Oracle® Integration Adapters

User's Guide for Adapter for SAP R/3 12c Release (12.1.3.0.0)

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Oracle Integration Adapters Context-Sensitive Help

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Content

Content		iii
Preface.		ix
Audien	nce	ix
Docum	nentation Accessibility	ix
Relate	d Documents	ix
Convo	ntions	v
CONVER		X
1 Unders	standing of the Adapter for SAP	1-1
1.1	Overview	1-1
1.2	Business Design Using Adapter for SAP	
1.3	Adapter Components	
1.4	Supported Versions and Platforms	
1.5	Supported SAP ABAP Technologies	
2 Workir	ng with Adapter for SAP	2-1
2.1	Prerequisites	2-1
2.1.	1 JDeveloper	2-1
2.1.	2 SAP Java Connector (JCo)	2-1
2.1.	3 Verify WebLogic and SOA	2-4
2.1.	4 Adapter Components	2-4
2.1.	5 Update the Default JNDI with the SAP Login Parameters	2-6
2.1.	6 SAP Login Parameters	2-7
2.2	SAP Connection Configuration Parameters	2-8
2.2.	1 Login Parameters	2-8
2	.2.1.1 Direct Connection	2-9
2	.2.1.2 Load Balanced	2-9
2.2.	2 Server Parameters (for Inbound)	2-10
2.2.	3 Trace Parameters	
2.2.	4 Connection Pool Parameters	
2.2.	5 SAP Connection Security Parameters (SNC)	
2.2.	6 Additional Connection Parameters	
23		
2.5	Create a Composite in Design-time	

	2.5	Deployment of the Composite on Run-time Environment	2-17
	2.5.1	Create Application Server in JDeveloper	2-17
	2.5.2	How to Deploy	2-17
	2.6	Testing the Deployed Projects	2-18
3	Support	ed SAP Interfaces	3-1
	3.1	Business Application Programming Interfaces (BAPI)	3-1
	3.1.1	Standard BAPI	
	3.1.2	Custom BAPI	3-2
	27	Pamata Englied Eurotian Madulas (PECs)	27
	J.Z	Standard PEC	
	222		
	5.2.2		
	3.3	Intermediate Document (IDoc)	3-3
	3.3.1	Standard IDoc	3-3
	3.3.2	Custom IDoc	3-3
	3.3.3	Extended IDoc	3-3
4	SAP Java	a Connector 3.x	4-1
	4.1	Supported Systems and Platforms	4-1
	47	Performance	4-7
	4.2.1	Connection Management	
	4.2.2	Connection Pooling	
	4.2.3	Caching of Metadata	4-4
	4.3	RFC Server Threads	4-4
	лл	Trace Lovel Darameter	1 1
	4.4		
	4.5	JCo Supported SAP Data types	4-5
5	Oracle A	Adapter for SAP Features	5-1
	5.1	tRFC/qRFC Support	5-1
	5.1.1	Modeling the tRFC SAP Endpoint:	5-2
	5.1.2	Testing the tRFC SAP Endpoint	5-4
	5.1.3	Modeling the qRFC SAP Endpoint	5-4
	5.1.4		
		Testing the qRFC SAP Endpoint	5-7
	5.2	Design-Time Test Functionality	5-7 5-8
	5.2 5.2.1	Testing the qRFC SAP Endpoint. Design-Time Test Functionality Using the Design-Time Test Functionality.	5-7 5-8 5-8
	5.2 5.2.1	Testing the qRFC SAP Endpoint Design-Time Test Functionality Using the Design-Time Test Functionality Exception Filter.	5-7 5-8 5-8 5-8
	5.2 5.2.1 5.3 5.3.1	Testing the qRFC SAP Endpoint. Design-Time Test Functionality Using the Design-Time Test Functionality. Exception Filter Create an Exception Filter Project	5-7 5-8 5-8 5-12 5-12
	5.2 5.2.1 5.3 5.3.1 5.3.2	Testing the qRFC SAP Endpoint. Design-Time Test Functionality Using the Design-Time Test Functionality. Exception Filter Create an Exception Filter Project Testing the Exception Filter Project	5-7 5-8 5-8 5-12 5-12 5-13
	5.2 5.2.1 5.3 5.3.1 5.3.2	Testing the qRFC SAP Endpoint Design-Time Test Functionality Using the Design-Time Test Functionality Exception Filter Create an Exception Filter Project Testing the Exception Filter Project Scheme Validation	
	5.2 5.2.1 5.3 5.3.1 5.3.2 5.4	Testing the qRFC SAP Endpoint Design-Time Test Functionality Using the Design-Time Test Functionality Exception Filter Create an Exception Filter Project Testing the Exception Filter Project Schema Validation Create a Project with Scheme Validation:	
	5.2 5.3.1 5.3.2 5.4 5.4.1	Testing the qRFC SAP Endpoint Design-Time Test Functionality Using the Design-Time Test Functionality Exception Filter Create an Exception Filter Project Testing the Exception Filter Project Schema Validation Create a Project with Schema Validation: Testing the Schema Validation Project:	
	5.2 5.3 5.3.1 5.3.2 5.4 5.4.1 5.4.2	Testing the qRFC SAP Endpoint Design-Time Test Functionality Using the Design-Time Test Functionality Exception Filter Create an Exception Filter Project Testing the Exception Filter Project Schema Validation Create a Project with Schema Validation: Testing the Schema Validation Project:	5-7 5-8 5-12 5-12 5-13 5-15 5-15 5-16
	5.2 5.3 5.3.1 5.3.2 5.4 5.4.1 5.4.2 5.5	Testing the qRFC SAP Endpoint Design-Time Test Functionality Using the Design-Time Test Functionality Exception Filter Create an Exception Filter Project Testing the Exception Filter Project Schema Validation Create a Project with Schema Validation: Testing the Schema Validation Project:	
	5.2 5.3 5.3.1 5.3.2 5.4 5.4.1 5.4.2 5.5 5.5.1	Testing the qRFC SAP Endpoint. Design-Time Test Functionality Using the Design-Time Test Functionality. Exception Filter Create an Exception Filter Project Testing the Exception Filter Project Schema Validation. Create a Project with Schema Validation: Testing the Schema Validation Project: AutoSYSTAT Feature for IDoc RFC Creating a Project with AutoSYSTAT01 Property	
	5.2 5.3 5.3.1 5.3.2 5.4 5.4.1 5.4.2 5.5 5.5.1 5.5.2	Testing the qRFC SAP Endpoint Design-Time Test Functionality Using the Design-Time Test Functionality Exception Filter Create an Exception Filter Project Testing the Exception Filter Project Schema Validation Create a Project with Schema Validation: Testing the Schema Validation Project: AutoSYSTAT Feature for IDoc RFC Creating a Project with AutoSYSTAT01 Property Test the Project with AutoSystat Property	

J.0.1	Create a Project for Flat File IDoc	5-20
5.6.2	Test the Flat File IDoc Project	5-20
5.7 (Seneric IDoc Support	
5.7.1	Create Generic IDoc Inbound Endpoint	5-22
5.7.2	Test the Generic IDoc Inbound Endpoint	5-23
5.7.3	Create Generic IDoc Outbound Endpoint	5-24
5.7.4	Test the Generic IDoc Outbound Endpoint	5-25
5.8 F	Revision IDoc Support	5-26
5.9 S	haring Program ID Feature	5-27
5.9.1	Create a Sharing Program ID Project:	5-27
5.10 N	Aultiple IDoc Support	5-28
5.10.1	Create a project for Multiple IDoc Support:	5-28
5.11 C	Credential Mapping for Oracle SOA Suite (BPEL, Mediator, BPM or OSB)	5-29
5.11.1	Setup Credential Mapping for the Adapter	5-29
5.11.2	Setup Credential Mapping for SOA	5-33
5.13	1.2.1 Creating SOA Project for Credential Mapping	5-33
5.12 S	itateful/Stateless Interaction	5-37
5.12.1	Create a Stateful BAPI project	5-39
5.12.2	Test the Stateful BAPI Project:	5-41
5.13 E	Fror Handling	5-41
5.14 S	OA Debugger Support	5-42
5.14.1	SOA Debugger for Inbound	5-43
5.14.2	SOA Debugger for Outbound	5-45
5.15 N	Von_Xml Characters Handling Feature	5-51
Complete	Walkthrough of the Adapter Configuration Wizard	6-1
	Dverview	
6.1 (, , , , , , , , , , , , , , , , , , ,	
6.1 (6.2 1	The Adapter Wizard in IDeveloper	6-1
6.1 (6.2 1	The Adapter Wizard in JDeveloper	6-1
6.1 (6.2 1 6.3 S	he Adapter Wizard in JDeveloper	6-1
6.1 C 6.2 T 6.3 S 6.4 C	The Adapter Wizard in JDeveloper Specifying the Service Name Connecting to SAP	6-1 6-2 6-2
6.1 C 6.2 T 6.3 S 6.4 C 6.4.1	The Adapter Wizard in JDeveloper Specifying the Service Name Connecting to SAP Define a Connection Name	6-1 6-2 6-2 6-4
6.1 C 6.2 7 6.3 S 6.4 C 6.4.1 6.4.2	The Adapter Wizard in JDeveloper Specifying the Service Name Connecting to SAP Define a Connection Name Define the Connection Parameters to the Connection Name	6-1 6-2 6-4 6-4
6.1 C 6.2 T 6.3 S 6.4 C 6.4.1 6.4.2 6.4.3	The Adapter Wizard in JDeveloper Specifying the Service Name Connecting to SAP Define a Connection Name Define the Connection Parameters to the Connection Name Connect to a Defined SAP connection	6-1 6-2 6-2 6-4 6-4 6-4 6-6
6.1 (6.2 7 6.3 S 6.4 (6.4.1 6.4.2 6.4.3 6.5 S	The Adapter Wizard in JDeveloper Specifying the Service Name Connecting to SAP Define a Connection Name Define the Connection Parameters to the Connection Name Connect to a Defined SAP connection Select SAP Objects from Objects Selection	6-1 6-2 6-4 6-4 6-6 6-17
6.1 C 6.2 7 6.3 S 6.4 C 6.4.1 6.4.2 6.4.3 6.5 S 6.5.1	The Adapter Wizard in JDeveloper Specifying the Service Name Connecting to SAP Define a Connection Name Define the Connection Parameters to the Connection Name Connect to a Defined SAP connection Select SAP Objects from Objects Selection Object Panel	6-1 6-2 6-2 6-4 6-4 6-4 6-17 6-18
6.1 (6.2 7 6.3 5 6.4 (6.4.1 6.4.2 6.4.3 6.5 5 6.5.1 6.5.2	The Adapter Wizard in JDeveloper Specifying the Service Name Connecting to SAP Define a Connection Name Define the Connection Parameters to the Connection Name Connect to a Defined SAP connection Connect to a Defined SAP connection Connect to a Defined SAP connection Connect Panel. Selected BAPI/RFC functions or IDoc messages panel	6-1 6-2 6-4 6-4 6-4 6-6 6-17 6-18 6-22
6.1 (6.2 7 6.3 5 6.4 (6.4.1 6.4.2 6.4.3 6.5 5 6.5.1 6.5.2 6.5.3	The Adapter Wizard in JDeveloper Specifying the Service Name Connecting to SAP Define a Connection Name Define the Connection Parameters to the Connection Name Connect to a Defined SAP connection Select SAP Objects from Objects Selection Object Panel Selected BAPI/RFC functions or IDoc messages panel Definition panel	
6.1 C 6.2 T 6.3 S 6.4 C 6.4.1 6.4.2 6.4.3 6.5.3 6.5.1 6.5.2 6.5.3 6.6 J	The Adapter Wizard in JDeveloper Specifying the Service Name Connecting to SAP Define a Connection Name Define the Connection Parameters to the Connection Name Connect to a Defined SAP connection Connect to a Defined SAP connection Connect SAP Objects from Objects Selection Object Panel Selected BAPI/RFC functions or IDoc messages panel Definition panel CA Properties Page	6-1 6-2 6-4 6-4 6-4 6-4 6-17 6-17 6-18 6-22 6-24 6-25
6.1 (6.2 7 6.3 5 6.4 (6.4.1 6.4.2 6.4.3 6.5 5 6.5.1 6.5.2 6.5.3 6.6 J 6.6.1	The Adapter Wizard in JDeveloper Specifying the Service Name Connecting to SAP Define a Connection Name Define the Connection Parameters to the Connection Name Connect to a Defined SAP connection Connect to a Defined SAP connection Select SAP Objects from Objects Selection Object Panel Selected BAPI/RFC functions or IDoc messages panel Definition panel CA Properties Page Interaction of JCA Properties (Outbound to the Adapter)	6-1 6-2 6-4 6-4 6-4 6-6 6-17 6-18 6-12 6-24 6-25 6-26
6.1 (6.2 7 6.3 5 6.4 (6.4.1 6.4.2 6.4.3 6.5.1 6.5.1 6.5.2 6.5.3 6.6 J 6.6.1 6.6.2	The Adapter Wizard in JDeveloper Specifying the Service Name Connecting to SAP Define a Connection Name Define the Connection Parameters to the Connection Name Connect to a Defined SAP connection Connect to a Defined SAP connection Connect sfrom Objects Selection Object Panel Selected BAPI/RFC functions or IDoc messages panel Definition panel CA Properties Page Interaction of JCA Properties (Outbound to the Adapter) Activation of JCA Properties (Inbound to the Adapter) ControlCharacter	6-1 6-2 6-4 6-4 6-4 6-6 6-17 6-18 6-22 6-24 6-25 6-26 6-28
6.1 (6.2 7 6.3 5 6.4 (6.4.1 6.4.2 6.4.3 6.5 5 6.5.1 6.5.2 6.5.3 6.6 J 6.6.1 6.6.2 6.6.3	The Adapter Wizard in JDeveloper Specifying the Service Name Connecting to SAP Define a Connection Name Define the Connection Parameters to the Connection Name Connect to a Defined SAP connection Select SAP Objects from Objects Selection Object Panel Selected BAPI/RFC functions or IDoc messages panel Definition panel CA Properties Page Interaction of JCA Properties (Outbound to the Adapter) Activation of JCA Properties (Inbound to the Adapter) ControlCharacter Generation of Corresponding (JCA) Artifacts (WSDL/XML Schemas)	6-1 6-2 6-2 6-4 6-4 6-6 6-17 6-18 6-12 6-24 6-25 6-26 6-28 6-28

