

DevTest 10 – Troubleshooting SAP Connectivity

General

Connectivity issues between DevTest and SAP can have multiple causes. This document describes the most common ones, encountered in PoCs and tests.

Note: In DevTest versions prior to 10.2, DevTest VSE and DevTest workstation did not release SAP JCo resources correctly that were bound to an even failed connection to the SAP system. Not even starting and stopping the virtual SAP IDoc service, nor redeployment of the virtual SAP service released these resources. If any of the connectivity issues occurred in versions prior to DevTest 10.2, please follow the procedure described in [Restart DevTest SAP JCo Environment](#).

Common Sources of Problems

SAP JCo Libraries

DevTest leverages SAP JCo API to connect to SAP systems. Therefore, to test or to record SAP services with DevTest requires the deployment of SAP JCo libraries (See [SAP File Requirements](#)).

It is recommended to add SAP JCo libraries to following locations of the DevTest installation:

- sapjco3.jar, sapidoc3.jar to LISA_HOME/lib/shared,
- (Windows) sapjco3.dll to LISA_HOME/bin

and to restart the DevTest services.

Current library versions to use are:

- sapjidoc3.0.12/sapidoc3.jar
- sapjco3.0.16/sapjco3.jar
- (Windows) sapjco3.0.16/sapjco3.dll

SAP Credentials

Credentials to connect to a SAP system comprise

- SAP Client ID, which is an integer number, usually 3 digits. Common client IDs are 100, 800
- SAP User ID is like any other user id to access a system
- SAP Password is like any other user's password to get access to a system

Meta Data Repository Access Privilege

The SAP credentials used to access the SAP system must also have the privilege to read data from RFC and IDoc Meta Data repository, which contains the full definitions of RFC interfaces and IDoc message structures, respectively.

When recording or replaying virtual SAP services, DevTest needs to access the Meta Data repository to complete the RFC interface or IDoc data structures based on the partial information received from its SAP peers.

Without this privilege SAP JCo will not be able to exchange RFC requests or IDocs with the SAP communication partners. Lacking Meta Data Repository Access will cause exceptions when starting recording or replay.

SAP Gateway

The SAP Gateway is a TCP/UDP service definition for SAP Services. It defines the TCP/UDP port number on a SAP system, by which a SAP service is available and listening. For DevTest, and other 3rd party applications, the SAP gateway definition must be added to other existing TCP/UDP service definitions in *etc/services*.

SAP gateway (or service) names follow naming conventions depending on the kind of SAP service access, whether accessing the SAP Application Server directly, or by using the SAP Message Host, which routes the requests.

SAP Application Server Gateway

When addressing a SAP Application Server (ashost) directly the SAP service name of the SAP Application server starts with 'sapgw' followed by the two-digit SAP System ID. For SAP System ID '01', the SAP gateway name is 'sapgw01'. Common SAP gateway names are 'sapgw00' and 'sapgw01'. SAP gateway names are mapped to TCP/UDP port numbers. By default, SAP gateway names are configured to port numbers, starting with 'sapgw00' mapped to port number '3300', and 'sapgw01' mapped to '3301', and so on.

SAP Message Hosts Gateway

When addressing a SAP Message Host system (mshost), that routes the requests to a SAP application that can process it, the SAP service name starts with 'sapms' followed by the Three-character SAP System/R3 Name. Each SAP System can have a single message host only. For SAP System 'CR2', the SAP message host gateway name is 'sapmsCR2'. SAP message host gateway names are also mapped to TCP/UDP port numbers. By default, SAP message host gateway names are mapped to port number '3600'.

SAP Gateway definitions in *etc/services*

A sample *etc/services* file containing common SAP Gateway definitions for two SAP Systems 'CR2' and 'CS2' may look like this:

```
sapgw00 3300/tcp
sapmsCR2 3600/tcp
sapmsCS2 3600/tcp
```

If these definitions are missing, SAP JCo may raise an exception, being unable to connect to the requested SAP Gateway.

SAP Gateway Access Control

- SAP can be configured to grant and deny access to SAP Gateways based on host names and/or IP addresses. If DevTest does not have the privilege to access the SAP Gateway, a SAP JCo exception is raised with an according error code.
- The SAP system maintains a log file that tracks which systems have attempted to access a SAP Gateway and were granted or denied access.
- SAP Gateway Access Control can be disabled completely in SAP.
- Be aware of multi-NIC (LAN, WLAN, VPN) systems running DevTest which get assigned different IP addresses usually, depending on the network they are connected to, when attempting to connect to the SAP Gateway. Host names are resolved to IP addresses by name services (DNS) before being applied to the Access Control List. So System A might be configured for SAP Gateway access when connected to the enterprise via LAN, but not when connected via VPN.
- Be aware also of the fact that the DevTest system and the SAP system can work with different name resolution services or servers, and that host name propagation in networks can be delayed. This may lead to the problem that for quite some time the DevTest's host name resolve to a different IP address on the DevTest system than on the SAP system. In context of our VPN/LAN example above that means, even when switching from VPN network to LAN, it may take a while until the new IP address of the host name is propagated to all the name servers in the enterprise network.

Error Conditions

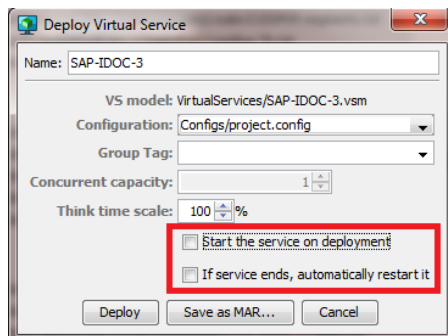
Following specific error conditions have been observed and were resolved or worked around.

