CORDYS academy

Web Services and the SOA Grid

Exercises

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1. Module

1.1 Objectives

After completing this course module, you will be able to:

- Explain which components in Cordys are used to connect to a back-end application
- Explain the concept of Service Groups, Service Containers, Web Service Interfaces, Web Service Operations, Application Connectors and Connection Points
- Explain the routing of SOAP messages
- Explain the concept and usage of LDAP in Cordys
- Explain the concept and usage of the Cordys Monitor
- Explain the concept and usage of the Web Gateway in Cordys
- Deploy and Test Web Services

1.2 Overview

This module introduces you to the concept of connectivity with Cordys. It describes the communication between all solution components, including external systems. The focus is more on SOA (Service Oriented Architecture) than on BPM (Business Process Modeling). You will understand how a business process model can run over various different systems and how Cordys solutions or applications can be scalable and high available.

2. About Web Services and the SOA Grid

2.1 Introduction

LDAP/CARS directory

CARS = Cordys Administration Repository Server. CARS is used by Cordys as a repository for storage of administrative data like users, roles, permissions and is used to determine the routing SOAP requests with Cordys.

When a SOAP request is received, Cordys uses CARS to:

- authenticate the sender
- check permissions
- find out which service group is related to the namespace and Web Service Operations invoked

CARS is an LDAP directory service.

LDAP = Lightweight Directory Access Protocol.

Web Service Interface and Operations

Web Service Operations are an essential part of Cordys because all actions are performed by means of Web Service Operations.

Web Services are used to call actions in various backends and/or applications like a CRM application, financial application etc. In order to be able to use those Web Services and execute them in/on the correct backend you need to setup connectivity to those backends and also assign the Web Service Interfaces to the correct backend connection.

2.2 References

More information about this subject is available

- Online Cordys Documentation
  Cordys Administration → System Resources Management
- http://community.cordys.com

3. Exercises

3.1 Prerequisites

Before you can start with this module, note the following prerequisites. The exercises are written based on their successful completion.

You must have completed the following modules

- Application Management.

You must have ONLY the following roles assigned to yourself

- Administrator
- Cordys Fundamentals Trainee

3.2 LDAP Repository

In this exercise you will study the contents of the LDAP repository.

1. Open the LDAP Explorer from *My applications palette*.

With the LDAP explorer, you can view the LDAP contents of those organizations that you are authorized to manage and the installed application.

2. Navigate to your *organization*

Which information is found here?

1 .....

2 .....

3 .....

4 .....

5 .....

3. Navigate to the *System Organization*.

4. Navigate to *soap nodes → Northwind System Service*.

Which namespace(s) is/are serviced?

_____

_____

5. Close the LDAP Explorer.

3.3 Web Service Interface and Web Services Operations

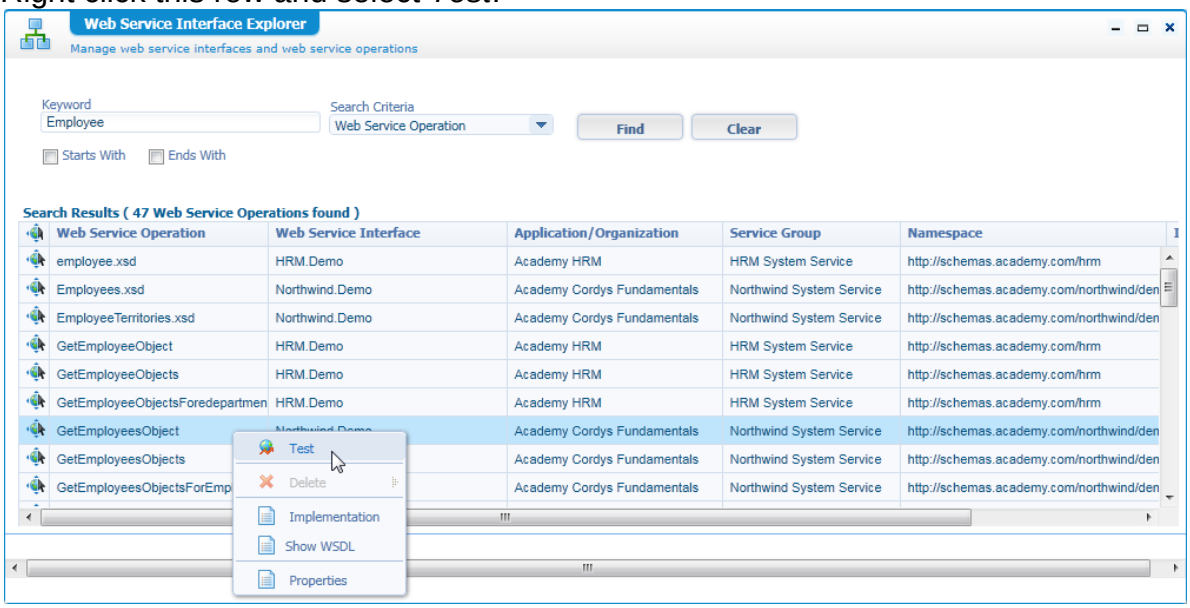
In this exercise you will use a deployed Web Service Operation (GetEmployeeObject) of the application Academy Cordys Fundamentals.

