z/VM Goody Bag

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March 6, 2009
Session 9153

Disclaimer and Acknowledgement

The examples presented here are for demonstration only. While they are based on real experience, there is no assurance that they will be applicable outside the original use at Nationwide Insurance.

Thanks to my coworker and SHARE's Deputy Director of Operations Jim Vincent for the work he did to extract the information about the VM "gems".

Sources

- "Free" stuff that came with VM
  aka "Hidden Gems"

- VM Download Packages web page
  http://www.vm.ibm.com/download/packages/

- University of Kentucky VM Workshop Tools
  http://ukcc.uky.edu/~tools/

- V/Soft Software
  http://www.vsoft-software.com/downloads.html

- Slippery Rock University – Fran Hensler
  http://zvm.sru.edu/~download

The Hidden Gems

- Where are these "gems"? On MAINT's….
  - 193 disk - "CMS system tools" a.k.a. "Samples disk"
    - the 493 disk is the "Test CMS system tools"
  - 194 disk - "CP & DV object code"
  - 3B2 disk - "CMS & REXX object code"

- Installation samples along with undocumented samples

- Everything from how to bake a cake to the benefits of having a cat for a pet...
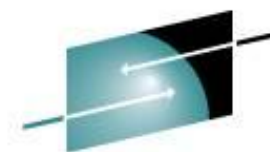
The Hidden Gems

```
 CAKE      SCRIPT    F1  V 132   Trunc=132 Size=13 Line=0 Col=1 Alt=0
====>
       |...+....1....+....2....+....3....+....4....+....5....+....6
00000 * * * Top of File * * *
00001 Cake Recipe
00002
00003 3 cups flour
00004 1 cup sugar
00005 2 cups pineapple
00006 2 eggs
00007 1 tbsp. oil
00008 1 tsp. baking powder
00009 1 tsp. baking soda
00010 1 tsp. salt
00011
00012 Mix all ingredients in a large bowl.
00013 Pour into a pan and bake at 350 degrees for 30 minutes.
00014 * * * End of File * * *
```

The Hidden Gems

- A real "fish" story:

```
 DEEP      SEA       F1  F 80  Trunc=80 Size=8 Line=0 Col=1 Alt=0

====>
      |...+....1....+....2....+....3....+....4....+....5....+....6
00000 * * * Top of File * * *
00001 THAT REMINDS ME OF THE TIME I ALMOST
00002 CAUGHT THE 50-POUND FISH.
00003 IT WAS EARLY IN THE MORNING, AND I WAS ALONE.
00004 I HAD A SUDDEN BITE ON THE LINE, AND I
00005 BEGAN FURIOUSLY REELING IT IN.
00006 I HAD GOTTEN THE FISH ALMOST IN THE BOAT,
00007 AND IT WAS A BEAUTY!
00008 SUDDENLY, THE LINE WENT SLACK.
00009 THE FISH WAS GONE!
00010 * * * End of File * * *
```

The Hidden Gems

- And a definitive story about cats:

```
 CAT      TALES     F1  F 80  Trunc=80 Size=8 Line=0 Col=1 Alt=0
====>
      |...+....1....+....2....+....3....+....4....+....5....+....6.
00000 * * * Top of File * * *
00001 THERE ARE MANY KINDS OF ANIMALS TO CHOOSE FROM
00002 WHEN YOU ARE LOOKING FOR A PET.
00003 BUT MANY PEOPLE FIND CATS ARE AN EXCELLENT CHOICE.
00004 CATS ARE CLEAN AND DO NOT REQUIRE A LARGE LIVING SPACE.
00005 ALTHOUGH THEY ARE INDEPENDENT, CATS ARE ALSO VERY AFFECTIONATE
00006 AND DEVOTED TO THEIR OWNERS.
00007 SO, IF YOU ARE LOOKING FOR A FRIENDLY, FURRY ADDITION
00008 TO YOUR FAMILY, CONSIDER A CAT.
00009 * * * End of File * * *
```

The Hidden Gems

- Those files, among others, are 'samples' used to populate the SFS directory VMSYS:MAINT.CMSREXX.OBJECT when INSTPOOL EXEC is run to start the file pool servers during VM installation

- Why are they there? They were/are used with the CMS/Xedit primer

Gems on Maint's 193/493

- 193/493 disk - "CMS system tools" a.k.a. "Samples disk"

- The following are all found on those disks...

