

WDJ - Adaptive RFC Troubleshooting Guide

Applies to:

Adaptive RFC Models in Web Dynpro for Java, NW04 SP18 onwards

Summary

The intention of writing this article is to document some of the most common mistakes and issues one encounters during the usage of Adaptive RFC. This should serve as a FAQ checklist which customers can refer to before they seek help from SAP. This also can serve as a reference guide for SAP Global Support looking to solve problems on Adaptive RFC. The document is written with reference to the previous CSN history over a year on the component. Most Issues occur due to faulty configurations, lack of knowledge or misuse. The document intends to reduce this.

Author: Arun Bhat J

Company: SAP Labs India Private Ltd.

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Author Bio

Arun Bhat works at SAP Labs in the Web Dynpro Development area. He earlier worked in the Mobile Web Dynpro Client area for two years since he joined SAP in Feb 2004. Currently he has been working on Web Dynpro models and Context and has been supporting the NW04 and NW04S releases.

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NoClassDefFoundError at Runtime

Errors like Class “WebDynproExtension not found”

```
Detailed Error java.lang.NoClassDefFoundError:
com/sap/mw/jco/webas/WebDynproExtension
```

Likely Cause:

This *No Class Definition Found* error is caused because JCO Jars are not deployed on your engine or that the Web Dynpro extensions corresponding to JCO are not deployed. Hence you need to have the “*jrfc.sda*” containing the newly introduced Web Dynpro extensions deployed on the Engine.

Solution:

Please refer to note #896787 (which is for NW04 SP) contains the correct “*jrfc.sda*”. This is for SP14 onwards.

One of the model Classes/Types not Found

You see an error like

```
com.sap.tc.webdynpro.services.exceptions.WDTypeNotFoundException: type
extern:com.sap.tcs.demo.model.types.CompanyListModel:com.sap.tcs.demo.mo
del.types.Bapi0014_1 could not be loaded:
com.sap.tcs.demo.model.types.Bapi0014_1 does not exist
```

Likely Causes:

The most likely reason for this kind of an error could be the follows

- The backend to which to connect at Runtime is not the same as the backend from which you imported the model. This could cause inconsistencies. You need to run with the same backend from where you imported your model or the version of the RFC in the backend used at runtime must be compatible to the one used to import the model.
- Data types have changed in the backend, such that the “Type” you imported earlier no longer exists. You need to re-import the model again.

Solution:

- In case 1 above you need to have one backend from where you have imported the model to where you run this. This avoids inconsistencies.
- In case 2 above you need to re-import the model again as suggested.

Logon Failure to RFC

Are you using SSO/Ticket for JCO Metadata Destination?

```
RfcException:
  message: 'Name' or 'Password' missing
  Return code: RFC_SYS_EXCEPTION(3)
  error group: 103
  key: RFC_ERROR_LOGON_FAILURE
  at com.sap.mw.rfc.api.RfcApi.RfcOpen(RfcApi.java:799)
```

If you are using SSO ticket for authorization while defining a metadata JCO Destination you might see an exception like the one above.

Username/Password is the only valid Authorization concept while you define your Metadata JCO Destinations. Never try to use SSO or ticket in your security settings while defining metadata JCO Destinations. At least from SP18 onwards there are validity checks in the content administrator which prevent you from using SSO/ticket for metadata JCO destinations.

Create new JCo Destination

1 General Data | 2 J2EE Cluster | **2 Connection Type** | 3.1 Appl. Server Connection | 3.2 Msg. Server Connection | 4 Security | 5 Summary

Data Type
Define the type of data you want to read using the JCo destination.
 Dictionary Meta Data
 Application Data

Destination Type
Define whether or not you want a load-balanced access.
Note: This is only possible for destinations used to read app
 Load-balanced Connection (recommended)
 Single Server Connection (should be used only for debugging)

Create new JCo Destination

1 General Data | 2 J2EE Cluster | 2 Connection Type | 3.1 Appl. Server Connection | 3.2 Msg. Server Connection | **4 Security** | 5 Summary

Define the required authentication method and (optionally) the parameters needed for a secure network communication (SNC).
Define the used authentication method and (optionally) the parameters needed for a secure network connection (SNC).

