

Bit Bucket x'3B'

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SHARE 134
Session 26201
Fort Worth, TX
28 Feb 2020





To Serve Man
the continuing aftermath...

(Ed Jaffe)

Why Remove z/OS SMB?

- SMB is a Microsoft file sharing protocol that grew from IBM's NetBIOS. The current protocol version is 3.0. It is secure, highly functional, and is the basis for the Common Internet File System.
- Originally Apple didn't support it, but eventually changed their mind. MacOS now fully supports current SMB/CIFS protocols.
- Linux fully supports SMB via SAMBA/CIFS.
- The z/OS SMB server was (IMHO) one of IBM's best efforts, but it was never updated to protocol levels beyond SMB 1.0.
- When SMB 1.0 was diagnosed with serious vulnerabilities, it was quickly deprecated by Microsoft.
- The Windows client even unilaterally uninstalls itself if not used for two weeks!

We Reluctantly Became a Sponsor User

- We vehemently expressed our disagreement with IBM's strategy:
 - NFS was originally designed for server-to-server remote mounts only.
 - Individual end-user authentication, etc. is very recent (NFS v4) and requires Kerberos single sign-on technology.
 - NFS v3 is the most popular protocol for NFS and Windows still uses it.
 - (MacOS supports NFS v4 for those that care about such things.)
- SMB/CIFS 3.0 works "out of the box" for Windows 10, MacOS, and Linux clients and so we "politely" suggested IBM's direction *should* be to upgrade its SMB server to support the SMB/CIFS 3.0 protocol like the other vendors.
- Kershaw Mehta promised me IBM would make NFS work "out of the box" for Windows 10 clients so, despite my skepticism, I offered to help out as a "sponsor user" and try to implement NFS in our environment.

Restrictions/Problems Discovered During Migration

Description

NFS does not support cascading mounts

NFS does not turn on MntEntFSModeExport in BPXYMNTTE

NFS does not support the use of forward slashes in client pathnames

NFS has no equivalent to the \\MYHOME support in SMB

NFS does not support near-simultaneous updates by multiple clients

NFS does not support v3 client SAF authentication with Kerberos

NFS does not support v3 client SAF authentication without Kerberos

NFS does not support AUTOMNT with SAF enabled

NFS does not support creation of read-only files with SAF enabled

NFS generates many extraneous ICH408I messages on Syslog

NFS does not support running EXEs (executables) with SAF enabled

NFS does not support z/OS UNIX ACLs without SAF enabled

NFS does not support z/OS UNIX ACLs with SAF enabled

NFS locking is “dog” slow

Workaround/Fix

OA57493 (OPEN)

None

None/Microsoft

Scripted mount H:

Adjust Windows registry

OA56224

OA56187

Export individual users

OA57489

None

Mapped file/Microsoft

None (Understandable)

OA57493 (OPEN)

None


```
# The WINPREFIX attribute specifies a z/OS UNIX file system
# prefix to be used by Windows clients. The prefix value must
# begin with a forward slash (/) followed by at least one and no
# more than six additional characters. Mount requests received
# by the Network File System beginning with this prefix value
# are identified as mount requests for z/OS UNIX but with
# additional customizations to enable the Windows native client
# to work smoothly. The prefix value is not part of the path name
# on the z/OS system.
#
# Customizations enabled by this prefix:
# 1. showmount -e will list additional export entries under the
#    given prefix: one additional winprefix'ed export for each
#    entry in the exports data set prefixed with the hfsprefix.
# 2. File mode reported to client is 777. This forces access
#    checking on the server side which has two benefits for
#    Windows clients:
#    a. ACLs work correctly (Windows clients do not send ACCESS
#       RPCs and thus do not attempt access to files where the
#       UNIX file mode denies access, but an ACL allows access).
#    b. File access is tolerated in environments with mis-matched
#       UIDs/GIDs (Windows client sends request and server
#       handles permissions properly based on z/OS UID).
# 3. Crossing mount points is enabled.
#
# Note: The file system must be mounted locally by z/OS UNIX.
#       Otherwise, the client mount fails.
# Note: This prefix is only valid and can only be enabled when
#       security is SAFEXP or EXPORTS for HFS data access.
# Note: This prefix is only exposed for NFSv3 accesses.
#
winprefix(/win)
```

[illegible]

- 777 permissions are misleading and result in many extraneous ICH408I failures on the log
 - At least you can access the files you need and ACLs work
- Cascading mounts works on the surface, but available space values are always presented from the highest file system in the hierarchy
 - This leads to "out of space" conditions that are not legit
 - Cascading mounts unusable until this is resolved

OA57493 (OPEN)

- To unambiguously set permissions, you must check and uncheck every permission box, then set the desired permissions and press Apply.

```
:/u/edjx1/sharetest: >ls -l
total 0
-rw-r--r--  1 EDJX1    DEV          0 Feb 27 23:16 abc.txt
```

abc.txt Properties

General NFS Attributes Details Previous Versions

File attributes

Type: Regular File Used: 0

Size: 0 Links: 1

File ID: 44 File System ID: 1423

Last access time: Thursday, February 27, 2020 11:19:46 PM

Last modification time: Thursday, February 27, 2020 11:16:15 PM

Last status change time: Thursday, February 27, 2020 11:16:33 PM

File permissions (mode)

		Owner			Group			Other		
Set UID	Set GID	R	W	X	R	W	X	R	W	X
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Owner (UID): 1074 Group (GID): 1

OK Cancel Apply

abc.txt Properties

General NFS Attributes Details Previous Versions

File attributes

Type: Regular File Used: 0

Size: 0 Links: 1

File ID: 44 File System ID: 1423

Last access time: Thursday, February 27, 2020 11:19:46 PM

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File permissions (mode)

		Owner			Group			Other		
Set UID	Set GID	R	W	X	R	W	X	R	W	X
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Owner (UID): 1074 Group (GID): 1

