

IBM Financial Transaction Manager for SWIFT
Services
for z/OS
3.2

*Readme
Fix Pack 6*



This edition applies to Version 3 Release 2 of IBM Financial Transaction Manager for SWIFT Services for z/OS (5655-FTB)
- Fix Pack 3.2.4.6.

Reference key: 20220510-1835

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General information

Before starting with the installation process, view the online version of this readme file to check if information has changed since the readme file was downloaded.

Download location

You can download FTM SWIFT 3.2.4.6 from Fix Central:

<https://www.ibm.com/support/fixcentral/>

Search for the Fix ID **3.2.4-FTM-SWS-ZOS-fp0006**.

Prerequisites and co-requisites

Before installing the current fix pack, perform the following steps:

- Check the hardware and software requirements of the fix pack you plan to install:
Go to <https://www.ibm.com/support/docview.wss?uid=swg27027034>
and select version **V3.2** and product **FTM for SWIFT Services for z/OS**.

Updates of pre-requisite software must not be performed during fix pack installation and migration. It is a separate activity:

- If your software is not at the minimum version required by the new fix pack, upgrade it to a level supported by your current installation and the new fix pack before you start the fix pack installation and migration activity.
- If the new fix pack provides support for a new software version, install this new version only after you finished the installation and migration activity of the fix pack.
- Review the flashes on the Financial Transaction Manager support web site:
<https://www.ibm.com/support/pages/node/6346924>
- Ensure that you have at least 500 MB of free disk space to contain the uncompressed installation image.
- If you already have FTM SWIFT installed:
 - If you have obtained special fixes, contact IBM Support to determine whether you need an updated version of the fixes before you install this fix pack.
 - Ensure that you have at least fix pack 3.2.4.4 installed and all post-installation steps were finished.

What's new in FTM SWIFT

The following sections summarize what has changed in updates of FTM SWIFT since fix pack 3.2.4.4.

For a list of fixes provided and APARs included in the various product updates refer to:
<https://www.ibm.com/support/pages/node/6242258>

What's new in FTM SWIFT Version 3 Release 2.4 Fix Pack 6

The following changes were introduced:

CBPR+ changes

The DNIFINPLUS message domain is enhanced to provide an early version of the *finplus2022* message definitions set containing the CBPR+ 2.1 messages. Securities related messages will be added with the full SR2022 support.

Note: New usage identifier values have been defined by SWIFT for CBPR+ 2.1 (Examples: swift.cbprplus.02, swift.cbprplus.02.stp). If such messages are provided by customer applications to FTM SWIFT, these new usage identifiers values have to be used in the *Option* element of *MsgStandardInfo*.

If you want to use the new standards release updates for testing purposes, you can activate them by using FTM SWIFT configuration. For details see [Testing a new message definition set](#).

MER Message list enhancements for FINplus messages [FTMSWIFT-I-109]

The MER message list is enhanced to show additional data for FINplus messages. For more details refer to [Message Attributes](#). The Properties folder in local environment is enhanced accordingly for FINplus messages. For details refer to [ComIbmDni.Dnq](#) in the Environment tree.

Import of XML/ISO20022 files is supported in SDF [FTMSWIFT-I-113]

SDF now allows to import files in XML format (for example CBPR+ messages) to be stored in queues.

Timestamp format for message printing configurable [FTMSWIFT-I-93]

You can configure in which format the print timestamp is printed by the message printing service and MER browser-based printing.

Administration utility improved [FTMSWIFT-I-98]

The Administration utility no longer require update rights for rehearse mode.

Description is added as filtering criteria for templates [FTMSWIFT-I-90]

MER can now filter message templates by searching the description field.

SAG Add-On improvements

The SAG Add-On 7.4 is changed to better support SAG 7.5 and SAG 7.6 platforms. Several problems have been resolved.

Update of the installed SAG Add-On required:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
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Attention:

FTM SWIFT Version 3 Release 2.4 Fix Pack 6 relies on the Universal Table Space migration performed at least for table space **DNFORM1**. For details, see DDL file `dnfmefasuts_dnfo_fsm_rcv_msg.ddl` in [Table 6 on page 33](#). Any later fix pack might require the migration ("[Migrating FTM SWIFT table spaces to universal table spaces \(UTS\)](#)" on page 29) to universal table spaces to be completed.

What's new in FTM SWIFT Version 3 Release 2.4 Fix Pack 5

The following changes were introduced:

CBPR+ changes

The validation of messages in the DNIFINPLUS message domain is improved for finplus2021. The CBPR+ validation is based on the usage guidelines published in March 2021 ("CBPRplus collection 2.0"). Affected message types:

Type	Changed validation
camt.029.001.09	CBPR+ and ISO20022 rules improved
camt.056.001.08	CBPR+ rules improved
camt.057.001.06	CBPR+ rules improved
camt.060.001.05	ISO 20022 rules improved
pacs.002.001.10	CBPR+ and ISO20022 rules improved
pacs.004.001.09	CBPR+ rules improved
pacs.008.001.08	ISO 20022 rules improved
pacs.008.001.08_STP	ISO 20022 rules improved
pacs.009.001.08	ISO 20022 rules improved
pacs.009.001.08_COV	ISO 20022 rules improved
pacs.009.001.08_ADV	ISO 20022 rules improved
pain.001.001.09	CBPR+ rules improved
pain.002.001.10	CBPR+ and ISO20022 rules improved

Number format for message printing configurable [FTMSWIFT-I-89]

You can configure thousands and decimal separators of numbers in FIN messages (for example, amounts) for the message printing service and MER browser-based printing.

Support InterAct Receive Store-and-Forward messages from SWIFT transaction manager

Messaging Services for SWIFTNet InterAct & FileAct (MSIF) provides support for SNL messages sent by the SWIFT transaction manager.

SAG 7.6 Support

You can now use SWIFT Alliance Gateway (SAG) 7.6 and SWIFTNet Link (SNL) 7.6 to send and receive messages or files. SAG Add-On 7.4 can be used to operate, configure, or monitor an SAG 7.6.



Attention:

FTM SWIFT Version 3 Release 2.4 Fix Pack 5 relies on the universal table space migration performed at least for table space **DNFORM1**. For details, see DDL file `dnfmefasuts_dnfo_fsm_rcv_msg.ddl` in [Table 6 on page 33](#). Any later fix pack might require the migration ("[Migrating FTM SWIFT table spaces to universal table spaces \(UTS\)](#)" on page 29) to universal table spaces to be completed.

Known Problems

For a list of known problems refer to:
<https://www.ibm.com/support/pages/node/6242088>

Installation information

You can find information about the installation and migration steps mentioned in this document in the IBM Documentation for FTM SWIFT for z/OS:

<http://www.ibm.com/docs/en/ftmswsfz324>

This readme document uses the following variables:

inst_dir

The installation directory of FTM SWIFT.
The default is: /usr/lpp/IBM/ftm/ftmswift/v324.

run_dir

The directory for runtime data.
The default is: /var/ftmswift_v324/run.

cust_dir

The directory for customization data.
The default is: /var/ftmswift_v324/cus.

deployment_dir

The deployment data directory.
The default is: /var/ftmswift_v324/cus/depdata.

instance

The name of the FTM SWIFT instance.
The default is: INST1.

ou

The name of the organizational unit.
Depending on the context this might be SYSOU, DNFSYSOU, or the name of a business OU.

admin_ds_prefix

The data set prefix for Db2® administration modules.

db2_ssid

The ID of the Db2 subsystem.

aplenv

The name of the Workload Manager (WLM) application environment.

Installing FTM SWIFT 3.2.4.6 – Create a new installation

If you have not yet installed FTM SWIFT, follow the description in the [IBM Documentation for FTM SWIFT](#) to install and customize a new instance instead of using this readme file.

Installing FTM SWIFT 3.2.4.6 – Update an existing installation

Updating an existing environment consists of the phases *Preparing*, *Switching*, *Cleaning up* and optionally *Falling back*.

Depending on how you share your product files, there are two installation variants that differ in the amount of migration steps you can prepare before entering the downtime during which you cannot process workload:

Separated file systems

The file systems of the installation system and the customization/runtime systems are separated. The fix pack installation only affects the installation system until you manually share the files with your customization and runtime system. This helps you to prepare migration steps while your system can still process workload.

Shared file system

Your installation, customization and runtime environment use a single shared file system. The fix pack installation may immediately affect your runtime environment. This reduces the steps you can do to prepare the migration while your system can still process workload.

Choose the subsection that applies to your file system setup.

Separated file systems: Preparing and Switching

Follow the steps required to prepare and switch your environment.