	7.1	Adapter Integration with Oracle WebLogic Server	7-1
	7.1.1	Configure Run-time Parameters for the Adapter for SAP	7-1
8	Integrat	ion Scenarios in Oracle SOA Suite	8-1
	8.1	Integration Overview	8-1
	8.2	The Adapter Integration With SOA Service Components	8-1
	8.2.1	Create a New Application Server Connection	8-1
	8.2.2	Create an Empty Composite for SOA	8-7
	8.2.3	Design an Outbound BPEL Process for BAPI/RFC/IDOC	8-9
	8.2.4	Design an Inbound BPEL Process for BAPI/RFC/IDOC	8-29
	8.2.5	Deploy the Composite with Inbound BPEL Process	8-41
	8.2.6	Generate an Event in SAP R/3 and Process It by the SOA Composite	8-42
	8.2.7	Define an Outbound Mediator Process	8-42
	8.2.8	Define an Inbound Mediator Process	8-52
	8.2.9	Deployment of Inbound Mediator Process	8-65
	8.2.1	0 Generate an Event in SAP R/3 for Testing Mediator Inbound and Outbound Proce	ss8-65
	8.3	The Adapter Integration with BPM Service Components	8-65
	8.3.1	Deployment of Adapter	8-65
	8.3.2	Create an Empty Composite for BPM	8-65
	8.3.3	Define a BPM Outbound Process	8-68
	8.3.4	Design a BPM Inbound Process	8-85
	8.4	The Adapter Integration with Oracle Service Bus (OSB)	8-95
	8.4.1	Create an Empty Composite for OSB	8-95
	8.4.2	Define an OSB Outbound Process	8-98
	8.4.3	Define an OSB Inbound Process	8-111
	8.5	Deploy the Defined Process	8-126
	8.6	Test the Deployed Process	8-131
	8.6.1	Test the Outbound Process	8-131
	8.	5.1.1 Invoking the Input XML Document in the Oracle Enterprise Manager Console	8-131
	8.6.2	Test the Inbound Process	8-136
	8.	5.2.1 Generate an Event in SAP R/3	8-136
9	Adapte	for SAP Performance Tuning	9-1
	9.1	Tuning and Performance	9-1
	9.1.1	Tuning Parameters	9-1
	9.	I.1.1 SAP JCo Parameter Tuning	9-1
	9.	1.1.2 BPEL Infrastructure Tuning Parameters (These are provided at Enterprise Mana	agement
	(E	M) level):	9-1
	9.1.2	System Configuration	9-3
	9.	I.2.1 Oracle Linux Server	9-3
	9.	1.2.2 Hardware	9-3
	9.1.3	Outbound Performance	9-3
	9.	1.3.1 Performance Summary	9-4
	9.	I.3.1 Enhanced Performance	9-5
	9.2	Inbound Performance	9-5
	9.2.1	Performance Summary	9-6
1	0 SOA R	eports Integration	10-1

10.1	Adapter Health Report	
10.3	1.1 Configuration Report	
1	L0.1.1.1 EIS Connectivity	
10.3	1.2 Monitoring reports	
10.3	1.3 Snapshot Reports	
11 Trout	bleshooting and Error Messages	11-1
11.1	Log file Information	
11.2	Oracle Adapter for SAP Design-Time JDeveloper	
11.3	Oracle Adapter for SAP Run-Time	
11.4	SAP R/3	
12 Migra	ation Support	12-1
12.1	Migration of SAP Endpoints in SOA Projects	
12.2	Migration of SAP Endpoints in OSB Projects	
12.3	Deploying the Adapter Migrated Project	
12.4	Execution Steps for Deployed Migrated Projects	
12.4	4.1 Inbound Project	
12.4	4.2 Outbound Project	
A SAP Sy	stem Configurations for Remote Processing	A-1
A SAP Sy A.1	stem Configurations for Remote Processing	A-1 A-1
A SAP Sy A.1 A.2	estem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object	A-1 A-1 A-1
A SAP Sy A.1 A.2 A.3	stem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object SAP Inbound Communication	A-1 A-1 A-3
A SAP Sy A.1 A.2 A.3 A.3.	stem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object SAP Inbound Communication .1 Configure a Logical System	A-1 A-1 A-1 A-3 A-4
A SAP Sy A.1 A.2 A.3 A.3. A.3.	stem Configurations for Remote Processing Roles and Authorizations	A-1 A-1 A-3 A-4 A-6
A SAP Sy A.1 A.2 A.3 A.3 A.3 A.3	stem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object SAP Inbound Communication .1 Configure a Logical System .2 Configure a Partner Profile .3 Configure Inbound Process Code	A-1 A-1 A-1 A-1 A-3 A-3 A-4 A-6 A-8
A SAP Sy A.1 A.2 A.3 A.3 A.3 A.3 A.3	stem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object SAP Inbound Communication .1 Configure a Logical System .2 Configure a Partner Profile .3 Configure Inbound Process Code .4 Configure a Distribution Model	A-1 A-1 A-1 A-1 A-3 A-3 A-4 A-6 A-8 A-8
A SAP Sy A.1 A.2 A.3 A.3 A.3 A.3 A.3 A.3 A.3	stem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object SAP Inbound Communication .1 Configure a Logical System .2 Configure a Partner Profile .3 Configure Inbound Process Code .4 Configure a Distribution Model .5 SAP Outbound Communication	A-1 A-1 A-1 A-3 A-3 A-4 A-6 A-8 A-8 A-10
A SAP Sy A.1 A.2 A.3 A.3 A.3 A.3 A.3 A.3 A.4 A.4	stem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object SAP Inbound Communication .1 Configure a Logical System .2 Configure a Partner Profile .3 Configure Inbound Process Code .4 Configure a Distribution Model .5 SAP Outbound Communication .1 Configure B Distribution Model	A-1 A-1 A-1 A-1 A-3 A-3 A-4 A-6 A-8 A-8 A-8 A-10 A-10 A-10
A SAP Sy A.1 A.2 A.3 A.3 A.3 A.3 A.3 A.3 A.4 A.4 A.4	stem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object SAP Inbound Communication .1 Configure a Logical System .2 Configure a Partner Profile .3 Configure Inbound Process Code .4 Configure a Distribution Model .5 SAP Outbound Communication .1 Configure a Distribution Model .2 Configure a Distribution Model .3 Configure a Distribution Model .4 Configure RFC Destination and Program ID .2 Configure a Port	A-1 A-1 A-1 A-3 A-3 A-4 A-6 A-6 A-8 A-8 A-10 A-10 A-12
A SAP Sy A.1 A.2 A.3 A.3 A.3 A.3 A.3 A.4 A.4 A.4 A.4 A.4	stem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object SAP Inbound Communication .1 Configure a Logical System .2 Configure a Partner Profile .3 Configure Inbound Process Code .4 Configure a Distribution Model .5 SAP Outbound Communication .1 Configure a Distribution Model .3 Configure RFC Destination and Program ID .2 Configure a Port .3 Configure a Port	A-1 A-1 A-1 A-1 A-3 A-3 A-3 A-4 A-6 A-6 A-8 A-8 A-10 A-10 A-12 A-13
A SAP Sy A.1 A.2 A.3 A.3 A.3 A.3 A.3 A.3 A.3 A.4 A.4 A.4 A.4 A.4 A.4	stem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object SAP Inbound Communication .1 Configure a Logical System .2 Configure a Partner Profile .3 Configure Inbound Process Code .4 Configure a Distribution Model .5 SAP Outbound Communication .1 Configure a Distribution Model .3 Configure RFC Destination and Program ID .2 Configure a Port .3 Configure a Distribution Model	A-1 A-1 A-1 A-3 A-3 A-4 A-6 A-6 A-8 A-8 A-8 A-10 A-10 A-12 A-13 A-13
A SAP Sy A.1 A.2 A.3 A.3 A.3 A.3 A.3 A.4 A.4 A.4 A.4 A.4 A.4 A.4	stem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object SAP Inbound Communication 1 Configure a Logical System .2 Configure a Partner Profile .3 Configure Inbound Process Code .4 Configure a Distribution Model .5 Configure a Port .3 Configure RFC Destination and Program ID .4 Configure a Distribution Model .5 Configure a Distribution Model	A-1 A-1 A-1 A-3 A-3 A-4 A-6 A-6 A-8 A-8 A-8 A-10 A-10 A-12 A-13 A-13 A-13 A-13
A SAP Sy A.1 A.2 A.3 A.3 A.3 A.3 A.3 A.3 A.4 A.4 A.4 A.4 A.4 A.4 A.4 A.4 A.4	stem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object SAP Inbound Communication 1 Configure a Logical System .2 Configure a Partner Profile .3 Configure Inbound Process Code .4 Configure a Distribution Model .5 Configure a Port .1 Configure RFC Destination and Program ID .2 Configure a Port .3 Configure a Distribution Model .4 Configure a Port .3 Configure a Port .4 Configure a Distribution Model .5 Configure Port .4 Configure a Distribution Model .5 Configure Partner Profile .5 Configure Partner Profile	A-1 A-1 A-1 A-1 A-3 A-3 A-3 A-4 A-4 A-6 A-6 A-8 A-8 A-10 A-10 A-12 A-13 A-13 A-13 A-13 A-16
A SAP Sy A.1 A.2 A.3 A.3 A.3 A.3 A.3 A.3 A.3 A.4 A.4 A.4 A.4 A.4 A.4 A.4 A.4 A.4 C.5 Glossary	stem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object SAP Inbound Communication .1 Configure a Logical System .2 Configure a Partner Profile .3 Configure Inbound Process Code .4 Configure a Distribution Model .5 SAP Outbound Communication and Program ID .1 Configure a Port .3 Configure a Port .4 Configure a Port .3 Configure a Port .4 Configure a Logical System .4 Configure a Distribution Model .5 Configure Partner Profile .5 Configure Partner Profile .5 Configure A Distribution Model	A-1 A-1 A-1 A-1 A-3 A-3 A-3 A-4 A-4 A-6 A-8 A-8 A-8 A-10 A-10 A-10 A-12 A-13 A-13 A-13 A-13 A-15 A-16 A-13 A-13 A-13 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-12 A-14 A-10 A-10 A-10 A-10 A-10 A-10 A-10 A-10 A-10 A-113 A-113 A-113 A-110 A-113 A-113 A-114 A-110 A-113 A-114 A-116
A SAP Sy A.1 A.2 A.3 A.3 A.3 A.3 A.3 A.3 A.3 A.3 A.4 A.4 A.4 A.4 A.4 A.4 A.4 A.4 C.5 Glossary Index	stem Configurations for Remote Processing Roles and Authorizations RFC Authorization Object SAP Inbound Communication 1 Configure a Logical System 2 Configure a Partner Profile 3 Configure Inbound Process Code 4 Configure a Distribution Model 5 SAP Outbound Communication 1 Configure a Distribution Model 2 Configure a Port 3 Configure a Port 4 Configure a Distribution Model 5 Configure a Distribution Model 6 Configure a Port 7 Configure a Logical System 6 Configure a Distribution Model 7 Configure Partner Profile 8 Configure Partner Profile 9 SAP User Authorizations for Adapter	A-1 A-1 A-1 A-3 A-3 A-4 A-6 A-6 A-8 A-8 A-8 A-8 A-10 A-10 A-10 A-110 A-12 A-13 A-13 A-13 A-13 A-13 A-13 A-13 A-13 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-11 A-12 A-11 A-11 A-12 A-10 A-10 A-10 A-10 A-10 A-10 A-10 A-11 A-10 A-10 A-10 A-10 A-11 A-11 A-10 A-10 A-11 A-11 A-10 A-10 A-11 A-11 A-10 A-11 A-11 A-11 A-11 A-11 A-11 A-110 A-110 A-110 A-110 A-113 A-113 A-113 A-113 A-114