1. Open the *Web Service Interface Explorer (* *)* from My Applications palette.
2. Enter the keyword **employee** as search criterion:

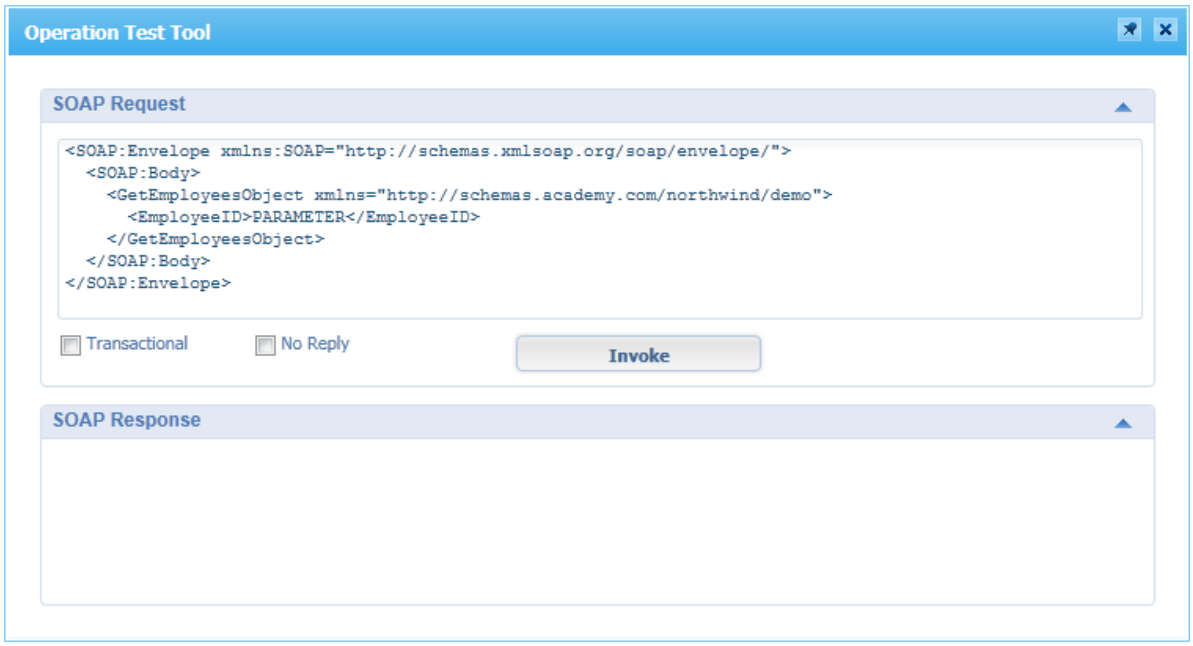
3. Select **Web Service Operation** as *Search Criteria*.
4. Click **Find**.
5. In the result list, find the row with the following details:

Field	Value
Web Service Operation	GetEmployeesObject
Web Service Interface	Northwind.Demo
Application/Organization	Academy Cordys Fundamentals

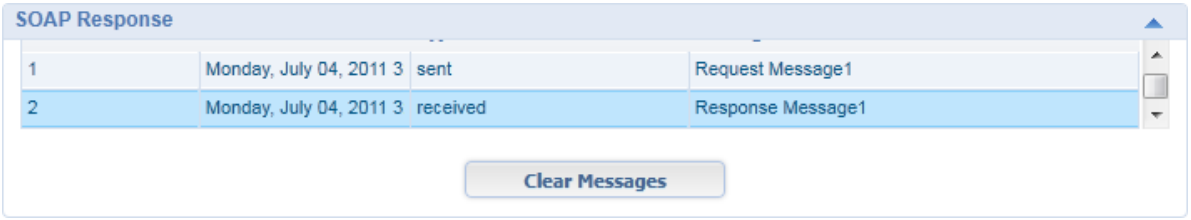
6. Right click this row and select *Test*.



The **Operation Test Tool** opens and based on the input message of the selected Web Service Operation a SOAP message (request) is created.



7. Double click *PARAMETER* and replace this with a value for *EmployeeID* (this should be a number in the range from 1 to 9).
8. Click **Invoke**.
9. In the *Soap Response* box, click on the row with type *received* to view the response message of the Web Service.



10. Check the message contents and close the *Message Viewer*.

Which Service Group/container services the request? Tip: think about the XML namespace!

.....

.....

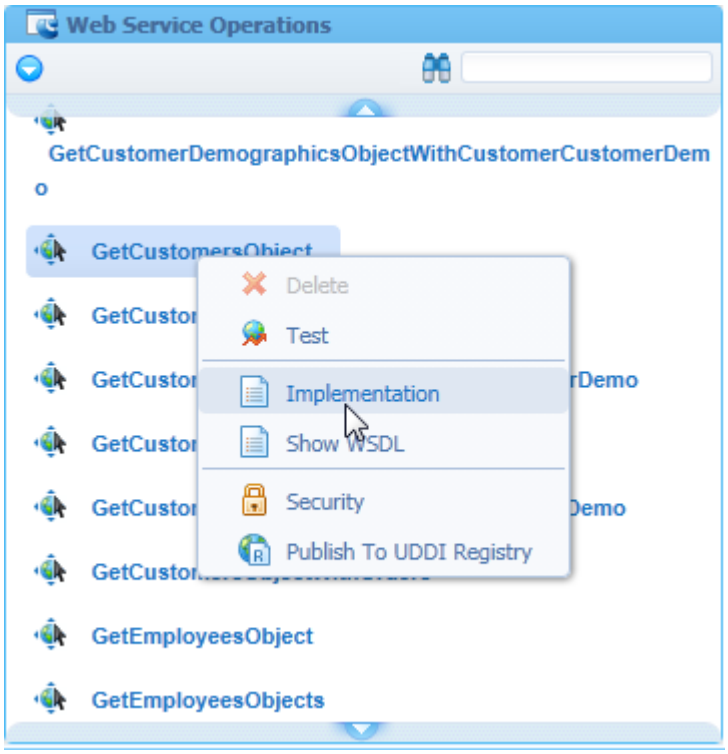
11. Close the *Operation Test Tool* to return to the *Web Service Interface Explorer.*
12. Search for all Web Service Operations in the *Web Service Interface* named **Northwind.Demo**.
13. Right-click the Web Service Operation *GetCustomersObject* and select *Properties*.