OK Cancel Apply

abc.txt Properties

General NFS Attributes Details Previous Versions

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File permissions (mode)

		Owner			Group			Other		
Set UID	Set GID	R	W	X	R	W	X	R	W	X
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Owner (UID): 1074 Group (GID): 1

OK Cancel Apply

- No matter what you do, the result will always appear again as 777
- Inspect using SSH or OMVS prompt ls -l command

OA57493 (OPEN)

```
MVSNFS 00000281 ICH408I USER(DEAN      ) GROUP(SUP      ) NAME(YAMADA, DEAN      ) 154
154 00000281      CL(DIRACC  ) FID(D3C1D5F0F140000300000000114B114A)
154 00000281      INSUFFICIENT AUTHORITY TO VREADDIR
154 00000281      ACCESS INTENT(R--) ACCESS ALLOWED(OTHER      ---)
154 00000281      EFFECTIVE UID(0000001300) EFFECTIVE GID(00000000007)
MVSNFS 00000281 ICH408I USER(DEAN      ) GROUP(SUP      ) NAME(YAMADA, DEAN      ) 155
155 00000281      CL(DIRACC  ) FID(D3C1D5F0F140000300000000114B114A)
155 00000281      INSUFFICIENT AUTHORITY TO VREADDIR
155 00000281      ACCESS INTENT(R--) ACCESS ALLOWED(OTHER      ---)
155 00000281      EFFECTIVE UID(0000001300) EFFECTIVE GID(00000000007)
MVSNFS 00000281 ICH408I USER(DEAN      ) GROUP(SUP      ) NAME(YAMADA, DEAN      ) 156
156 00000281      CL(DIRSRCH ) FID(D3C1D5F0F140000300000000114B114A)
156 00000281      INSUFFICIENT AUTHORITY TO VLOOKUP
156 00000281      ACCESS INTENT(--X) ACCESS ALLOWED(OTHER      ---)
156 00000281      EFFECTIVE UID(0000001300) EFFECTIVE GID(00000000007)
MVSNFS 00000281 ICH408I USER(DEAN      ) GROUP(SUP      ) NAME(YAMADA, DEAN      ) 157
157 00000281      CL(DIRACC  ) FID(D3C1D5F0F140000300000000114B114A)
157 00000281      INSUFFICIENT AUTHORITY TO VREADDIR
157 00000281      ACCESS INTENT(R--) ACCESS ALLOWED(OTHER      ---)
157 00000281      EFFECTIVE UID(0000001300) EFFECTIVE GID(00000000007)
MVSNFS 00000281 ICH408I USER(DEAN      ) GROUP(SUP      ) NAME(YAMADA, DEAN      ) 158
158 00000281      CL(DIRACC  ) FID(D3C1D5F0F14000030000000011D281D27)
158 00000281      INSUFFICIENT AUTHORITY TO VREADDIR
158 00000281      ACCESS INTENT(R--) ACCESS ALLOWED(OTHER      ---)
158 00000281      EFFECTIVE UID(0000001300) EFFECTIVE GID(00000000007)
MVSNFS 00000281 ICH408I USER(DEAN      ) GROUP(SUP      ) NAME(YAMADA, DEAN      ) 159
159 00000281      CL(DIRACC  ) FID(D3C1D5F0F14000030000000011D281D27)
159 00000281      INSUFFICIENT AUTHORITY TO VREADDIR
159 00000281      ACCESS INTENT(R--) ACCESS ALLOWED(OTHER      ---)
159 00000281      EFFECTIVE UID(0000001300) EFFECTIVE GID(00000000007)
```

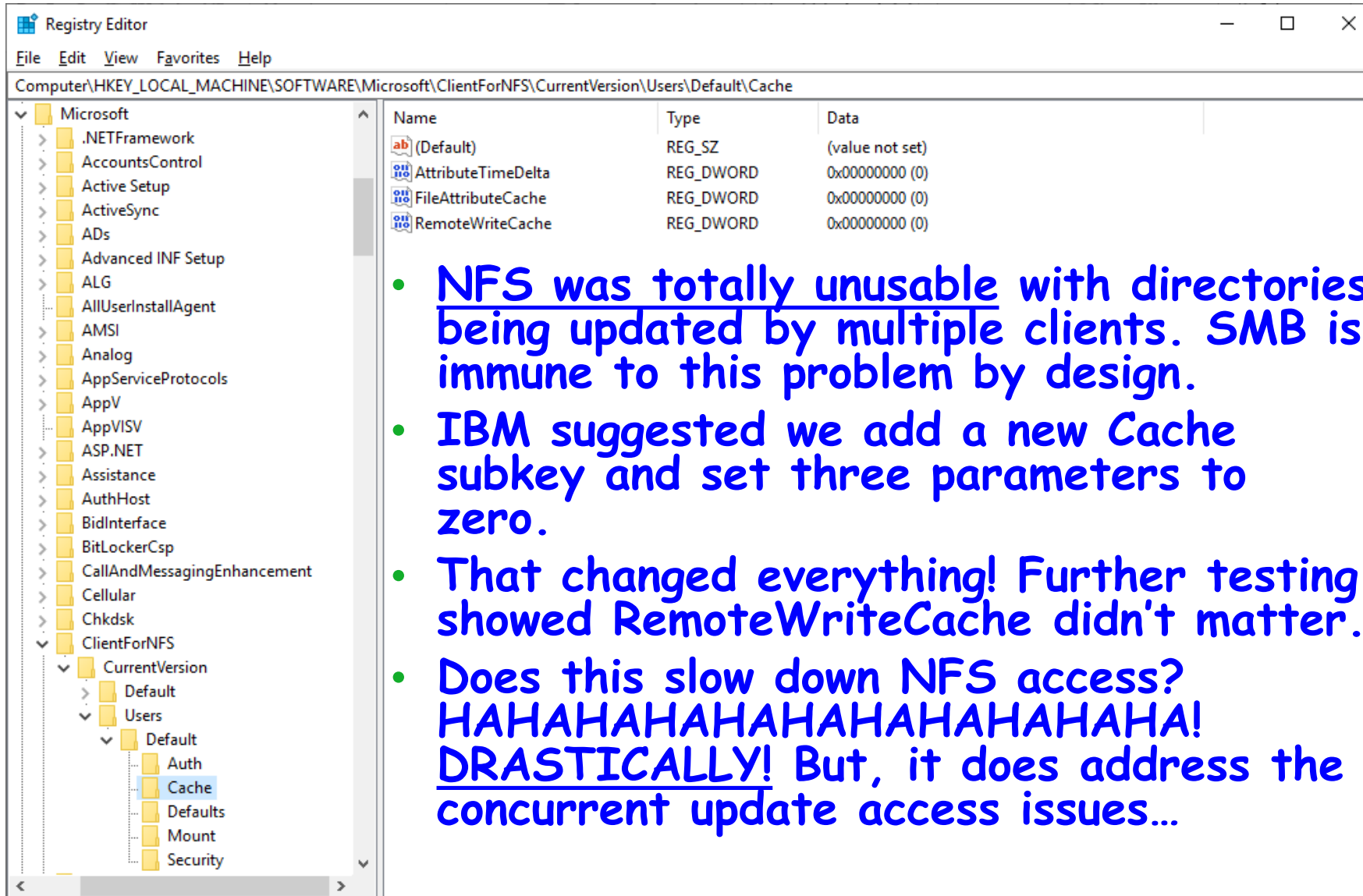
- Users are unaware of these failures and unaffected.
- Auditing of such failures is ineffective
- The hex FID (this one starting with LAN01) seems kinda useless even for real failures