Preparing

Perform the following steps while your runtime system continues to process workload:

1. [Ensure that no customization operation is pending.](#)
2. [Ensure that no configuration or security administration change is pending.](#)
3. Create a backup of your customized administrative scripts from `deployment_dir/instance/admin`:

```
mkdir ~/admin_scripts_backup
cp /var/ftmswift_v324/cus/depdata/INST1/admin/* ~/admin_scripts_backup
```

4. [Use IBM Installation Manager to install the fix pack for FTM SWIFT 3.2.4.6.](#)
5. Share the files in the `inst_dir/admin` directory with your customization system.
6. [Update customization definition data, and create deployment instructions and vehicles.](#)
7. If you plan manual deployment of the FTM SWIFT BAR files, follow [Prepare BAR files for manual deployment.](#)

Switching

Perform the following steps during a scheduled downtime:

1. Stop all sessions and services you use.
2. Stop all FTM SWIFT application servers.
3. Back up the FTM SWIFT IBM WebSphere Application Server (WAS) profiles.
4. Restart all FTM SWIFT application servers.
5. Stop all FTM SWIFT enterprise applications.
6. [Stop all FTM SWIFT related message flows.](#)
7. Stop all FTM SWIFT message brokers.
8. Share the files in the `inst_dir/run` directory with your runtime system.
9. Open and follow the deployment instructions.
If you do not plan to use generated deployment vehicles for resource class CFGPF, you need to manually update the following enterprise applications:

Application	Migrating from FP4	Migrating from FP5
Administration and Operation (AO)	Yes	No
Message Entry and Repair (MER)	Yes	Yes
Relationship Management Application (RMA)	Yes	No

Application	Migrating from FP4	Migrating from FP5
WebHome enterprise application	Yes	No

10. Restart all FTM SWIFT message brokers.
11. [Deploy BAR files.](#)
12. Verify the deployed BAR files:

```
dniczbap -cmd list -flow DNI_SYSADM
```

The deployment was successful if the displayed version contains 3.2.4.6.

13. [Re-activate FTM SWIFT accounting](#) if you use the SIPN FIN or FMT FIN service.
14. [Restart all FTM SWIFT related message flows.](#)
15. Restart all FTM SWIFT enterprise applications.
16. Restart all sessions and services.
17. [Update the IBM Integration Toolkit workstation](#) if you use either of the following:

- FTM SWIFT sample message flows as foundation for your own flow development
- FTM SWIFT nodes in your own message flows

Replace the file `com.ibm.dnq.api.jar` in the Toolkit dropins directory with the updated file from `inst_dir/admin/toolkit`.

Rebuild and redeploy all BAR files that contain message flows:

- for MER routing
- for General Purpose routing

18. If you use the SAG Add-On version 7.4 for SAG 7.5 or SAG 7.6:
Follow the description in [Update an SAG Add-On](#) to update your existing SAG Add-On version 7.4 installation.
19. If you use the [Administration Utility cleanup](#) command you must grant the DELETE permission on the new runtime database table `DNQE_ME_DNIFINPLUS` to the user executing this utility command.

After you finished the fix pack migration, you can continue to convert table spaces that you did not yet migrate to UTS. For details, see [“Migrating FTM SWIFT table spaces to universal table spaces \(UTS\)”](#) on page 29.

Shared file system: Preparing and Switching

Follow the steps required to prepare and switch your environment.

Preparing

Perform the following steps while your runtime system continues to process workload:

1. [Ensure that no customization operation is pending.](#)
2. [Ensure that no configuration or security administration change is pending.](#)
3. Create a backup of your customized administrative scripts from `deployment_dir/instance/admin`:

```
mkdir ~/admin_scripts_backup
cp /var/ftmswift_v324/cus/depdata/INST1/admin/* ~/admin_scripts_backup
```

Switching

Perform the following steps during a scheduled downtime:

1. Stop all sessions and services you use.
2. Stop all FTM SWIFT application servers.
3. Back up the FTM SWIFT IBM WebSphere Application Server (WAS) profiles.
4. Restart all FTM SWIFT application servers.
5. Stop all FTM SWIFT enterprise applications.
6. Stop all FTM SWIFT related message flows.
7. Stop all FTM SWIFT message brokers.
8. Use IBM Installation Manager to install the fix pack for FTM SWIFT 3.2.4.6.
9. Update customization definition data, and create deployment instructions and vehicles.
10. Open and follow the deployment instructions.
If you do not plan to use generated deployment vehicles for resource class CFGPF, you need to manually update the following enterprise applications:

<i>Table 2. IBM WebSphere Application Server applications to be updated</i>		
Application	Migrating from FP4	Migrating from FP5
Administration and Operation (AO)	Yes	No
Message Entry and Repair (MER)	Yes	Yes
Relationship Management Application (RMA)	Yes	No
WebHome enterprise application	Yes	No

11. Restart all FTM SWIFT message brokers.
12. If you plan manual deployment of the FTM SWIFT BAR files, follow Prepare BAR files for manual deployment.
13. Deploy BAR files.
14. Verify the deployed BAR files:

```
dniczbap -cmd list -flow DNI_SYSADM
```

The deployment was successful if the displayed version contains 3.2.4.6.

15. Re-activate FTM SWIFT accounting if you use the SIPN FIN or FMT FIN service.
16. Restart all FTM SWIFT related message flows.
17. Restart all FTM SWIFT enterprise applications.
18. Restart all sessions and services.
19. Update the IBM Integration Toolkit workstation if you use either of the following:
 - FTM SWIFT sample message flows as foundation for your own flow development
 - FTM SWIFT nodes in your own message flows

Replace the file `com.ibm.dnq.api.jar` in the Toolkit dropins directory with the updated file from `inst_dir/admin/toolkit`.

Rebuild and redeploy all BAR files that contain message flows:

- for MER routing

- for General Purpose routing
20. If you use the SAG Add-On version 7.4 for SAG 7.5 or SAG 7.6:
Follow the description in [Update an SAG Add-On](#) to update your existing SAG Add-On version 7.4 installation.
 21. If you use the Administration Utility cleanup command you must grant the DELETE permission on the new runtime database table DNQE_ME_DNIFINPLUS to the user executing this utility command.

After you finished the fix pack migration, you can continue to convert table spaces that you did not yet migrate to UTS. For details, see [“Migrating FTM SWIFT table spaces to universal table spaces \(UTS\)”](#) on page 29.

Cleaning up

After you have verified that the migrated environment works as expected, and if you are sure that no fallback to the previous level of FTM SWIFT is needed, you can remove obsolete resources:

1. Drop the backed up WebSphere Application Server profiles.
2. Identify and reorganize table spaces to resolve the *Pending* state: :
 - a. Log on to TSO as a Db2 administrator (UDB2ADM1).
 - b. Identify table spaces in pending state using the following commands:

```
-DISPLAY DATABASE(DNIVDB01) SPACENAM(*) ADVISORY
-DISPLAY DATABASE(DNIVDB01) SPACENAM(*) RESTRICT
```

- c. Reorganize the identified table spaces. A sample job DNIMZREO is provided in the instance administration data set.

Note: Ensure that the table spaces are only reorganized (no RUNSTATS¹).

Falling back to the previous fix pack level

1. Stop all sessions and services you use.
2. Stop all FTM SWIFT application servers.
3. [Stop all FTM SWIFT related message flows.](#)
4. Stop all FTM SWIFT message brokers.
5. [Recover the customization system.](#)
6. [Roll back the IBM Installation Manager update of the fix pack.](#)
7. If you had installed an interim fix (iFix) on your previous fix pack level, re-install this iFix.
8. Share your files from the installation system with the customization and runtime system, if applicable.
9. Restart all FTM SWIFT message brokers.
10. Deploy previous FTM SWIFT BAR files:

```
. /var/ftmswift_v324/run/dniprofile
dniczbap -cmd prepare -update old -deploy [-broker broker_name]
```

11. Verify the deployed BAR files:

```
dniczbap -cmd list -flow DNI_SYSADM
```

The deployment was successful if the displayed version contains the fix pack that was your migration starting point.

¹ If you did run RUNSTATS by accident, then ensure that the statistics information for the table spaces used by DNF_IAMS and DNF_OAMS is generated as described in [Administering database tables used by the SIPN FIN service.](#)

12. Re-activate FTM SWIFT accounting if you use the SIPN FIN or FMT FIN service.
13. Restart all FTM SWIFT related message flows.
14. Restore the IBM WebSphere Application Server profile backups.
15. Restart all FTM SWIFT application servers.
16. Restart all sessions and services.
17. Restore the backup of your customized administrative scripts created in step “3” on page 10 (separated file systems) or “3” on page 11 (shared file system):

```
rm -rf /var/ftmswift_v324/cus/depdata/INST1/admin/*
cp -p ~/admin_scripts_backup/* /var/ftmswift_v324/cus/depdata/INST1/admin/
```

Re-migrating after a previous fallback

After you fall back to an earlier level, plan for re-migration only after you have identified the reason for the fallback and have corrected the problem.