Preface

- Audience
- Documentation Accessibility
- Related Documents
- Conventions

Audience

Oracle Fusion Middleware User's Guide for Adapter for SAP is intended for anyone who is interested in using these adapters.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit

```
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing
impaired.
```

Related Documents

For more information, see the following documents in the Oracle Fusion Middleware 12c Release (12.1.3.0.0) documentation set:

- Oracle Fusion Middleware Programming Resource Adapters for Oracle WebLogic Server
- Oracle Fusion Middleware Adapter for Oracle Applications User's Guide
- Oracle Fusion Middleware Developer's Guide for Oracle SOA Suite

- Oracle Fusion Middleware Administrator's Guide
- Oracle Fusion Middleware Administrator's Guide for Oracle SOA Suite and Oracle Business Process Management Suite
- Oracle Fusion Middleware Administrator's Guide for Oracle Service Bus
- Oracle Application Server Installation Guide for Legacy Adapters

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Understanding of the Adapter for SAP

This chapter provides an introduction to the Oracle Integration Adapter for SAP R/3. It contains the following topics:

- Section 1.1, "Overview"
- Section 1.2, "Business Design Using Adapter for SAP"
- Section 1.3, "Adapter Components"
- Section 1.4, "Supported Versions and Platforms "
- Section 1.5, "Supported SAP ABAP Technologies"

1.1 Overview

The Adapter for SAP is used for the integration of Oracle products with SAP Enterprise to exchange the real-time data. It is developed in the Oracle JCA framework. It is based on the SAP Java Connector 3.0 (SAP JCo) and is used for the inbound and outbound interaction with SAP using message types RFC/BAPI/IDOC.

- **Outbound interaction:** When an application uses the Adapter for SAP to invoke an SAP R/3 business object or business operation, the interaction is termed as Outbound interaction.
- Inbound interaction: When an SAP R/3 system triggers an event and the event is listened by an application using Adapter for SAP as a result of which the application receives SAP R/3 data, the interaction is termed as Inbound interaction.

Adapter for SAP allows different types of connection methods including secure connection and message server communication method, with both Unicode and Non-unicode SAP systems.

It offers organizations a service-oriented approach to unlock the information assets that have evolved in most IT environments. It provides tighter integration with both the design-time and run-time components of SOA suite and also with other Oracle products which helps customer for better business data integration.

1.2 Business Design Using Adapter for SAP

Adapter for SAP provides seamless integration between SAP R/3 systems and non-SAP systems. It supports xml communication as standard business message format which is useful in integrating different platforms. Adapter run-time provides access to an SAP System and control secure communication, connection management and function execution. Adapter

design-time module comes as an integral part of Oracle SOA Suite and OSB products. This helps you to design business integration scenarios with SAP R/3 systems.

Adapter for SAP run-time supports bi-directional communication to an SAP system. You can add, update or receive business data to and from SAP. The Adapter for SAP supports multiple SAP interfaces like BAPI/RFC/IDOC to perform such operations. As an end user, you only need to know which RFC/IDOC/BAPI of SAP system would be used and which type of communication would be required in the business use case. Security and connection management is handled by the adapter itself. Before starting integration with Adapter for SAP, you should have SAP user credentials for communication. The SAP user should have minimum required permissions to execute BAPI/RFC/IDOC. To receive any data from SAP system, you should take help of SAP admin to define logical systems in SAP side.

Adapter for SAP encapsulates most of the complex data types supported by SAP R/3 systems in the form of xml standard type which ease the integration for end user by avoiding the complexity of data mapping at the time of process design.

1.3 Adapter Components

Components of Adapter for SAP are defined in two parts:

- 1. Design-time Component (JDeveloper extension)
- 2. Run-time Component (WebLogic application)

Design-time component for Adapter comes with Oracle JDeveloper as a part of SOA, OSB, and BPM Oracle integration products. Adapter design-time provides wizard based design flow which contains pages categorized to support step-by-step procedure to create an SAP reference/service in the SOA/OSB composites. JCA artifacts are created as a result of the Adapter design.

The Adapter run-time component comes with Oracle SOA/OSB release as a JCA connector. This component is implemented using j2EE Connector Architecture Framework. Adapter runtime must be deployed to the WebLogic Server as a resource adapter before deploying any SOA/OSB projects using Adapter for SAP. This adapter component executes a native call to SAP and sends back result as an xml in case of outbound execution. It takes care of the native call to SAP and creates abstraction of SAP related execution complexities from the user.

1.4 Supported Versions and Platforms

Oracle Integration Adapter for SAP R/3 supports the below mentioned versions of the interacting/underlying systems:

Operating System (OS) Versions:

Oracle Integration Adapter for SAP R/3 supports all the versions of operating systems that are supported by SAP JCo 3.0. Below is the list of the OS platforms.

For more information about the versions supported by SAP JCo 3.x, refer to SAP Note #1077727 in the SAP service Market Place.

- Windows
- Linux
- Solaris x86
- IBM AIX

HP-UX

SAP Versions:

- SAP R/3 4.7
- SAP ECC 5.0
- SAP ECC 6.0

JAVA Versions:

 Oracle Integration Adapter for SAP R/3 supports all java version supported by SAP JCo 3 API

JCo Versions:

SAP JCo 3.X

Oracle SOA Versions:

• Oracle Fusion Middleware 12.1.3

1.5 Supported SAP ABAP Technologies

Oracle Integration Adapter for SAP R/3 provides access to the following SAP ABAP interfaces:

- 1. RFC (Remote Function Call)
- 2. BAPI (Business Application Programming Interface)
- 3. IDocs (Intermediate Documents)

Remote Function Call (RFC) is a standard SAP interface for communication within SAP systems and with external non-SAP systems. RFC calls a function to be executed in a remote system.

Business Application Programming Interfaces (BAPIs) are defined as API methods of SAP business object types. A BAPI is implemented as a function module that is stored and described in the Function Builder. BAPIs are remotely enabled functions which mean that these can be invoked from remote programs like standalone Java programs or Web services. This attribute of the BAPIs help to facilitate the integration of third-party systems with the SAP proprietary R/3 products. BAPI is usually a self-contained business function.

Intermediate Document (IDoc) is an SAP document format for business transaction data transfers. As the name suggests, these documents act as intermediate storage of information, which can be sent bi-directionally for exchange of data between SAP R/3 and non-R/3 systems.

An IDoc is made up of the following parts:

Control record: This section contains control information regarding the IDoc. Its constituents are Sender's name, Receiver name, Message type, and IDoc type. The format of the control record is similar for all the IDoc types.

- Data records: It consists of a header that contains the identity of the IDoc. Its constituents include a sequential segment number, a segment type description, and field containing the actual data of the segment.
- Status records: The status record shows the information regarding already processed stages and remaining processing stages of the IDoc. It has an identical format for each IDoc type.

2

Working with Adapter for SAP

This section provides a quick start guide to use the Oracle Integration Adapter for SAP R/3. This chapter contains the following topics:

- Section 2.1, "Prerequisites"
- Section 2.2, "SAP Connection Configuration Parameters"
- Section 2.3, "Create a Composite in Design-time"
- Section 2.4, "Setting up JNDI for Adapter for SAP at Run-time"
- Section 2.5, "Deployment of the Composite on Run-time Environment"
- Section 2.6, "Testing the Deployed Projects"

2.1 Prerequisites

This section lists the prerequisites for using Adapter for SAP in design-time and runtime environment.

2.1.1 JDeveloper

Installation of the appropriate version of JDeveloper is required for developing the components at design-time. For more information on installation steps of JDeveloper, refer to *Oracle Fusion Middleware Installation Guide for Oracle JDeveloper*.

2.1.2 SAP Java Connector (JCo)

SAP JCo is a middleware component which is used for communication between the Adapter and the SAP system. This component has to be installed in both design-time and run-time environments of Adapter for SAP. Below are the details which will help you to install and validate the SAP JCo.

1. JCo version supports SAP Java Connector 3.x. The latest version available is SAP JCo 3.0.9. More details on the supported operating systems and platforms, is provided in chapter

SAP Java Connector 3.x". The Adapter does not support the platforms which are not supported by the SAP JCo 3.x.

- 2. JCo Files: Below are the required SAP JCo installation files:
 - i. Microsoft Windows
 - a. sapjco3.jar
 - b. sapjco3.dll
 - c. sapidoc3.jar
 - ii. Linux
 - a. sapjco3.jar
 - b. libsapjco3.so
 - c. sapidoc3.jar
- 3. Source for SAP JCo files:

These files are provided by SAP administrator or you can download the installation files from SAP service market place under service.sap.com/connectors.

4. Check for the compatibility:

After downloading the SAP JCo files, place it in the directory of the system where these libraries need to be validated. Perform the following steps to validate SAP JCo:

- i. Navigate to the directory where the sapjco3.jar file is located.
 - a. On Windows:
 - Right-click the **sapjco3.jar** file.
 - Select **Open with** and then click Java 2 Platform Standard Edition binary. Or

Run sapjco3.jar file from command prompt, as shown in Figure 2-1.

Figure 2-1 Run Command Screen



- b. On Linux:
 - Execute the command from the command prompt java -jar sapjco3.jar
- ii. Execute the above command in respective OS. A popup window appears, as shown in Figure 2-2. If the popup opens successfully, it implies that JCo installation is successful.