SFS Tool: WHO EXEC

- WHO will sort the storage groups and output what users (who) are enrolled in each storage group.

- Very easy way to find out what everyone in a filepool is using

- Example: WHO VMBSYS (FILE

SFS Tool: WHO EXEC

```
                  STORAGE GROUP REPORT FOR VMBSYS
                        DATE: 02/19/09
                     TIME GENERATED: 23:34:57


                     USERS IN STORAGE GROUP 2


 User        Storage Group  4K Block Limit 4K Blocks Committed Threshold
 --------------------------------------------------------------------
 BARLOWR          2              100000          41923-41%        90%
 CFCONSOL         2                2000             13-00%        90%
 DRUSER           2                5000              5-00%        90%
 DRWEB            2               50000            167-00%        90%
 HTTPD            2                5000           3663-73%        90%
 MAINT            2              400000         169864-42%        90%
 RSCSDNS1         2                1000             22-02%        90%
 SOFTWARE         2              500000         447226-89%        90%
 VINCENJ          2              150000          93849-62%        90%
 …and many many more...
```

SFS Tool: TALLY EXEC

- TALLY will tabulate the amount of space which has been added to a storage group. It will show the amount of space being used and also show the amount of free space left. TALLY will also calculate the difference between the actual physical space and the logical allocated space.

- Example: TALLY VMBSYS (FILE

SFS Tool: TALLY EXEC

```
STATUS REPORT FOR VMBSYS

                         DATE: 02/19/09
                 TIME GENERATED: 23:40:13


FILE POOL INFORMATION


      1000   MAXIMUM NUMBER OF STORAGE GROUPS
      1000   MAXIMUM NUMBER OF MINIDISKS
   2527232   POTENTIAL ADDRESSABLE 4K BLOCKS IN FILE POOL


CURRENTLY DEFINED MINIDISK INFORMATION


MINIDISK NUMBER    GROUP NUMBER    4K BLOCKS IN-USE    4K BLOCKS FREE
       1                1              1790 - 100%            0
       4                1              3521 -  98%           67
       6                1              3423 -  95%          165
       9                1              3137 -  35%         5846
       2                2             44556 -  99%          388
       3                2            175899 -  98%         3905
       5                2             47683 -  99%          318
       7                2             17768 -  99%          206
       8                2             17809 -  99%          165
      10                2            163552 -  82%        36570
      11                2            119276 -  60%        80846
```

SFS Tool: TALLY EXEC

```
PHYSICAL/ALLOCATED BLOCK INFORMATION


GROUP NUMBER   # of USERS   PHYS. 4K BLOCKS   ALLOC. 4K BLOCKS   DIFFERENCE

     1             0             17949               0              17949

     2            72            708941            2180700          -1471759

     3             0               0                 0                 0

     4             0               0                 0                 0

     5             0               0                 0                 0

     6             0               0                 0                 0

     7             0               0                 0                 0

     8             0               0                 0                 0

     9             0               0                 0                 0

    10             0               0                 0                 0

    11             0               0                 0                 0
```

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SFS Tool: SFSTRANS EXEC

- Transfer ownership of all directories and files from one userid to another. This exec must be run on a userid with Shared File System Administrator authority. The target userid must already be enrolled.

- After this exec has completed, a DELETE USER command must be executed to delete the old userid from the filepool.

- Very easy way to transfer *everything* when a userid needs to be renamed, a person leaves and someone else needs the files, etc.

- Syntax: SFSTRANS userid1 userid2

SFS Tool: REGRANT EXEC

- This exec will regrant file and directory authorities for a user who has changed their userid.

- For example: if user WASME changed their userid to NEWME, all file and directory level grants to WASME would be changed to NEWME. All references to OLDID will then be deleted (revoked). This exec can be executed after a userid has been transferred using the SFSTRANS EXEC.