Other APARs



- OA56224 provides NFSv3 client SAF authentication with Kerberos
- OA56187 provides MVSLOGIN, MVSLOGOUT and SHOWATTR commands for use with Windows
 - Network traffic is not encrypted
 - IBM recommends the use of Kerberos
- OA56489 allow file owner read/write despite filemode

Allowing Near-Simultaneous Updates



Registry Editor

Computer\HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\ClientForNFS\CurrentVersion\Users\Default\Cache

Name	Type	Data
(Default)	REG_SZ	(value not set)
AttributeTimeDelta	REG_DWORD	0x00000000 (0)
FileAttributeCache	REG_DWORD	0x00000000 (0)
RemoteWriteCache	REG_DWORD	0x00000000 (0)

- NFS was totally unusable with directories being updated by multiple clients. SMB is immune to this problem by design.
- IBM suggested we add a new Cache subkey and set three parameters to zero.
- That changed everything! Further testing showed RemoteWriteCache didn't matter.
- Does this slow down NFS access? HAHAHAHAHAHAHAHAHAHAHA! DRASTICALLY! But, it does address the concurrent update access issues...

- This is obviously a Windows solution.
- Mac and Linux allow you to set the cache parameters on the mount itself.
- Recommend you use **-noac** and heed the following warning from the Linux man pages:

Using the noac option provides greater cache coherence among NFS clients accessing the same files, but it extracts a significant performance penalty. As such, judicious use of file locking is encouraged instead. The DATA AND METADATA COHERENCE section contains a detailed discussion of these trade-offs.

Mapped File Updates for EXE Execution

- In NFSATTR add:
 - mapped
- Create file called hlq.NFS.MAPPING with the following:
 - #NFS.MAPPING
 - #NFS.MAPPING.MAPPED
 - .exe binary nosaf
- This will prevent SAF access to EXE files in order to work around a Microsoft bug.

NFS Locking is "Dog" Slow

- We experienced unacceptably-slow performance for programs that perform a lot of locking.
- We wrote a test program that showed just how slow it was
- Unfortunately, this is an issue with NFS in general and not z/OS.
 - Same slowness observed on Linux for Z as well as Linux for Intel and across clients (Windows, Mac, Linux)

```
LittleMac:FileLock etech$ ./FileLock /Volumes/Temp/register.dbf
Testing with locking.           Duration: 00:02:25      2688 loop iterations
Testing without locking.        Duration: 00:00:00      2688 loop iterations
LittleMac:FileLock etech$
LittleMac:FileLock etech$ ./FileLock /Volumes/Temp/register.dbf
Testing with locking.           Duration: 00:02:23      2688 loop iterations
Testing without locking.        Duration: 00:00:00      2688 loop iterations
LittleMac:FileLock etech$
LittleMac:FileLock etech$ mount | fgrep ep.phx
ep16centos7.ep.phx:/Viking on /Volumes/Temp (nfs, read-only)
```

Workload Placement and Future Considerations



- Unfortunately, this debacle has forced us to move some workload off the mainframe.
- That HURTS!
- We might be able to bring it back (in a sense) by leveraging SAMBA/CIFS under zCX once we upgrade to wanna them fancy new z15s (we're at z13s now).
- In the mean-time, we'll keep trying to help IBM improve z/OS NFS for the workload that hasn't yet left...