Figure 2-2 Popup window of OS

- iii. Another way of validation is to check the path of JCo library and path of JCo archive property in screen. If they are showing correct library and archive (jar) file, it means that JCo library is correct for your Operating System.
- 5. JCo file location for the Adapter for SAP.
 - In Design-time environment, place the files at below path: <ORACLE_HOME>/soa/plugins/jdeveloper/integration\adapters/lib
 - In Run-time environment, place the files at below path: <ORACLE_HOME>/user_projects/domains/soa_domain/lib
- **6.** Update the Global variables:

We need to update the path of the JCo library installed in the PATH of the Global variables.

i. Windows:

In the Windows Operating systems, the environment variables have to be updated as mentioned in the below steps.

- a. Go to My Computer properties.
- b. Navigate to Advanced Properties -> Environment variables, and update the PATH and CLASSPATH variables as below:

- PATH=\$PATH; <ORACLE_HOME>\soa\plugins\jdeveloper\integration\adapters\lib
- ii. Linux:

In the Linux Operating systems, the environment variables have to be updated as mentioned in the below steps.

a. Navigate to the Bash profile with the below command, using the same SOA Installation.

vi ~/.bash_profile

- b. Press "i" for insertion and add the below entries in the bash_profile file
 - PATH=\$PATH; <ORACLE_HOME>\soa\plugins\jdeveloper\integr ation\adapters\lib
- c. Press <Esc> and then press <Ctrl+Shft+x> to save.

2.1.3 Verify WebLogic and SOA

After installation of WebLogic and SOA, verify that the servers are in the **Running** state and **Health** is **OK** as shown in Figure 2-3.

Figure 2-3 Summary of Servers

Summary of Servers				
Configuration Control				
A server is an instance of WebLog This page summarizes each server	ic Server that runs in its own Ja that has been configured in th	ava Virtual Machine (JVM) ar e current WebLogic Server	nd has its own configuration. domain.	
(2)				
© Customize this table				
Servers (Filtered - More Colu	mns Exist)			
New Clone Delete				
🔲 Name 🐟	Туре	Cluster	Machine	
AdminServer(admin)	Configured		new_UnixMachine_1	
soa_server1	Configured	new_Cluster_1	new_UnixMachine_1	
soa_server2	Configured	new_Cluster_1	new_UnixMachine_2	
New Clone Delete	· ·	·	·	

2.1.4 Adapter Components

1. **Design-time:** After installing the Adapter for SAP in design-time of the build provided, create or open an existing SOA project in JDeveloper and check for the Adapter icon in the Component palette of JDeveloper, as shown in the Figure 2-4.



Figure 2-4 Adapter Icon in the Component Palette of JDeveloper

2. **Run-Time:** After installation of Adapter run-time in the WebLogic console, verify the status of the Adapter to be **Active** and checked **OK**, as shown in Figure 2-5.

Figure 2-5	Summary of Deployments
------------	------------------------

Sum	mary	of Deployments		
Cor	ntro	Monitoring		
Tł st To	his pa coppe o inst	age displays a list of Java EE applications and stand-alone application modules that have be d, updated (redeployed), or deleted from the domain by first selecting the application n call a new application or module for deployment to targets in this domain, click the Install	een installe ame and u button.	ed to this (Ising the c
D CI	usto	mize this table		
De	ploy	ments		
Ir	nstal	Update Delete Start ~ Stop ~		
	N	ame	State	Health
		state-management-provider-memory-rar	Active	🖋 ОК
		coherence-transaction-rar	Active	🖋 ОК
)	SAPAdapter	Active	🖋 ОК
) 6	B Toworklistapp	Active	🖋 ок

2.1.5 Update the Default JNDI with the SAP Login Parameters

Update the default JNDI with the SAP Login parameters in the below path of console.

1. Home →Summary of Servers →Summary of Deployments →Adapter for SAP, as shown in Figure 2-6.

Figure 2-6 Setting for Adapter for SAP

Settings f	or SAPAdapt	ter								
Overview	Deploymer	nt Plan	Configuration	Security	' T	argets	Cont	trol T	esting	Monitor
General	Properties	Outb	ound Connection	Pools	Admi	in Objec	ts V	Vorkload	l Inst	rumentat
This pag groups. instance below. Outbou	ge displays a ta Groups are list e within an Out nd Connectio Delete	ible of C ted by c tbound on Pool	Outbound Connection factory i Connection factory i Connection Pool gr	on Pool g interface a roup. Click able	roups and th the r	and inst ne instar name of	tances nces arr a grou	for this e listed up or ins	resource by their tance to	e adapter JNDI nan o configur
Gr	oups and Ins	tances	~							Con
	javax.resource	e.cci.Cor	nectionFactory							javax
	eis/SAP/FMW[DEMO								javax
New	Delete									

2. Click on **eis/SAP/FMWDEMO**. The **Outbound Connection Properties** page is displayed, as shown in Figure 2-7.

Figure 2-7 Properties Tab

Settings f	for javax.resource.cci.ConnectionFactory	
------------	--	--

Properties Transaction Authentication Connect	ction Pool Logging
---	--------------------

This page allows you to view and modify the configuration properties of this outbound connection pool. Properties yo

Outbound Connection Properties

Save		
Property Name 🗠	Property Type	Property V
DestinationDataProvider_JCO_ALIAS_USER	java.lang.String	
DestinationDataProvider_JCO_ASHOST	java.lang.String	10.30.0.26
DestinationDataProvider_JCO_CLIENT	java.lang.String	800
DestinationDataProvider_JCO_CODEPAGE	java.lang.String	
DestinationDataProvider_JCO_CPIC_TRACE	java.lang.String	
DestinationDataProvider_JCO_DEST	java.lang.String	
DestinationDataProvider_JCO_EXPIRATION_PERIOD	java.lang.String	
DestinationDataProvider_JCO_EXPIRATION_TIME	java.lang.String	
DestinationDataProvider_JCO_GETSSO2	java.lang.String	
DestinationDataProvider_JCO_GROUP	java.lang.String	

2.1.6 SAP Login Parameters

You need to have SAP R/3 logon parameters for making the connection to the SAP system from DT wizard or RT (JNDI). These are provided by the SAP System Administrator. Below ia the list of mandatory connection parameters which are required for making a simple outbound connection to the SAP system.

- 1. Client: This is the client number of the SAP system. This is a 3 digit numeric character. For example, Client = 100.
- **2.** User name: This is the SAP user. Dialog or Communication type of SAP user can be used here.
- 3. Password: Password of SAP user.
- **4. Language:** SAP Logon language. The language provided here should be one of the installed languages provided by the SAP administrator. In case of language dependent data, the response data text is returned based on the language passed in this parameter. This is a 2 digit character. For example, 'EN', 'DE'.
- 5. Application Server: A fully qualified domain name or IP of the SAP Application Server.
- 6. System Number: Instance number of the Application Server.

There are various other SAP Connection Parameters which are part of connection configuration and used for the inbound and outbound connection to SAP. Below is the list of different type of parameters. For more information, refer to the section "SAP Connection Configuration Parameters".

1. Direct Application Server Connection parameters.

- 2. Message Server Connection parameters.
- 3. Server parameters for inbound.
- 4. Tracing parameters.
- 5. Connection pool parameters.
- 6. SAP secured connection parameters.
- 7. Additional connection parameters.

2.2 SAP Connection Configuration Parameters

This section contains the SAP R/3 logon parameters, which are used to configure a connection to SAP R/3 using the Oracle Application Adapter.

2.2.1 Login Parameters

Table 2-1 lists and describes user login parameters

Parameter	Description	Example	Comment
Client (DestinationDataProvi der_JCO_CLIENT)	Identifies the SAP client.	800	In organizational, commercial, and technical terms, a self-contained unit in an SAP system with separate master records and its own set of tables. It is a mandatory parameter.
User name (DestinationDataProvi der_JCO_USER)	SAP login ID.	JCA_DE V	User type for dialog-free communication between systems. It is a mandatory parameter.
Password (DestinationDataProvi der_JCO_PASSWD)	Confidential authentication information	JCA_11 1@D	Password for logging in to the SAP system. This is a protected word or string of characters that identifies or authenticates a user for access to an SAP system. It is a mandatory parameter.
Language (DestinationDataProvi der_JCO_LANG)	A language key. EN (English) is the default.	EN	The current logon language of SAP. It is a mandatory parameter.
alias_user (DestinationDataProvi der_JCO_ALIAS_US ER)	Logon user alias	JCA_AL IAS	Specifies the alias user name for the SAP user login. It is an optional parameter.
mysapsso2 (DestinationDataProvi der_JCO_MYSAPSS O2)	Indicates whether or not to use the specified SAP Cookie Version 2 as the login ticket instead of user ID and password.		Login with single sign-on is based on secure network connection (SNC) encryption and can only be used in combination with an SNC. It is an optional parameter.

Table 2-1Login Parameters

x509cert (DestinationDataProvi der_JCO_X509CERT)	Indicates whether or not to use the specified X509 certificate as the login certificate instead of user ID and password.		Login with X509 is based on Secure Network Connection (SNC) encryption and can only be used in combination with an SNC. It is an optional parameter.
--	---	--	--

2.2.1.1 Direct Connection

Table 2-2 lists and describes Direct Connection parameters.

 Table 2-2
 Direct Connection parameters

Parameter	Description	Example	Comment
Application Server (DestinationDataProvide r_JCO_ASHOST)	Connects to an ABAP application server.	10.30.XX. XX	To obtain meta data information, a connection to a single application server is required. Application programs in an R/3 System are run on application servers.
System Number (DestinationDataProvide r_JCO_SYSNR)	Identifies a unique instance on the application server.	00	An application server may have different system numbers.

2.2.1.2 Load Balanced

Table 2-3 lists and describes Load Balanced Connection parameters.

Parameter	Description	Example	Comment
Message Server (DestinationDataProv ider_JCO_MSSERV)	Connects to an ABAP message server.		Application servers from one SAP system are usually configured in logon groups (For load balancing purposes), where each group serves a particular kind of user. The message server is responsible for communication between the application servers. It passes requests from one application server to another within the system. It also contains information about application server groups and the current load balancing within them. It uses this information to choose an appropriate server when a user logs onto the system.
Message Host (DestinationDataProv ider_JCO_MSHOST)	Connects to an ABAP message Host.		The IP of message server host.
R/3 Name (DestinationDataProv ider_JCO_R3NAME)	Identifies a unique instance on the application server.		Symbolic SAP system name used to identify the system.

Server Group (DestinationDataProv ider_JCO_GROUP)	Identifies the logon group.	PUBLIC	Logon group that the user ID belongs with.
Router	SAP Route String		To be able to connect to an SAP
(DestinationDataProv	describes a		server from the internet, one uses
ider_JCO_SAPROU	connection required		SAP router as a proxy between the
TER)	between two hosts		SAP GUI and the SAP server.

2.2.2 Server Parameters (for Inbound)

Table 2-4 lists and describes SAP Gateway Server parameters.

Table 2-4SAP Gateway Server Parameters

Parameter	Description	Example	Comment
SAP Gateway Host (DestinationDataProv ider_JCO_GWHOST)	Enter the name of an SAP Gateway server.	"isdsrv2"	The SAP Gateway carries out CPI- C services within the SAP world, which are based on TCP/IP. These services enable SAP Systems and external programs to communicate with one another.
SAP Gateway Service (DestinationDataProv ider_JCO_GWSERV)	Enter the service name (usually a compound of the service name and system number).	Sapgw00	Service name on the gateway host.
Program ID (ServerDataProvider_ JCO_PROGID)	A program identifier that has been specified on the SAP Gateway Server (case sensitive).	"S1PROG"	Program ID is a unique identifier for your communication session specified by your system administrator. The value entered in this field must match the one exposed on the gateway.

2.2.3 Trace Parameters

Table 2-5 lists and describes Trace parameters.