To re-migrate, follow the steps described in this readme document, but with the following exception:

When re-migrating from FP4:

- If you deployed resource classes **DB** successfully in the previous migration, you can now skip the deployment vehicle for this class.

When re-migrating from FP5:

- If you deployed resource classes **DB** successfully in the previous migration, you can now skip the deployment vehicle for this class.
- If you deployed resource classes **DBGNT** successfully in the previous migration, you can now skip the deployment vehicle for this class.

Maintenance tasks

The following sections provide detailed instructions for selected installation steps of a fix pack. Refer to “Installing FTM SWIFT 3.2.4.6 – Update an existing installation” on page 9 to find out which steps you have to perform and to determine the sequence.

Ensure that no customization operation is pending

When you apply maintenance fixes to FTM SWIFT, no customization operation must be pending. That is, all previously prepared deployment instructions were carried out and the CDP **implement** command was used before you can apply an update.

To check that all previous CDD changes were implemented using the CDP:

1. Log on to z/OS UNIX on the customization system as a customizer (UCUST1).
2. Enter the following command:

```
inst_dir/admin/bin/dnicdpst -i instance -cdefs cust_defs_dir
```

where:

inst_dir

The FTM SWIFT installation directory

instance

The name of the FTM SWIFT instance

cust_defs_dir

The name of the customization definitions directory as specified in the CDP ini file, for example: `/var/ftmswift_v324/cus/defs`

3. Check whether the response indicates that a customization operation is still pending.
4. If a operation was pending in customization mode (dnicdp), implement it before continuing.
5. If a operation was pending in migration mode (dnicdpm):
 - Ensure that you have not yet shared the new files contained in this or any other product update with the customization system.
 - Implement the pending operation before continuing.

Note: Ensure that no changes are made to the currently implemented CDD until the migration for the current product update has been completely finished.

Ensure that no configuration or security administration change is pending

When you apply maintenance fixes to FTM SWIFT, no configuration or security administration changes must be pending.

To ensure that all configuration administration changes have been deployed and that all security administration changes have been approved:

1. Log on to z/OS UNIX on the runtime system as a system configuration administrator (SA1).
2. Run the `dniprofile` by entering:

```
. /var/ftmswift_v324/run/dniprofile
```

3. Enter the following commands:

```
dnicli -s DNI_SYSADM -ou SYSOU -c "list -ou % -qo amorz"
dnicli -s DNI_SYSADM -ou SYSOU -c "list -cos % -qo amorz"
dnicli -s DNI_SYSADM -ou SYSOU -c "list -ct % -qo amorz"
```

4. Check that each list command did result in 'No [OU/COS/CT] match search criteria'.
5. Log on to z/OS UNIX on the runtime system as a security administrator (UA1).
6. Run the dniprofile by entering:

```
. /var/ftmswift_v324/run/dniprofile
```

7. Enter the following commands:

```
dnicli -s DNI_SECADM -ou SYSOU -c "list -ro % -qo mor"
dnicli -s DNI_SECADM -ou SYSOU -c "list -rg % -qo mor"
```

8. Check that each list command did result in 'No roles/role groups found that match specified criteria'.
9. Enter the following command for each OU:

```
dnicli -s DNI_SECADM -ou OU -c "list -user % -qo mor"
```

10. Check that each list command did result in 'No users found that match specified criteria'.

Note: Ensure that no changes are made to configuration and security administration until the migration for the current product update has been completely finished.

Use IBM Installation Manager to install the fix pack

Transfer the ZIP file (that you downloaded from Fix Central) in binary mode to the FTM SWIFT installation system, for example, to directory `/usr/lpp/InstallationManagerRepository/HSWS324`.

After you have successfully installed the fix pack using IBM Installation Manager, perform the tasks described in the following sections:

1. [“Permissions of the installed files” on page 17](#)
2. [“Sharing files with the customization and runtime systems” on page 18](#)
3. [“Setting up the use of shared library regions” on page 18](#)
4. [“Granting access permissions to FTM SWIFT users” on page 18](#)

IBM Installation Manager offers different modes. The following two sections provide examples using wizard mode (graphical user interface or web) or command line driven installations. Choose one of the IBM Installation Manager modes.

Install a fix pack using wizard mode

To install a fix pack using wizard mode:

1. Start the IBM Installation Manager in graphical user interface or web mode
2. Add the fix pack repository:
 - a. Go to **File > Preferences > Repository > Add repository**
 - b. Enter the path of the FTM SWIFT fix pack repository file, for example:

```
/usr/lpp/InstallationManagerRepository/HSWS324/Ftm_Swift_Repo.zip
```

- c. Click **OK**
3. Test the repository connection
 4. Close the Preferences dialog
 5. In the IBM Installation Manager main window, click **Update**
 6. Select the package group of the FTM SWIFT installation to update with the fix pack

7. Click **Next**
8. Ensure the correct fix pack is displayed and selected
9. Click **Next**
10. Accept the license agreement
11. Click **Next**
12. Review the summary information and click **Update**
13. Click **Finish**
14. Close the IBM Installation Manager:
 - In graphical user interface mode, click **File > Exit**
 - In web mode, click **File > Stop server**

Install a fix pack using command line mode

To install a fix pack on the command line:

1. Go to the Installation Manager tools directory, for example:

```
cd /InstallationManager/bin/eclipse/tools
```

2. Check what is currently installed for FTM SWIFT:

```
./imcl listInstalledPackages -long | grep com.ibm.dni
```

The output includes a line for the installed fix pack. There may be additional lines for installed iFixes. All lines have the format:

```
inst_dir : package_id : name : version
```

Note the value for *inst_dir*, which is identical in all lines of the output.

3. Run the following command:

```
./imcl install com.ibm.dni.v324
-installationDirectory inst_dir -repositories fix_pack_repo
-acceptLicense
```

where

inst_dir

is the value determined in step “2” on page 17

fix_pack_repo

is the FTM SWIFT repository file *Ftm_Swift_Repo.zip*, for example:

/usr/lpp/InstallationManagerRepository/HSWS324/Ftm_Swift_Repo.zip.

4. Verify the installation result by issuing the following command:

```
./imcl listInstalledPackages -long | grep com.ibm.dni
```

The output includes the version of the installed fix pack, for example 3.2.4.1 for fix pack 1. Ensure that this version matches the fix pack you are currently installing.

Permissions of the installed files

After installing FTM SWIFT, the installer (UIM1) becomes the owner of the files in the installation system. The owner group is the default group of the installer, for example, DNIINST.

[Table 3 on page 18](#) shows the access permissions of the installed files.

Table 3. Permissions of the installed files

Directory	Owner permissions	Owner group permissions	Other permissions
/usr/lpp/IBM/ftm/ftmswift/v324	r w x	r - x	r - x
/usr/lpp/IBM/ftm/ftmswift/v324/admin	r w x	r - x	- - -
/usr/lpp/IBM/ftm/ftmswift/v324/run	r w x	r - x	- - -
/usr/lpp/IBM/ftm/ftmswift/v324/iFix	r w x	r - x	- - -

After you install FTM SWIFT, check the owner and the owning group of the product directory and its contents. You might need to adjust these to correspond to the users and groups you chose for your system. When sharing the data between different systems, make sure that all required users and groups have access to this data.

Sharing files with the customization and runtime systems

After installation, make the HFS or zFS directories, that contain the installed product, available to the customization and runtime systems.

If the customization and runtime systems are different, the best way to share the FTM SWIFT data is to define it as a shared HFS or zFS. How to do this is described in *UNIX System Services: Planning*.

If you use other sharing techniques, for example, Network File System (NFS), you can share the complete product directory.

The deployment directory of the customization system must be accessible from each runtime system.

Setting up the use of shared library regions

To reduce the amount of memory required by the broker execution groups, and to decrease startup times, you can use shared library regions. For more information, refer to the section [Customizing UNIX System Services on z/OS](#) in the IBM Documentation for IBM Integration Bus.