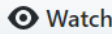


Workflow Woes

(Mike Shorkend)

Get the XML from github


<https://github.com/IBM/IBM-Z-zOS/tree/master/zOS-Workflow/zOS%20V2.4%20Upgrade%20Workflow>

 IBM / IBM-Z-zOS






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Branch: master ▾ IBM-Z-zOS / zOS-Workflow / zOS V2.4 Upgrade Workflow / [Create new file](#) [Find file](#) [History](#)

 marnawalle

 Made exported links more obvious Latest commit 8abf72f on Oct 22

..		
 HC_rexx.txt	Add z/OS V2.4 Upgrade Workflows themselves	4 months ago
 discovery.txt	Update the Upgrade workflows for zOS24, and added the new z15 upgrade	3 months ago
 readme.md	Made exported links more obvious	last month
 zOS Upgrade from V2.2 to V2.4-Lev...	Update the Upgrade workflows for zOS24, and added the new z15 upgrade	3 months ago
 zOS Upgrade from V2.3 to V2.4-Lev...	Update the Upgrade workflows for zOS24, and added the new z15 upgrade	3 months ago

Download the XML

IBM / IBM-Z-zOS

Watch

72

Star

132

Fork

81

<> Code

Issues

1

Pull requests

0

Projects

0

Security

Insights

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Branch: master ▾

IBM-Z-zOS / zOS-Workflow / zOS V2.4 Upgrade Workflow / zOS Upgrade from V2.2 to V2.4-Level1.0.xml

Find file

Copy path

MarkWallen

Update the Upgrade workflows for zOS24, and added the new z15 upgrade

961fbb3 on Sep 12

2 contributors

2.03 MB

Download

History

Transfer the XML to z/OS



This is a text file(xml) so text transfer(i.e. translate to EBCDIC).

Right?

Create the Workflow in z/OSMF

The screenshot displays the IBM z/OS Management Facility (z/OSMF) interface. On the left is a navigation pane with a tree view containing the following items: Welcome, Notifications, Workflow Editor, Workflows (selected), Cloud Provisioning, Configuration, Consoles, Links, Performance, Problem Determination, Software, z/OS Classic Interfaces, z/OSMF Administration, and z/OSMF Settings. Below the tree is a 'Refresh' button. The main content area has a tabbed interface with 'Welcome' and 'Workflows' tabs. The 'Workflows' tab is active, showing a 'Workflows' section with the text 'Simplifies tasks through guided step-based'. Below this is an 'Actions' dropdown menu with the following options: View Properties, Open (highlighted), Modify..., Cancel, Delete, Archive, Stop Automation, Generate Feedback..., Create New Based on..., Reactivate..., Update Workflow Step..., Create Workflow... (highlighted with a red rectangle), Customize JOB State..., Workflows View, and a 'Select All' checkbox. The 'Create Workflow' dialog box is open, featuring the title 'Create Workflow' and the instruction: 'Type or select a workflow definition file to use for creating a new workflow. For a z/OS data set, specify a fully qualified name, with no quotes.' It contains three input fields: 'Workflow definition file:' with the value '/u/.../zosmf/fw/zOS24.upgrade.xml', 'Workflow variable input file:' with the value 'Select or type', and '* System:' with a blacked-out value. At the bottom of the dialog are five buttons: '< Back', 'Next >', 'Finish', 'Cancel', and 'Help'.

IBM z/OS Management Facility

Welcome x Workflows x

Workflows
Simplifies tasks through guided step-based

Actions ▾ Active

- View Properties
- Open
- Modify...
- Cancel
- Delete
- Archive
- Stop Automation
- Generate Feedback...
- Create New Based on...
- Reactivate...
- Update Workflow Step...
- Create Workflow...
- Customize JOB State...
- Workflows View

☒ Select All

Create Workflow

Type or select a workflow definition file to use for creating a new workflow.
For a z/OS data set, specify a fully qualified name, with no quotes.

* Workflow definition file:
/u/.../zosmf/fw/zOS24.upgrade.xml

Type or select a variable input file to populate the new workflow. For a z/OS data set, specify a fully qualified name, with no quotes.

Workflow variable input file:
Select or type

* System:
[Redacted]

< Back Next > Finish Cancel Help

Hmm... Something is Wrong

Create Workflow

✖ The validation of workflow definition file "/u/s03/fw/zOS24.upgrade.xml" IZUWF0120E failed. See line "1" for errors. More information from the XML parser: "Content is not allowed in prolog."



Type or select a workflow definition file to use for creating a new workflow.
For a z/OS data set, specify a fully qualified name, with no quotes.

* Workflow definition file:

/u/s03/fw/zOS24.upgrade.xml

Type or select a variable input file to populate the new workflow. For a z/OS data set, specify a fully qualified name, with no quotes.

Workflow variable input file:

Select or type

* System:

[Redacted] ▼

Doing it Like a Millennial

- <https://www.youtube.com/watch?v=ejQRSYaxz9M> (for 2.1, thanks Marna, for the tweet)
- Downloaded zOS Upgrade from V2.2 to V2.4-Level1.0.xml
- *Binary* upload to z/OS unix
- Load into z/OSMF

More Problems



Workflow definition file "/u[REDACTED]/zosmf/fw/zOS24.upgrade.xml" was not added to the Workflows task because the user is not authorized to read the specified file. IZUWF0102E

- Look at the permission bits - 640
- Changed to 755 - fixed it
- Kind of strange because I was using the same user for the FTP and z/OSMF

Still More Problems

The screenshot shows the IBM z/OS Management Facility interface. The left sidebar contains a navigation menu with items: Welcome, Notifications, Workflow Editor, Workflows (selected), Cloud Provisioning, Configuration (with sub-item Configuration Assistant), Consoles, Links, Performance, Problem Determination, Software, z/OS Classic Interfaces, z/OSMF Administration, and z/OSMF Settings. A 'Refresh' button is at the bottom of the sidebar. The main content area has tabs for 'Welcome' and 'Workflows'. The 'Workflows' tab is active, showing a 'Workflows' section with a description: 'Simplifies tasks through guided step-based workflows, and provides administrative functions for assigning workflow responsibilities and track'. Below this is a filter bar with 'Actions' and 'Active' (with a refresh icon). A modal window titled 'Create Workflow' is open, displaying an error message in a red box: 'The workflow definition file "/u/s03/zosmf/fw/zOS24.upgrade.xml" refers to IZUWF0111E file type template for file "discovery.txt", which cannot be found.' Below the error message is a text input field containing '/[redacted]zosmf/fw/zOS24.upgrade.xml'. Further down, there is a section for 'Workflow variable input file' with a dropdown menu showing 'Select or type'.