SAP connection still in use

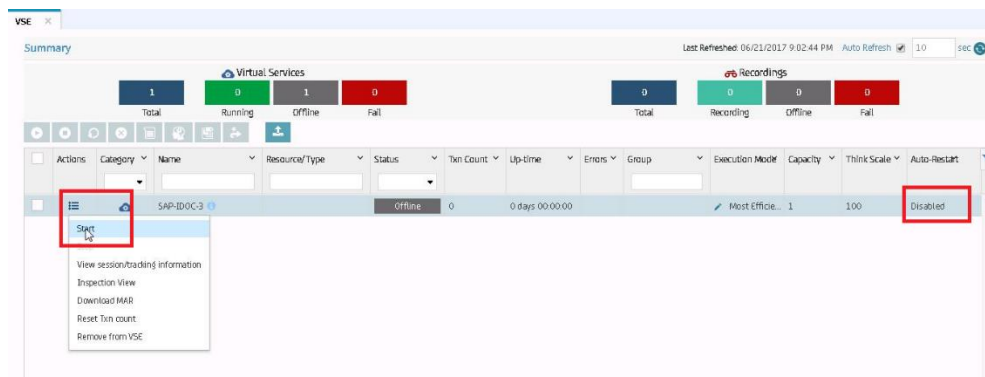
- Symptom: VSE or Workstation cannot connect to SAP system even though connection settings are correct.
- Should not occur in DevTest 10.2 and later. Otherwise, try [Restart DevTest SAP JCo Environment](#)

Virtual SAP service starts with errors

- Symptom: Upon deployment with auto-start and auto-restart after termination enabled the VS terminates immediately with an error condition despite correct connection settings.
- Cause: Unknown. There is perhaps a race condition between errors occurring upon shut down and restart of the virtual service
- Workaround:
 1. Deploy virtual service from Workstation with auto-start and auto-restart disabled



2. Start Virtual Service from DevTest Portal



SAP JCo Libraries not installed

- Symptom: log file contains Java exception
java.lang.NoClassDefFoundError: com/sap/conn/jco/...
- Cause: SAP JCo libraries are not installed
- Fix: follow product documentation and add SAP JCo libraries to DevTest:
 - sapjco3.jar, sapidoc3.jar to LISA_HOME/lib/shared,
 - sapjco3.dll to LISA_HOME/bin

Note: When starting the VSE Recorder in Workstation in DevTest 10.2 or later, the availability of the SAP JCo libraries is verified.

SAP JCo Error Codes

SAP JCo errors are logged in DevTest log files (VSE, Workstation, Simulator).

SAP provides some guidance on how to deal with JCo exceptions at [SAP JCo Exceptions](#). A list of SAP JCo Error codes is available at [SAP JCo constant values](#).

The following sections cover error conditions that occurred during tests with DevTest and virtualization of SAP services.

SAP Configuration Error (101)

- Symptom: log file contains java exception code
 - (101) RFC_ERROR_PROGRAM: Configuration of destination <Destination_Name> is incomplete: Parameter backend host ('ashost') is missing
- Potential causes: invalid connection settings
- Fix: Review connections against product documentation

SAP Connection to Gateway Failed (102)

- Symptom: log file contains java exception with error code
 - (102) RFC_ERROR_COMMUNICATION: Connect to SAP gateway failed
- Potential causes:
 - SAP gateway definition missing in *etc/services*
 - Wrong SAP gateway used in configuration file
 - SAP Port number blocked by firewall on system or intermediate network devices
 - Access to SAP Gateway denied
 - Fix:
 - Verify SAP gateway definitions in *etc/services* and in connection settings.
 - Verify connection attempt and refusal in SAP Gateway log file.
 - Verify firewall settings

SAP Credentials incorrect or locked (103)

- Symptom: log file contains java exception with error codes
 - (103) RFC_ERROR_LOGON_FAILURE: Name or password is incorrect (repeat logon)
 - (103) JCO_ERROR_LOGON_FAILURE: User is locked. Please notify the person responsible on servername sysnr 15
- Potential causes:
 - User ID or password is incorrect,
 - User ID is not yet 'productive' or locked.
- Fix: Verify user ID and password by launching SAP GUI and log in with credentials to make sure that the user id is not locked. When logging in for the first time, you may have to change the preset password for the user ID to become productive.

SAP System Failure (104)

- Symptom: log file contains java exception with error codes
 - (104) JCO_ERROR_SYSTEM_FAILURE: (3) IDOC_ERROR_METADATA_UNAVAILABLE

SAP Application Exception (105)

- Symptom: log file contains java exception with error codes
 - (105) RFC_ERROR_APPLICATION_EXCEPTION

SAP Destination does not exist (106)

- Symptom: VSE or Workstation cannot connect to SAP system. Vse.log file shows error similar to
 - (106) JCO_ERROR_RESOURCE: Destination ZE1 does not exist
- Cause: In server.properties parameter jco.server.repository_destination requires a reference to a client destination name that contains the repository_destination definition to use. I.e. 'ZE1' is not a Client or Server System Name used in connection establishment.
- Fix: Rename (Client or Server) System Name definition in VSE recorder or JCo IDoc Listener step to the SAP System name.

Restart DevTest SAP JCo Environment

1. Shut down every DevTest component (Workstation, VSE, Simulator) that uses SAP JCo resources to connect to a SAP system.
2. Recycle VSE service or Workstation if new or modified SAP JCo connection parameters must be applied. It is recommended to stop and to remove the virtual SAP service from VSE first.
3. Redeploy the virtual service.

Document Changes

Version	Date	Primary Author	Description
1.0	30/06/2016	Ulrich Vogt	Initial version