- Ensure that you have at least read access to the BPX.FILEATTR.SHARELIB FACILITY class. This is required for you to be able to issue the **extattr** command with the +l option.
- To set up the use of shared address spaces and shared libraries for the FTM SWIFT modules of all brokers, issue each of the following commands once:

```
extattr +l inst_dir/run/bin/*
extattr +l inst_dir/run/lib/*
extattr +l inst_dir/run/lil64/*
```

Granting access permissions to FTM SWIFT users

This description assumes that you use the following group names:

- DNIADMIN
- DNILPP

To ease access for these groups, issue the following commands in a z/OS® UNIX shell:

```
chgrp -R DNIADMIN inst_dir/admin
chgrp -R DNILPP inst_dir/run
chmod 755 inst_dir
chmod -R 750 inst_dir/admin
chmod -R 750 inst_dir/run
chmod -R 755 inst_dir/iFix
```

This gives the users in each of the specified groups access to the specified directories and all their subdirectories.

Table 4. Required access permissions to the customization programs, runtime programs, and data

Directory	Owner permissions	Owner group permissions	Other permissions	Owner group
<i>inst_dir</i>	r w x	r - x	r - x	DNIINST
<i>inst_dir/admin</i>	r w x	r - x	- - -	DNIADMIN
<i>inst_dir/run</i>	r w x	r - x	- - -	DNILPP
<i>inst_dir/iFix</i>	r w x	r - x	r - x	DNIINST

Update customization definition data, and create deployment instructions and vehicles

FTM SWIFT maintenance may require to update resources for an instance. The customization definition program (CDP) detects which resources are affected and prepares the necessary deployment data.

To execute the CDP in migration mode:

1. Log on to z/OS UNIX on the customization system as a customizer (UCUST1).
2. Change to the customization file system, for example:

```
cd /var/ftmswift_v324/cus
```

3. Run your customization profile:

```
./dnicus_instance
```

4. Start the CDP in migration mode and use the following commands to migrate customization data:

```
dnicdpm -i instance
> export cdd/instance_FPxxxx.cdd
> import cdd/instance_FPxxxx.cdd
> prepare
```

where

instance

The name of the FTM SWIFT instance.

xxxx

The version of the fix pack, for example 3241.

deployment_dir

The name of the customization deployment directory, for example: /var/ftmswift_v324/cus/depdata

This step updates the customized administrative scripts in the directory *deployment_dir/instance/admin*. It generates deployment instructions and record it in the file *deployment_dir/instance/timestamp/instructions.txt*. Dependent on the fix pack migration it generates the deployment data and vehicles.

5. Implement the customization definition data and quit the CDP session:

```
> implement
```

When the message "DNIZ9013I: If you continue, the current CDD will be overwritten by a new CDD." is displayed enter 'y' to continue.

```
> quit
```

Prepare BAR files for manual deployment

If you want to use the Toolkit or `mqsdeploy` command to manually deploy the updated BAR files, you can customize them as soon as you have shared the FTM SWIFT installation directory's `run/flows` subdirectory with the message broker runtime system.

To customize BAR files for manual deployment:

1. Ensure that the updated BAR files are available.

If your installation and runtime systems are different:

Share the `run/flows` subdirectory of the FTM SWIFT installation directory from the installation system with the runtime system.

If your installation and runtime systems are identical:

Install the update using IBM® Installation Manager as described in [“Use IBM Installation Manager to install the fix pack” on page 16](#) during the switching phase.

2. On the runtime system where the message broker runs, log on as IBM Integration Bus administrator (UWMBAA1).
3. Run the `dniprofile` by entering:

```
. /var/ftmswift_v324/run/dniprofile
```

4. Create a sub-directory `ftmswift_xxxx` where `xxxx` is the version of the fix pack. You need read and write access and it must have at least 50 MB of free space. This is the directory in which `dniczbap` will store the customized BAR files.
5. Issue the following command to let the BAP identify the BAR files that are to be updated and customize them:

```
dniczbap -cmd prepare -update new -dir output_dir
```

where `output_dir` represents the directory you created in step [“4” on page 20](#).

Each customized BAR file in the output directory has a name of the form:

`instance.broker.exec_group.BAR_file.bar` where

instance

The name of your FTM SWIFT instance.

broker

The name of the broker to which the BAR file is to be deployed.

exec_group

The name of the execution group to which the BAR file is to be deployed.

BAR_file

The name of the BAR file as provided by FTM SWIFT.

6. Transfer, in binary mode, the customized BAR files in the output directory to the system where you need to deploy them, for example your Toolkit system.
7. If you use the Toolkit to deploy the customized BAR files, import them now into your workspace.

Stop all FTM SWIFT related message flows

FTM SWIFT related message flows are based on FTM SWIFT provided IBM Integration Bus plugins. To ensure that both are updated before new messages are processed you need to stop the flows.

FTM SWIFT related message flows include:

- Flows provided by FTM SWIFT
- Flows you developed based on FTM SWIFT APIs

You can use either the BAP, the Toolkit or the command `mqsistopmsgflow` to stop message flows provided by FTM SWIFT. For flows that you have developed you have to use the Toolkit or `mqsistopmsgflow`.

To use the BAP to stop the message flows provided by FTM SWIFT on each broker server:

1. Ensure that your brokers and execution groups are still running.
2. On the runtime system, log on to z/OS UNIX as IBM Integration Bus administrator (UWMBAA1).
3. Run the `dniprofile` by entering:

```
. /var/ftmswift_v324/run/dniprofile
```

4. Issue the following command to stop all message flows provided by FTM SWIFT on the current broker:

```
dniczbap -cmd stop
```

Verifying the installation of the database routines

To verify the installation of the database routines:

1. On the runtime system, log on to z/OS UNIX as a Db2 administrator (UDB2ADM1).
2. Ensure that you have access to a Java™ runtime environment.
3. Run the `dniprofile` by entering:

```
. /var/ftmswift_v324/run/dniprofile
```

4. Issue the **`dnimaintinfo`** command, for example:

```
dnimaintinfo -dsn MYDB -schema DNI
```

For details about the **`dnimaintinfo`** command, see [Maintenance Information command](#).

5. Examine the output and ensure that the following message is displayed:

```
DNID0001I Jar file version verification successful
```

If you did not assign the **`DNFFIN`** service bundle (SVB) to any OU, the output should be:

```
DNID0015E JAR file 'dnfcdrt.jar' for jarId 'dnfcdrt' is either not installed or has an unexpected version.
```

Deploy BAR files

During the switching phase you need to update the message flows running in IBM Integration Bus. If you use multiple broker servers, you must perform the following steps for each.

If you have created customized BAR files as described in [“Prepare BAR files for manual deployment”](#) on page 20, use the Toolkit or `mqsdeploy` now to deploy them.

To use the BAP to automatically customize and deploy updated BAR files:

1. Ensure that your brokers and execution groups are running.
2. On the runtime system, log on to z/OS UNIX as IBM Integration Bus administrator (UWMBAA1).
3. Run the `dniprofile` by entering:

```
. /var/ftmswift_v324/run/dniprofile
```

4. Ensure that you have at least 50 MB of free space in the current directory.
5. Issue the following command:

```
dniczbap -cmd prepare -update new -deploy -broker brokername
```

The parameter `-broker` is only required if you use multiple broker servers.

The BAP will identify all BAR files for which the message flows deployed in the broker need to be updated and automatically customize and deploy them.

Re-activate FTM SWIFT accounting

If you use the SIPN FIN or FMT FIN service, re-activate FTM SWIFT accounting.

1. Issue the following z/OS console commands:

```
F broker,CHANGEFLOWSTATS A=YES,E='eg',f='DNF_ILS_ACK',C=ACTIVE,B=BASIC,O='XML'  
F broker,CHANGEFLOWSTATS A=YES,E='eg',f='DNF_ILS_FIN',C=ACTIVE,B=BASIC,O='XML'
```

where:

broker

The name of the broker.

eg

The name of the execution group.

If you deployed the above mentioned bar files to multiple execution groups, repeat the steps for each execution group in which the bar files are deployed.

Restart all FTM SWIFT related message flows

After the updated message flows have been deployed as described in [“Deploy BAR files” on page 21](#) you need to restart your message flows.

You can use either the BAP, the Toolkit or the command `mqsistartmsgflow` to start message flows provided by FTM SWIFT. For flows that you have developed you have to use the Toolkit or `mqsistartmsgflow`.

To use the BAP to start the message flows provided by FTM SWIFT on each broker server:

1. Ensure that your brokers and execution groups are running.
2. On the runtime system, log on to z/OS UNIX as IBM Integration Bus administrator (UWMBA1).
3. Run the `dniprofile` by entering:

```
./var/ftmswift_v324/run/dniprofile
```

4. Issue the following command to start all message flows provided by FTM SWIFT on the current broker:

```
dniczbap -cmd start
```

Recover the customization system

Recover former service bundles, and restore the current definition directory and the deployment directory for administrative resources `deployment_dir/instance/admin`.