IBM z/OS Management Facility

Welcome x Workflows x

Workflows

Simplifies tasks through guided step-based workflows, and provides administrative functions for assigning workflow responsibilities and track

Actions Active

Create Workflow

✖ The workflow definition file "/u/s03/zosmf/fw/zOS24.upgrade.xml" refers to IZUWF0111E file type template for file "discovery.txt", which cannot be found.

Type or select a workflow definition file to use for creating a new workflow. For a z/OS data set, specify a fully qualified name, with no quotes.

* Workflow definition file:
/[redacted]zosmf/fw/zOS24.upgrade.xml

Type or select a variable input file to populate the new workflow. For a z/OS data set, specify a fully qualified name, with no quotes.

Workflow variable input file:
Select or type

Downloaded Missing Files

- discovery.txt
- HC_rexx.txt
- Binary upload to z/OS
- Chmod 755
- Try again

What Now?

Turns out that the rexx gets downloaded as html. I had to copy/paste from the website

Workflows ▶ z/OS V2R4 Upgrade Workflow from z/OS V2R2 - Workflow_0 ▶ 1. Discover z/OS features in use

Properties for Workflow Step 1. Discover z/OS features in use

General	Details	Dependencies	Notes	Perform	Status	Input Variables	Feedback
---------	---------	--------------	-------	---------	--------	-----------------	----------

Name:	ID:	Class:	Type:	Status:	Return code:
S03	J0703971	L	JOB	OUTPUT	CC 0012

JESMSG LG	JESJCL	JESYSMSG	SYS PRINT	SYSTSPRT
-----------	--------	----------	-----------	----------

DD name:	Step name:	Procedure step name:	Dataset ID:	Class:	Record count:
SYSTSPRT	RUNIT		104	X	6

Output (0.115KB of 0.115KB shown)

```
1READY
  %TSOREXX
    1 +++ <!DOCTYPE html>
IRX0035I Error running TSOREXX, line 1: Invalid expression
READY
END
```


How To Do It Right

- Read the **entire** readme file on github!
- Download the xml,HC_rexx.txt,discovery.txt as **raw**
- **Binary** upload to USS
- Change permissions
- Load the workflow
- Define z/OSMF workflow

• .

Use UTF-8 to View

```
Menu Utilities View Options Help

z/OS UNIX Directory List                                     Row 1 to 6 of 6
Command ==>                                                Scroll ==> PAGE

Pathname : /u.      zosmf
EUID : 15000001

Command  Filename      Message      Type Permission Audit Ext Fmat Owner   Group   Links  Size      Modified
-----
.        .               .            Dir  rwxrwxrwx  fff--  ---- 3      8192 2019/12/24 10:31:00
..       ..            ..            Dir  rwxr-xr-x  fff--  ---- 11     8192 2020/01/26 15:53:44
discovery.txt  File  rwxr-xr-x  fff--  --s-  ---- 1      39629 2019/12/24 10:30:44
fw         Dir  rwxr-xr-x  fff--  ---- 2      8192 2020/02/18 09:40:28
zOS Upgrade fro  File  rwxr-xr-x  fff--  --s-  ---- 1     2132109 2019/12/24 10:30:42
/         HC_rexx.txt  File  rwxr-xr-x  fff--  --s-  bin   1      23023 2019/12/24 10:30:44
***** Bottom of data *****

Directory List Actions

File ----- /u      zosmf/HC_rexx.txt

DIRLIST Action
6 1. Edit                      14. Information
  2. Edit - ASCII             15. File System
  3. Edit - UTF-8             16. Modify Mode Fields
  4. View                     17. Modify Extended Attrs
  5. View - ASCII             18. Modify Owning User
  6. View - UTF-8             19. Modify Owning Group
  7. Browse                   20. Modify Format
  8. New                      21. User Auditing
  9. Directory List           22. Auditor Auditing
 10. Delete                   23. Execute command
 11. Rename                   24. Refadd
 12. Copy Out                 25. Manage ACLs
 13. Copy In

Select a choice and press ENTER to process data set action.
```

HILITE Unavailable - Time for a New Requirement?

```
VIEW      /u/.../zosmf/HC_rexx.txt                                HILITE unavailable
Command ==> hi jcl                                             Scroll ==> CSR
***** Top of Data *****
000001 //*****
000002 //*****/
000003 /** Copyright 2017 IBM Corp.                               */
000004 /**                                                         */
000005 /** Licensed under the Apache License, Version 2.0 (the "License"); */
000006 /** you may not use this file except in compliance with the License. */
000007 /** You may obtain a copy of the License at                     */
000008 /**                                                         */
000009 /** http://www.apache.org/licenses/LICENSE-2.0                 */
000010 /**                                                         */
000011 /** Unless required by applicable law or agreed to in writing, software*/
000012 /** distributed under the License is distributed on an "AS IS" BASIS, */
000013 /** WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. */
000014 /** See the License for the specific language governing permissions and */
000015 /** limitations under the License.                               */
000016 //*****/
000017 /**
000018 /** STEP #1:          COPY STEP - IEBGENER -
000019 //*****
000020 //GENER      EXEC PGM=IEBGENER
000021 //SYSPRINT DD SYSOUT=*
000022 //SYSIN      DD DUMMY
000023 //SYSUT1     DD DDNAME=TSOREXX
000024 //SYSUT2     DD DISP=(NEW,PASS),DSN=8&TMP(TSOREXX),
000025 //            UNIT=SYSALLDA,SPACE=(1024,(500,100,1)),
000026 //            DCB=(RECFM=FB,LRECL=1024,BLKSIZE=0)
000027 //TSOREXX    DD *,DLM=$$
000028 /* rexx */
000029 /*-----*/
000030 /* CHANGE ACTIVITY:                                           */
000031 /* Flag  Person Reason                                       */
000032 /* ----  -----  --
000033 /* 1506   DJB      Su
000034 /*                               on
000035 /*-----*/
```

The HILITE command is not available in ascii or utf8 edit sessions.