Which properties screen is opened?

_____

_____

14. Right-click the Web Service Operation *GetCustomersObject* and select *Implementation*.



What is the implementation type?

15. Close the implementation window.
16. Right-click *GetCustomersObject* and select *Show WSDL*.

What is the data type for the element CustomerID and what are the restrictions?

Where is the Web Service (soap address) located?

17. Return to the Web Service Interface Explorer.
18. Check and test a few other Web Service Operations.

3.4 Deployment of Application Services

When an application is deployed, typically the application will contain Web Service Operations. In this exercise, you will explore how to deploy those web services within your organization.

During the exercise you will encounter several error messages. However, these are intentional and meant to give you a better understanding of how the routing mechanism of Web Service calls works.

3.4.1 Using a Web Service of a Deployed Application

In this part you will explore the deployed web services.

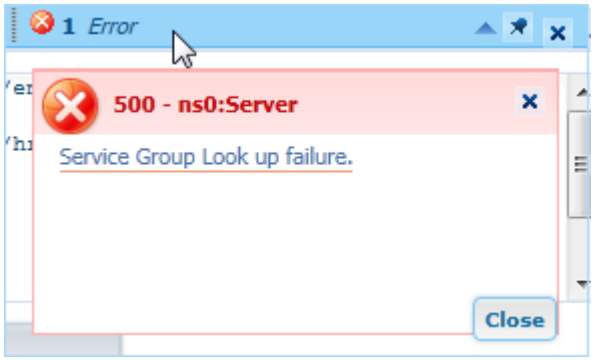
> **NOTE**
> Make sure you have completed the prerequisites of this module on page 5 exactly else the error messages will not match with the ones in this exercise.

1. If closed, open the *Web Service Interface Explorer*.
2. Search for a Web Service Operation with keyword **Salary**.

3. Right click the Web Service Operation *calcSalaryPerPeriod* and select *Test*.
4. Provide the following request values:

```
<month13th>Yes</month13th>
<holidayPercentage>8</holidayPercentage>
<returnPeriod>year</returnPeriod>
<salary>32000</salary>
<nrPeriods>12</nrPeriods>
```

5. Click **Invoke**.
   The following error message (UFO) appears.



What does this mean and how can you solve this?

_____

_____

6. Minimize the Web Service Interface Explorer, so you can reuse the Operation Test Tool and the contents of the SOAP request later on.

3.4.2 Creating a Service Group

In this part you will create the relevant Service Group to service the HRM Utils.Salary operations.

1. Open the *System Resource Manager* ( )
2. In the *System Resource Manager*, click the little arrow next to **Show**

   and choose *All Service Groups:*

3. Click **New** ( ) in the toolbar to start New Service Group wizard.

Application Connector

4. Select the *WS-AppServer* application connector.

How can you tell which application connector to choose for a Web Service Interface?