SFS Tool: REGRANT EXEC

- System Administrator authority is required

- Syntax: REGRANT
  - The routine will prompt for the userid(s) that need to be re-granted.

Pipe Tool: RITA MODULE

"Lovely Rita, Meter Maid…"

- Rita reports on the CPU utilization of a pipeline complex by stage and pipeline specification.

- Detailed output is written to a disk file, and a summary is displayed on the console.

- A MUST HAVE for anyone writing, debugging, and tuning CMS Pipelines!!

Pipe Tool: RITA MODULE

- The most current version of RITA can be found at:
  http://vm.marist.edu/~pipeline/

- Use RITA by replacing any "PIPE" command with "RITA"

- Example, change:

PIPE CP Q TIME | CONSOLE | COUNT LINES | CONSOLE

to

RITA CP Q TIME | CONSOLE | COUNT LINES | CONSOLE

Pipe Tool: RITA MODULE

```
TIME IS 15:42:43 EDT THURSDAY 2000-07-20

CONNECT= 08:46:48 VIRTCPU= 000:32.45 TOTCPU= 000:36.60

2

    CPU Utilization by Pipeline Specification          20 Jul 2000 15:42:43


   0.018 (       0.018) ms total in "NoName001" (1 invocation)


   0.400 ms total.


Detailed output from Rita in UNNAMED RITA001.
```

Pipe Tool: RITA MODULE

```
 UNNAMED   RITA001   A1   V 80   Trunc=80 Size=18 Line=0 Col=1 Alt=0           1
====>
|...+....1....+....2....+....3....+....4....+....5....+....6....+....7....+
* * * Top of File * * *
CPU Utilization by Pipeline Specification     from: 6 Aug 2008 23:46:22
                                                to: 6 Aug 2008 23:46:22


CPU utilization of pipeline specification "NoName001":
     0.001 (     0.001) ms (    8K) in stage   1 of pipeline  1: CP Q TIM
     0.001 (     0.001) ms (    2K) in stage   2 of pipeline  1: CONSOLE
     0.000 (        0) ms (  <1K) in stage   3 of pipeline  1: COUNT LI
     0.001 (     0.001) ms (    2K) in stage   4 of pipeline  1: CONSOLE
     0.003 (     0.003) ms total in "NoName001" (1 invocation) <=====


     0.003 ms attributed to stages; no virtual I/O.


     0.014 ms in scanner.
     0.008 ms in dispatcher.
     0.047 ms in accounting overhead.


     0.072 ms total.
* * * End of File * * *
```

Pipe Tool: CALENDAR EXEC

- An easy way to create a 3-month calendar from a Pipe.

- Produces a calendar of three months starting with the input date or today's month and RC = 0 RC=998 input date cannot be processed. e.g. 5-digit year RC=999 if the specified month is not valid.

Pipe Tool: CALENDAR EXEC

- PIPE CALENDAR | CONSOLE
  would produce

```
      February 2009              March 2009               April 2009

 S  M  T  W  T  F  S       S  M  T  W  T  F  S       S  M  T  W  T  F  S

 1  2  3  4  5  6  7       1  2  3  4  5  6  7                   1  2  3  4

 8  9 10 11 12 13 14       8  9 10 11 12 13 14       5  6  7  8  9 10 11

15 16 17 18 19 20 21      15 16 17 18 19 20 21      12 13 14 15 16 17 18

22 23 24 25 26 27 28      22 23 24 25 26 27 28      19 20 21 22 23 24 25

                         29 30 31                   26 27 28 29 30
```

Look in the CALENDAR REXX file for the syntax/use notes

Pipe Tool: CALENDAR REXX

- There is a newer version at
    http://vm.marist.edu/~pipeline/

- We have a couple of mods too:

    22 Nov 1999 ... Allow current month in MIDDLE – CurrMonMid
    18 Nov 1999 ... Add WEEKS and SUNDAYLAST options
                              Move Sunday BACK to start of week

    - If you'd like our copy, let me know or E-mail me later.