HILITE Alternative

zOS Upgrade from V2.2 to V2.4-Level1.0.xml

```
1  <?xml version="1.0" encoding="UTF-8"?>
2
3  <workflow xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="../wor
4    <autoTakeOwnership>true</autoTakeOwnership>
5    <workflowInfo>
6      <workflowID>e0zm100_v2r4</workflowID>
7      <workflowDescription>zOS V2R4 Upgrade Workflow from zOS V2R2</workflowDescription>
8      <workflowVersion>2.0</workflowVersion>
9      <vendor>IBM</vendor>
10   </workflowInfo>
11   <variable name="check">
12     <label>Check name</label>
13     <abstract>IBM Health Check name</abstract>
14     <description><![CDATA[ This health check will be invoked in association with this upgrade act
15     <category/>
16     <string>
17       <default>IBMZMIG,ZOSMIG_HTTP_SERVER_DOMINO</default>
18     </string>
19   </variable>
20   <variable name="tcpiibase_status">
21     <label>TCPIIBASE</label>
22     <abstract>Get Status of TCPIIBASE.</abstract>
23     <description><![CDATA[ The current status of TCPIIBASE.]]></description>
24     <category>started</category>
```



RACFROD and RACFADM
with a little zigi tossed in
(Bill Smith)

"Spare the rod and spoil the admin."

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Farewell ACF2... Welcome, RACF!



- The City & County of San Francisco (CCSF)
 - ❖ z13s, z/OS 2.3 - managed by Trident Services, Inc. > 25 years
 - ❖ 3 LPARs: Production, Hall of Justice, and Test Sysprog Sandbox
- 25+ years of CA ACF2
 - ❖ Skill set and ongoing service/support becoming scarce/problematic
 - ❖ Senior sysprog (principal ACF2 caretaker) is retiring March 2020
- Decision point spring 2019: Cut the cord and migrate to RACF
- Early fall 2019: Migration complete, time to begin deployment
 - ❖ One shared RACF vs. three discrete ACF2 security data bases

What Do We Do About RACF Reporting?

- ACF2 & RACF provide canned sets of batch reports: What is germane to the needs of the City? Replace 'what' with 'what'?
- Referred to Tom Conley's presentation "RACF Power Tools - Using IRRICE and REXX on IRRADU00 and IRRDBU00", June 2015
 - ❖ Wealth of RACF best practices and insightful guidance on the use of IBM's supplied audit and data base unload utilities
- Created GDGs and implemented daily, CA-Scheduler unloads of the RACF database
 - ❖ SYS1.SAMPLIB(IRRICE) - built all 43 jobs & successfully executed
 - ❖ FAR too much output to reasonably review on a routine basis

The Open World is the Panacea!

- Third party vendor products: No can do, no budget, pricey
- Check out forums & CBT - nothing surfaced
- Scour the internet: B I N G O!
- Moribund website in Italy: rizutto.IT (2000-2001) - Nick Rizutto
 - ❖ "ICERACF: Format RACF Database Information Extracted for IRRDBU00"
 - 13 batch DFSort ICETool reports - clean and compact
 - ❖ "ERA, Enhanced RACF Administration: ISPF-based facility for RACF administration"
 - Sadly, DOA: TSO session looped. *Three evenings later*: debugged, fixed
 -  In real-time, populate ISPF tables with RACF data base content

RACFROD and RACFADM

- CCSF security admins: non-technical, infrequent TSO and JCL users - often need the watchful eyes of a systems programmer
- Created new ISPF dialog "RACFROD: RACF Reports On-Demand"
 - ❖ One panel using file tailored DFSort ICETool job streams/skeletons
 - ❖ Specify any of 15 generation data sets by relative reference
 - ❖ Can select all reports or any combination thereof: directly into EDIT
 - ❖ PF3 submits the generated JCL
- Sec admin extremely pleased, best at 62x160, and each report selectable with SDSF "?" held output queue command
- Sam Golob is adding to CBT; Lionel Dyck has added to GitHub

Sample RACFROD ICETool Report Selection Display

```
----- RACF IRRDBU00: ICETool Reports On-Demand -----
COMMAND ==> _____ Scroll ==> CSR_

Type S or X to generate all reports or select reports by record number.

Optionally, leave S/X fields blank and press Enter to generate all reports, or
select any RecTyp text field using a mouse double click for one report choice.

-----

RACF Unload Data Set Name ==> SECURITP.RACF.UNLOAD(0)_____

S/X  RecTyp  IRRDBU00 Record Name / ICETool Report Headings - (SA23-2289)
---  -
=    ALL     Generate all of the following 13 RACF record type reports.
-    100     Group Basic Data - GPBD
              Group, Sup Group, Owner, Create Date, Description
-    102     Group Members - GPMEM
              User, User Authorization, Group
-    200     User Basic Data - USBD
              User, Name, DefGrp, Create/Logon/Revoke Date, Owner,
              Spec, Oper, Revoke
```

RACFROD and RACFADM

- ERA renamed: RACFADM
- The Cabal kick starts enhancing RACFADM: a collaborative effort
 - ❖ Significant logic errors resolved; REXX code consolidated
 - ❖ Panels are using more consistent layouts
 - ❖ Many human factors and functional/usability shortfalls addressed
 - ❖ Tutorials added with KC hyperlinks
- Early demonstrations to security admins have been very optimistic with positive feedback.
- Goal: Eliminate altogether use of anachronistic IBM RACF panels.