_____

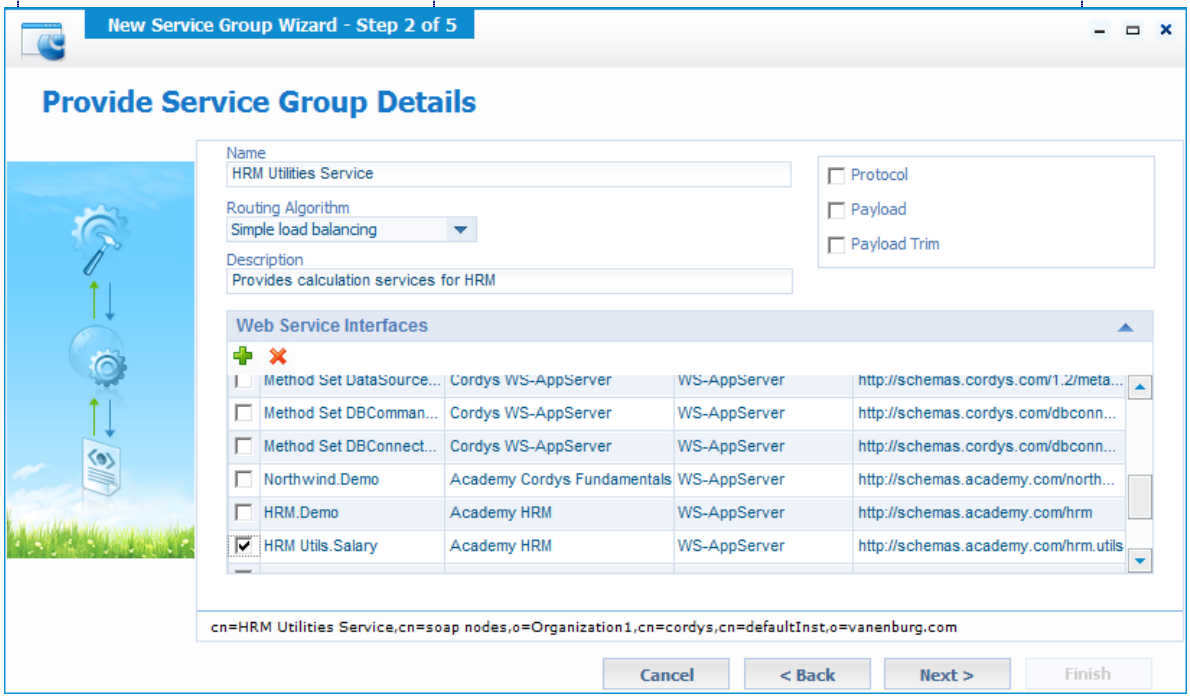
_____

5. Click **Next**.

Service Group

6. Next, you need to provide the *Service Group Details*:

Field	Value
Name	HRM Utilities Service
Routing algorithm	Simple load balancing
Description	Provide calculation services for HRM
Web Service Interfaces **check**	HRM Utils.Salary (of Academy HRM)