1. Log on to z/OS UNIX on the customization system as a customizer (UCUST1).
2. Change to the customization file system, for example:

```
cd /var/ftmswift_v324/cus
```

3. Run your customization profile:

```
./dnicus_instance
```

4. Start the CDP in migration mode and use the following commands to recover customization data:

```
dnicdpm -i instance
> recover
```

where *instance* is the name of the FTM SWIFT instance.

Roll back the IBM Installation Manager update of the fix pack

Use the roll back feature of IBM Installation Manager to remove an update and revert to a previous fix pack of FTM SWIFT.

After having reverted to a previous version of FTM SWIFT, follow the instructions in:

1. [“Permissions of the installed files” on page 17](#)
2. [“Sharing files with the customization and runtime systems” on page 18](#)
3. [“Setting up the use of shared library regions” on page 18](#)
4. [“Granting access permissions to FTM SWIFT users” on page 18](#)

IBM Installation Manager offers different modes. The following two sections are examples using wizard mode (graphical user interface or web) or command line driven roll backs. Choose one of the IBM Installation Manager modes.

Roll back using wizard mode

To roll back a fix pack using wizard mode:

1. Start Installation Manager in graphical user interface or web mode.
2. Click **Roll Back**.
3. Select the package group of FTM SWIFT and click **Next**.
4. Select the fix pack level to roll back to.
5. Click **Next**.
6. Review the summary information and click **Roll Back**.
7. Click **Finish**.
8. Close the Installation Manager:
 - In graphical user interface mode, click **File > Exit**.
 - In web mode, click **File > Stop server**

Roll back using command line mode

To roll back FTM SWIFT to the previously installed fix pack on the command line:

1. Go to the Installation Manager tools directory, for example:

```
cd /InstallationManager/bin/eclipse/tools
```

2. Run the following command:

```
./imcl rollback com.ibm.dni.v324
```

3. Verify the roll back result:

```
./imcl listInstalledPackages -long | grep com.ibm.dni
```

The output includes the version of the installed fix pack, for example 3.2.4.1 for fix pack 1. Ensure that this version matches the fix pack you are rolling back to.

Update an SAG Add-On

If a fix pack contains an update of SAG Add-On, use IBM Installation Manager to install the update. How to obtain the Installation Manager repository is described in [Installing the SAG Add-On / Pre-installation steps](#). You do not need to stop the SAG in order to update the SAG Add-On.

To update an SAG Add-On:

1. Stop the SAG Add-On.

How to do this depends on the operating system of your SAG workstation:

- On AIX®: Stop the SAG Add-On subsystems as described in [Stopping an SAG Add-On on AIX](#)
- On RHEL x86: Stop the SAG Add-On service as described in [Stopping an SAG Add-On on RHEL x86](#)
- On Windows: Stop the SAG Add-On service as described in [Starting, stopping, or displaying the status of an SAG Add-On](#)

If the SAG Add-On cannot be stopped, stop the SAG Add-On process manually. How to do this depends on the operating system of your SAG workstation and is described here:

- For AIX: [Killing the SAG Add-On process on AIX \(use only if the process is deadlocked\)](#)
- For RHEL x86: [Killing the SAG Add-On process on RHEL x86 \(use only if the process is deadlocked\)](#)
- For Windows: [Starting, stopping, or displaying the status of an SAG Add-On](#)

2. Create a backup of your SAG Add-On profile `dnfcssao.cfg` that is located in the SAG Add-On runtime directory:

- On AIX and RHEL x86: `/var/ftmswift_v324/sao`
- On Windows: `%PROGRAMDATA%\ftmswift_v324\sao`

Note: Do not store the backup file in the SAG Add-On runtime directory, but in a different location.

3. Uninstall the currently installed version of the SAG Add-On using IBM Installation Manager.

4. Install the SAG Add-On with the new fix pack level using IBM Installation Manager.

5. Copy the backup of the SAG Add-On profile `dnfcssao.cfg` (that you created in step [“2”](#) on page 24) to the SAG Add-On runtime directory:

- On AIX and RHEL x86: `/var/ftmswift_v324/sao`
- On Windows: `%PROGRAMDATA%\ftmswift_v324\sao`

6. Start the SAG Add-On.

Prepare the migration of configuration entities

FTM SWIFT maintenance may require to update configuration entities. The program `dnfczmlc` compares your current configuration with the target configuration. If it detects differences it creates CLI command files which will contain the configuration migration statements to bring your environment to the target configuration.

To prepare the migration of configuration entities:

1. If your installation and runtime systems are different:

Share the `run/data` subdirectory of the FTM SWIFT installation directory from the installation system with the runtime system.

2. On the runtime system, log on to z/OS UNIX as the system configuration administrator (SA1), and run the profile for your runtime environment by entering:

```
. /var/ftmswift_v324/run/dniprofile
```

3. Create a sub-directory `ftmswift_xxxx` where `xxxx` is the version of the fix pack, for example 3241.

4. Switch to this directory and enter the following command:


```
dnfczmlc -i instance [-dual YES|NO] [-to timeout]
```

where

-i *instance*

The name of the FTM SWIFT instance.

-dual YES|NO

Specifies whether files are to be created for a system that uses dual authorization for SYSOU. The default is -dual YES. Specify -dual NO only if dual authorization is turned off for both DNI_SYSADM and DNI_SECADM in SYSOU at the time when the created files are executed. Whether dual authorization is switched on or off for other OUs is irrelevant.

-to *timeout*

The number of milliseconds that the CLI waits for a response to this command before it issues an error message. The default is 100000 (100 seconds). It must be a whole number between 20000 and 9999999.

The command dnfczmlc lists the CLI command files that it created in the current directory, for example:

```
Generating the command files for migration ...
The following files are generated and need to be executed for migration:

Seq  User   File
---  -
001  Any UA  dnfczmlc_1_ua_rem_ro_all.cli
002  Any SA  dnfczmlc_2_sa_ent_all.cli
003  Any UA  dnfczmlc_3_ua_cre_ro_all.cli

DnfInfo: Script /opt/IBM/ftm/swift/v324/run/bin/dnfczmlc completed successfully.
```

Note: The command dnfczmlc starts a long-running task that might take several minutes to complete.

5. Save the output of dnfczmlc which tells you the sequence and the user ID you have to use later when you submit the CLI command files in [“Migrate the configuration entities”](#) on page 25.

Migrate the configuration entities

FTM SWIFT maintenance may require to update configuration entities. In section [“Prepare the migration of configuration entities”](#) on page 24 you created the required CLI command files that now need to be executed.

To migrate the configuration entities:

1. For each CLI command file listed in the output of dnfczmlc in [“Prepare the migration of configuration entities”](#) on page 24, log on to z/OS UNIX as the user specified for the current file.

The user IDs are:

1st, 2nd, or Any SA

The first system configuration administrator (SA1), the second system configuration administrator (SA2), or any system configuration administrator.

1st, 2nd, or Any UA

The first user administrator (UA1), the second user administrator (UA2), or any user administrator.

2. Run the profile for your runtime environment by entering:

```
. /var/ftmswift_v324/run/dniprofile
```

3. Switch to the sub-directory ftmswift_XXXX you created in section [“Prepare the migration of configuration entities”](#) on page 24, step [“3”](#) on page 24.

4. Run the current CLI command file by issuing the following command:

```
dnicli -s svc -ou SYSOU -cft file | tee -a dnfczmlc_cli_XXXX.log
```

where:

svc

DNI_SYSADM

For files executed by a system configuration administrator.

DNI_SECADM

For files executed by a security administrator.

file

The CLI command file name, for example dnfczmlc_5_sa_cre_ct_com.cli.

xxxx

The version of the fix pack, for example 3241.

5. Check the log file to see if any error occurred.

Saving configuration and security data

To generate the consistent set of image copies:

1. On the system where the Db2 subsystem resides, log on to TSO as a Db2 administrator (UDB2ADM1).
2. In the data set *prefix.instance.ADMIN*, locate and edit the member DNIMZCFS as follows:
 - a) Adapt the job card to your needs.
 - b) Locate and replace all occurrences of the placeholder DNIxICPF with the prefix of the image copy data sets (up to 8 characters).
 - c) If you have already installed FTM SWIFT 3.2.4.2, and if you either created your instance on this fix pack level or migrated to universal table spaces (UTS), you have to update the LISTDEF as follows:
 - i) Remove all INCLUDE TABLESPACES statements from LISTDEF CONF_SEC_LISTDEF.
 - ii) Insert all INCLUDE TABLESPACES statements from LISTDEF MIG_LISTDEF contained in member DNIMZCF0.

