NWDI/JDI System Copy Migration

Applies to:
Java Development Infrastructure (JDI) – 6.40 SP15 and newer SPs, NetWeaver Development Infrastructure (NWDI) – 7.00 SP7 and newer SPs, NetWeaver Development Infrastructure (NWDI) – all releases newer than 7.00, System Copy Tool

For more information, visit the Software Logistics homepage.

Summary
This article is about how the NWDI/JDI can be migrated to another system with help of the System Copy Tool. In addition to the official System Copy Guides it should give a deeper understanding about how the System Copy works with NWDI/JDI and how problems can be avoided during the System Copy migration. It will also give you some 'tips and tricks' and explain some technical details that will help you to do a successful NWDI/JDI migration.

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Introduction

This article is about how the NWDI/JDI can be migrated to another system with help of the System Copy Tool. In addition to the official System Copy Guides it should give a deeper understanding about how the System Copy works with NWDI/JDI and how problems can be avoided during the System Copy migration. It will also give you some 'tips and tricks' and explain some technical details that will help you to do a successful NWDI/JDI migration.

This article is NOT meant to be a replacement for the official System Copy Guides. When you do a System Copy migration please stick to the instructions in the System Copy Guides and take this article only as additional background information.

As reader you should be familiar with the NWDI/JDI and it’s components CMS, CBS and DTR.

What is a System Copy and for what can it be used?

A System Copy is a copy of an existing system. A system that can be copied can be a Java system, an ABAP system as well as a dual stack system.

Since we are talking about NWDI/JDI we understand a system as a Java system that consists out of the engine installation, the deployed applications and the database content.

There are various reasons why a system should be copied (please note that not all of the following use cases are fully supported with NWDI/JDI as we will see later):

- **Hardware Replacement (fully supported):**
  The hardware on which the system is installed should be replaced. In this case the system can be moved to the new hardware by doing a System Copy.

- **Safe Upgrade (partially supported):**
  The system should be safely upgraded to a new SP. In this case you can make a System Copy, upgrade the copied system and in case of problems you can still go back to the old system.

- **Training System Setup (partially supported):**
  For educational trainings you want to prepare a system for each participant. In this case you can prepare one system and then make a System Copy for each participant.
How can a System Copy be done? How does the System Copy Tool work?

To make a System Copy you have to use the System Copy Tool.

The System Copy Tool basically executes 3 steps to do the System Copy:

- It installs the target system.
- It deploys the applications on the target system.
- It copies the database content from the source system to the target system.

This System Copy procedure brings some advantages, but also has some limitations and problems.

Advantages:

- Since the installation of the target system is part of the System Copy procedure, it allows you to directly do an upgrade when doing a System Copy:
  This means if you have for example a 7.00 SP9 system you can use the System Copy Tool to install a 7.00 SP16 system as copy of your 7.00 SP9 system.

  **Important:** The target system must not have a lower version than the source system!
  The reason for this limitation is that on an upgrade from SPX to SPX+1, there might be data migrations that cannot be undone when copying the migrated SPX+1 data to an SPX system, the SPX system would fail to handle the migrated SPX+1 data.

Limitations:

- Since the installation of the target system is part of the System Copy procedure, it is not possible to copy applications and database content from a system to an already existing target system.
- You can always only make a copy of the complete system.
  This means for example if you have NW/ID/JDI and a Portal and the same system you can't use the System Copy Tool to move only the NW/ID/JDI to a new system. If you use the System Copy Tool you will always get a copy of all applications that are deployed on the source system.

Problems:

- Some applications (e.g. DTR) rely on entities that have globally unique IDs. If the database content is simply copied from the source to the target system all entities of the source system exists after the copy with the same ID also in the target system. These entities can now be concurrently modified in both the systems which leads to the situation that entities are indeed different although they have the same ID. This can cause severe errors and inconsistencies in the application. E.g. in DTR there could be two versions with the same ID but with different contents.
- Some applications (e.g. CMS) store URLs to other systems in their data. If the other systems are moved by doing a System Copy the stored URLs get invalid, which leads to application failures.
- Some applications (e.g. CBS) store locations to local resources in their data. If the application is moved to another system the referenced local resources might not be available on the new system (or they are available in different locations), which leads to application failures.
NWDDI/JDI and System Copy, how does it work?