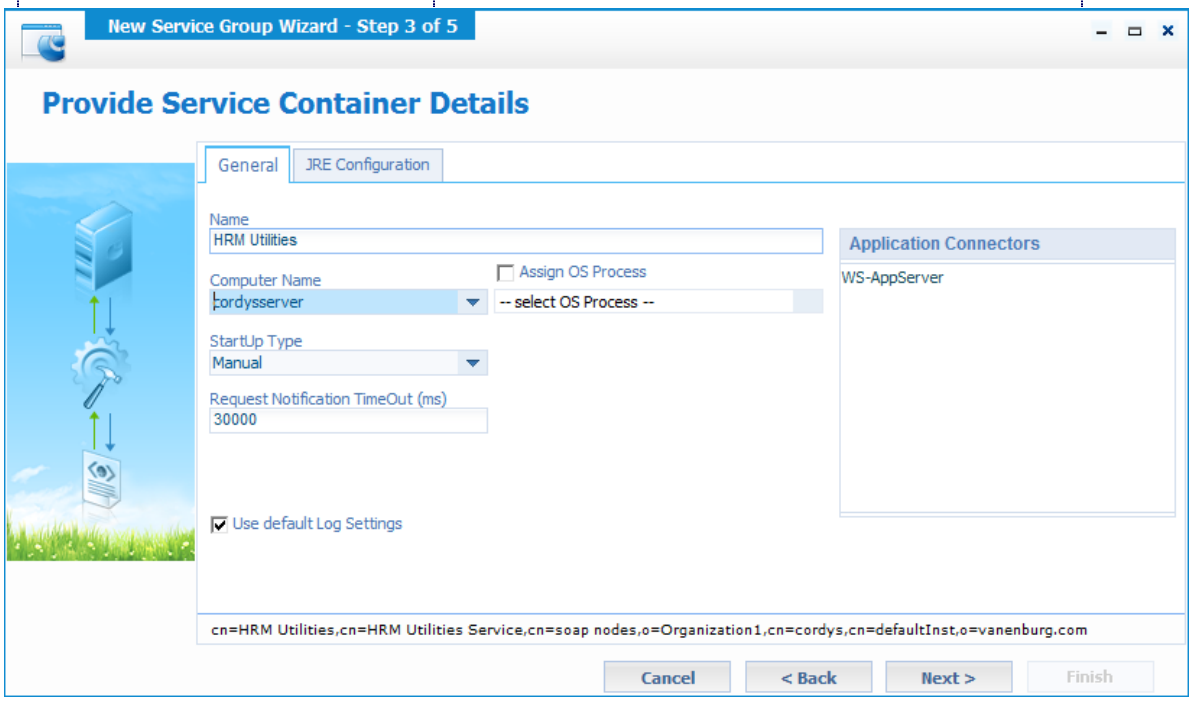


7. Click **Next**.

Service Container

8. Next, you need to provide the *Service Container Details*. At the General tab page, enter the following details:

Field	Value
Name	HRM Utilities
Startup Type	Manual

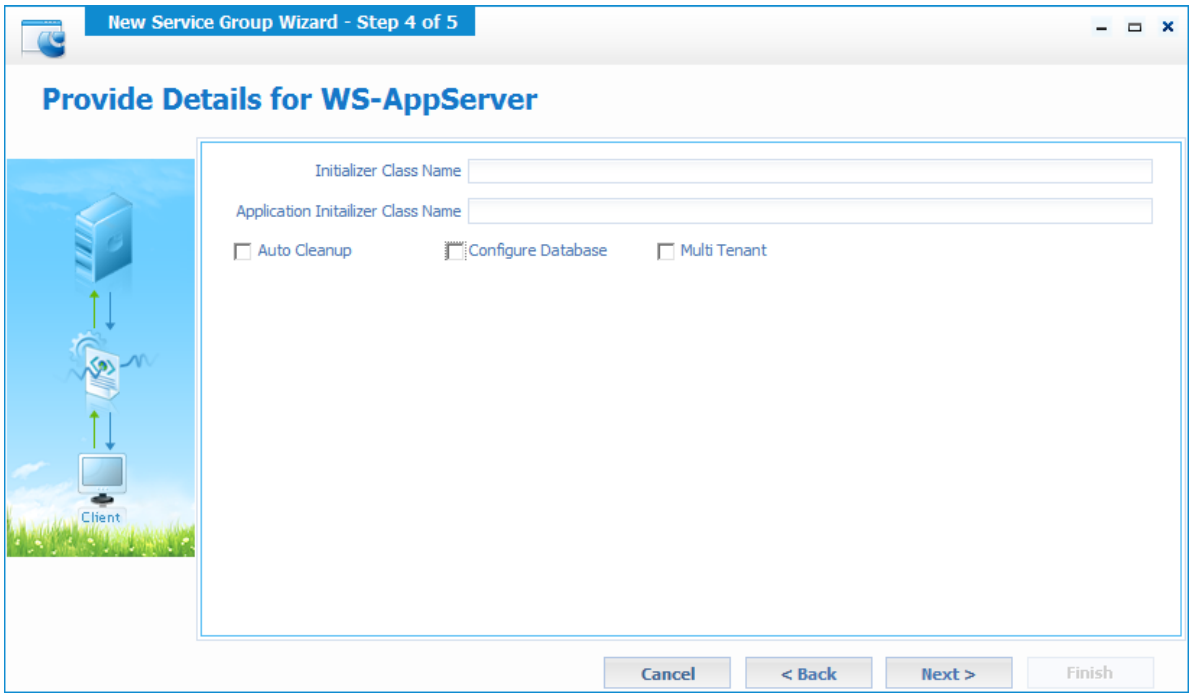


When would you choose to set the startup type to automatic or to manual?

9. Click **Next**.

Application Connector Properties

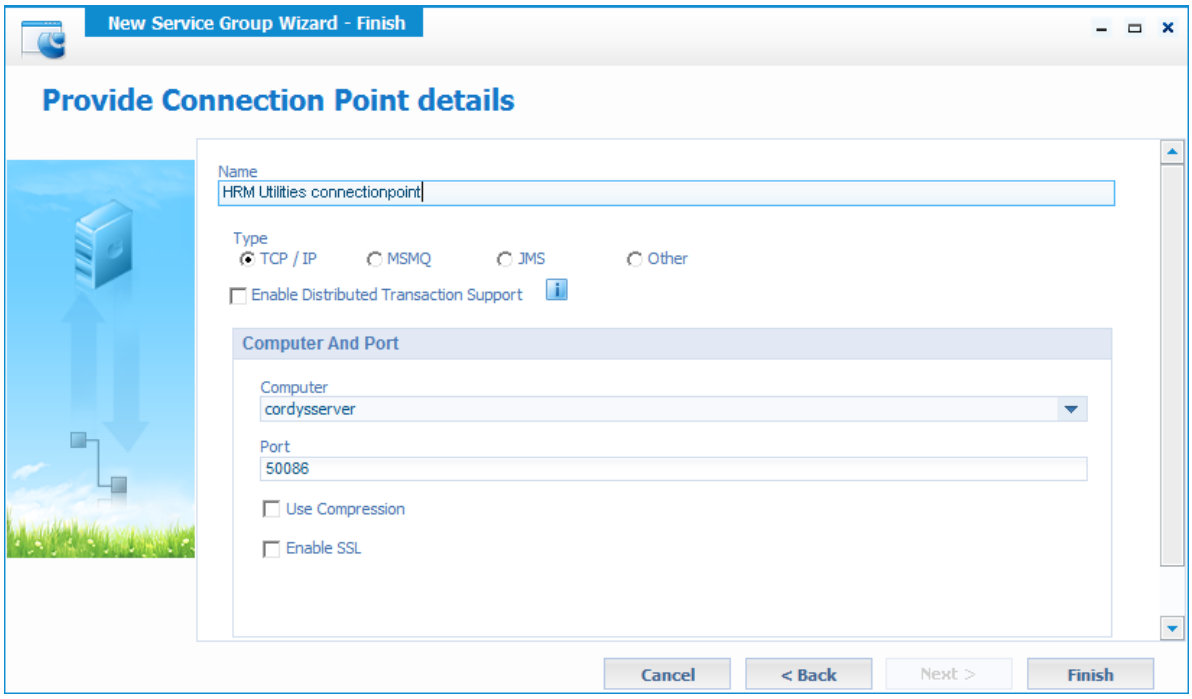
10. Uncheck *Configure Database* (With WS-AppServer, you can also provide database access, however this is not needed here).



11. Click **Next**.

Connection point

12. Provide the name: **HRM Utilities connectionpoint**.

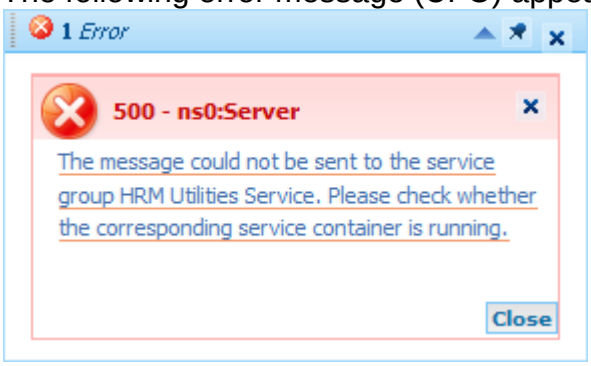


> **NOTE**
> In this training you can use the random TCP/IP port number; normally you should ask your system administrator to provide you a proper (unique) port number to avoid conflicts on the system.