User Authentication

Used Method: **User / Password**
 Name: Test
 Password:
 Confirm Password:
 Language: English

Secure Network Connection (SNC)

SNC Mode: Off
 SNC Partner Name:
 SNC Security Level:
 SNC Name:
 SNC Library Path:

◀ Previous | Next ▶ | Finish | Cancel

Please observe in the above figure that you need to only select username/Password combination here, as seen in the Content Admin.

RFC_ERROR_LOGON_FAILURE

The trace contains a message like “SSO ticket is not authorized”

```
com.sap.mw.jco.JCO$Exception: (103) RFC_ERROR_LOGON_FAILURE: Issuer of SSO ticket is not authorized
```

- **Likely Cause 1:**

Most probably the Administrator user you've used on the J2EE side to logon for Web Dynpro Content Admin / test JCO destination does not exist in the R/3 system.

Solution:

Get a valid user for the R/3 system that is used by your SSO. Try logging in through the SAP Logon window. If this doesn't work you need to get an authorized user until which the JCO wouldn't work

- **Likely Cause 2:**

You see an exception with a message like the below

```
com.sap.mw.jco.JCO$Exception: (103) RFC_ERROR_LOGON_FAILURE: System received an expired SSO ticket
```

The SSO ticket has indeed expired .The default expiry time is 8 hrs. If you leave a system for more than this time, the ticket will expire. In that case you might need to increase the timeout value of the ticket.

There was also a bug on this in the earlier releases of Web Dynpro. The reasoning being that the tickets are held cached. The "expired SSO ticket" can also be caused by a JCO connection pool not having been destroyed when a WD application terminates. Then the same user starts another WD application using the same user id/authentication method/backend system combination. This is really a bug in that the Portal does not correctly notify the WD Framework that the WD app has closed. Hence the older ticket is still held and returned showing an Expired ticket error. The fix was in the UME so that appropriate notifications are sent to Web Dynpro regarding termination of the session. This is resolved from NW04 SP15 onwards. There was no reported issue on NW04s.

NullPointerException in the trace when maintaining JCO destinations

You see an exception with a message like the below

```
NullPointerException, maintaining jco destinations .
java.lang.NullPointerException #at
com.sap.tc.webdynpro.serverimpl.wdc.sl.SystemLandscapeFactory.checkStatus(SystemLandscapeFactory.java:983)
#at
com.sap.tc.webdynpro.services.sal.sl.api.WDSystemLandscape.checkStatus(WDSystemLandscape.java:485)
```

Likely Causes:

1. Some fields for the backend system used to setup the JCO destination are not updated properly (i.e. empty) in SLD. Once you have configured your SLD please also ensure that you have selected the relevant "Message Server Connection". The Message Server, System Name and Logon Group must not be left empty. Ensure that SLD contains up-to-date and complete information about backend systems (Please refer to documentation on SLD on how to have this updated. This is provided in the link at the end of the document).

Create new JCo Destination

1 General Data 2 J2EE Cluster 2 Connection Type 3.1 Appl. Server Connection **3.2 Msg. Server Connection** 4 Security 5 Summary

Define the message server, system name and the logon group used by the JCO connection.

Message Server: A1S Idcia1s

System Name: A1S

Logon Group: PUBLIC

Use SAP Router

SAP Router String:

◀ Previous Next ▶ Finish Cancel

2. In general you also need to ensure that the SLD is setup properly. Click on the "Test Connection" to check that the SLD is up and running.

Check Connection to the System Landscape Factory (SLD)

The following System Landscape Directory (SLD) is used:

Host Name:

Port:

User:

URL:

Errors in Load-Balanced Connection / RFC_ERROR_COMMUNICATION

You see an error something like the below

RFC_ERROR_COMMUNICATION with error "service sapmsXYZ unknown"

Likely Causes:

1. The R/3 which you are trying to connect to is down or overloaded. Please login through the SAP-Logon to check if this works.
2. The most likely reason could be that the RFC communication service is not maintained for the R/3 system you want to use on the J2EE.