The first lines of the LISTDEF should look as follows:

```
LISTDEF CONF_SEC_LISTDEF
INCLUDE TABLESPACES TABLE DNIvSN.DNI_COS
INCLUDE TABLESPACES TABLE DNIvSN.DNI_COS_CT_CON_REL
INCLUDE TABLESPACES TABLE DNIvSN.DNI_COS_CT_CON_REL_CTRLA
INCLUDE TABLESPACES TABLE DNIvSN.DNI_COS_CT_CON_REL_CTRLB
...
```

3. Submit the job.
4. Check the SYSPRINT output. Ensure that the highest return code was 0. If the job was customized as suggested, after successful completion, the image copies are stored in data sets with names of the following form:

```
prefix.db2_subsystem_id.DNI.database.tablespace.suffix
```

where *prefix*, *db2_subsystem_id*, *database*, *tablespace*, and *suffix* represent values set in DNIMZCFS.

Restoring configuration and security data

To restore configuration and security data:

1. On the system where the Db2 subsystem resides, log on to TSO as a Db2 administrator (UDB2ADM1).
2. In the data set with the name *prefix.instance.ADMIN*, locate and edit the member DNIMZCFR as follows:
 - a) Adapt the job card to your needs.
 - b) Locate and replace all occurrences of the placeholder DNIxICPF, including those in the header, with the prefix of the image copy data sets (up to 8 characters).
 - c) The header of DNIMZCFR contains SQL statements similar to those shown below.

```

SELECT HEX(START_RBA)
  FROM SYSIBM.SYSCOPY
 WHERE      DBNAME = (SELECT DBNAME
                      FROM SYSIBM.SYSTABLES
                      WHERE      NAME      = 'DNI_CT'
                      AND CREATOR = 'schema'
                      )
 AND TSNAME = (SELECT TSNAME
              FROM SYSIBM.SYSTABLES
              WHERE      NAME      = 'DNI_CT'
              AND CREATOR = 'schema'
              )
 AND DSNAME LIKE 'prefix.db2_subsystem_id.DNI.dbname.%;'
;

```

The schema name, prefix, Db2 subsystem ID, and database name are already set to those of the image copy data set.

Execute these statements to retrieve the RBA or LRSN recorded in SYSIBM.SYSCOPY for the consistent set of image copies created in [“Saving configuration and security data”](#) on page 26.

- d) To specify the TOLOGPOINT in the RECOVERY statement, replace the dashes by the RBA or LRSN retrieved in step [“2.c”](#) on page 26.
- e) If you have already installed FTM SWIFT 3.2.4.2, and if you either created your instance on this fix pack level or migrated to universal table spaces (UTS), you have to update the LISTDEF as follows:
 - i) Remove all INCLUDE TABLESPACES statements from LISTDEF CONF_SEC_LISTDEF.
 - ii) Insert all INCLUDE TABLESPACES statements from LISTDEF MIG_LISTDEF contained in member DNIMZCFO.

The first lines of the LISTDEF should look as follows:

```

LISTDEF CONF_SEC_LISTDEF
INCLUDE TABLESPACES TABLE DNIvSN.DNI_COS
INCLUDE TABLESPACES TABLE DNIvSN.DNI_COS_CT_CON_REL
INCLUDE TABLESPACES TABLE DNIvSN.DNI_COS_CT_CON_REL_CTRLA
INCLUDE TABLESPACES TABLE DNIvSN.DNI_COS_CT_CON_REL_CTRLB
...

```

3. Submit the job.
4. Check the SYSPRINT output. Ensure that the highest return code was 4. This warning return code is caused by the indexes being in REBUILD PENDING status after the RECOVER statements, but before the REBUILD statements, were processed. After successful completion the configuration and security tables are reset to their original and previously saved state.

Update the IBM Integration Toolkit workstation

To install the new versions of the Toolkit resources, follow the instructions listed in:

- [Transferring the FTM SWIFT Toolkit resources](#)
- [Installing the FTM SWIFT Eclipse plug-ins](#)

If you use FTM SWIFT sample message flows as foundation for your own flow development follow the instructions provided in [Using the sample routing flows](#).

Otherwise, continue with the instructions provided in:

- [Importing FTM SWIFT sample projects](#)
- [Importing the message sets and sample routing flows](#)

Additionally, if you use FTM SWIFT message set projects containing XML schema definitions for your own flow development follow the instructions provided in: [Importing XSD files for SWIFT message payloads](#).

Furthermore, you have to rebuild and redeploy your message flows if they are based on the FTM SWIFT API.

Migrating FTM SWIFT table spaces to universal table spaces (UTS)

Note: You can skip this chapter, if the starting point of the migration to FTM SWIFT 3.2.4 fix pack 4 was a new FTM SWIFT instance created with a minimum fix pack 2. All related table spaces were created as UTS table spaces when this instance was created, and no migration is required.

This section describes how you migrate the table spaces of an existing FTM SWIFT instance to UTS.

After you have finished the installation and migration to FTM SWIFT 3.2.4 fix pack 4, you can migrate the segmented table spaces of existing instances to partition-by-growth universal table spaces (UTS) except of the following table spaces:

- DNFASP (used by tables for ASP data)
- DNFOMI1S and DNFOMI2S (used by some MSIF tables)
- DNFOMWM (used by message warehouse tables)
- DNFRMDP (used by tables for RMA authorisations)
- DNFTS04 (used by table DNF_MSGS for SIPN FIN and FMT FIN processing)
- DNQEMSG (used by MER tables)
- The table spaces identified by the following placeholders:
 - DNFvMWF, DNIvMWH, DNFvMWM, DNFvMWO, and DNFvMWX (used by message warehouse tables)
 - DNIvAMB, DNIvAMH, and DNIvAUM (used by message audit tables)
 - DNIvAMCO and DNIvAMP (used by tables for partitioned message audit log)
 - DNIvAUU (used by user audit tables)
 - DNIxTSHI (used by tables in the history database)

You can migrate the table spaces at your own pace; for example, you can migrate all table spaces at once, or one table space after the other. To check which table spaces are not yet migrated to UTS, you can use the **-verify_ts** action of the maintenance information command `dnmaintinfo`, for example:

```
dnmaintinfo -verify_ts -dsn DNIDB -schema DNI -uid UDB2ADM1 -pw password
```

To migrate the FTM SWIFT table spaces, a FTM SWIFT downtime is required. During the migration phase all FTM SWIFT services, sessions, application servers, and message brokers must be stopped.

To migrate the table spaces to UTS, you can do either of the following:

Using vehicles provided by FTM SWIFT

In this case, proceed as described in [“Performing migration of table spaces using FTM SWIFT vehicles”](#) on page 30.

If a problem occurs after a table space was migrated, you can fall back as described in [“Falling back”](#) on page 38. To be able to fall back to the original table space, you must backup the appropriate table data as described in [“Backing up”](#) on page 38 before you start to migrate a table space.

Using Db2 functional level 508

You can use the new Db2 functional level 508 to migrate the FTM SWIFT table spaces listed in column **Table spaces** of [Table 6](#) on page 33.

- For more information about using the new functional level 508, see https://www.ibm.com/docs/en/db2-for-zos/12?topic=d1fl-function-level-508-activation-enabled-by-apar-ph29392-october-2020#db2z_fl_v12r1m508__e101.
- For information about the feature *Moving tables from multi-table table spaces to partition-by-growth table spaces (UTS)*, see <https://www.ibm.com/docs/en/db2-for-zos/12?topic=ats-moving-tables-from-multi-table-table-spaces-partition-by-growth-table-spaces>.

Note: If you decide to migrate the table spaces by using Db2 functional level 508, you must use exactly the same table space names as listed in column **Table spaces** of [Table 6 on page 33](#). For more information, contact your IBM service representative.

Performing migration of table spaces using FTM SWIFT vehicles

To migrate the table spaces to UTS by using the vehicles provided by FTM SWIFT, proceed as follows:

1. Preparation:

- a. On the runtime system, log on as a Db2 administrator (UDB2ADM1).
- b. Set up the usage of the Db2 command line processor (CLP) for the migration modules:
 - i) Create a properties file `c1p.properties` for the Db2 command line processor that contains the following line defining the FTM SWIFT connection alias:

```
FTMDBALIAS=DNIvDBHOST:DNIvDBPORT/DNIvDSN,USER,PASSWORD
```

where:

DNIvDBHOST

The hostname

DNIvDBPORT

The database port

DNIvDSN

The name of the Db2 location containing the runtime database

USER

The user ID of the database administrator (UDB2ADM1)

PASSWORD

The password of the database administrator

Make sure that only you, the Db2 administrator, has read access to this properties file.