13. Click **Finish**.

Why are the Service Container, Application Connector and Connection point all part of the Service Group wizard?

14. Switch back to the *Web Service Interface Explorer*, effectively, you will return to the web service operation test tool, since this was left open before.
15. Test the *calcSalaryPerPeriod* operation again. (see Using a Web Service of a Deployed Application on page 9).
    The following error message (UFO) appears:



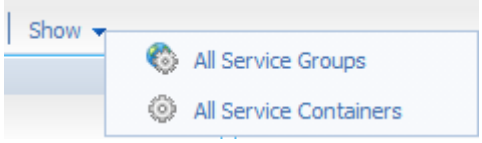
What does this mean and how can you solve this?

16. Minimize the Web Service Interface Explorer, so you can reuse the Operation Test Tool and the contents of the SOAP request later on.

3.4.3 Service Group Administration

1. In the *System Resource Manager* click the triangle right of the **Show (**

)and next **All Service Containers**.



Which Service Containers are available in your organization?

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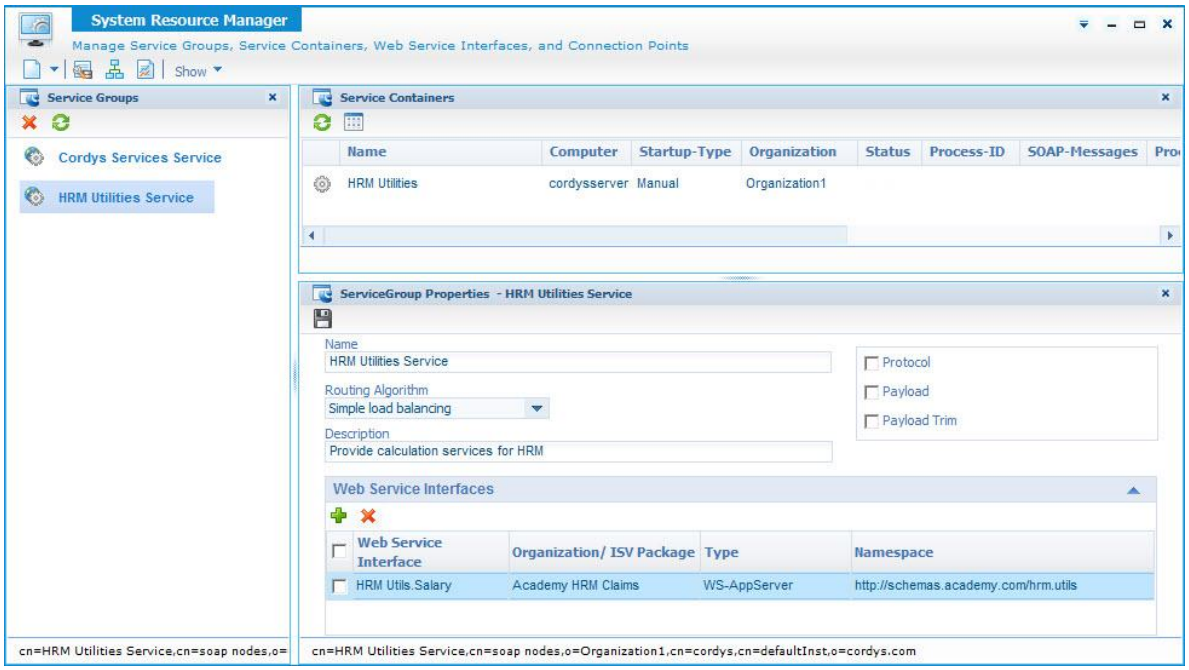
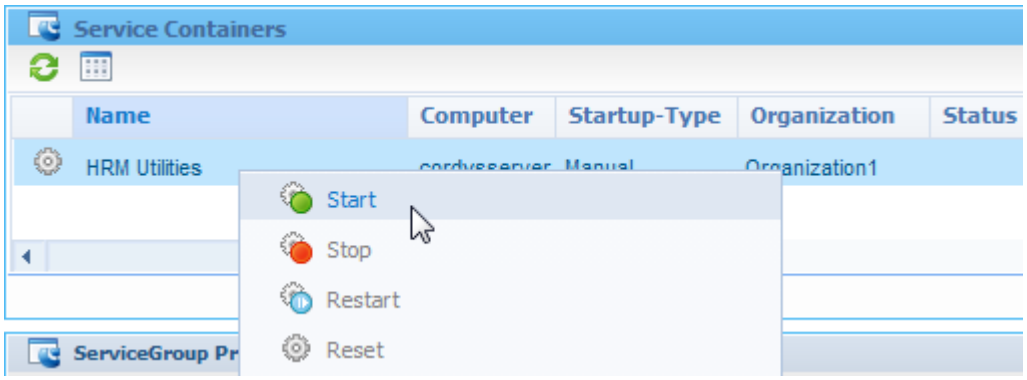
2. Double click on the created service group, i.e. *HRM Utilities Service*:



3. Right click the related Service Container and select *Start*.



What is another way to start a service container and what is the difference?