Pipe Tool: OSPDS REXX

- Decompose an OS PDS unloaded with IEBCOPY

- Input: The logical records written by IEBCOPY. If the dataset comes from tape, then it is usually in a VB format which must be unblocked before it comes here; a reader file (sendfile) is in netdata format and must be unblocked from that format.
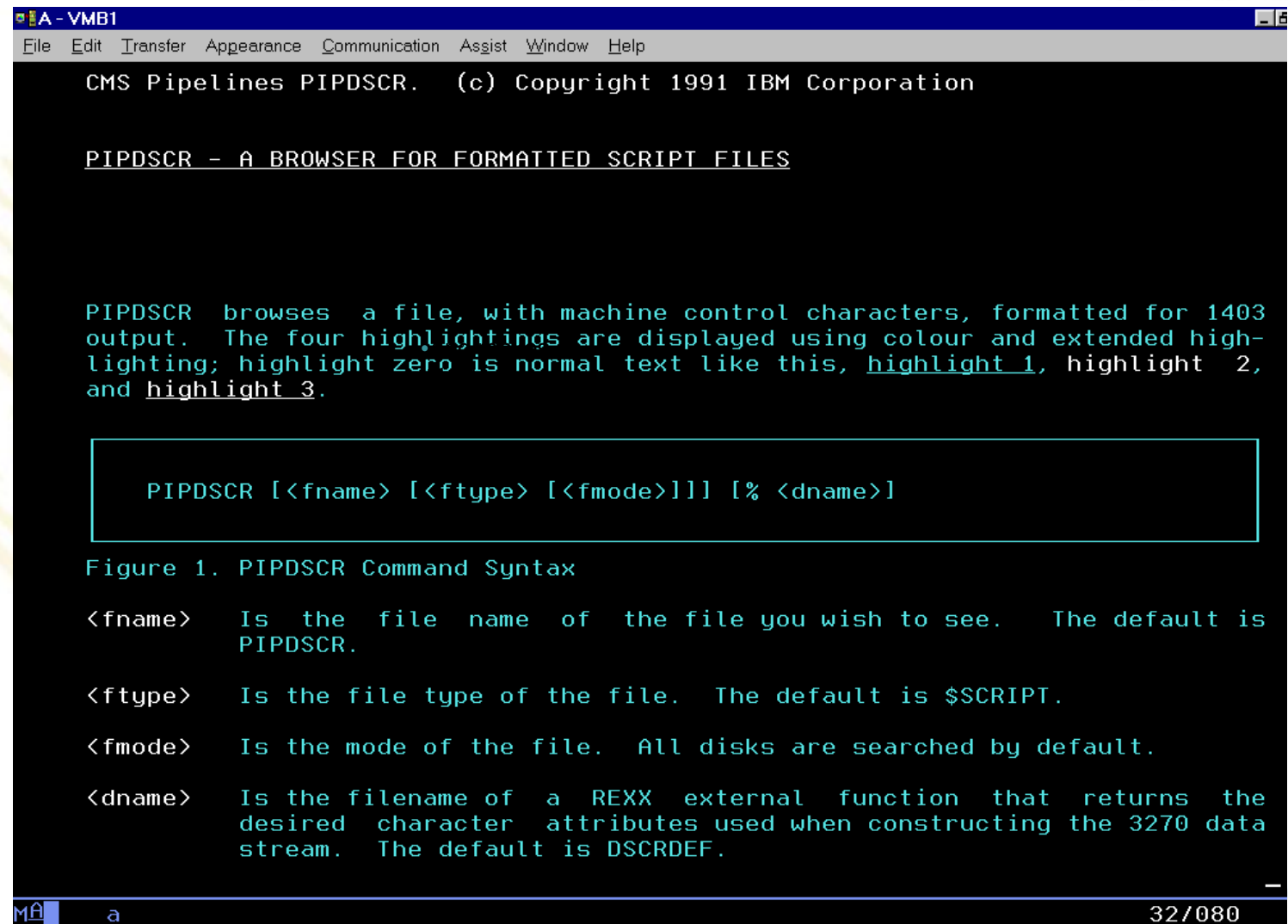
Pipe Tool: PIPDSCR EXEC

- Takes a 1403 formatted SCRIPT (DCF) and displays it with highlighting, etc, on your console.