- ii) Execute the following command, and ensure to execute it every time you use the CLP for migration purposes (for example, by adding it to your profile):

```
export CLPPROPERTIESFILE=DNIvCLPPATH/c1p.properties
```

where `DNIvCLPPATH` represents the path to the properties file that you created in step [“1.b.i” on page 30](#).

c. Prepare the stored procedures used by the UTS table space migration:

- i) Set up the WLM and authorizations in order to execute the stored procedure DSNUTILU provided by Db2.

Note: If you are using RACF authorization, you must set up a RACF group and assign the Db2 administrator (UDB2ADM1) to that group.

For more information about the setup of the DSNUTILU, see <https://www.ibm.com/docs/en/db2-for-zos/12?topic=db2-dsutilu>.

- ii) Create the stored procedures DNI_CALL_REORG and DNI_CHECK_TSTYPE:

- a) Prepare DNI_CALL_REORG to use the Db2 REORG utility:

The default z/OS data set pattern used for sequential copy dataset is

```
&US. .&SSID. .UNL.&DB. .&TS. .D&JD.&MI.
```

where:

- `&US` is the invoking user id
- `&SSID` is the subsystem id

- *UNL* is a fix qualifier
- *&DB* is the database name
- *&TS* is the table space name
- *D* is the fix prefix of the last qualifier
- *&JD* is the day in year
- *&MI* is the minute in year

If you do not want to use this default data set pattern, or if you do not want to use the utility ID DNIUTSREORG, edit the file *deployment_dir/DNIvINST/admin/dnimuts_cre_checks_sp.ddl* and change the data set pattern or utility ID as required.

- b) Execute the following command to create the stored procedures DNI_CALL_REORG and DNI_CHECK_TSTYPE:

```
java com.ibm.db2.clp.db2 +c -td# -z dniuts_sp.log -svf deployment_dir/DNIvINST/admin/dnimuts_cre_checks_sp.ddl
```

2. Migration:

For each service bundle that you have deployed, check [Table 6 on page 33](#) to determine which table spaces you want to migrate to UTS. For each of these table spaces perform the following steps:

- a. Backup the table data for the case of a fallback. There are two ways to do this (which are described in [“Backing up” on page 38](#)).

If you decided to use the sample JCL **DNIUBAK**:

- Edit **DNIUBAK**.
- Replace the data set prefix placeholder *DNIxICPF* with a value that meets your requirements.
- Replace the placeholder *TSLSTDEF* with the file that is specified in column **List definition TSLSTDEF for DNIUBAK** of [Table 6 on page 33](#) for the table space to be migrated.
- Run the job and verify the output for success.
- For recover purposes, obtain the image copy dataset name of the table space from the job output. Search for message DSNU1038I and note the value of its parameter **DSN** (shown in the example job output below, where **DNFOFD** is the table space name).

```
DSNU1038I  310 14:34:03.04 DSNUGDYN - DATASET ALLOCATED.  TEMPLATE=SYSCOPY
DSN=UDB2ADM.DC11.COPYF.DSN1.DNFOFD.D31034
```

- b. In [Table 6 on page 33](#), identify the DDL file that is specified for the table space to be migrated. This DDL file resides in directory *deployment_dir/DNIvINST/admin*. Run this DDL file by using the Db2 CLP.

For example, issue the following CLP command to migrate the table space DNIYOU:

```
java com.ibm.db2.clp.db2 +c -t -z dnimuts_ou.log -svf deployment_dir/DNIvINST/admin/dnimuts_ou.ddl
```

If the command was executed successfully, the following message is displayed:

```
DNIB1001I : UTS table space migration successful for tablespace
```

where *tablespace* is the table space that was migrated.

If a Db2 error occurred, check the SQL statement that caused the problem. Resolve the problem and rerun the migration DDL. If the problem relates to DNI_CALL_REORG or DNI_CHECK_TSTYPE, inspect the following table for more information on how to proceed:

Table 5. SQLSTATE values issued by the stored procedures DNI_CALL_REORG and DNI_CHECK_TSTYPE		
SQLSTATE	Explanation	Required action
99TS0	Stored procedure DNI_CALL_REORG was issued with inconsistent input parameters.	Check the invocation of DNI_CALL_REORG within the migration module and adapt the input parameters. Run the procedure DNI_CALL_REORG again.
99TS1	The specified table space was not found.	Check the invocation of the stored procedure DNI_CHECK_TSTYPE and verify if the correct table space name and database name are provided. Run the procedure DNI_CHECK_TSTYPE again.
99TS2	The specified table space does not have the expected type and was not successfully migrated to a universal table space.	Check the REORG output and fix the errors. Then, run the procedure DNI_CALL_REORG again.

- c. Execute the DIC command `build` if you have activated the data integrity framework, and if the output of step “2.b” on page 31 contains the following message:

```
DNIB1002I : If the data integrity framework is active,
            you have to run DIC Build for the following table:
            table
```

where *table* is the table that must be specified for the **-table** parameter of the DIC command `build`.

For example, if you did run the DDL file `dnimuts_ou.ddl` to migrate table space DNI_OU used by database table DNI_OU, execute the following command:

```
dnpdic -build -Djava.security.policy=/var/ftmswift_v324/run/ftmswift.policy
        -passphrase @/var/ftmswift_v324/run/passphrase.stash
        -dsn DSN1 -schema DNI
        -table DNI_OU
```

The following table provides, per service bundle, the following information:

- The DDL files to be used for migration
- The table spaces that are migrated by a DDL file
- Whether invocation of DIC command `build` is required after migration
- The DDL files to be used for fallback (if required)
- The list definition file to be used for data backup in step “2.a.iii” on page 31

Table 6. UTS DDL files for service bundles

Service bundle	DDL file required for migration	Table spaces	DIC build required?	DDL file required for fallback	List definition TSLSTDEF for DNIUBAK	
DNICOMMON	dnimuts_common.ddl	DNICOS DNICT DNISCOM DNICTA DNICOSRE DNITIMER DNIDBSTA DNIDBHS DNICNTRL DNISESS DNICUR DNICTY DNIBICI DNIRDU DNIFACC DNIUJPR DNIRDMBI DNIRDMCT DNIRDMCU		dnimuts_common_fb.ddl	uts_ld_common	
	dnimuts_cos_ct_con_rel.ddl	DNICOSCC DNICOSCA DNICOSCB	√	dnimuts_cos_ct_con_rel_fb.ddl	uts_ld_cos_ct_con_rel	
	dnimuts_ct_attr_value.ddl	DNICTAV DNICTAVA DNICTAVB	√	dnimuts_ct_attr_value_fb.ddl	uts_ld_ct_attr_value	
	dnimuts_event.ddl	DNIEVENT DNIEVENA DNIEVENB	√	dnimuts_event_fb.ddl	uts_ld_event	
	dnimuts_ou.ddl	DNIYOU DNIYOUA DNIYOUB	√	dnimuts_ou_fb.ddl	uts_ld_ou	

Table 6. UTS DDL files for service bundles (continued)

Service bundle	DDL file required for migration	Table spaces	DIC build required?	DDL file required for fallback	List definition TSLSTDEF for DNIUBAK
DNICOMMON (continued)	dnimuts_rg_role_rel.ddl	DNIRGR DNIRGRA DNIRGRB	√	dnimuts_rg_role_rel_fb.ddl	uts_ld_rg_role_rel
	dnimuts_ro_ct_attr_rel.ddl	DNIROA DNIROAA DNIROAB	√	dnimuts_ro_ct_attr_rel_fb.ddl	uts_ld_ro_ct_attr_rel
	dnimuts_role_resolved.ddl	DNIROR DNIRORA DNIRORB	√	dnimuts_role_resolved_fb.ddl	uts_ld_role_resolved
	dnimuts_role.ddl	DNIROLE DNIROLEA DNIROLEB	√	dnimuts_role_fb.ddl	uts_ld_role
	dnimuts_rolegroup.ddl	DNIRG DNIRGA DNIRGB	√	dnimuts_rolegroup_fb.ddl	uts_ld_rolegroup
	dnimuts_user_resolved.ddl	DNIURV DNIURVA DNIURVB	√	dnimuts_user_resolved_fb.ddl	uts_ld_user_resolved
	dnimuts_user.ddl	DNIUSR DNIUSRA DNIUSRB	√	dnimuts_user_fb.ddl	uts_ld_user
	dnimuts_usr_rg_rel.ddl	DNIURG DNIURGA DNIURGB	√	dnimuts_usr_rg_rel_fb.ddl	uts_ld_usr_rg_rel
	dnimuts_usr_role_rel.ddl	DNIUSRRO DNIUSRRA DNIUSR RB	√	dnimuts_usr_role_rel_fb.ddl	uts_ld_usr_role_rel