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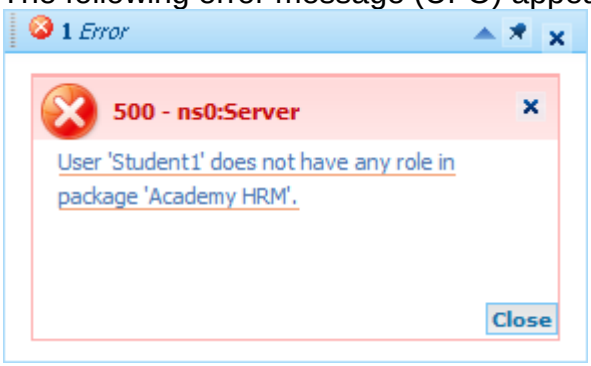
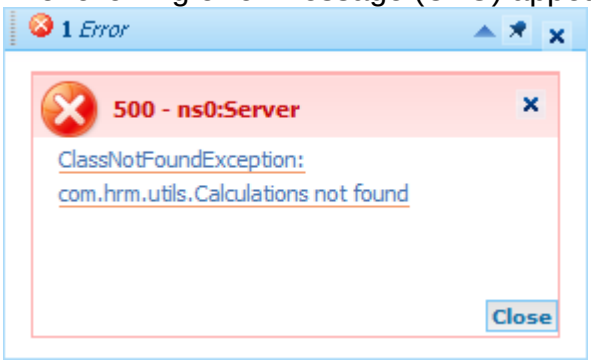
17. Switch back to the *Web Service Interface Explorer* application.

18. Test the calcSalaryPerPeriode operation once again (see Using a Web Service of a Deployed Application on page 9).
    The following error message (UFO) appears:



What does this mean and how can this be solved?

19. Minimize the *Web Service Interface Explorer*.
20. Open the *User Manager* to add the role *HRM service usage* to yourself.
21. Close the *User Manager*.
22. Test the calcSalaryPerPeriode operation once again (see Using a Web Service of a Deployed Application on page 9).
    The following error message (UFO) appears:



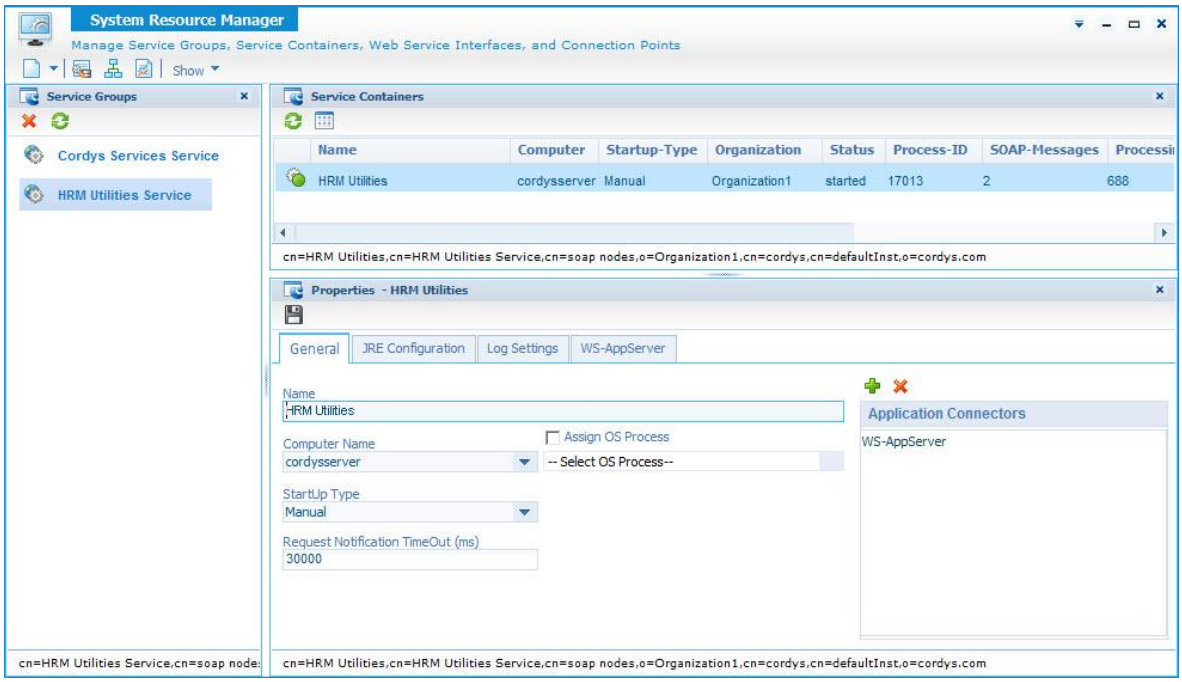
What does this mean and how can this be solved?

23. Minimize the *Web Service Interface Explorer*.

3.4.4 Service Container Administration

1. Go to the *System Resource Manager*.
2. Double click on the service group *HRM Utilities Service*.

3. Right click on the related service container *HRM Utilities* and select properties (or double click on the service container).



4. Go to the *JRE Configuration* tab.

5. Open *Fundamentals Configuration* (

) via *My Applications* palette.