As pointed out above there are some problems with the System Copy procedure that affect the NWDDI/JDI components, DTR, CBS and CMS. As consequence of these problems for NWDDI/JDI there are some prerequisites that must be fulfilled BEFORE a System Copy is done as well as some manual steps that need to be executed on the target system AFTER the System Copy was done.

Also there is a very important limitation when using the System Copy Tool together with NWDDI/JDI:

- **After the System Copy is done you are not allowed to use the NWDDI/JDI on the source system any more** (There is only one exception for DTR if the System Copy is done with the option 'COPY' as explained later in the section 'The System Copy options ‘MOVE’ and ‘COPY’').

  **If you continue to use the source system you'll ruin data unrepairable!**

All prerequisites and manual post steps are described in the Java System Copy Guides. The Java System Copy Guides are available on the SAP Service Marketplace. To find the System Copy Guides you can start from the following page in SDN and follow the instructions from the section 'System Copy Guide':

https://www.sdn.sap.com/irj/sdn/systemcopy

Since it might be a bit tricky to find the System Copy Guides I will explain how to navigate through the SAP Service Marketplace to find the System Copy Guides for 6.40 and 7.00 (however since the document structure is sometimes changing, this information may get outdated):

**for 6.40:**

- start from: https://www.sdn.sap.com/irj/sdn/systemcopy
- go to the section ‘System Copy Guide' and click on the link 'http://service.sap.com/instguidesnw'
- follow the link for 'SAP NetWeaver 2004'
- click on 'Installation' in the 'Guides' table
- open the node for 'SAP Web AS' and follow the link 'SAP Web AS 6.40 SR1 and Related Documentation'
- follow the link 'Homogeneous and Heterogeneous System Copy (including SAP Web AS 6.40 Patch Collection)' to find the System Copy Guides for 6.40

**for 7.00:**

- start from: https://www.sdn.sap.com/irj/sdn/systemcopy
- go to the section ‘System Copy Guide' and click on the link 'http://service.sap.com/instguidesnw'
- follow the link for 'SAP NetWeaver 7.0 (2004s)'
- click on the link 'plan and install' in the section 'Installation'
- in the section ‘System Copy' you will find the System Copy Guides for 7.00

**Important:** Please pay attention to the note 877029 'System Copy for NWDDI'. It contains important information about which System Copy Guide you have to use (there are some few versions of the System Copy Guides in which the DI/JDI-specific instructions are **incomplete** and which therefore **must not be used**). Also the note clarifies some limitations that are also discussed in this article.
NWDI/JDI System Copy Prerequisites

There are a number of prerequisites that must be fulfilled on a source system with NWDI/JDI before a System Copy can be done.

The steps described here may get outdated or be incomplete. For your System Copy migration please rely on the official System Copy Guide and the note 877029 (‘System Copy for NWDI’!)

1. First of all you have to ensure that you have a version of the NWDI/JDI that supports a System Copy migration.
   - For 6.40 JDI supports System Copy from SP15.
   - For 7.00 NWDI supports System Copy from SP7.
   - For newer releases than 7.00 System Copy is supported for all SPs.
   - In case you have a version of NWDI/JDI for which System Copy is not supported please check the alternatives described in the section ́
Alternatives to doing a System Copy

2. You have to ensure that the users and passwords that are available in the source system are valid in the target system too.
   This can for example be achieved by using the same user store (e.g. by using the UME).
   If the users and password of the source system are not valid in the target system you can run into various problems:
   - If you have protected the access to DTR by ACLs you may not be able to logon to the target DTR (since the ACLs in DTR are only valid for the old users which are invalid in the target system).
   - CBS stores user and password information to the access DTR. If the stored DTR user is not valid anymore CBS can neither do activation nor do a build.
   - etc.

3. All open DTR activities have to be either checked-in or must be reverted.
   First of all it is a bit tricky to find all open activities in a DTR since with the activity search in the DTR WebUI (http://[dtrhost]:[port]/dtr/system-tools/reports/ActivityQuery) it is only possible to search for open activities in a workspace.

   For 7.00 SP13 and later you can use the DTR Console to find all open activities, see
   http://help.sap.com/saphelp_nw70/helpdata/EN/d8/8685e73f9046bc1684762139ff/frameset.htm:
   - start the DTR Console and connect to the DTR Server with the 'connect' command:
     connect host:port user password
   - find all open activities:
     listActivities -state open

     **Important:** Before you start the System Copy make sure that this command returns no results. If there are open activities they must be either checked-in or reverted.