Solution:

The solution is with respect to Point 2 above

1. In the file %windir%\system32\drivers\etc\services add an entry
`sapms<SID> <PORT>/tcp" (<SID> = R/3 system ID, <PORT> = message server port).`
2. Run "Update SAPPCADM" in Windows Start / SAPPCADM. This will (among other things) update the above mentioned file with data for SAP internal R/3 systems. This is only for Internal SAP use.
3. There is another potential problem with the service file entries. There could be duplicate entries for the system you are trying to access. If you want to access system XYZ, simply adding a new line at the end of the file for `sapmsXYZ 3600/tcp` may not solve any problems if there is already a `sapmsXYZ` entry further up the file. When the services file is read, the port number from the first matching entry is always used (even if it is wrong!)

The error only occurs for "load balanced" connections as only these need this message server entry.

“Error obtaining JCO connection”

In the trace you could see an error like “**Error while obtaining JCO Destination**”. This could be because of several reasons.

1. The error occurs as WD-APIs for creating/checking JCO destinations are used from outside the Web Dynpro Runtime (calls to “*WDSYSTEMLANDSCAPE*” methods from a servlet deployed to the J2EE). Since Web Dynpro Runtime-API implementation, in general, needs environment information like current user, which is not available for applications not running inside the Web Dynpro Runtime this would not work.
2. You see a error like

```
Failed to create new JCO client connection All_WD RFC_METADATA_DEST:
com.sap.tc.webdynpro.services.sal.sl.api.WDSYSTEMLANDSCAPEException: Error while obtaining
JCO connection. at com.sap.tc.webdynpro.serverimpl.wdc.
```

Solutions:

1. Please run Adaptive RFC within the J2EE engine environment only and not try to run it outside with jar references
2. The problem could be that the SLD does not contain logon groups for the R/3 system you refer to via message server connection (I've just checked this by creating a new JCO destination to R/3 LRF, client 000). You can see this in the step "Message Server Connection" of the Creation wizard where logon groups and system name remain empty.

When a technical system is created in the SLD, you can give the name of any logon group you wish: the existence of this logon group is not checked in the back end system at the time the technical system is created. Therefore, it is possible to run a Web Dynpro application using a JCO destination that points to a technical system having a non-existent logon group!

In this case, you must logon to the SAP system and use transaction `SMLG` to create the logon group.

Warning!

Transaction `SMLG` has some unusual behavior! After you have created the logon group, you must press the "Save" button on the tool-bar. This gives the appearance that the data has been saved. If then re-test the WD application, you will get the same JCO connection failure message. This is because transaction `SMLG` has been written in such a way that it does not commit its changes to the SAP database until you **exit** the transaction even though it has told you the data has been saved. (Actually, many of the transactions starting with `SM*` have this type of behavior).

“IndexOutOfBoundsException Error”

You get an error like the below with a stack trace

```
java.lang.IndexOutOfBoundsException: Attribute index 10 Size
Cause:
Exception(java.lang.IndexOutOfBoundsException: Attribute index 10 Size:
0) during processing a Web Dynpro Application.
```

Solution:

This is a Web Dynpro bug. You need a fix. You need to move to the latest Web Dynpro runtime patch.

“RFC Connection Pool Resource” Error

You get an exception trace with a message that the connection pooled is exhausted, something like the below.

[EXCEPTION]

```
{0}#1#com.sap.mw.jco.JCO$Exception: (106) JCO_ERROR_RESOURCE:
Connection pool SAP_R3_SelfServiceGenerics_FRSTEI2.ADM_DE_useSSO is exhausted. The current
pool size limit (max connections) is 10 connections. at
com.sap.mw.jco.JCO$Pool.getClient(JCO.java:5314)
```

Likely Cause:

Connections for Metadata and data JCO destinations are maintained in pools. Connections at runtime are requested from the pool and returned to the pool when not used. A pooled RFC connection is allocated much faster than a new connection. Therefore, increasing the pool size will optimize the time needed to get a new connection. Hence after a timeout the connections are returned to a pool when they not used.. There is one instance of a metadata JCO Destination and 'n' instances of data destinations for 'n' instances of an application say running in the same I-view of the portal. The below document [“How to Compute JCO destination Settings”](#) explains this in greater detail

Solution:

1. Increase the number of connections allowed for the pool (setting "Maximum Connections" for JCO destination)
2. Decrease the lifetime of a connection in the pool (setting "Connection Timeout")

These settings can be changed via the Web Dynpro Content Admin for the JCO destinations used by Web Dynpro applications in question (only for the Data Destination and not metadata destination).