Table 2-5 Trace Parameters

Parameter	Description	Example	Comment
SAP trace (DestinationDataProvi der_JCO_TRACE)	Enables the SAP Java connectors trace behaviour.	0 / 1	Off default - only hard errors are recorded in a trace file (dev rfc.trc) in append mode. ON - individual rfc*.trc and JCO*.trc are written for each request. Useful in finding errors, not recommended in a productive system.
Trace level (DestinationDataProvi der_JCO_CPIC_TRAC E)	Indicates the level of detail in the SAP traces.	03	Select a value that ranges from 0 through 10 from the list.

2.2.4 Connection Pool Parameters

Table 2-6 lists and describes Connection Pooling parameters.

Parameter	Description	Example	Comment
Pool Capacity (DestinationDataProvider_J CO_POOL_CAPACITY)	Maximum number of connections which will be kept open by the pool for possible reuse. These connections will be automatically closed if they cannot be reused for more than the Connection Timeout period. A value of 0 has the effect that there is no connection pooling, i.e. connections will be closed after each request.	3	3 Connections will be kept open by the pool for reuse.
Peak Limit (DestinationDataProvider_J CO_PEAK_LIMIT)	Maximum number of connections which can be allocated from the pool. This enables the user to create more connections as specified by the Peak limit parameter, for example for temporary peak usage times. If the value for Maximum connections is less than the value of the parameter Peak limit , the parameter will automatically be reset to the value of Peak limit . All allocated connections exceeding the Peak limit will be closed immediately, if they are released from the application to the pool again.	10	Maximum 10 connections can be allocated from the pool.
Max Wait (DestinationDataProvider_J CO_MAX_GET_TIME)	Defines the maximum time to wait to obtain a requested connection. If the connection pool is exhausted (that means that the Maximum Connections limit is reached) and another thread is requesting an additional connection, this is the time that is being waited for some connection to be released by another thread so that that one can be handed out to the waiting thread.	30 s	The default value for the Maximum Waiting time is 30 seconds.
Expiration Time (DestinationDataProvider_J CO_EXPIRATION_TIME)	Time in ms after which the connections held by the internal pool can be closed.	10,000	The connections will be closed after 10 seconds.
Expiration Period (DestinationDataProvider_J CO_EXPIRATION_PERIO D)	This is interval in ms with which the timeout checker thread checks the connections in the pool for expiration.	5,000	The timeout checker will check the connections every 5 seconds.

Table 2-6	Connection	Pooling	Parameters
-----------	------------	---------	------------

For more information on parameters, see Table 4-1.

2.2.5 SAP Connection Security Parameters (SNC)

Table 2-7 lists and describes SNC parameters.

Table 2-7 SNC Parameters

	Parameter	Description	Example	Comment
--	-----------	-------------	---------	---------

SNC mode (DestinationDataProvider_J CO_SNC_MODE)	Flag for activating SNC.	1 (on)	This is a required parameter.		
SNC Partner (DestinationDataProvider_J CO_SNC_PARTNERNAM E)	Specifies the application server's SNC name	p:CN=ABC , O=MyCom pany C=US	User can find the application server's SNC name in the profile parameter snc/identity/as.		
SNC level (DestinationDataProvider_J CO_SNC_QOP)	Specifies the level of protection to use for the connection.	Selection, see the next column.	 Authentication only Integrity protection Privacy protection (default) Use the value from snc/data protection/use on the application server Use the value from snc/data_protection/max on the application server Default value = 3 		
SNC Name (DestinationDataProvider_J CO_SNC_MYNAME)	Specifies SNC name.	p:CN=SAP J2EE O=MyCom pany, C=US	This parameter is optional, but set it to ensure that the correct SNC name is used for the connection.		
SNC library Path (DestinationDataProvider_J CO_SNC_LIBRARY)	Specifies the path and file name of the external library.	C:\SAP J2EE_ Engine\SA PCry ptolib\sa pcrypto.dll	The default is the system-defined library as defined in the environment variable SNC LIB.		

2.2.6 Additional Connection Parameters

Table 2-8 lists and describes Additional Connection parameters.

 Table 2-8
 Additional Connection Parameters

Parameter	neter Description Example		Comment			
Type (DestinationDat aProvider_JCO _TYPE)	Type of remote host	2 = R/2, 3 = R/3, E = External	Remote host used to connect to RFC Destination.			
CodePage (DestinationDat aProvider_JCO _CODEPAGE)	Initial codepage in SAP notation	8400	Uniquely identifying the logon language and Extracts the text data according to the logon language.			
Lcheck (DestinationDat aProvider_JCO _LCHECK)	Enable/Disable logon check at open time.	1/0	Check connection to SAP when enabled using Ping from SAP.			
Repository_des tination (DestinationDat aProvider_JCO _DEST)	Specifies which destination should be used as repository.	10.32.32.XX	SAP Repository destination to connect.			

Repository User (DestinationDat aProvider_JCO _REPOSITOR Y_USER)	If repository destination is not set, and this property is set, it will be used as user for repository calls. This allows using a different user for repository lookups.	MYSAPREPO	Repository user having only access to connect to specified SAP Repository only.
Repository Password (DestinationDat aProvider_JCO _REPOSITOR Y_PASSWD)	The password for a repository user. Mandatory, if a repository user should be used.	MYPASS	Connect to the destination successfully with valid repository user and Repository Password.

2.3 Create a Composite in Design-time

1. Open the JDeveloper installed from the below path:

<ORACLE_HOME>/jdeveloper/jdev/bin /jdev

- **2.** Create a new SOA application and corresponding project. For more information, refer to the section "Create an Empty Composite for SOA".
- 3. Drag and drop the Adapter to the External Reference, as shown in Figure 2-8.

Figure 2-8 Adapter Component



- 4. The configuration wizard for the Adapter appears.
- 5. Provide the required details in the wizard respectively. For more information, refer to the section "Adapter Wizard in JDeveloper".
- 6. Configure the BPEL process. For more information, refer to the section "Define an Outbound BPEL Process".
- 7. Outbound Composite created at the end of the process will look as shown in Figure 2-9.



Figure 2-9 Outbound Composite

- **8.** Below artifacts are created as a part of Adapter outbound composite creation. You can find those artifacts in the left side pane under the project node. As shown in Figure 2-10.
 - PROJECT1_sap.jca
 - PROJECT1.xsd
 - PROJECT1.wsdl
 - (Where PROJECT1 is the name of the Adapter reference name provided in the adapter wizard)

Figure 2-10 Created Artifacts as part of Adapter Outbound Composite



9. Follow the similar steps to create an inbound Adapter composite. In this case, drag the Adapter to **Exposed Services** swim lane. For more information, refer to the section "Define an Inbound BPEL Process".

10. Inbound Composite created at the end of the process will look as shown in Figure 2-11.

Exposed Services	Components	External References						
can Service	BPELProcess1							
Operations:								
MATMAS01								
		Ų						
4								
Design Source History								
Messages - Log		×						
destination Con with propert	ies:{jco.destination.auth_type=CONFIGURED_USER, jco.client.u	ser=JCA_DEV, jco.clien ^						
Jun 18, 2014 12:08:50 PM ora	cle.tip.adapter.sap.share.connection.SapConnector ping							
WARNING: SAP client Connected	d successfully							
destination Con with properties: (jco.destination.auth_type=CONFIGURED_USER, jco.client.user=JCA_DEV, jco.clien 								
WARNING: SAP client Connected	d successfully							
destination Con with propert	<pre>ies:{jco.destination.auth type=CONFIGURED USER, jco.client.u</pre>	ser=JCA DEV, jco.clien						
		•						
Messages Extensions × SOA ×		•						

Figure 2-11 Created Inbound Composite

2.4 Setting up JNDI for Adapter for SAP at Run-time

This section describes how to configure JNDI connection parameters which consists of the following steps:

1. Update the default JNDI with the SAP Login parameters in the below path of console.

Home \rightarrow Summary of Servers \rightarrow Summary of Deployments \rightarrow Adapter, as shown in Figure 2-12.

Figure 2-12 Update JNDI with Connection Parameters

			(n.)							
Home	>Summary of Serv	ers >Su	mmary of Deployme	nts >SAP	Adapter					
Setting	gs for javax.res	ource.c	ci.ConnectionFa	ctory						
Overv	iew Deploymen	t Plan	Configuration	Securit	y Targets	Control	Testing	Monitoring	Notes	
Gener	ral Properties	Outb	ound Connection	Pools	Admin Objec	ts Work	load Ins	strumentation	1	
This conn name Outb	This page displays a table of Outbound Connection Pool groups and instances for this resource adapter. The top level entries in the table represent Outbound connection factory interface and the instances are listed by their JNDI names. Expand a group to obtain configuration information for a Connection Pool insta name of a group or instance to configure it. Automatically generated Connection Pools are not displayed in the table below. Outbound Connection Pool Configuration Table									
	Groups and Ins	stance	s 🏟						Co	nnection Factory Interface
	🖃 javax.resourc	e.cci.Co	onnectionFactory						jav	ax.resource.cci.ConnectionFactory
	eis/Chinese								jav	ax.resource.cci.ConnectionFactory
	eis/DECDAT								jav	ax.resource.cci.ConnectionFactory
	eis/FMW2SAP								jav	ax.resource.cci.ConnectionFactory
	eis/French								jav	ax.resource.cci.ConnectionFactory
	eis/German								jav	ax.resource.cci.ConnectionFactory

Once clicked on eis/SAP/FMWDEMO, below screen appears, as shown in Figure 2-13.

Figure 2-13 Outbound Connection Properties

	Home >Summary of Servers >Summary of Deployments > SAPAdapter								
9	Settings for javax.resource.cci.ConnectionFactory								
	General	Properties	Transaction	Authentication	Connection Pool	Logging			
2									

This page allows you to view and modify the configuration properties of this outbound connection pool. Properties you modify here are saved to a

Outbound Connection Properties

Save		
Property Name 🗞	Property Type	Property Value
DestinationDataProvider_JCO_ALIAS_USER	java.lang.String	
DestinationDataProvider_JCO_ASHOST	java.lang.String	
DestinationDataProvider_JCO_CLIENT	java.lang.String	800
DestinationDataProvider_JCO_CODEPAGE	java.lang.String	
DestinationDataProvider_JCO_CPIC_TRACE	java.lang.String	
DestinationDataProvider_JCO_DEST	java.lang.String	
DestinationDataProvider_JCO_EXPIRATION_PERIOD	java.lang.String	
DestinationDataProvider_JCO_EXPIRATION_TIME	java.lang.String	
DestinationDataProvider_JCO_GETSSO2	java.lang.String	
DestinationDataProvider_JCO_GROUP	java.lang.String	

- 2. Save the JNDI.
- **3.** Select the Adapter in the summary of deployments. Click **Update** button and follow wizard, as shown in Figure 2-14, to update the connection configuration.



Figure 2-14 Update Application Assistant

4. The updated connection information will be applicable for the projects which deployed after update. Now the projects can be deployed for execution.

2.5 Deployment of the Composite on Run-time Environment

The developed Adapter project has to be deployed to the Application Server Connection which is already created in the JDeveloper. Below are the steps which include the creation and deployment of the application server.

2.5.1 Create Application Server in JDeveloper

Perform the following steps for creating the new application server:

- **1.** Go to the **Application Server** tab and right-click on the parent node of application server.
- 2. Select the type of server. Standalone is the default.
- 3. Provide the connection name and credentials in the nextscreens respectively.
- 4. Test the connection and finish the wizard if it is successful.

For more information on creation of Application Server Connection, refer to the section "Create a New Application Server Connection".

2.5.2 How to Deploy

Perform the following steps for deploying the project:

- 1. Select the project.
- 2. Right-click and select **Deploy**.
- 3. From the list, select the server on which you need to deploy.

4. Click on Next and then Finish.

For more information on deployment of the project, refer to the section "Deploy the Defined Process".

2.6 Testing the Deployed Projects

Refer to the section "Test the Deployed Process" for the details on how to test the Outbound and Inbound Endpoints in EM.