6. Go to the tab *Web Services & SOA Grid*.

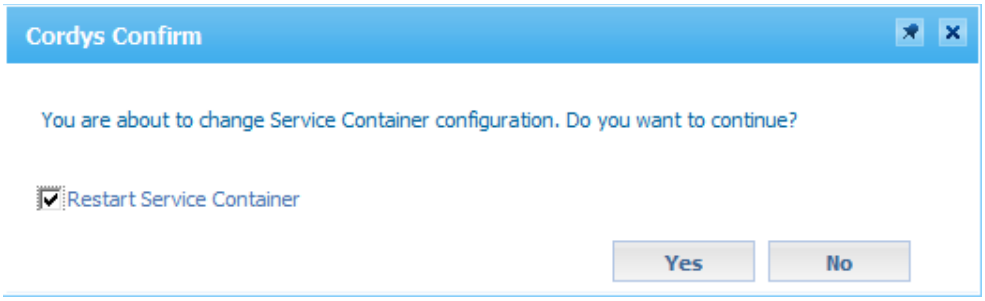
7. Copy the *HRM Utilities Classpath*.

8. Switch back to the Service Container properties.

9. Paste the value in the *Classpath* field.

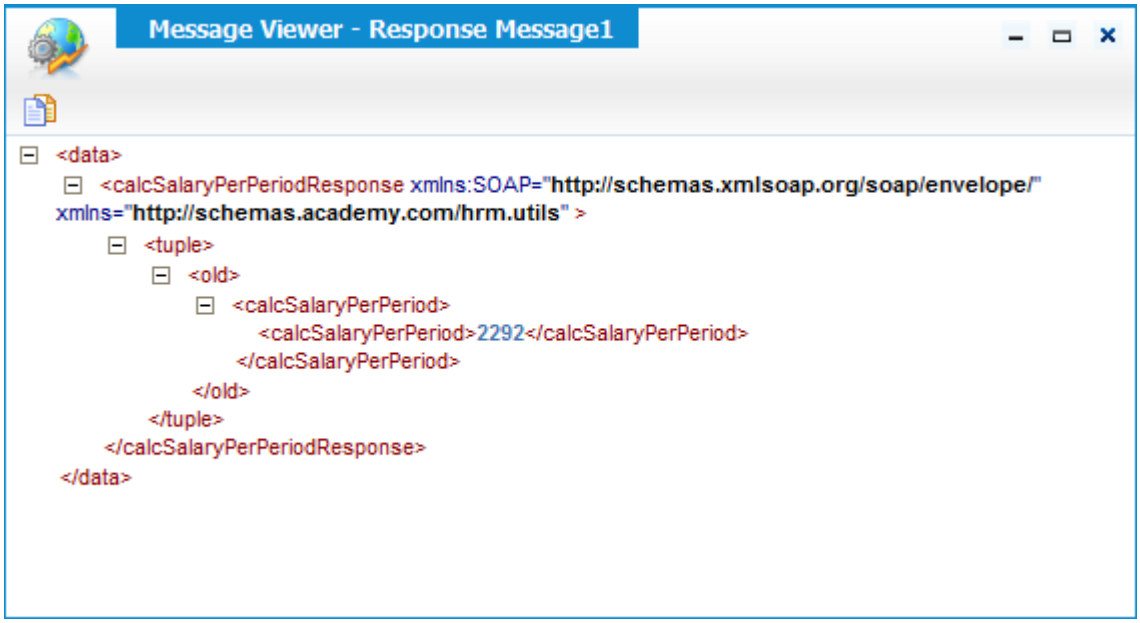
10. Save the changes you have made at service container.

A question will pop up to indicate that the changes have been saved: select to restart the service container:



What are the consequences of selecting yes?

11. Click **Yes**.
12. Switch back to the *Web Service Interface Explorer* application.
13. Test the *calcSalaryPerPeriode* operation again (see Using a Web Service of a Deployed Application on page 9).



3.5 Questions

1) *What are the prerequisites for executing a Web Service Operation of a deployed application*?

2) *Put the following constituents in the right order, e.g. sending a SOAP request to retrieve employee data.*

1.Client

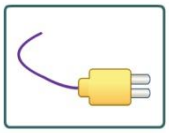
2.Web Server

3.SOAP Request

4.SOAP response

5.Web Gateway

6 Service container

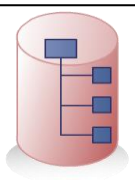


7.Connection Point

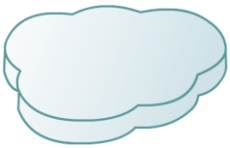
8.Application Connector

9.Service Group

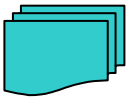
10.Back-end



11.LDAP



12.Internet



13.Web Service Interface

3) *Discuss your solution with other students, in case of any differences try to find the correct solution.*

Learning Report

Achievements

- ❑ I know the concept of routing SOAP requests and the components involved like Service Groups, Service Container, Application Connector, Connection Point LDAP, etc.
- ❑ I can explain how SOAP requests or SOAP messages are routed in Cordys.
- ❑ I can test a Web Service Operation in Cordys.
- ❑ I can deploy a Web Service Interface from an application.
- ❑ I can define service groups and service containers.
- ❑ I know the meaning and solution to some common errors when defining service group and containers.

Notes