How to Manage IT Investigations (2 days).
• A 6-Step Framework for Incident Response (2 days).
• Introduction to Computer and Network Security (2 days).
• How to Develop a Winning Security Architecture (2 days).
• Fast-Track Security Architecture Development Assistance (5 days).
• How to Develop Information Security Policies (2 days).
• Information Security Policies and Procedures Development Assistance (5 days).
• How to Develop Information Security Standards & Procedures (2 days).
• Management Skills for a Superior Information Security Program (2 days).
• Facilitated Risk Analysis for Business and Security (2 days).
• How to Create & Sustain a Quality Information Security Awareness Program (2 days).
• Essential Training for the Decentralized Security Team (1 day).
• How to Become an Effective Security Liaison: Security as a Part-Time Job Function (2 days).
• Computer Security: A Management Briefing (2-4 hr).
• Information Security Awareness Program Development Assistance (5 days).
• Technical Recovery of Electronic Evidence (3 days).
• CISSP Prep for Success Workshop (3 days).

Figure 7: Scheduled courses in North America (part four)
http://www.cdicorporateeducation.com
- Operating Systems Security (PS52, 1 day).
- Security Auditing, Attacks and Threat Analysis (PS53, 2 days).
- Network Security and Firewalls (PS50, 2 days).
- Designing a Secure Microsoft Windows 2000 Network (2150, 5 days).
- Secure Web Access Using Microsoft Proxy Server (836, 2 days).
- Plus platform-specific security courses for Lotus Domino and BorderManager.

http://www.pbsc.com
- Network Security and Firewalls (PS213, 2 days).
- Designing a Secure Microsoft Windows 2000 Network (2150A, 5 days).
- Operating Systems Security (PS214, 1 day). For NT and Linux.
- Security Audit, Attacks and Threats (PS216, 2 days). For NT and Linux.
- Plus platform-specific security courses for Lotus Domino and Proxy Server.

http://www.wavetech.com
- IT Security Survival Boot Camp (5 days).

http://www.pgp.com/services/education
- PGP Admin (TNS-PA, 3 days).
- PGP Engineer (TNS-PE, 3 days).
- Gauntlet Admin Unix (TNS-GA-UNX, 3 days).
- Gauntlet Admin NT (TNS-GA-NT, 3 days).
- CyberCop Admin (TNS-CCA, 3 days).
- Appliance Training (TNS-EpplA, 3 days).

http://www.natsem.com
- Microsoft Windows NT Security in an Enterprise Environment (1 day).

Figure 8: Scheduled courses in North America (part five)

- Exploiting the OS/390 Security Server (ES88U, 3 days).
- MVS RACF for Admin (BE87, 4 days).
- Implementing RACF Security for CICS/ESA (CE65U, 4.5 days).
- Internet Security and Firewalls Concepts (IN29U, 2 days).
- Tivoli Security Management (TM16U, 2 days).
- Designing a Secure Windows 2000 Network (MIC2150U, 5 days).
- Securing Intranets with BorderManager (NW770U, 3 days).
- Plus platform-specific security courses for AS/400, Lotus Domino, Red Hat Linux, Microsoft Proxy Server, and IBM Firewall.

Figure 9: Scheduled courses in the UK (part one)
http://www.rsm.co.uk
- RACF Basics (1 day).
- Understanding RACF (1 day).
- RACF Technical Overview (1 day).
- RACF for Systems Programmers (4 days).
- RACF Administration (4 days).
- Auditing RACF (2 days).

http://www.wdr.co.uk
- OS/390 Security Server (RACF) Fundamentals (MV26, 1 day).
- RACF for Systems Programmers (MV29, 2 days).
- OS/390 Security Server (RACF) Administration (MV27, 3 days).
- RACF for Auditors (MV28, 1 day).
- Introduction to Network Security (SE12, 1 day).
- Securing Microsoft Internet and Commerce Networks (SE13, 2 days).
- Windows 2000 Network Security (NT16, 3 days).
- Plus platform-specific courses for Firewall-1 and AS/400.

http://www.circle-group.com/training/Schedule.htm
- RACF Overview (MRFO, 1 day).
- RACF for Administrators and Auditors (MRFA, 4 days).

http://www.amdahl-education.co.uk
- RACF Overview (MRFO, 1 day).
- RACF for Administrators & Auditors (MRFA, 4 days).

http://www.tcr.co.uk
- RACF Administration and Auditing.

http://www.fastpath.co.uk
- RACF Overview (1 day).
- Internet Security Overview (1 day).
- Management of Internet Security (3 days).
- Introduction to PKI Technologies (1 day).
- Designing a Secure Windows 2000 based Network (5 days).
- Plus platform-specific courses for AS/400, Firewall-1 and VPN-1.

http://www.wavetech.co.uk
- IT Security Survival Bootcamp (5 days). Currently being redeveloped.