The values here do not actually indicate the values you should have. In general 30 seconds for the “Connection Timeout” and 30 seconds for “Maximum Waiting Time” should be sufficient.

Create new JCo Destination

Define the name and the maximal pool size of the JCO connection.
Optionally you can create the new JCo destination as a copy of an existing one.

Destination Name	JCo Pool Configuration
Name: <input type="text" value="KER_100_MODELDATA"/>	Maximal Pool Size: <input type="text" value="5"/>
Client: <input type="text" value="000"/>	Maximum Connections: <input type="text" value="10"/>
<input type="checkbox"/> Copy it from an existing JCo destination	Connection Timeout (sec.): <input type="text" value="10,000"/>
<input type="text" value="KER_100_MODELDATA_DEST"/>	Maximum Waiting Time (sec.): <input type="text" value="30,000"/>

Find more information on these settings in the section "Create a new JCO destination" of the doc for WD Content Admin in SDN:

<https://www.sdn.sap.com/irj/servlet/prt/portal/prtroot/docs/library/uuid/526bd490-0201-0010-038e-d3ff7eb1d16e>

In addition the following SDN doc on how to compute JCO destination settings may also be useful.

This one is especially of interest to consultants to configure the JCO Destinations.

<https://www.sdn.sap.com/irj/servlet/prt/portal/prtroot/docs/library/uuid/3103eb90-0201-0010-71af-be6f4a6f61d1>

To understand how JCO pools work and how many connections are really used up, please read this link.

<https://www.sdn.sap.com/irj/servlet/prt/portal/prtroot/docs/library/uuid/85a483cb-0d01-0010-2990-c5168f01ce8a>

Errors like “GUI and CNTL_ERROR”

You see errors with stack traces which contain messages like the below.

1. MESSAGE ID = "DC", MESSAGE NUMBER = "006", MESSAGE = "Control Framework: Fatal error - GUI cannot be reached".
2. MESSAGE ID = "SY", MESSAGE NUMBER = "002", MESSAGE = "Exception condition CNTL_ERROR raised."
3. MESSAGE ID = "00", MESSAGE NUMBER = "359", and it is a terminate message.

Likely Cause:

The RFC function module you call via Web Dynpro Adaptive RFC model must not contain / call any ABAP statements using SAPGUI dialog processing logic; this cannot be handled remotely as no SAPGUI is available (the error messages you get also point to this).

Solution:

Implement the RFC function module in a way that it does not use any ABAP dialog processing logic; otherwise it is bound to ABAP environment and can only run there.

Example ABAP statements that would cause this type of error could be like `message` or `call screen`. Another culprit here is when customers write their own custom function modules and make use of other SAP standard (non-RFC enabled) function modules. Customers **must** check to see if any of the standard SAP function modules contain (deep within them) any statements that assume the client to be SAPGUI. Another killer here is calling standard SAP function modules from within your own custom function modules that execute ABAP statements that will cause an ABAP session change (e.g. `commit` or `rollback`). Customers must take great care to follow the rules for RFC coding when writing their own ABAP function modules to be called from Web Dynpro.

“Pool Already Exists”

An Error like something below

A pool with the identifier 'SAP_R3_SelfServiceGenerics_TRAV03_EN_useSSO' already exists

Likely Cause:

This is due to Web Dynpro applications starting concurrently and trying to create the pool holding JCO connections to be used by Adaptive RFC in Web Dynpro applications - the error occurs if names are equal

and synchronization does not prevent the second Web Dynpro application from trying to create the pool again. Occurrence of this error is quite unlikely as it heavily depends on thread scheduling of the Web Dynpro applications (so factors influencing it are system load, OS, etc.).

Solution:

We provide an improvement fixing this problem with NW04 SP16 .So if you are using something older than SP16 please upgrade.

ABAP Data Dictionary changes don't reflect

You have changed something in the backend in the ABAP Data Dictionary and you either get an error or you see that your changes are not reflecting.