- This is way cool…

- The only way to explain it is to show it to you:

  EXEC PIPDSCR PIPDSCR $SCRIPT

Pipe Tool: PIPDSCR EXEC

- Takes a script file that looks like…

```
 A - VMB1                                                                   _
File  Edit  Transfer  Appearance  Communication  Assist  Window  Help

   PIPDSCR    $SCRIPT   C1   V 80   Trunc=80 Size=240 Line=0 Col=1 Alt=0        12:33
====>  _
 |...+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....
* * * Top of File * * *
¿SCRIPT/VS 3.2.1: DEVICE 1403N8 CHARS MONO
»
¿   CMS Pipelines PIPDSCR.   (c) Copyright 1991 IBM Corporation
¿   CMS Pipelines PIPDSCR.   (c) Copyright 1991 IBM Corporation
¿   CMS Pipelines PIPDSCR.   (c) Copyright 1991 IBM Corporation
¿   CMS Pipelines PIPDSCR.   (c) Copyright 1991 IBM Corporation
¿
¿   PIPDSCR - A BROWSER FOR FORMATTED SCRIPT FILES
¿   PIPDSCR - A BROWSER FOR FORMATTED SCRIPT FILES
¿   PIPDSCR - A BROWSER FOR FORMATTED SCRIPT FILES
¿   PIPDSCR - A BROWSER FOR FORMATTED SCRIPT FILES
¿   _____
¿
¿
¿   PIPDSCR  browses  a file, with machine control characters, formatted for 140
¿   output.  The four highlightings are displayed using colour and extended high
¿   lighting; highlight zero is normal text like this, highlight 1, highlight  2
¿                                               _____   highlight  2
¿                                                             highlight  2
¿                                                             highlight  2
¿   and highlight 3.
¿       highlight 3
¿       highlight 3
¿       highlight 3
¿       _____
¿
¿   ÐxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxÐxxxxxxxxxxxxx
¿   |
MA     a                                                                 02/007
```

Pipe Tool: PIPDSCR EXEC

- … and makes it look like:

```
A - VMB1
File  Edit  Transfer  Appearance  Communication  Assist  Window  Help

   CMS Pipelines PIPDSCR.   (c) Copyright 1991 IBM Corporation


   PIPDSCR - A BROWSER FOR FORMATTED SCRIPT FILES



   PIPDSCR  browses  a file, with machine control characters, formatted for 1403
   output.   The four highlightings are displayed using colour and extended high-
   lighting; highlight zero is normal text like this, highlight 1, highlight  2,
   and highlight 3.


   ┌─────────────────────────────────────────────────────────────────────────┐
   │                                                                           │
   │    PIPDSCR [<fname> [<ftype> [<fmode>]]] [% <dname>]                       │
   │                                                                           │
   └─────────────────────────────────────────────────────────────────────────┘

   Figure 1. PIPDSCR Command Syntax

   <fname>    Is   the   file   name   of  the file you wish to see.   The default is
              PIPDSCR.

   <ftype>    Is the file type of the file.   The default is $SCRIPT.

   <fmode>    Is the mode of the file.   All disks are searched by default.

   <dname>    Is the filename of  a  REXX  external  function  that  returns  the
              desired  character  attributes used when constructing the 3270 data
              stream.   The default is DSCRDEF.

MA   a                                                                  32/080
```

Other Gems…
SCM XEDIT

- SCM formats comments in EXECs so that they are nice and neat. Found on MAINT's 493/193 disks.