<u>3</u>

Supported SAP Interfaces

Adapter for SAP provides access to SAP R/3 interfaces such as Remote Enabled Function Modules (RFC), Business Application Programming Interfaces (BAPI) and Intermediate Documents (IDoc).

This section contains the following topics:

- Section 3.1, "Business Application Programming Interfaces (BAPI)"
- Section 3.2, "Remote Enabled Function Modules (RFCs)"
- Section 3.3, "Intermediate Document (IDoc)"

3.1 Business Application Programming Interfaces (BAPI)

BAPI's (Business Application Programming Interface) are a set of interfaces to objectoriented programming methods in SAP. They enable a programmer to integrate third-party software into the proprietary R/3 product from SAP. These interfaces can be used by external applications developed by customers and complementary software partners as well as by other SAP applications. For specific business tasks such as uploading transactional data, BAPIs are implemented and stored in the R/3 system as Remote Function Call (RFC) modules.

BAPIs provide the client with an object-oriented view of the application objects without needing to know the implementation details. BAPIs are always developed by defining scenarios which are used to map and implement system-wide business processes.

Note: Online BAPIs(which call SAP screens) were not supported by Adapter for SAP.

3.1.1 Standard BAPI

Some BAPIs and methods provide basic functions and can be used for most SAP Business Objects. Such BAPIs are known as "standardized" BAPIs. For example, Some BAPIs are used for replicating business object instances: They enable specific instances of an object type to be copied to one or more different systems. These BAPIs are used mainly to transfer data between distributed systems within the context of Application Link Enabling (ALE).

A number of service BAPIs provide basic help functions. Service BAPIs provide information

or services for the BAPIs from Individual Business Components. Service BAPIs are created in the Business Object Repository (BOR) under the application component hierarchy shown below:

- Cross-Application Components
- Business Framework Architecture

There are some parameters that can be created for various BAPIs because they contain the same or equivalent data in all BAPIs. Such parameters are known as "standardized parameters". They should be implemented in the same way in all BAPIs.

Return Parameters: Each BAPI must have an export return parameter for returning messages to the calling application. To provide application programmers with a consistent error handling process for BAPI calls, all Return Parameters must be implemented in the same standardized way.

Change Parameters: For the BAPIs that cause database changes (for example, Change and Create BAPIs), you must be able to distinguish between parameter fields that contain modified values and parameter fields that have not been modified. This diffrentiationis made through the use of standardized parameters.

3.1.2 Custom BAPI

Though SAP provides a bunch of ready-to-use BAPI's but you can also create your own BAPI(s) easily if required.

Custom BAPIs can be created as per the business requirement of the Customer / Project. Generally, the option of using the Standard BAPIs is explored to see if the requirement can be satisfied, otherwise Custom BAPI can be used.

Custom BAPI's code can always be updated according to the business requirements, at any point of time, unlike Standard BAPI's which you cannot change. Information about the updated BAPI can be retrieve by Adapter for SAP at any point of time.

3.2 Remote Enabled Function Modules (RFCs)

RFC is the protocol used by SAP for remote communication, that is, for communications between remote (independent) systems.

A Remote Function Call (RFC) is the call or remote execution of a Remote Function Module in an external system.

RFC is used for communications between two independent SAP systems, or for communications between an SAP system and a non-SAP system, such as an external application. It can also be used for communications between modules on the same system.

Using the RFC interfaces, you can extend the functionality of R/3 applications from an external program.

Compared to using the GUI interfaces, using RFC interfaces requires more knowledge of the business logic of the R/3 applications with which you are integrating the external application.

RFC is the standard SAP interface for communication between SAP systems. RFC calls a function to be executed in a remote system.

3.2.1 Standard RFC

SAP provides a range of ready-to-use RFCs based on different business requirements. Standard RFC can be called and executed remotely by an external system like Adapter for SAP. For example, RFC_READ_TABLE is a standard SAP function module available within R/3 SAP systems. This returns the details of the fields present within an SAP table.

3.2.2 Custom RFC

If Standard RFCs are not enough to meet business/customer requirements then Custom RFCs are created. You can later update the custom RFC according to the requirement. Adapter for SAP can then use the updated custom RFC.

3.3 Intermediate Document (IDoc)

Intermediate Document (IDoc) is a standard SAP document format. IDocs enable the connection of different application systems using a message-based interface. The use of IDocs has three main aims:

- Structured exchange and automatic posting of application documents.
- Reduction of the varying complex structures of different application systems to one simple structure. For example, the structure of an SAP application document and the structure of the corresponding Electronic Data Interchange (EDI) message according to the UN/EDIFACT standard.
- Detailed error handling before the data is posted in the application. IDocs can be regarded and defined on two levels: On a technical level and on an application level. The technical level enables the support of cross-application functions such as routing and technical error handling.

Intermediate Documents (IDocs) are the "logical messages" that correspond to different business processes. They enable different application systems to be linked by a messagebased interface. The IDoc type indicates the SAP format to use to transfer the data for a business transaction. An IDoc is a real business process in the form of an IDoc type that can transfer several message types.

3.3.1 Standard IDoc

Standard IDocs are available in SAP for meeting most of the business requirements. Standard IDocs can be used for exchanging and automatic posting of application documents. For example, MATMAS01 is a standard IDoc available in the SAP Form Material Master data.

3.3.2 Custom IDoc

Custom IDocs are created according to the special business/customer requirements for which standard IDoc is not already available. If later some changes are required in IDoc, it can be done in Custom IDocs. The Adapter for SAP will be able to use the latest updated IDoc.

3.3.3 Extended IDoc

When the Standard IDocs provided by SAP are not sufficient for a business process, you can use Extended IDoc. Extension of an IDoc can take place whenever dictionary table has a new structure appended, as required by the business process.

Extension of an IDoc takes place when extra fields are required for the business process. For instance, when you already have a predefined IDoc type say "*INVOIC02*", but the requirement is to transfer additional structure containing VBRK-KTGRD (Account assignment group for this customer) and VBRK-MANSP (Dunning block). To meet the requirement, you will have to create a segment structure by adding segment with two additional fields as an extension to the existing IDoc type '*INVOIC02*'. Thus IDoc extension is adding extra functionality to the existing message type.
4

SAP Java Connector 3.x

This chapter describes the SAP JCo 3.x library. SAP Java Connector 3.x is a standalone java library to connect with any SAP R/3 system. SAP JCo supports communication with the AS ABAP (Application server for ABAP) in both directions: Inbound (Java calls ABAP) and Outbound calls (ABAP calls Java).

You can find further information on the communication between SAP Java applications and the ABAP environment in the SAP Library: http://help.sap.com

The section contains the following topics:

- Section 4.1, "Supported Systems and Platforms"
- Section 4.2, "Performance"
- Section 4.3, "RFC Server Threads"
- Section 4.4, "Trace Level Parameter"
- Section 4.5, "JCo Supported SAP Data types "

4.1 Supported Systems and Platforms

SAP JCo 3.0 is supported by SAP JVM 5 and 6 versions as well as for Java 5, 6, and 7 Standard Editions of the corresponding platform vendor. You should use the SAP JVM 5 or 6, because it adds further diagnostic support features and it is also not subject to the end-ofmaintenance restrictions of the JVMs of other vendors.

The JCo 3.0 release is supported for the operating systems mentioned in the following link (SAP Note #1077727) in combination with the SAP JVM 5 or Java 5 Standard Edition of the corresponding platform vendor.

SAP R/3 does not support the particular JVM if that is not included in the list of supported JVMs.

Generally a new patch level is downwards compatible to the previous patch levels of the same release. So the files of an old JCo 3.0 installation may simply be replaced with the latest ones. SAP JCo 3.0 is replacing SAP JCo 2.0 and SAP JCo 2.1 and is released for Java 5, 6, and 7 version.

SAP JCo 3 with combination of SAP JVM 5/6 or JAVA 5/6 supports 64 and 32 bit operating system. From SAP JCo 3 onwards, it does not support 32 bit UNIX system.

4.2 Performance

This section describes the Connection configuration in detail like Connection pooling and thread related management and caching of metadata for faster performance.

4.2.1 Connection Management

SAP JCo 3 initiate many useful changes in Connection Management rather than just creating direct connections to the SAP system. SAP JCo provides connection pooling and thread related management. This Pool is managed by JCo; JCo is responsible for creating and removing connections from pool. This improves JCo throughput performance.

This allows reusing of connections without having to go through the expensive logon process again. If a connection that is not part of the internal array is returned to the pool. (This is only possible if maximum connection is larger than maximum pool size).

Make connection peak limit large enough so that the limit is never reached. An exception to this would be the small pools used for individual named user. Here a small maximum connection is a suitable way to ensure that the same user does not have an inordinate number of sessions with the SAP system.

4.2.2 Connection Pooling

In SAP JCo 3.0, the connection setup is no longer implemented explicitly using a single or pooled connection, Instead the type of connection is determined only by the connection properties (properties) that define a single or pooled connection implicitly. Besides making direct connection, you can use pool connection to make it available instead of creating a connection every time. There is a limit to the maximum number of connections that can be active in pool and their timeout in JCo Destination connection parameters. Below are the parameters that are defined to configure connection pool, as shown in Figure 4-1.

Edit SAP R/3 Connection	×
Connection Name: DefaultClient	Import
User Connection Management	
Connection Management Parameters: (Optional)	
Pool Capacity:	
Pe <u>a</u> k Limit:	
Max Wait (ms):	
Expiration Time (ms):	
Expiration Period (ms):	
Server Security Trace Management Additional	Test Connection
	•
Help	OK Cancel

Figure 4-1 Management Tab

Table 4-1 lists and describes the JCo parameters used in connection management.

Table 4-1 JCo Parameters

Parameter	Description
jco.destination.peak_limit	Maximum number of active connections that can be created for a destination simultaneously.
jco.destination.pool_capacity	Maximum number of idle connections kept open by the destination. A value of 0 has the effect that there is no connection pooling that is connections will be closed after each request.
jco.destination.expiration_time	Time in milliseconds after that the connections hold by the internal pool can be closed.
jco.destination.expiration_chec k_period	Interval in milliseconds with which the timeout checker thread checks the connections in the pool for expiration.
jco.destination.max_get_client_ time	Maximum time in milliseconds to wait for a connection, if the maximum allowed number of connections is allocated by the application.

Note: The Management tab is not supported for the current release, it will be introduced in the future releases.nline BAPIs(which call SAP screens) were not supported by Adapter for SAP.

4.2.3 Caching of Metadata

SAP Java connector API cache repository metadata into local cache to avoid number of calls to the SAP system. This feature improves performance of SAP JCo. Metadata for functions and parameters will be fetched at the first request and will be stored in the repository cache. SAP JCo 3 handles object caching itself and hence the developers do not need to take care of that. API provides some method to clear cached metadata.

4.3 RFC Server Threads

SAP JCo 3.0 provides RFC Server module that helps to run an RFC function module on non-SAP system. The SAP ABAP program can invoke this function module. These java programs register using a program ID in SAP R/3 Gateway using server threads.

After connection, these RFC programs wait for incoming calls from the SAP system. Server threads listen for any incoming messages from the SAP system on a particular program ID. For this, the program ID should be registered with the SAP system. If RFC Connection once interrupted, JCo server automatically registers itself again with the SAP Gateway.

Configuration parameters can be used to make the throughput more efficient. This configuration can be changed in the Adapter through the WebLogic console.

If program ID with the same name is registered multiple times from different RFC servers, IDoc sent on that program ID from SAP system get transferred to one of the registered RFC server based on default **Load Balancing** scenarios. You can modify load balancing scenario based on your requirement. For modification, consult with your SAP system administrator.

4.4 Trace Level Parameter

SAP JCo 3 uses the RFC and CPIC API. Traces generated by these components include JCo API calls, RFC traces, and CPIC traces. You can trace JCo API calls by enabling the JCo traces and setting the appropriate trace level in the Adapter configuration.