Figure 10: Scheduled courses in the UK (part two)
http://www.consul.com
- RACF Introduction and Overview (ER881, 1 day).
- RACF Reporting and Auditing (ER884, 1 day).
- RACF General Functions and Implementation (ER882, 3 days).
- RACF Advanced Functions and Implementation (ER883, 3 days).
- RACF Selected Topics (CR540, 1 day).
- Consul/RACF and Audit Overview (CR510, 1 day).
- RACF Management using Consul/RACF (CR530, 2 days).
- RACF Report and Audit with Consul/Audit (CR520, 2 days).
- OS/390 Auditing using Consul/Audit (CR525, 2 days).
- Consul Auditing and Reporting Language (CARLa) (CR550, 3 days).

http://www.integrata.de
- Security Server (RACF) Vertiefung (5812, 2 days).
- Security Server (RACF) Grundlagen (5813, 2 days).
- OS/390 Webserver Security (5808, 2 days).

http://www.intranet.dk
- RACF Overview (MRFO, 1 day).
- RACF for Administrators & Auditors (MRFA, 4 days).

http://www.betasystems.com
- RACF Workshop (5 days).
- BETA 88 Administration (5 days).
- BETA 88 Auditor/Revisor (3 days).
- BETA 89 Administration (3 days).
- BETA Query Language (BQL) Workshop (3 days).

Figure 11: Scheduled courses in Europe

http://www.ast.co.za/education
- RACF for Administrators (5 days).

Figure 12: Scheduled courses in South Africa

http://www.cistraining.net/FRpage2.htm
- RACF Introduction to Data Security (1/2 day).
- RACF Security Policy (1/2 day).
- RACF Definition of Groups and Users (2 days).
- RACF Program and Application Security (1 day).
- RACF JES2 Security (2 days).
- RACF DASD Dataset Security (1/2 day).
- RACF Tape Dataset Security (1/2 day).

Figure 13: Privately-booked courses in North America (part one)
http://www.viplink.com/clientservices/training.cfm
• z/OS Security Server (RACF) Administration (4.5 days).
• z/OS Security Server (RACF) Group Administration (2 days).
• z/OS Security Server (RACF) Security and Audit (4.5 days).
• Effective Use of Vanguard Administrator (1 day).
http://www.actisit.com
• RACF Security Management (5 days).
• Internet Security and Firewall Systems (2 days).
• MQSeries Security and Systems Administration (2 days).
http://www.mentor-services.com
• Administering RACF (4 days).
• Implementing Web Security.
• Internet and Intranet Firewalls.
• Deploying Internet and Intranet Firewalls.
• Implementing Windows NT Security.
http://www.actpr.com
• RACF Effective Administration (4 days).
http://www.villegasassociates.com/services.html
• Custom designed courses in RACF, CA-ACF2, CA-Top Secret, HIPPA, business continuity planning, firewalls, and security for OS/390, AS/400, networks, the Internet, and Web sites.
http://www.estec.com
• Security Awareness: Administrator (1 day).
• Security Awareness: Management (1 hr).
• Security Awareness: Employee (2 hr).
http://www.masp.com
• EDI Security, Audit and Control (MC-30).
• Plus many IT audit and contingency planning courses.
http://www.newinstruction.com
• Securing Your Windows 2000 Server (3 days).
http://www.bpgtraining.com
• Unix Security Issues (2 days).
http://www.gpworldwide.com/services/it/it_catalog_courses.asp
• Domino Application Security & Workflow (LNDOASW, 2 days).
http://www.mcafeeb2b.com/services/mcafee-training
• McAfee Basic Training (2 days).
• McAfee Advanced Training (2-5 days).