- Example:

```
 TEMP      EXEC      A1  V 255  Trunc=255 Size=5 Line=0 Col=1 Alt=12        12:41

====>

     |...+....1....+....2....+....3....+....4....+....5....+....6....+....7...
00000 * * * Top of File * * *
00001 /* A test exec */
00002 Address 'COMMAND' /* Address basics */
00003 'CP Q TIME' /* Is it time to go yet?? */
00004 'CP MSG SLOTH Are you going to do some work today?' /* Be wise... */
00005 Exit /*adios!*/
00006 * * * End of File * * *
```

Other Gems…
SCM XEDIT

- ## SCM * 71 would give:

```
 TEMP      EXEC     A1  V 255   Trunc=255 Size=5 Line=0 Col=1 Alt=17        12:42

====>

      |...+....1....+....2....+....3....+....4....+....5....+....6....+....7...
00000 * * * Top of File * * *
00001 /* A test exec                                                     */
00002 Address 'COMMAND'                      /* Address basics           */
00003 'CP Q TIME'                            /* Is it time to go yet??    */
00004 'CP MSG SLOTH Are you going to do some work today?'   /* Be wise... */
00005 Exit                                   /*adios!                     */
00006 * * * End of File * * *
```

Other Gems…
FMTP XEDIT

- ## An easy way to format your Pipelines into a more readable format (Found on MAINT's 493/193 disks)
  - ## "readable" is a personal preference

- ## Example

```
 TEMP      EXEC     A1  V 255  Trunc=255 Size=5 Line=0 Col=1 Alt=0          12:46
====>
     |...+....1....+....2....+....3....+....4....+....5....+....6....+....7...
00000 * * * Top of File * * *
00001 /* A test exec */
00002 Address 'COMMAND'
00003
00004 'PIPE CP Q TIME | CONSOLE | COUNT LINES | VAR HOWMANY'
00005
00006 * * * End of File * * *
```

Other Gems…
FMTP XEDIT

- FMTP typed in the Prefix area next to the PIPE command would produce:

```
 TEMP     EXEC     A1  V 255   Trunc=255 Size=9 Line=0 Col=1 Alt=5          12:50

====>

       |...+....1....+....2....+....3....+....4....+....5....+....6....+....7...
00000 * * * Top of File * * *

00001 /* A test exec */

00002 Address 'COMMAND'

00003

00004 'PIPE(name TEMP)|',

00005    'CP Q TIME |',

00006    'CONSOLE |',

00007    'COUNT LINES |',

00008    'VAR HOWMANY'

00009

00010 * * * End of File * * *
```
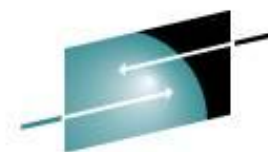
VM Download Library

List of All-Time Favorites (40 total)

Rank	Count	Name	Types	Abstract	More...
1	14598	B2H	v-2894K z-576K	B2H: Convert Bookmaster, GML, Script/VS and "flat" files to HTML (Internet) **Release 4.7**	(+)
2	6596	PRFCOPY	v-36K z-25K	The most complete "cut&paste" for XEDIT **V4.2.f**	(+)
3	5501	YR2000VM	v-656K z-215K	Technical Description of VM/ESA's Year 2000 Support (updated Sept. 1999)	(+)
4	5193	CPQUERY	v-345K	CMS GUI exec, issues CP Query commands and manages NSS **V4.0.1**	(+)
5	4821	VMWEBCD	v-5245K z-1091K	Redbook SG24-5347 "Web-Enabling VM resources" sample programs.	(+)
6	4652	LP3820	v-405K	Convert AFP (LIST3820) files to personal printers	(+)
7	4633	CHARLOTT	v-812K	Charlotte - fullscreen, textual World Wide Web browser for CMS	(+)
8	4551	H2S	v-91K z-66K	H2S - Converts HTML to Script/VS (DCF) for fine printing with AFP or PostScript	(+)
9	4275	GUIBLD95	v-1208K	Windows 95 GUI Builder for Writing CMS GUI Applications	(+)
10	4257	GUISKEL	v-1676K	A framework to build REXX CMS/GUI applications much easier. **V3**	(+)
11	4184	PIPESERV	v-801K	A Pipeline Server. A driver for service machines. Version 1.2.4.	(+)
12	4085	PRFGUI	v-478K	A CMSGUI interface for VMPRF Trend & Summary files **Version 1.13**	(+)
13	4033	MAILGATE	v-90K	Package to enable SMTP gateway functions on a pre-VM/ESA 2.3.0 system.	(+)
14	4012	RSK-GA	v-342K	RSK Extras (GA level)	(+)
15	3997	RSKFIX	v-355K	Reusable Server Kernel (RSK) fix pack	(+)
16	3789	FILELIST	v-205K	Improvements to FILELIST, RDRLIST and EXECUTE **Version 2.4.6**	(+)
17	3738	LIBRCMS	v-81K	VSE/ESA Librarian Server for CMS users	(+)
18	3725	FCOPY	v-131K	* FCOPY - High speed CMS file copy routine with PACKLIB support	(+)
19	3699	MONVIEW	v-60K	Tools to look at raw VM/ESA or z/VM monitor data.	(+)
20	3687	LOOKALL	v-65K	Probably the best XEDIT-based search engine you will find.	(+)