Sample RACFADM User Profile: Tabular Display

```
------( RACFADM - User Profiles )----- Row 58 to 69 of 69
Command ==> _ Scroll==> CSR

FILTER: TS*
SELECT: S Show, SE Search, L List, C Chg, A Add, R Remove, RS Reset, RV Revoke
```

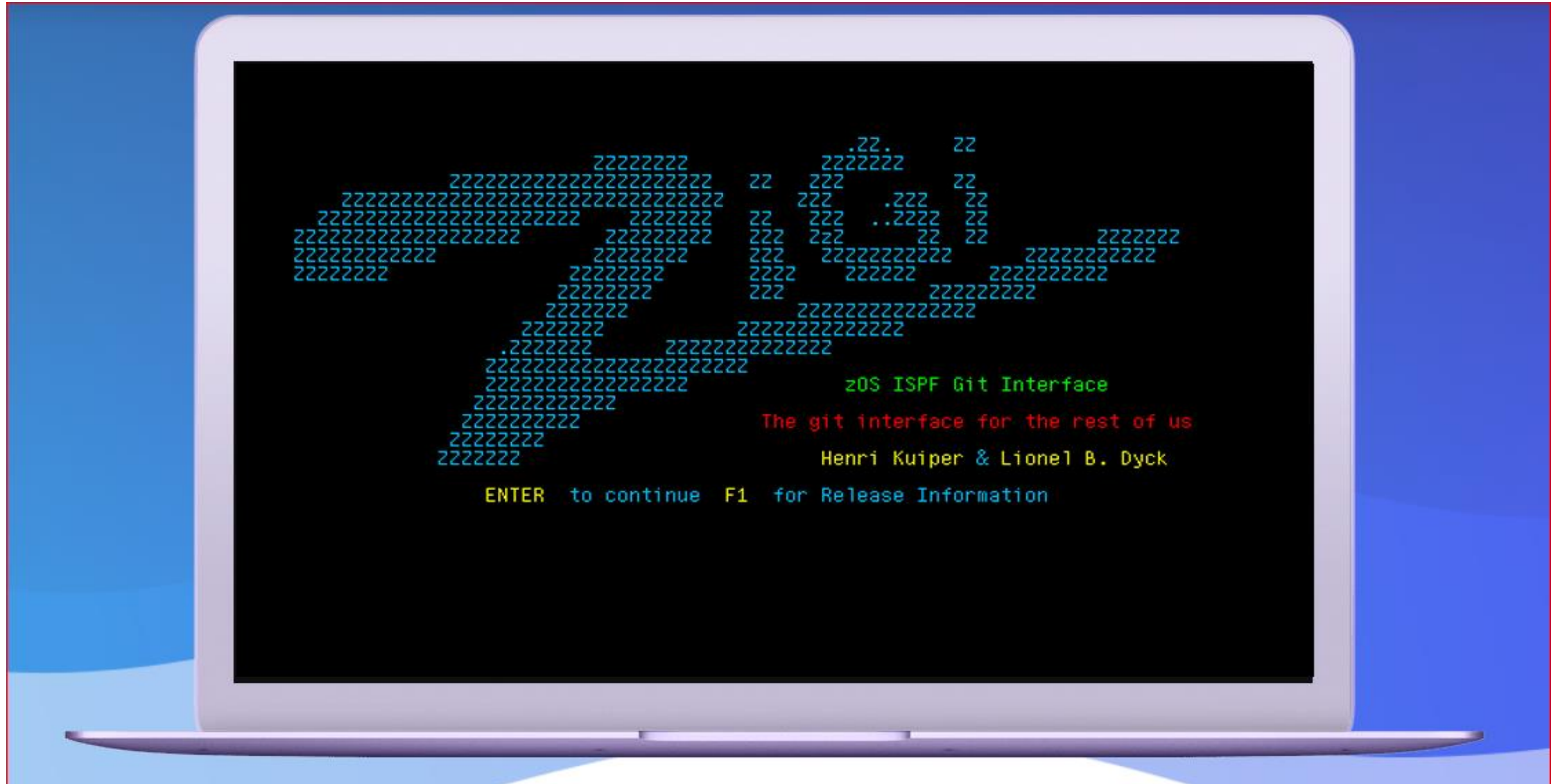
S	Userid	Name	Group	Logon	Owner	Rev	Att	TSO
---	TSSMITH	SMITH WILLIAM	SYS1	20/02/21	SYS1		YES	YES
---	TSSMIT1	SMITH WILLIAM	APLPROG	20/02/07	SYS1		YES	YES
---	TSSOLED	SOLEDAD MARIA C	SFTIS	20/02/19	SYS1		YES	YES
---	TSSWONG	WONG SIU-MEI	APLPROG	19/10/28	SYS1		YES	YES
---	TSTHOMP	THOMPSON KIM M	APLPROG	UNKNOWN	SYS1		YES	YES
---	TSTSANG	SHARON TANG	APLPROG	UNKNOWN	SYS1		YES	YES
---	TSWCRA	ROTH WILLIAM 2	APLPROG	20/02/12	SYS1		YES	YES
---	TSWCRB	ROTH WILLIAM 3	SFTIS	19/10/29	SYS1		YES	YES
---	TSWELLI	WELLING EILEEN	SFTIS	UNKNOWN	SYS1		YES	YES
---	TSWHEAT	WHEATLEY GEORGE	OPSPROG	20/02/20	SYS1		YES	YES
---	TSYBANE	YBANEZ GLACIER	SYSPROG	UNKNOWN	SYS1		YES	YES
---	TSZHAOB	ZHAO BEN	OPSPROG	20/02/20	SYS1		YES	YES

```
***** Bottom of data *****
```

Time to Git It On and Rock With zigi

- zigi: **z**/OS **I**SPF **G**it **I**nterface is pure REXX & ISPF dialog services
- Collaborative, open source, international in scope, development
 - Henri Kuiper and Lionel Dyck, key contributors
 - Download here: <https://github.com/wizardofzos/zigi>
- Embraces an ardent belief that ISPF is here to stay and thrives among its adherents.
- GitHub: web-based hosting and software version control mgmt. with 40,000,000 users; free registration; developed by Linus Torvalds; managed/owned by Microsoft
- <https://zigi.rocks/>