Figure 14: Privately-booked courses in North America (part two)
http://www.sysprog.co.uk
• RACF Overview.
• RACF for Systems Programmers.
• RACF Administration.

http://www.bminternational.co.uk
• RACF Administration and Auditing (5 days).

http://www.it-iq.co.uk/
• Planning and Implementing a Secure Internet Presence (5510, 2 days).
• Designing a Secure Windows 2000-based Network (2150, 5 days).
• Secure Web Access Using Proxy Server 2.0 (836, 2 days).

Figure 15: Privately-booked courses in the UK

http://www.cross-systems.de
• MVS/ESA RACF System Programmierung (MVSRS, 5 days).
• MVS/ESA RACF Planung und Administration (MVSRA, 3 days).
• DB2 Security Konzepte und Realisierung (DB2SR, 2 days).

http://www.quadrat-gruppe.de/stellen.html
• RACF Administration (RF0020).

Figure 16: Privately-booked courses in Europe

http://www.adcomed.com.au
• RACF for Administrators (5 days).
• RACF V2 Structure and Impact (1 day).
• CICS for Security (2 days).

http://www.softed.co.nz
• Network Security, Policy & Firewall Implementations (2 days).

Figure 17: Privately-booked courses in Australia and New Zealand
http://www.etnetworks.com
• Effective RACF Administration (H27S0, 4.5 days).
• Enterprise IT Security for e-business: An Overview (E70S0, 3 days).
• Internet Security and Firewall Planning (N02S0, 2 days).
• Plus platform-specific security courses for AIX and AS/400.

http://webtrack.cai.com/edu/will.cfm
• CA-ACF2 MVS: Basics (5 days).
• CA-Top Secret: MVS Advanced Technical (2 days).

http://www.compchannel.com
• E-Commerce Security: Creating an Enterprise-Wide Policy (20000903, 54 min).
• Web Site Security: Beyond Firewalls (990702, 54 min).
• PKI: The Core of E-Commerce Security (20000804, 53 min).
• Understanding Public Key Infrastructure and Its Value (20000302, 58 min).
• Understanding Security for Intranets, Extranets and the Internet (981104, 39 min).
• Firewalls: Covering Your Assets (20000305, 46 min).
• IP Security: Protecting Your VPNs (20000402, 58 min).
• IPSec: A Review of the New Security Protocols (991105, 37 min).
• Identifying and Managing IT Risk Factors (991006, 42 min).
• Information Security: From Risk Containment to Arrest Attainment (991207, 52 min).
• Windows 2000 Security Features (20000805, 56 min).
• Windows NT 4.0 Series: Part 4 – Securing the NT Environment (971201, 56 min).
• Windows NT 4.0 Series: Part 5 – NT in High Security Environments (980106, 48 min).

http://www.webseminarslive.com
• Web Security: End-to-End eBusiness Security (1-2 hr, free).
• Security Vulnerabilities: Protecting Your Digital Assets (1.25 hr, free).

http://am.globalknowledge.com
• Network Security and Firewall Administration (20 hr, $1195).

Figure 18: Virtual classroom courses

ELSEWHERE
As mentioned above, courses are listed only once in this article, even if they would fit into more than one category. Note also that because
some classroom courses are also offered as IBT or other forms of self-
study, they are not listed in this article at all. Instead, they feature in
‘RACF/security Internet-Based Training’ or ‘Other RACF/security
self-study’.

Chris Bruns
(Canada)  © Xephon 2001

RACF/security training directories

Most Human Resources (HR) departments do not even try to handle
the education planning internally for their computing staff. Given the
amount and cost of training involved, there are many consultants and
even entire companies making a living fulfilling that need. And a few
have begun to offer Web-based services.

But the Internet has some free sources of great information. And that
is what most of the Web sites listed in Figures 1-4 provide.

The numbers indicate search results (ie number of courses listed)
based on RACF and security keywords.