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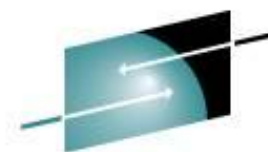
VM Download Library

20	3687	**LOOKALL**	v-65K	Probably the best XEDIT-based search engine you will find.	(+)
21	3682	**SG245148**	v-201K	Redbook "VM/ESA Network Computing with Java and NetRexx" sample programs	(+)
22	3678	**COMPARE**	v-139K z-169K	Comparing files with XEDIT, Comparing minidisks (or FILELISTs). **V1.8**	(+)
23	3647	**VMHP**	v-114K	Tools we use to manage the VM home page system.	(+)
24	3634	**PICKPIPE**	v-33K	Choose between default VM, Marist, and test runtime versions of Pipelines	(+)
25	3625	**SEARCH**	v-352K	Search Engine for VM-Hosted Web Sites	(+)
26	3617	**GUIONE**	v-1632K	Make your own CMS/GUI performance monitor (includes GBOS2) **V1.1**	(+)
27	3597	**SPOOLCHN**	v-474K	System Programmer/System Operator Extended Spool Query Commands	(+)
28	3551	**VM220PRF**	v-840K	VM/ESA Version 2 Release 2.0 Performance Report	(+)
29	3544	**INFOLIST**	v-266K	The CMS File Manager. Replaces FILELIST, RDRLIST, MACLIST	(+)
30	3528	**GETBACK**	v-15K	Recover a wrongly erased file.	(+)
31	3495	**XASTOR**	v-49K	A multi-functioned, programmable, full-screen storage display	(+)
32	3481	**PIPEFIND**	v-545K	VERY FAST/FUZZY PIPELINES SEARCH OF FILES.	(+)
33	3480	**HASHWF**	v-28K z-17K	A General HASH function (S/370 and other systems)	(+)
34	3435	**TLD**	v-144K	TCP/IP line driver for CMS distributed queues.	(+)
35	3431	**CHAT**	v-10K	Network chatting tool demonstrating various CMS APIs.	(+)
36	3400	**SG245164**	v-92K	Redbook "Exploiting Recent CMS Function: A User's Guide to CMS Application Multitasking" sample programs.	(+)
37	3386	**ECHO**	v-8K	Empty Rexx/Sockets-based, multi-client TCP server	(+)
38	3321	**MULTISRV**	v-444K	Multiple protocol server for TCP/IP	(+)
39	3284	**DRM**	v-190K	An XEDIT based interface to manage the CP Directory **Version 4.5.2**	(+)
40	3212	**BOX2BMS**	v-3K	Draw box diagrams for BookMaster documents	(+)

VMARC

- VMARC is a data compaction and file archiving utility for VM/CMS. Although compacted files may make economical use of storage space or network bandwidth, they are not directly usable by applications.

- Similar in function to WinZip

- File date / time preserved in VMARC

- http://www.vm.ibm.com/download/

VMARC

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University of Kentucky

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V/Soft Software

Slippery Rock University

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Slippery Rock University

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TRACK

- The 'widely acclaimed' TRACK utility for monitoring and poking around in virtual machines, real storage, etc.