Time to Git It On and Rock With zigi



Time to Git It On and Rock With zigi

Tutorial ----- The z ISPF Git Interface (zigi) ----- Tutorial
Selection ==>

Current Repository

Commands available (select for more information or press Enter to see each):

<u>AddDsn</u>	Add dataset *	<u>Grep</u>	Find Strings	<u>Row</u>	Options
<u>AddAll</u>	Add all to Git	<u>Merge</u>	Merge Branches *	<u>Set</u>	Set Defaults
<u>Branch</u>	Change Branch *	<u>Network</u>	Network Report	<u>SnapShot</u>	Escrow
<u>Commit</u>	Record Changes	<u>Pull</u>	Pull from origin	<u>Status</u>	Git Status
<u>Find</u>	Find in table	<u>Push</u>	Push to origin	<u>Tag</u>	Git Tag
<u>GitCmd</u>	Git Commands	<u>Refresh</u>	Replace Datasets *	<u>TagList</u>	List Tags
<u>Githelp</u>	Git Help	<u>Remote</u>	Add remote	<u>View</u>	OMVS Dir
<u>Gitlog</u>	Show git log	<u>Rollback</u>	Revert *		


* not supported within subdirectories.

Use 0 to display a popup for commands if the menu has been hidden.

Press the Enter key to continue your zigi tutorial journey.

RACFROD and RACFADM are Live on GitHub

- RACFROD and RACFADM are available on GitHub and are updated solely using zigi (CBT is coming soon.)
 - ❖ <https://github.com/lbdyck/racfrod>
 - ❖ <https://github.com/lbdyck/racfadm>
- Git tutorial
 - ❖ <https://www.atlassian.com/git/tutorials/learn-git-with-bitbucket-cloud>
- zigi introductory video
 - ❖ https://1drv.ms/v/s!Ahj3V6TiD2BlUrjAeiU_nZMvaI



Doo Doo Diligence
Snatching defeat from the
jaws of victory
(Skip Robinson)

Tale Number 1: We Don't Need no Y2K Stink

- Y2K was a monumental hurdle in the IT world
- No secret, it was known about forever
- The choice had been widely made to forego storing the two-digit year
- As the 90s wore on, unease morphed into concern into panic
- The ante was upped when liability Beckham-bended toward CxOs
- There was talk of jailing (!) top management in case of big-time failures
- So the game was to test EVERYTHING in sight whether it made sense or not

Tale Number 1: We Don't Need no Y2K Stink



- At a sewage treatment facility north of LA, a major Y2K test was unleashed
- Wastewater flow was controlled by a series of motorized gates
- Which were in turn controlled by a cadre of wienie-ware computers
- The test plan was to force the date on each to 1 Jan 2000
- Of course this had never been done at that site before
- So much for the best laid plans

Tale Number 1: We Don't Need no Y2K Stink



- The gate-controlling computers did not like the sudden date change
- They reacted by powering off!
- No one saw that coming
- Then the computers were all powered back on
- When they came up, all the waste-water gates went to open state
- No one saw that coming up either
- Within minutes gushing wastewater overflowed the treatment site
- Millions of gallons of untreated sewage flooded the adjacent public park
- The ultimate Y2K stink

Tale Number 1: We Don't Need no Y2K Stink

- <http://articles.latimes.com/1999/jun/18/news/mn-47795>
- http://www.washingtonpost.com/wp-srv/business/longterm/y2k/stories/services_061899.htm
- <https://www.govinfo.gov/content/pkg/GPO-CPRT-106sprt10/pdf/GPO-CPRT-106sprt10-7-3.pdf>
- <http://community.seattletimes.nwsource.com/archive/?date=19990618&slug=2967204>
- <https://www.orlandoweekly.com/orlando/y2k-complacent/Content?oid=2263127>
- <https://www.deseret.com/1999/12/29/19482859/horseless-carriages-y2k-glitches-popping-up-from-coast-to-coast>
- <https://www.computerworld.com/article/2478423/a-dog-and-pony-show-for-a-new-millennium.html>

Tale Number 2: Cut the Red Wire or the Blue One

- A certain shop in LA had no mature disaster recovery process
- The general plan was to restore volumes from backup tapes stored offsite
- Meanwhile they were working on a robust DR process
- Volumes would be mirrored to a DR site
- In preparation, they acquired a new DASD subsystem for testing
- Big enough to hold the entire production farm on one side
- Plus a mirror of production on the other side
- The test side of the box was to be initialized on a Saturday night

Tale Number 2: Cut the Red Wire or the Blue One

- I got a call late that night asking if we had a "standalone restore tape"
- With divergent tape technology, you can't really swap tape media these days
- What's up?
- A consultant had been brought in to initialize the unused DASD
- Suddenly all production LPARs rolled over and died
- Somehow the consultant had initialized the in-use side of the box!
- All production volumes were instantly erased
- Backup tapes were available in Arizona, but no OS was running in LA
- Hence the need for a standalone restore tape

Tale Number 2: Cut the Red Wire or the Blue One

- Some sysprogs jumped in a car and drove to the AZ repository
- They obtained a restore tape and a whole passel of backups
- They drove back to LA and began restoring systems
- After some SA restores, they could IPL
- Then restore the remainder
- Most systems were back up and running by Tuesday
- (I don't know the rest of the story)

What Are the Morals of These Tales?



- We in IT believe fervently in planning, preparation, and testing
- The mantra is "You can't test too much"
- It turns out that testing CAN kill you
- What will YOU do when asked to perform career-threatening tests?

Acknowledgements Knowing and Unknowing



- Charles Bryant (IBM)
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- Sam Golob



See You In
Boston