Table 6. UTS DDL files for service bundles (continued)

Service bundle	DDL file required for migration	Table spaces	DIC build required?	DDL file required for fallback	List definition TSLSTDEF for DNIUBAK	
DNFEFAS	dnfmefasuts.ddl	DNFOMI3S DNFOFE DNFOLH DNFOTO DNFORE1 DNFOFI DNFOFO DNFOIW		dnfmefasuts_fb.ddl	uts_ld_efas	
	dnfmefasuts_dnfo_config_data.ddl	DNFOCD1 DNFOCD1A DNFOCD1B	√	dnfmefasuts_dnfo_config_data_fb.ddl	uts_ld_config_data	
	dnfmefasuts_dnfo_fsm_download.ddl	DNFOFD DNFOFDA DNFOFDB	√	dnfmefasuts_dnfo_fsm_download_fb.ddl	uts_ld_fsm_download	
	dnfmefasuts_dnfo_fsm_rcv_msg.ddl	DNFORM1 DNFORM1A DNFORM1B	√	dnfmefasuts_dnfo_fsm_rcv_msg_fb.ddl	uts_ld_fsm_rcv_msg	
	dnfmefasuts_dnfo_fsm_receive.ddl	DNFOFR DNFOFRA DNFOFRB	√	dnfmefasuts_dnfo_fsm_receive_fb.ddl	uts_ld_fsm_receive	
	dnfmefasuts_dnfo_fsm_send.ddl	DNFOFS DNFOFSA DNFOFSB	√	dnfmefasuts_dnfo_fsm_send_fb.ddl	uts_ld_fsm_send	
	dnfmefasuts_dnfo_fsm_snd_msg.ddl	DNFOSM DNFOSMA DNFOSMB	√	dnfmefasuts_dnfo_fsm_snd_msg_fb.ddl	uts_ld_fsm_snd_msg	
	dnfmefasuts_dnfo_fsm_state.ddl	DNFOFA DNFOFAA DNFOFAB	√	dnfmefasuts_dnfo_fsm_state_fb.ddl	uts_ld_fsm_state	

Table 6. UTS DDL files for service bundles (continued)

Service bundle	DDL file required for migration	Table spaces	DIC build required?	DDL file required for fallback	List definition TSLSTDEF for DNIUBAK
DNFEFAS (continued)	dnmfefasuts_dnfo_lob_data.ddl	DNFOLD DNFOLDA DNFOLDB	√	dnmfefasuts_dnfo_lob_data_fb.ddl	uts_ld_lob_data
	dnmfefasuts_dnfo_msg_part.ddl	DNFOMP DNFOMPA DNFOMPB	√	dnmfefasuts_dnfo_msg_part_fb.ddl	uts_ld_msg_part
	dnmfefasuts_dnfo_mwh_data.ddl	DNFOMD DNFOMDA DNFOMDB	√	dnmfefasuts_dnfo_mwh_data_fb.ddl	uts_ld_mwh_data
DNFFIN	dnffinuts.ddl	DNFFLTSS		dnffinuts_fb.ddl	uts_ld_fin
	dnffinuts_iams.ddl	DNFIAMS DNFIAMSA DNFIAMSB	√	dnffinuts_iams_fb.ddl	uts_ld_iams
	dnffinuts_oams.ddl	DNFTS01 DNFTS01A DNFTS01B	√	dnffinuts_oams_fb.ddl	uts_ld_oams
DNFFINCI	<OU>_dnfmzuts.ddl (OU specific file)	DNFVFA (OU specific placeholder)		<OU>_dnfmzuts_fb.ddl (OU specific file)	<OU>_uts_ld_finci (OU specific file)
DNFFMTFIN	dnffmtfinuts.ddl	DNFPFR		dnffmtfinuts_fb.ddl	uts_ld_fmfin
DNFVERIF	dnfmsigverifuts.ddl	DNFVRQ DNFVCY DNFVTM DNFVMSG		dnfmsigverifuts_fb.ddl	uts_ld_verif

Table 6. UTS DDL files for service bundles (continued)

Service bundle	DDL file required for migration	Table spaces	DIC build required?	DDL file required for fallback	List definition TSLSTDEF for DNIUBAK
DNFRMA	dnfrmauts.ddl	DNFRMY DNFRMSS		dnfrmauts_fb.ddl	uts_ld_rma
	dnfrmauts_rmah.ddl	DNFRMAH DNFRMAHA DNFRMAHB	√	dnfrmauts_rmah_fb.ddl	uts_ld_rmah
	dnfrmauts_rmqh.ddl	DNFRMQH DNFRMQHA DNFRMQHB	√	dnfrmauts_rmqh_fb.ddl	uts_ld_rmqh
	dnfrmauts_rmqs.ddl	DNFRMQS DNFRMQSA DNFRMQSB	√	dnfrmauts_rmqs_fb.ddl	uts_ld_rmqs
DNFRMR	dnfrmruts.ddl	DNFRMRL DNFRMAL DNFRMTS		dnfrmruts_fb.ddl	uts_ld_rmr
DNPAO	dnpmzuts.ddl	DNPAOLS		dnpmzuts_fb.ddl	uts_ld_aols
DNQER	dnqzmzuts.ddl	DNQEMD		dnqzmzuts_fb.ddl	uts_ld_er
DNQPRINT	dnqmputs.ddl	DNQPQUE DNQPORD DNQPMSG DNQPCNT		dnqmputs_fb.ddl	uts_ld_print

Backing up

If you migrate a table space by using FTM SWIFT vehicles, you must backup the appropriate table data before. You can do this in one of the following ways:

Using private or local procedure

Backup the table data, the table, and the table space definitions on your own.

Using the FTM SWIFT sample

Use the sample JCL **DNIUBAK** provided in the data set `FTMDEP.FTMSW324.DNIvINST.ADMIN`.

Note: For this backup method it is necessary that the definitions of the original table spaces, data tables, and indexes were not changed in comparison to FTM SWIFT provided definitions.

To use the sample JCL **DNIUBAK**, copy the appropriate file from the HFS deployment directory into an z/OS data set:

1. On the customization system, log on to TSO as a customizer (UCUST1).
2. Edit the script `deployment_directory/DNIvINST/admin/dniczcpu` according to its usage description.
3. Execute the script:

```
./dniczcpu
```

Falling back

Falling back from UTS means to return to Db2 segmented table spaces. This might be necessary if, after migration, you encounter severe problems with a migrated table space that can best be resolved by reverting it to its original. You have only to revert those table spaces for which you encounter severe problems, and you can keep the migrated UTS table spaces that are working.

To fall back a migrated UTS table space to a segmented table space:

- If you backed up your database by your own, restore this backup.
- If you used the sample JCL **DNIUBAK** as described in [“Backing up” on page 38](#), do the following to restore the original table space:
 1. On the runtime system, log on as a Db2 administrator (UDB2ADM1).
 2. Run the corresponding fallback DDL module that is specified in [Table 6 on page 33](#) and that resides in directory `deployment_dir/DNIvINST/admin`.

For example, issue the following CLP command to fall back from the UTS table spaces DNIYOU, DNIYOUA, and DNIYOUB:

```
java com.ibm.db2.clp.db2 +c -t -z dnmuts_ou_fb.log -svf deployment_dir/DNIvINST/admin/dnmuts_ou_fb.ddl
```

If the command was executed successfully, a message like the following one is displayed:

```
DNIB1011I : Fallback module successful for tablespaces
```

where *tablespaces* is the list of table spaces that were processed.

3. Recover the data of the table space:
 - a. Edit the sample JCL **DNIUREC** in `FTMDEP.FTMSW324.DNIvINST.ADMIN`.
 - b. Replace all occurrences of placeholder `DNIxTS` with the table space that you want to revert.
 - c. Replace placeholder `IMGCOPYDS` with the data set name (**DSN**) that you noted during migration in step [“2.a.v” on page 31](#).

Note: To find out which table space was migrated by which DDL file, inspect [Table 6 on page 33](#).

 - d. Run the job.

Cleaning up

As soon as all table spaces listed in column **Table spaces** of [Table 6 on page 33](#) are migrated, the Db2 administrator can do the following:

- Delete the backup images of the table spaces that were created when using sample JCL **DNIUBAK** as described in step [“2.a” on page 31](#).
- Delete the file `clp.properties` that was created in step [“1.b.i” on page 30](#).

However, do not drop the stored procedures `DNI_CALL_REORG` and `DNI_CHECK_TSTYPE` that were created in step [“1.c.ii.2” on page 31](#).

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Document change history

Date	Description of change
2022-05-10	Initial publication date



Product Number: 5655-FTB