   For 6.40 and 7.00 < SP13 the easiest way to find all open activities in a DTR is to execute the following SQL query against the DTR database:
   ```sql
   SELECT r.PATHURI, r.OBJNAME FROM PVC_VERSIONSET vs
   JOIN DAV_RESOURCE r ON vs.VERSIONSETID = r.RESOURCEID
   WHERE vs.EXTERNALTYPE = 2
   AND vs.OBJSTATE = 1
   ```

     **Important:** Before you start the System Copy make sure that this SQL query returns no results. If there are open activities they must be either checked-in or reverted.

     **Note:** If the above SQL statement fails because the tables cannot be found try to add the following database schema in front of the table names: SAP<SID>DB (where <SID> needs to be replaced by the system-ID of your engine)
   ```sql
   SELECT r.PATHURI, r.OBJNAME FROM SAP<SID>DB.PVC_VERSIONSET vs
   JOIN SAP<SID>DB.DAV_RESOURCE r ON vs.VERSIONSETID = r.RESOURCEID
   WHERE vs.EXTERNALTYPE = 2
   AND vs.OBJSTATE = 1
   ```

   If you have pending changes that you want to keep, you have to check-in the corresponding open activities in the SAP NetWeaver Developer Studio (NWDS). Since a checkin can only be successful if the locally changed files are available for upload, the checkin can only be done in the NWDS in which the activity was created. This means that you have to ask every developer to check if he has
still open activities that he wants to checkin.

If you want to discard pending changes by reverting the open activities you can do this in the DTR WebUI or in the DTR Console (available from 7.00 SP13).

Revert activity in the DTR WebUI:
- Go to the Resource Details Page in the DTR WebUI and find the activity by entering the activity path (/act/...): http://[dtrhost]:[port]/dtr/system-tools/reports/ResourceDetails
- To revert the activity click on the 'Revert activity' icon in the tool bar (7.00) or follow the quicklink 'Revert this activity' (6.40).
- Make sure that the checkbox ‘Delete the activity resource also’ is checked and click on the ‘Revert’ button.

Revert activity in the DTR Console (available with 7.00 SP13):
- start the DTR Console and connect to the DTR Server with the 'connect' command: connect host:port user password
- revert the activity with the 'revert' command: revert /act/...
- delete the now empty activity with the 'delete' command: delete /act/...

For reverting an activity you must be either owner of the activity or have 'ADMINA' privileges on the activities in DTR.

Important: It is important that there are really no open activities in DTR when the System Copy is done, otherwise you can get inconsistencies in the DTR database!
If there are still open activities e.g. the following can happen:

- After the copy the same open activity (same ID) exists in the source DTR and in the target DTR.
- Now the activity is checked-in in the source DTR and afterwards it is transported to the target DTR.
- The result is an inconsistency in the target DTR because there are contradicting information about the activity state (the activity that is already in the target DTR has the state 'open', whereas the activity that is imported and which has the same ID is 'closed'). The inconsistency occurs since DTR as a distributed versioning system relies on globally unique IDs for its resources, which is due to the system copy violated in this case.
- Even worse, when having the same open activity in the source and target DTR, you may also add different files to the open activity in the source and target DTR which leads to an activity with the same ID having different content.

4. All open DTR propagation lists have to be either closed or be deleted.

Here the problem is similar as with open activities, however to have open propagation lists is quite unlikely since it can normally only be achieved by using the DTR Commandline Tools.

Again in the DTR WebUI you have no possibility to globally search for open propagations lists in DTR.

The easiest way to find all open propagation lists is to execute the following SQL query against the DTR database:

```sql
SELECT r.PATHURI, r.OBJNAME FROM PVC_VERSIONSET vs
JOIN DAV_RESOURCE r ON vs.VERSIONSETID = r.RESOURCEID
WHERE vs.EXTERNALTYPE = 4
AND vs.OBJSTATE = 1
```

Important: Before you start the System Copy make sure that this SQL query returns no results. If there are open propagation lists they must be either closed or be deleted.