<table>
<thead>
<tr>
<th>Web Address</th>
<th>RACF</th>
<th>Security</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://www.solutioncentral.com">http://www.solutioncentral.com</a></td>
<td>29</td>
<td>6,840</td>
</tr>
<tr>
<td>Requires free registration to get course details.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><a href="http://www.uk.thinq.com">http://www.uk.thinq.com</a></td>
<td>7</td>
<td>91</td>
</tr>
<tr>
<td><a href="http://www.courseleader.co.uk">http://www.courseleader.co.uk</a></td>
<td>2</td>
<td>28</td>
</tr>
<tr>
<td>UK site: 5 RACF; security 61.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><a href="http://www.thinq.com">http://www.thinq.com</a></td>
<td>5</td>
<td>177</td>
</tr>
<tr>
<td><a href="http://www.seminarinformation.com">http://www.seminarinformation.com</a></td>
<td>4</td>
<td>148</td>
</tr>
<tr>
<td><a href="http://www.corptraining.com">http://www.corptraining.com</a></td>
<td>3</td>
<td>370</td>
</tr>
<tr>
<td><a href="http://www.trainingregistry.com">http://www.trainingregistry.com</a></td>
<td>3</td>
<td>51</td>
</tr>
</tbody>
</table>

Figure 1: Mainframe courses (part one)
http://www.atr-training.com.au
• 0 RACF; 5 CA-ACF2; 225 security.
• Requires free registration to search, substantial subscription fee to get course details.

http://www.trainseek.com
• 0 RACF; 735 security.

http://www.knowledgeplanet.com/marketplace/course/catalog.jsp?tab_sel=4
• 0 RACF; 17 security.
• Requires free registration to search; only existing customers can purchase; vendor name not always shown.

http://www.itaudit.org/YellowPages/category/education_and_training.htm
• detailed vendor list; no course list.

http://www.hatainers.org/vendlist.htm
• vendor list only; no course list.

http://dmoz.org/Computers/Software/Online-Training
• vendor list only; no course list.

http://www.auditnet.org/trainres.htm
http://www.auditnet.org/edures.htm
• vendor lists only; no course list.

http://www.edupoint.com/providers/providerlist.jsp
• vendor list with no URLs; no course list.

http://www.loriaux.com/s390/training.html
• list of mainframe consultants and trainers.

http://www.hungrymindsuniversity.com
• search failed when tested.

Figure 2: Mainframe courses (part two)

http://www.click2learn.com
• > 300 security.

http://www.skillvest.com/indexes/index_search.htm
• > 50 security.

http://www.microsoft.com/trainingandservices
• training by Microsoft and partners.

Figure 3: Non-mainframe courses
CONSULTANTS

If you can’t find the course you’re looking for, many training vendors can create custom training to your specifications. Alternatively, you could use a consultant, many of whom have taught classroom courses in the past. Most have extensive experience with knowledge transfer, ensuring that support staff can carry on after they have completed a project.

Local consultants can be found in a telephone directory. And the Internet has at least one large directory of consultants at:

http://www.icca.org

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*Chris Bruns*

*(Canada)*

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**RACF Update on the Web**

Code from individual articles of *RACF Update*, and complete issues in Acrobat PDF format, can be accessed on our Web site, at:


You will be asked to enter a word from the printed issue.

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http://fsai.fh-trier.de/~holert/fernlernen/fernlernen.html
- German.

http://web-stark.de/links/pages/Bildung/Fernstudium/index.html
- German.

*Figure 4: Non-English courses*
RACF/security conferences

Find the right conference, and you can learn as much in a one-hour conference session as you would in a two-day classroom course. But you have to work at it:

• Listen carefully.

• Take notes to expand on or cover points not listed on the handout (typically a copy of the slides).

• Invent your own tests and do them when you get home.

• Research any questions that come up in the relevant product manuals.

• If possible, ask the speaker a question or discuss things with other attendees.

But be warned: conferences can be exhausting experiences. To obtain maximum value:

• Come well rested.

• Do not plan any social activities in the evening if you’re attending sessions all day.

• If you can afford/justify it, stay in the hotel where the conference is hosted, or at least one nearby, so that your waking hours are spent learning, not commuting.

In Figures 1-2, conferences are listed by URL only, categorized by the part of the world where they are normally held.