Likely Cause:

Several stacks like Web Dynpro, Metadata Interface and JCO etc read the ABAP metadata and cache it on the J2EE Engine. Hence the older metadata still remains cached.

In fact there are 3 caches within the J2EE engine that hold the RFC metadata. Only one of these caches can be flushed programmatically. Also, there is no reverse look-up capability on these caches. In other words, the WD framework can look in the cache index and say "Which metadata objects are used by model class ABC?", but the reverse is not possible; it cannot say "which model classes reference metadata object XYZ?". Therefore, if new metadata is imported into one of the caches, it is not possible to work out which WD applications will be affected by the arrival of the new data. Therefore, the entire cluster needs to be restarted.

Solution:

1. If the interface of a function module is changed on the ABAP side, the restart of the J2EE application server updates the metadata caches on Java side. A restart of the ABAP application server is not necessary.
2. People think about an option to update the metadata cache without a restart of the J2EE application server. But this is currently not possible.

ARFC Execution shows no result

You run the adaptive RFC execute and see that you don't get any result on the output after execution. However, when you run the RFC on the ABAP workbench you see the output.

Likely Cause:

This kind of problem has largely been attributed to customers not using the Adaptive RFC in the right way in their implementation.

The most likely cause here is that the WD developer has forgotten to invalidate the context model node corresponding to the output side of BAPI interface.

Consider the BAPI "*Bapi_Flight_Getlist*" with "*Bapi_Flight_Getlist_Output*" as Output and "*Bapi_Flight_Getlist_Input*" as Input. "*Bapisfldat*" has a relation to "*Bapi_Flight_Getlist_Input*". All the UI element mappings for the Bapisfldat and output will have to happen through this context with the mappings through the *Bapi_Flight_Getlist_Input*. Below is the sample code as I would write it. Remember you have to write the `execute()` and the *Bapi_Flight_Getlist_Output* will have to be mapped to the table where you want to see the result.

```

msgMgr      = wdComponentAPI.getMessageManager();
bapiInput  = new Bapi_Flight_Getlist_Input();

Bapisfldst destTo    = new Bapisfldst();
Bapisfldst destFrom = new Bapisfldst();

bapiInput.setDestination_To(destTo);
bapiInput.setDestination_From(destFrom);

wdContext.nodeBapi_Flight_Getlist_Input().bind(bapiInput);

try {
    bapiInput.execute();
    wdContext.nodeOutput().invalidate();
}
catch(WDDynamicRFCExecuteException ce) {
    msgMgr.reportException(ce.getMessage(), false);
}

//@@begin others
IWDMessageManager msgMgr;
Bapi_Flight_Getlist_Input bapiInput;
//@@end

```

Solution:

Please notice that:

- The message manager and model object are declared in the "begin others" section. This allows these variables to be called from any method in the controller class
- You need to create two instances of class Bapisfldst in order to populate the DESTINATION_TO and DESTINATION_FROM parameters.
- It is always simpler to call the execute method directly on the model object, rather than going via the context in order to derive the bound model object. (Strictly speaking model nodes are redundant - unless you want to share information between controllers)

Related Content

Please include at least three references to SDN documents or web pages.

- **Web Dynpro forum at SDN**

<https://www.sdn.sap.com/irj/sdn/forum?forumID=52>

- **Web Dynpro Administration**

<https://www.sdn.sap.com/irj/sdn/developerareas/webdynpro?rid=/webcontent/uuid/b143cb42-0a01-0010-d29b-8a2aa11a2323>

- **How to Use the Web Dynpro Content Administrator**

<https://www.sdn.sap.com/irj/servlet/prt/portal/prtroot/docs/library/uuid/526bd490-0201-0010-038e-d3ff7eb1d16e>

- **How to Compute JCO destination Settings**

<https://www.sdn.sap.com/irj/servlet/prt/portal/prtroot/docs/library/uuid/3103eb90-0201-0010-71af-be6f4a6f61d1>

- **JCO Quick Summary**

<https://www.sdn.sap.com/irj/servlet/prt/portal/prtroot/docs/library/uuid/85a483cb-0d01-0010-2990-c5168f01ce8a>

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