Note: If the above SQL statement fails because the tables cannot be found try to add the following database schema in front of the table names: SAP<SID>DB (where <SID> needs to be replaced by the system-ID of your engine)

```sql
SELECT r.PATHURI, r.OBJNAME FROM SAP<SID>DB.PVC_VERSIONSET vs
JOIN SAP<SID>DB.DAV_RESOURCE r ON vs.VERSIONSETID = r.RESOURCEID
WHERE vs.EXTERNALTYPE = 4
AND vs.OBJSTATE = 1
```

Closing an open propagation list:

- In 6.40 and 7.00 < SP13 you have to use the 'property' command of the DTR Command Line Tool to set the property 'XCM:version-set-state' of the open propagation list to the value 'closed' (http://help.sap.com/saphelp_nw04/Helpdata/EN/79/6c9f3f12e1eb0ce10000000a114084/frameset.htm).
- In 7.00 SP13 and later you can use the DTR Console for closing open propagation lists (http://help.sap.com/saphelp_nw70/helpdata/EN/d8/f8685e73f39046bc168470632139ff/frameset.htm):
  - start the DTR Console and connect to the DTR Server with the 'connect' command:
    ```
    connect host:port user password
    ```
- close the propagation list with the 'close' command:
  close /prop/...

Deleting an open propagation list:

- In **6.40 and 7.00 < SP13** you have to use the 'delete' command of the DTR Command Line Tool to delete the open propagation list ([http://help.sap.com/saphelp_nw04/Helpdata/EN/79/6c9f3f12e1eb0ce10000000a114084/frameset.htm](http://help.sap.com/saphelp_nw04/Helpdata/EN/79/6c9f3f12e1eb0ce10000000a114084/frameset.htm)).

- In **7.00 SP13 and later** you can use the DTR Console for deleting open propagation lists ([http://help.sap.com/saphelp_nw70/helpdata/EN/d8/f8685e73f39046bc168470632139ff/frameset.htm](http://help.sap.com/saphelp_nw70/helpdata/EN/d8/f8685e73f39046bc168470632139ff/frameset.htm)):
  - start the DTR Console and connect to the DTR Server with the 'connect' command:
    connect host:port user password
  - delete the propagation list with the 'delete' command:
    delete /prop/...

**Important:** It is important that there are really no open propagation lists in DTR when the System Copy is done, otherwise you can get inconsistencies in the DTR database!

5. **Every developer has to remove the existing development configurations from his NWDS.**
   This step is important because with this it is verified:
   - that no developer has any open activities left and
   - that after the System Copy no developer accidently works in the old NWDI/JDI (the development configurations contain URLs to the (old) NWDI/JDI systems (DTR, CBS and CMS))

6. **There must be no pending entries in the the DTR Name Reservation queue (only for 6.40 and 7.00).**
   - Verify in the DTR WebUI ([http://[dtrhost]:[port]/dtr/sysconfig/support/NameReservationList](http://[dtrhost]:[port]/dtr/sysconfig/support/NameReservationList)) that there are no entries with the state 'PRELIMINARY', 'FINALIZE_PENDING' or 'REVERT_PENDING' in the queue.
   - If there are entries with the state 'FINALIZE_PENDING' or 'REVERT_PENDING' you have to wait for the next run of the name reservation background task in the DTR server that ends these entries. This background task runs by default every 15 minutes. To check the frequency of this background task you can have a look at [http://[dtrhost]:[port]/dtr/sysconfig/scheduled_tasks.html](http://[dtrhost]:[port]/dtr/sysconfig/scheduled_tasks.html) and check the value 'Periodicity' for the task 'ProcessNameReservationsTask'. As precondition for a successful execution of this background task, the name server must be configured in the DTR server ([http://[dtrhost]:[port]/dtr/system-tools/administration/NameServerConfiguration](http://[dtrhost]:[port]/dtr/system-tools/administration/NameServerConfiguration)).
   - There should be no entries with the state 'PRELIMINARY' in the name reservation queue since such entries only occur if there are open activities (which should not be the case if you followed the previous steps).
   - For details about how the Name Reservation is working in NWDI/JDI please have a look at the [note 1113274 ('NWDI Name Reservation / Name Reservation Queue in DTR')](http://help.sap.com/saphelp_nw70/helpdata/EN/d8/f8685e73f39046bc168470632139ff/frameset.htm).
   - From **7.10** on there is no Name Reservation in DTR anymore.
7. Stop all applications of the NWDI/JDI on the source system. Do not restart these applications until the complete System Copy including all manual post steps has been finished. This is important since otherwise the following can happen:
   o When the tracks in the target CMS are updated to point to the new CBS and new DTR, the new CBS tries to remove the buildspace ownership on the workspaces in the old DTR before setting the new buildspace ownership on the workspaces in the new DTR. The consequence would be that due to the missing buildspace ownerships on the workspaces in old DTR the source NWDI/JDI system would not properly work anymore.