- Includes
    - Basic dis-assembler
    - Ability to display ASCII for Linux guests

- http://vm.marist.edu/track/

- TRACK for z/VM – What's Happening in Your Virtual Machines? From past SHARE, Session 9123

TRACK

SHARE 112 - Session 9153

Pipelines Runtime Library

- This is the author's version of what has been included in the CMS distribution as CMS Pipelines feature. The Runtime Library contains the most current enhancements.

- The Pipelines Runtime Library was made available in response to a SHARE requirement "which requested IBM's permission for software vendors (including shareware vendors) to package a current version of the CMS Pipelines runtime library with their software products in order that they could use new features of Pipes in their products".

- http://vm.marist.edu/~pipeline

- See PIPELINE NEWS for the list of changes

CHARLOTT

- Web Browser for VM

- CHARLOTT is a highly capable 3270-compatible web browser.

- Handles most text-heavy web pages with no problem. Web pages with a lot of graphics are not very useful.

- http://www.vm.ibm.com/download/charlott.vmarc

CHARLOTT

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GOPHER

- Gopher is a protocol system, which in advance of the World Wide Web, allowed server based text files to be hierarchically organised and easily viewed by end users who accessed the server using Gopher applications on remote computers.
  From The Internet Gopher http://www.codeghost.com/gopher_history.html

- http://www.casita.net/~rmt/software/gopher24.vmarc

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IPGATE

- An application that allows the sharing APPC resources across VM systems without the need of SNA. IPGATE communicates through TCP/IP and sets up a separate session for each conversation. One conversation is needed per user and APPC resource pair. IPGATE has been tested extensively with Shared File Pools (SFS) and the IBM Performance ToolKit (a.k.a. FCON/ESA).

- Written in REXX and uses MTREXX

- Allow distributed IUCV across TCP/IP when ISLINK and SNA are not an option

- http://www.vsoft-software.com/downloads.html

VMFTP

- VMFTP is a macro processor for the VM TCP/IP File Transfer Protocol (FTP) command. It allows a REXX program to issue FTP subcommands and process the responses to them.

- From Romney White in a pre-IBM endeavor

- http://zvm.sru.edu/~download/vmftpupd.vmarc

VMFTP - Example

```
/* Sample VMFTP Macro named TEST*/

'open some.where'

If RC <> 220 Then Signal Oops


i = OUTPUT.0

Parse Var OUTPUT.i user rest

If user <> 'USER' Then Signal Oops


'barlowr'

If RC <> 331 Then Signal Oops


'my_pw'

If RC <> 220 & RC \= 230 Then Signal Oops


'dir'

If RC <> 226 Then Signal Oops
```

```
'quit'

If RC <> 221 Then Signal Oops


Exit 0


Oops:

Say 'Return code' RC 'not expected'

Say OUTPUT.0 'lines'

Do i = 1 To OUTPUT.0

    Say "'"Output.i"'"

End

Exit RC
```
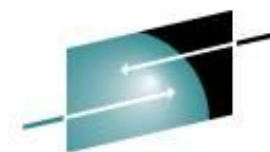
VMFTP - Example

```
VMFTP TEST

Return code 250 not expected

7 lines

'200 Port request OK. '

'125 List started OK '

'AG        SERVERS  V         17         10          1 2008-08-08 18:45:45 -'

'AGLIST    EXEC     V         71         29          1 2008-08-08 18:26:34 -'

'DPTOOL    IMAGE    V      49152        212       1264 2007-10-23 13:51:12 -'

'WORK               DIR        -          -          - 2005-06-10 09:04:13 -'

'250 List completed successfully. '

>>>QUIT

221 Quit command received. Goodbye.
```

TAPEMAP

- TapeMap describes the contents of a tape.

- Scans a tape from beginning to end and attempts to determine how many files and the layout

- Source files and install notes in VMARC;
  Build TAPEMAP MODULE

- http://ukcc.uky.edu/~tools/1998/tapemap.vmarc

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TAPEMAP

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WEBSHARE

- Rick Troth's HTTPD server for z/VM (CMS)

- Written entirely in REXX and CMS Pipelines

- Allows both text and binary files to be served out to web browsers very easily from CMS

- http://www.vsoft-software.com/downloads.html

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