Unlike training, Internet-based Web delivery of conference sessions, either live or on-demand, has been very slow in coming. Back in 1996, Gartner Group offered streaming RealAudio with full-motion video, and IBM used its proprietary Bamba technology to deliver streaming audio synchronized with slides of selected technical conference sessions. Now, five years on, we seem to have not yet come back to the point where we were in 1996. The truth, of course, is that there were major problems with the technology back then.
**Worldwide**
- http://www.idug.org
- http://www.isaca.org/conf1.htm
- http://www.ttvanguard.com
- http://www.drii.org/upcoming.htm
- http://www.iqpc.com
- http://www.gartner.com
- http://www.marcusevansconferences.com
- http://www.iir.org/locations.cfm
- http://www.interdoc.ws/e/events

**North America**
- http://www.vipexpo.com
- http://www.viplink.com/conference
- http://www.share.org
- http://www.gocsi.com
- http://www.caworld.com
- http://www.dci.com
- http://www.drj.com
- http://www.afcom.com
- http://www.thinkhdi.com/hdiconference
- http://www.xplor.org

**UK**
- http://www.xephon.com
- http://www.gse.org.uk

**Europe**
- http://www.gse.org

*Figure 1: Traditional conferences*

- http://www.ibm.com/services/learning/conf/online
- http://www.netsessions.net
- Plus, SHARE has conference proceedings on CD-ROM.

*Figure 2: Sessions available on the Internet*
Contributing to *RACF Update*

In addition to *RACF Update*, the Xephon family of *Update* publications now includes *CICS Update, MVS Update, TCP/SNA Update, VSAM Update, DB2 Update, AIX Update, Domino Update, MQ Update, NT Update, Oracle Update*, and *TSO/ISPF Update*. Although the articles published are of a very high standard, the vast majority are not written by professional writers, and we rely heavily on our readers themselves taking the time and trouble to share their experiences with others. Many have discovered that writing an article is not the daunting task that it might appear to be at first glance.

They have found that the effort needed to pass on valuable information to others is more than offset by our generous terms and conditions and the recognition they gain from their fellow professionals. Often, just a few hundred words are sufficient to describe a problem and the steps taken to solve it.

If you have ever experienced any difficulties with RACF, or made an interesting discovery, you could receive a cash payment, a free subscription to any of our *Updates*, or a credit against any of Xephon’s wide range of products and services, simply by telling us all about it. For a copy of our *Notes for Contributors*, which explains the terms and conditions under which we publish articles, please write to the editor, Fiona Hewitt, at any of the addresses shown on page 2, or e-mail her at fionah@xephon.com.
CONSUL/Audit 2.6 for RACF and ACF2 provides automatic status auditing of the Unix subsystem of OS/390. And Consul/Enterprise Audit 2.2.2 now provides integrated auditing across HP-UX and Lotus Domino platforms, in addition to the product’s existing support for OS/390, Windows NT/2000, AIX, Sun Solaris, Check Point FireWall-1, Cisco Router, and Microsoft Internet Information Server (IIS).

For further information, contact:
CONSUL Risk Management, Marshalllaan 2, 2625 GZ Delft, Netherlands.
Tel: (31) 15 2513333.
30 Great Road, Acton, MA 01720, USA.
Tel: (888) 323 0880.
URL: http://www.consul.com

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Schumann Security Software has a new name, SYSTOR, and its flagship product, SAM (Security Administration Manager), has three new components:

- **SAM Role Miner** applies data mining techniques to the creation of role concepts for the administration of user IDs.
- **SAM Connect** allows security-critical applications and platforms to be incorporated efficiently into the SAM Security Management system.
- **SAM/LDAP Support** interfaces SAM to the Lightweight Directory Access Protocol (LDAP) Internet security standard.

For further information, contact:
SYSTOR, Baslerstrasse 60, CH-8048 Zurich, Switzerland.
Tel: (41) 1 405 31 11.
6411 Ivy Lane, Suite 610, Greenbelt, MD 20770, USA.
Tel: (301) 486 4600.
URL: http://www.systor.com

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Blockade has integrated its OS/390 security products with Entrust’s getAccess secured e-business portal management software. A Pluggable Authentication and Authorization Module (PAAM) has been added to Blockade’s OS/390 security server, allowing getAccess to use it to provide authentication, authorization, and auditing.

For further information, contact:
Blockade Systems, 2200 Yonge Street, Suite 1400, Toronto, Ontario M4S 2C6, Canada.
Tel: (888) 898 9949.
URL: http://www.blockade.com
Entrust Technologies, 4975 Preston Park Blvd, Suite 400, Plano, Texas 75093, USA.
Tel: (888) 690 2424.
URL: http://www.entrust.com

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IBM’s eServer announcements in October 2000 have renamed or replaced most System/390 hardware systems and operating systems, as well as AS/400, AIX, and Netfinity. Relevant details can be found inside this issue in the ‘Security Implications with z’ article beginning on page 29.