The System Copy options 'MOVE' and 'COPY'

When doing a System Copy for NWDI/JDI you have the choice between the options 'MOVE' and 'COPY'.

This choice is important for DTR. CBS and CMS do NOT support the option 'COPY', which means that for them only a 'MOVE' will be done, even if you choose the 'COPY' option.

'MOVE' means that the NWDI/JDI is moved to the target system, after the System Copy is done you are **not allowed** to use the NWDI/JDI (DTR, CBS and CMS) on the source system any more.

For DTR this especially means that you **must not do any transport** between the source and the target DTR Server. If transports are done anyway this can lead to inconsistencies in the database of the target DTR Server. The inconsistencies occur since due to the copy of the database the resource IDs are not globally unique anymore.

If you want to continue development in the source DTR Server after the System Copy was done, you have to choose the 'COPY' option (**CBS and CMS are still not allowed to be used any further**). In this case it is possible to do transports between the source DTR Server and the target DTR Server by doing DTR exports and DTR imports. However in this case the IDs for some resources in the target DTR Server will be newly generated (as part of the System Copy procedure) in order to ensure that the IDs are globally unique (e.g. there will be new IDs for all workspaces and the repository itself).
How to find out if DTR was 'copied' or 'moved' after a System Copy was done?

To check whether a DTR Server was 'copied' or 'moved' you can have a look at the migrations that have been executed in the DTR Server. An overview over the executed migrations you can find in the DTR WebUI: [http://[dtrhost]:[port]/dtr/sysconfig/support/MigrationStatus](http://[dtrhost]:[port]/dtr/sysconfig/support/MigrationStatus)

As indicator you can check if the migration
'com.tssap.dtr.pvc.migration.pvc.PvcPostCopyMigration' was executed. A migration is executed if its value in the 'State' column is 'Done'. If this migration was executed the DTR Server was setup by a System Copy with the option 'COPY'.

If the migration 'com.tssap.dtr.pvc.migration.pvc.PvcPostCopyMigration' was not executed (check if the value in the 'State' column is 'New'), but the migration
'com.tssap.dtr.pvc.migration.pvc.RemoveCentralServerConfigurationMigration' was executed the DTR Server was setup by a System Copy with the option 'MOVE'.

If neither the migration 'com.tssap.dtr.pvc.migration.pvc.PvcPostCopyMigration' nor the migration
'com.tssap.dtr.pvc.migration.pvc.RemoveCentralServerConfigurationMigration' were executed the DTR Server was not setup by a System Copy migration, but was normally installed.

**Note:** If a system is several times migrated with the System Copy Tool the indicators as explained above may not be accurate. In this case you have to find out about the times when the migrations have been last executed. You can only check in the DTR database by executing the following SQL query:

```
SELECT * FROM PVC_TAGGEDVALUE
```

If the above SQL statement fails because the table cannot be found try to add the following database schema in front of the table name: SAP<SID>DB (where <SID> needs to be replaced by the system-ID of your engine)

```
SELECT * FROM SAP<SID>DB.PVC_TAGGEDVALUE
```
NWDI/JDI post System Copy steps:

To successfully finish a System Copy for NWDI/JDI systems you need to do a number of manual steps in the target system after the System Copy was done.

These steps are sufficiently described in the System Copy Guides and shall not be repeated here. In this article we only want to comment on some of the needed post steps to explain why they are needed:

1. **Update of the database statistics:**
   This step is very important for the overall performance of the NWDI/JDI system. If the database statistics are not updated the database optimizer will take wrong decisions to execute SQL statements which will result in a very poor performance.

2. **Engine configuration:**
   It is important that the target system is configured according to the note 889038 (‘Collective note: NWDI/JDI server component configuration’).