The trace level property specifies the level of detail in the traces produced by JCo. The amount of trace data increases with trace level, and each level contains all of the trace data from the lower levels. If you choose one of the higher trace levels, you need to ensure that you have enough free disk space available.

SAP JCo 3 provides trace configuration to trace information. JCo 3 defines parameters for different type of logging. *jco.client.trace* parameter is used to define logging level for RFC logs. Possible values are 0 (disable) or 1(enable). *jco.client.cpic_trace* parameter is used for CPIC trace logs. Possible values for CPIC trace is given in Table 4-2.

Parameter	Description
-1 0	Take over environment value No trace
1	Errors
2	Errors and warnings

Table 4-2 CPIC Trace Value

3 Info messages, errors and warnin	ıgs
------------------------------------	-----

jco.server.trace parameter is used for JCo RFC Server level logging. Possible values are 0 (enable), 1 (disable).

dev_jrfc.trc is always created when an RFC error occurs, even if traces are turned off.

JCo tracing can be turned on using *jco.trace_level* property as an environment variable. This enables logging for all API and communication happening in JCo. Possible values and their description are given in Table 4-3.

Parameter Description 0 Nothing 1 Errors 2 Errors and warnings 3 Info messages, errors and warnings 4 Execution path, info messages, errors and warnings 5 Verbose execution path, info messages, errors and warnings 6 Verbose execution path, limited data dumps, info messages, errors and warnings 7 Full execution path, data dumps with metadata, verbose info messages, errors and warnings 8 Full execution path, full data dumps with metadata, verbose info messages, errors and warnings

Table 4-3 JCo Trace Value

Note that the trace file can be find at {jdev_home}\jdev\bin.

4.5 JCo Supported SAP Data types

The Adapter for SAP allows all JCo supported SAP data types that can be used in data exchange between SOA composites and SAP applications. Table 4-4 shows the mapping between basic ABAP data types used in SAP application and JCo java data types.

ABAP Type	Description	Data Type
С	Character	String
Ν	Numerical Character	String
Х	Binary Data	Byte ()
Р	Binary Coded Decimal	Big Decimal
Ι	4-byte Integer	Int
В	1-byte Integer	Int
S	2-byte Integer	Int
F	Float	Double
D	Date	Date
Т	Time	Date
decfloat16	Decimal floating point 8 bytes (IEEE 754r)	BigDecimal
decfloat34	Decimal floating point 16 bytes (IEEE 754r)	BigDecimal

Table 4-4Mapping between basic ABAP data types used in SAP application andJCo java data types

G	String (variable length)	String
Y	Raw String (variable length)	Byte ()

Additional ABAP data types are handled as follows:

- Type h (Hierarchical) supported, as JCo tables.
- Nested supported, record within record.
- Deep supported, if referenced type is supported.

Oracle Adapter for SAP Features

12.1.3 Release provides new features for the Oracle Adapter for SAP, which is described in this chapter. This chapter contains the following sections:

- Section 5.1, "tRFC/qRFC Support"
- Section 5.2, "Design-Time Test Functionality"
- Section 5.3, "Exception Filter"
- Section 5.4, "Schema Validation"
- Section 5.5, "AutoSYSTAT Feature for IDoc RFC"
- Section 5.6, "Encode IDoc"
- Section 5.7, "Generic IDoc Support"
- Section 5.8, "Revision IDoc Support"
- Section 5.9, "Sharing Program ID Feature"
- Section 5.10, "Multiple IDoc Support"
- Section 5.11, "Credential Mapping for Oracle SOA Suite (BPEL, Mediator, BPM or OSB)"
- Section 5.12, "Stateful/Stateless Interaction"
- Section 5.13, "Error Handling"
- Section 5.14, "SOA Debugger Support"

5.1 tRFC/qRFC Support

These are the SAP communication methods which are supported by the Adapter for SAP in the outbound processing.

Transactional RFC (tRFC): This is an asynchronous communication method that manages to execute the called function in the target system only once. The listener to the port need not to be available at the time when the RFC client program SAP is executing a tRFC. The tRFC component stores the called RFC function together with the corresponding data, in the SAP database under a unique transaction ID (TID).

Queued RFC (qRFC): This is also an asynchronous communication method which guarantees that multiple requests are processed in the order, specified by the sender. tRFC can be serialized using queues (inbound and outbound queues). In simple, the tRFC requests which are serialized using the inbound/outbound queues in SAP, are called queued RFC

(qRFC). qRFC is therefore an extension of tRFC. It processes and request only if it has no predecessors in the same queue. You can use qRFC if requirement is to guarantee that several requests are processed in a defined order. This section provides the details of modeling and testing of an endpoint in the tRFC/qRFC communication method as mentioned below:

- Modeling the tRFC SAP Endpoint
- Testing the tRFC SAP Endpoint
- Modeling the qRFC SAP Endpoint
- Testing the qRFC SAP Endpoint

5.1.1 Modeling the tRFC SAP Endpoint:

- 1. To create a tRFC SAP Endpoint, create an outbound RFC project. (For more information, refer to the section "Design an Outbound BPEL Process").
- 2. In the Object Selection page, right-click on any RFC and then click on Select, as shown in Figure 5-1.

The selected RFC appears in the Select BAPI/RFC functions or IDOC messages area.



idapter Configuration Wiza iject Se <mark>lection</mark>	rd - Step 3 of 4		0101010101010101	*19191919191	*
Select SAP objects, BAPI, RFC,	or IDoc, to retrieve and de:	scribe	Selected BADI/DEC	functions	or IDOC messages
	FLOW	> >> <<	Definition: ZZ_FLC	UST_CHAN(55
Image: Constraint of the second se	CUST_CHANGE Ch T_CHANGE_NEW (CUST_CHECKPASSW) CUST_CREATEFROMI CUST_CHANGEPASS CUST_CHANGEPASS CUST_ENABLEWEBUS Select View Schema		Name CUSTOMERNU CUSTOMER_DA CUSTOMER_DA EXTENSION_IN EXTENSION_OUT RETURN	Type NUM STRUCT STRUCT TABLE TABLE TABLE	Description Customer number Customer data BAPI Customer Import custom Export custom Return Messages
Help	Test		Next >	Einish	Cancel

3. Right-click on the selected RFC and select RFC Options, as shown in Figure 5-2.

Adapter Configuration Wizard - Step 3 of 4	
oject Se <mark>lection</mark>	0101010101010101010101010
Select SAP objects, BAPI, RFC, or IDoc, to retrieve ar	nd describe.
Hierarchical Alphabetical	Selected BAPI/RFC functions or IDOC message
🕀 💼 ZMES 🔮	🔪 🔌 🥵 ZZ_FLCUST_CHANGE Change Flight Cus
🕀 🖆 ZMHO	RFC Options
E 2MMASTER_WORKFLOW	
Demos ZMX_PHARMA	8
E ZODI_LKM_PCKG	
E ZODI_RKM_PCKG	45
I ZOEM_PCKG	
	Definition, 77 ELCUST, CHANCE
	Dennidon, 22_1 CCOT_CHANGE
	Name Type Description
	CUSTOMERNU NUM Customer number
	CUSTOMER_DA STRUCT Customer data
	CUSTOMER_DA STRUCT BAPI Customer
	EXTENSION_IN TABLE Import custom.
	DETLIDN TABLE EXPORT CUSTOM
Ending 22_FCC051_CHANGE Chang	RETORN TABLE Recontinessage

The Configure RFC Option window appears.

- 4. Select the **tRFC** radio button, as shown in Figure 5-3.
- 5. Click OK.

Figure 5-3 Configure RFC Option

onfigure RFC Options	5			×
 RFC (synchronous) tRFC (transactional) qRFC (queued) 	Queue Name:	OSAQUEUE		
<u>H</u> elp			ОК	Cancel

6. Click Finish.

The jca file of the project looks like as shown in Figure 5-4.

Figure 5-4 JCA File



5.1.2 Testing the tRFC SAP Endpoint

- 1. Deploy project. (For more information, refer to the section "Deploy the Defined Process").
- **2.** Test deployed the project by sending the request messages while providing a TID value, as shown in Figure 5-5.

Figure 5-5 tRFC Endpoint

3. Make sure the TID value provided, is unique every time a new request is sent to SAP, else the RFC execution will not happen.

5.1.3 Modeling the qRFC SAP Endpoint

1. To create a qRFC SAP Endpoint, create an outbound RFC project. (For more information, refer to the section "Design an Outbound BPEL Process").

2. In the **Object Selection** page, right-click on any RFC and then click on **Select**, as shown in Figure 5-6.

The selected RFC appears in the **Selected BAPI/RFC functions or IDOC messages** area.

gure 5-6 Object Select	tion Page				
Adapter Configuration Wize	ard - Step 3 of 4				
oject Selection			010101010101010	19393939353	*
Select SAP objects, BAPI, RFC,	, or IDoc, to retrieve and des	scribe. -			
Hierarchical Alphabetical		S	elected BAPI/RF	C functions (or IDOC messages:
🕀 🖆 ZMES		>			
🗈 🗀 ZMHO		s			
🗄 🙆 ZMMASTER_WOR	KFLOW				
🕀 🗀 ZMX_PHARMA	<	3			
E CODI_LKM_PCKG		22			
🗄 🗀 ZODI_RKM_PCKG		\$5			
E ZODIBW_PCKG					
E ZOEM_PCKG		L			
ZPACK			- C:-: L: 77 EI/	UCT CHANK	
	USTOMER		Perinicion: 22_FLC		3C
E CEAPI_FL	CUST_CHANGE Ch	r	Vame	Туре	Description
	SI_CHANGE_NEW (EUSTOMERNU	NUM	Customer number
E CBAPI_FL	CUST_CHECKPASSWI	0	EUSTOMER_DA	. STRUCT	Customer data
E CBAPI_FL			EUSTOMER_DA	. STRUCT	BAPI Customer
E CBAPI_FL	CUST_CHANGEPASS	E	EXTENSION_IN	TABLE	Import custom
E CBAPI_FL		E	EXTENSION_OUT	TABLE	Export custom
	Select	F	RETORN	TABLE	Return Messages
	View Schema	L			

3. Right-click on the selected RFC and select RFC Options, as shown in Figure 5-7.

Oracle Adapter for SAP Features 5-5



The Configure RFC Options window appears.

- 4. Select the **qRFC** radio button, as shown in Figure 5-8.
- **5.** Enter the queue name in the **Queue Name** field. This queue should exist in the SAP system.
- 6. Click OK.

Figure 5-8 Configure RFC Option

👩 Configure RFC Options	;			×
 RFC (synchronous) tRFC (transactional) qRFC (queued) 	Queue Name:	OSAQUEUE		
Help			ОК	Cancel

7. Click Finish.

The jca file of the project looks like as shown in Figure 5-9.





5.1.4 Testing the qRFC SAP Endpoint

- **1.** Deploy project. (For more information, refer to the section "Deploy the Defined Process").
- **2.** Test deployed the project by sending the request messages while providing a TID value, as shown in Figure 5-10.

Figure 5-10 Test qRFC Endpoint



- **3.** Make sure that the TID value provided is unique every time a new request is sent to SAP, else the RFC execution will not happen.
- **4.** The request message can be seen in the SAP queue with SMQ2 tcode, as shown in Figure 5-11.

Figure 5-11 qRFC Monitor



5.2 Design-Time Test Functionality

The design-time test functionality, available in Adapter, is used to test any SAP object in the design-time itself. It returns the result of the execution in the Adapter wizard. This feature is applicable only for outbound testing of RFC and BAPI objects, but not for IDocs.

5.2.1 Using the Design-Time Test Functionality

1. On **Object Selection** page in the Adapter Configuration Wizard, right-click on any objects (BAPI/RFC) and then click **Test** button, as shown in Figure 5-12.