3. **Redeployment of the DTR database schema** (from 7.10 on this should not be needed anymore, but can also not harm):
   In 6.40 and 7.00 this step is needed due to missing support for database views in the System Copy Tool / Java Dictionary.
   If the DTR database schema is not redeployed this can lead to errors in DTR as described in the note 959218 (‘missing DTR database views after System Copy Tool migration’). This note also explains how such problems can be solved.

4. **The Name Server Configuration in DTR must be updated** (only in 6.40 and 7.00, in newer releases there name reservation in DTR anymore).

5. **For CBS several service properties have to be adjusted to the hardware and software configuration of the new system.**
   If this is not done, most of the CBS operations are supposed to fail.

6. **For CMS you have to copy the content of the transport directory of the source system to the transport directory of the target system.**
   This step is needed since the System Copy Tool only copies application data that is stored in the database. Filesystem content is not automatically copied to the new system.

7. **For CMS you have to adapt all URLs that point to other systems that have been moved** (e.g. DTR, CBS, SLD) to the new locations as described in the System Copy Guide.
   This will also update the central development configurations. CMS will then also provide the new development configurations to CBS (so that CBS knows where to find the new DTR).

8. **All developers need to update the SLD URL in their NWDS and import the new development configurations.**
   It is very important that the developers do not forget to change the SLD URL in their NWDS, otherwise it might happen that they accidently continue working in the old NWDI/JDI system.

Tip: To avoid that some developers accidently continue to work on the old NWDI/JDI system it is a good idea to remove all privileges for this system.
Alternatives to doing a System Copy

- The note 790922 (‘Relocating the JDI to a new JDI server’) describes how you can move your NWDI/JDI to a new system without using the System Copy Tool.

| Important: With the solution described in this note you will only move the current version of each development object. This means that the whole version history will be lost and is not available in the target system after the migration! |

- Starting from 7.00 you can use the 'replicate' command in the DTR Console to move tracks (including the complete version history) from one NWDI/JDI system to another NWDI/JDI system.
  - The 'replicate' command is described here: [http://help.sap.com/saphelp_nw70/helpdata/en/1d/aac545d8184be9853ef9c580c82ee5/fram eset.htm](http://help.sap.com/saphelp_nw70/helpdata/en/1d/aac545d8184be9853ef9c580c82ee5/fram eset.htm)
  - How a track can be replicated/relocated is described here: [http://help.sap.com/saphelp_nw70/helpdata/en/46/5d032c1e661cbee10000000a11466f/fram eset.htm](http://help.sap.com/saphelp_nw70/helpdata/en/46/5d032c1e661cbee10000000a11466f/fram eset.htm)

Conclusion

Following all the steps from the System Copy Guide and the hints from this article you can do an NWDI/JDI System Copy but there are some limitations for the System Copy uses cases introduced in the beginning of this article:

1. Hardware Replacement:

   The hardware on which the system is installed should be replaced. In this case the system can be moved to the new hardware by doing a System Copy.

   This use case is fully supported with the NWDI/JDI. You can move an NWDI/JDI to new hardware. However you are not allowed to continue using the source system.

2. Safe Upgrade:

   The system should be safely upgraded to a new SP. In this case you can make a System Copy, upgrade the copied system and in case of problems you can still go back to the old system.

   This use case is partially supported with the NWDI/JDI. You can move an NWDI/JDI system to a new host and safely upgrade the copied system, if the upgrade fails you can reactivate the old NWDI/JDI system (however it is not possible to continue development in the old NWDI/JDI system while you upgrade the copied system since it is not possible to transport the new development done in the old NWDI/JDI system to the new (upgraded) NWDI/JDI system once the upgrade is considered to be successful).

   For DTR as a single component this use case is fully supported if the System Copy option 'COPY' is used.
3. **Training System Setup:**

   For educational trainings you want to prepare a system for each participant. In this case you can prepare one system and then make a System Copy for each participant.

   This use case is partially supported with the NWDI/JDI. It is possible to do several copies of an NWDI/JDI system for educational trainings if it is ensured that the copied systems do not communicate with each other and do not exchange any data (especially this means that there must be no transports done between the copied systems).

   For DTR as a single component this use case is fully supported if the System Copy option 'COPY' is used.

**Related Content**

- Note 877029 'System Copy for NWDI'
- Track Replication
- DTR Console (7.00)