🍘 Adapter Configuration Wizard - Step 3 of 4	E	×
Object Selection		
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and describe Hierarchical Alphabetical Cross-Application Components Customer Service Customer Service Select View Schema	e. Selected BAPI/RFC functions or IDOC messages: BusinessArea.GetDetail [BAPI_BUSINESSARE BusinessArea.GetDetail [BAPI_BUSINESSARE Definition: GetDetail Name Type Description BUSINESSAREAID CHAR Business area LANGUAGE CHAR Language LANGUAGE_ISO CHAR Language acco BUSINESSAREA STRUCT Business area RETURN STRUCT Return code	
Help	Next > Einish Cancel	

Figure 5-12 Adapter Configuration Wizard

2. Provide the necessary inputs and click **Run Test** button, as shown in Figure 5-13.

Name	Value	Description
(🖗 CotDotoil	Value	Business Aven Details
	1500	Business Area Decails
	1500 F	
	F	Language according to IS.

Figure 5-13 Test Dialog

This shows result of the BAPI/RFC executed, as shown in Figure 5-14.

Figure 5-14 Test Output

Test SAP RFC/BAPI Method	
Test Input Test Output	
xml version = '1.0' encoding = 'UTF-8' standalone = 'yes'?	
<bapi_businessarea_getdetail></bapi_businessarea_getdetail>	
<input/>	
<businessareaid>1500</businessareaid>	
<businessarea detail=""></businessarea>	
<pre><bus area="">1500</bus></pre>	
<pre><bus ar="" des="">Consumer Products: Food</bus></pre>	
<cons_ba>1500</cons_ba>	
<return></return>	
<type></type>	
<code></code>	
<message></message>	
<message_v1></message_v1>	
<pre><message_v2></message_v2> <message_v3></message_v3></pre>	_
Help Run Test	Done

The BAPIs which takes structure or table as an input , needs to follow the below steps to run the design time functionality test.

Figure 5-15 Result Dialog

Adapter Configuration Wizard	- Step 3 of 4				×
Object Selection			01010101010101010	19898989	*
Select SAP objects, BAPI, RFC, or	IDoc, to retrieve and o	describ	е.		
Hierarchical Alphabetical			Selected BAPI/RF	C functions	or IDOC messages:
SAOA	*	>			
I SAOI		8			
I SAOM					
I SAOP		8			
SAP_CATT_ALE					
SAPBC_BOR	SAPBC_BOR				
SAPBC_GLOBAL					
SAPBC_IBF_SBOOK					
SAPBC_IBF_SCUSTOMER			Definition: BAPI_F	LCUST_CR	EATEFROMDATA
SAPBC_BAPI_SCUSTOMER	SAPBC_BAPI_SCUSTOMER		Name	Type	Description
	Determine List		CUSTOMER D	STRUCT	. Customer data
	ASSWORD Chec		TEST_RUN	CHAR	Switch to simul
	- Change Elight (CUSTOMERNU	NUM	Customer Number
			EXTENSION_IN	TABLE	Import custom
			RETURN	TABLE	Return Messages
	Select	1			
	View Schema				
Help	Test		<u>N</u> ext >	<u>F</u> inish	Cancel

Right-click on the CUSTOMER_DATA , click on $\ensuremath{\textbf{Expand}}$ to expand the structure.

Name		Value	Description
C BAPI_FLCUST	CREATEFROMDATA	Create N	Create New Flight Customer
SUSTOM			Customer data
■ TEST_RL	Expand		Switch to simulation mode
EXTENSI	Add Row		Import customer enhancem
🗞 RETURN	Remove		Return Messages

Figure 5-16 Result Dialog

Now give the required input as mentioned below , then Click on $\ensuremath{\textbf{Run Test}}$ button.

Test Input			
Name	Value	Description	
C BAPI FICUST C	REATE	Create New Flight	Custo 🔺
	DATA	Customer data	
	ME 1234	Customer name	
FORM		Form of address	
STREET		Street	
		PO Box	
POSTCO	DDE	Postal Code	
		City	
	ર	Country Indic.	
	R_ISO	ISO country code	
REGION	I	Region	
PHONE		Telephone numbe	r of fli
EMAIL		Customer e-mail a	ddress
	PE	Customer type	
DISCOU	INT	Discount rate	
LANGU		Language Key	
LANGU_	ISO	ISO language cod	e
Help		Run Test	Done

Figure 5-17 Test Input

5.3 Exception Filter

The Adapter for SAP provides a JCA interaction spec property, "ExceptionFilter", to enable the adapter to filter outbound exceptions using an exception filter class. A default implementation, *oracle.tip.adapter.sap.exception.SAPExceptionFilter*, is included with the Adapter for SAP. It filters the JCO exceptions into PCRetriableResourceException (a remote fault) or PCResourceException (a binding fault), supported by the Oracle Fault handling and rejection framework. The default exception filter can be replaced with a custom filter by changing the className attribute of <exception-filter> element in the generated JCA file.

5.3.1 Create an Exception Filter Project

Perform the following steps to create an SAP Endpoint with Exception Filter feature:

1. Create an outbound BAPI/RFC/IDoc endpoint using the Adapter for SAP.

(For more information, refer to the section "Configure the Adapter Component" under BPEL Outbound Process)

2. Set "ExceptionFilter" property to on in the JCA Properties page, as shown in Figure 5-18.

Figure 5-18 Exception Filter Property

🍘 Adapter Configuration Wizard - Ste	p 4 of 5		×
JCA Properties		0101010101010101010404040105555	*
Specify the Name and Value of all JCA Ada	oter Properties.		
Properties			×
Name	Value		
Interaction	stateless		
ExceptionFilter	on .		
SchemaValidation	off		
jca.retry.count	9		
jca.retry.interval	1		
jca.retry.backoff	2		
jca.retry.maxInterval	120		
Help	< <u>B</u> ack <u>N</u> e	ext > Einish	Cancel

5.3.2 Testing the Exception Filter Project

Remote Fault: PCRetriableResource Exception

To test the Exception Filter Project:

- 1. Deploy the project with exception filter **on**. (For more information, refer to the section "Deploy the Defined Process").
- **2.** Simulate an exception by disconnecting the WebLogic server from SAP, for example, lock the SAP user.
- 3. Execute the outbound project.
- 4. The output fails with an error message.
- 5. Check the SOA server diagnostic log.

It contains an exception as given below and shown in Figure 5-19.

```
oracle.tip.adapter.sap.exception.SAPExceptionFilter@301155b3.a
pplyFilter(): javax.resource.ResourceException:
    com.sap.conn.jco.JCoException: (103) JCO_ERROR_LOGON_FAILURE:
    User is locked. Please notify the person responsible on
    10.30.32.42 sysnr 00 linked to class
    com.sap.conn.jco.JCoException wrapped with
    oracle.tip.adapter.api.exception.PCRetriableResourceException
```

Figure 5-19 SOA Server Diagnostic Log Screen

Proot@JCADEV2:/oracle/stage9/Middleware/user_projects/domains/soa_domain/servers/soa_server1/logs
ap] [tid: [ACTIVE].ExecuteThread: '5' for queue: 'weblogic.kerne
tuning)'] [userId: <anonymous>] [ecid: 61423db6-eccf-4297-90c4-(</anonymous>
bad8,0] [APP: soa-infra] [J2EE_APP.name: soa-infra] [J2EE_MODUL
WEBSERVICE.name: bpelprocess1_client_ep] [WEBSERVICE_PORT.name:
racle.soa.tracking.FlowId: 1806838] [oracle.soa.tracking.Instand
racle.soa.tracking.SCAEntityId: 80028] [oracle.soa.tracking.Faul
<pre>posite_name: EXFILTER_RETRY!1.0] [FlowId: 0000KC9Px1CFS8w_wDp2iv</pre>
acle.tip.adapter.sap.exception.SAPExceptionFilter@15243067.apply
resource.ResourceException: com.sap.conn.jco.JCoException: (103)
_FAILURE: User is locked. Please notify the person responsible of
nr 90 linked to class com.sap.conn.jco.JCoException wrapped with
ter.api.exception.PCRetriableResourceException
[2013-12-19T11:24:52.452+05:30] [soa_server1] [ERROR] [] [oracle
id: [ACTIVE].ExecuteThread: '5' for queue: 'weblogic.kernel.Defa
)'] [userId: <anonymous>] [ecid: 61423db6-eccf-4297-90c4-0c8d03d</anonymous>
] [APP: soa-infra] [J2EE_APP.name: soa-infra] [J2EE_MODULE.name
VICE.name: bpelprocess1 client epl [WEBSERVICE PORT.name: EXFIL

This confirms that the exception has been captured.

Binding Fault: PCResource Exception

To test the Exception Filter Project:

- 1. Create an outbound endpoint for the RFC object BAPI_MATERIAL_GET_DETAIL, exposed as a proxy service.
- **2.** Deploy the project with exception filter **on**. (For more information, refer to the section "Deploy the Defined Process").
- 3. Execute the outbound project.
- 4. The output fails with an error message.

5. Check the SOA server diagnostic log, as shown in Figure 5-20.

Figure 5-20 SOA Server Diagnostic Log Screen

teThread: '75' for queue: 'weblogic.kernel.Default (self
00cd575,0:2] [APP: soa-infra] [J2EE_APP.name: soa-infra]
<pre>ICE_PORT.name: sapReference_PT_pt] [oracle.soa.tracking.</pre>
AEntityId: 70034] [composite_name: SOA_RFC!1.0] [FlowId:
tionFilter@3a2cc38.applyFilter(): javax.resource.Resourc
material 1234 does not exist or is not activated linked
ception.PCResourceException
soa_ser .cr1 diagnostic 16.1c g:[2013-12-27T06:35:35.614+0
teThread: '189' for queue: 'weblogic.kernel.Default (sel
000cd5cc,0:2] [APP: soa-infra] [J2EE_APP.name: soa-infra
VICE DORT name. sanReference DT ntl [oracle soa tracking

Testing RetryCount Property of the Adapter

Deploy the project with the property jca.retry.count in the JCA Properties page of the Adapter wizard set to the number of times you want the Adapter for SAP to try and connect to SAP. For example, jca.retry.count = 9, as shown in Figure 5-21.
 Figure 5-21 JCA Properties Page

Adapter Configuration Wizard - S ICA Prop <mark>erties</mark>	Step 4 of 5	×
Specify the Name and Value of all JCA Ad	dapter Properties.	
Properties		×
Name	Value	
Interaction	stateless	
ExceptionFilter	on	
5chemaValidation	off	
ca.retry.interval	1	
ca.retry.maxInterval	120	
ca.retry.count	9	
jca.retry.backoff	2	

- **2.** Simulate an exception by disconnecting the WebLogic server from the SAP, for example, lock the SAP user.
- **3.** Execute the outbound project.
- 4. The output fails with an error message.

5. Check the SOA server diagnostic log.

It will show that Adapter for SAP is retrying about 9 times as there will be entries like:

- Waiting 1 second before retry #1
- Waiting 1 second before retry #2
- Waiting 4 seconds before retry #3 And so on, as shown in Figure 5-22.

Figure 5-22 SOA Server Diagnostic Log Screen

pelprocessi_client_epj [webservice_PORT.name: EXFLLT_PT_pt] [
.ng.FlowId: 1806838] [oracle.soa.tracking.InstanceId: 5290530] [
<pre>ing.SCAEntityId: 80028] [oracle.soa.tracking.FaultId: 40009] [co</pre>
<pre>FILTER_RETRY!1.0] [FlowId: 0000KC9Px1CFS8w_wDp2iW1Ig07q0001ew] J</pre>
ILTER RETRY:EXFILT [EXFILT PT::BAPI COMPANYCODE GETDETAIL(param
] Waiting 64 seconds before retry #7

If while retrying, the WebLogic server is connected to SAP again by unlocking the user then there will be no more retry entries in the diagnostic log and the result of the execution will be received successfully.

Note: Manual editing of JCA properties file (.jca file) to change the value of Exception Filter property from "**on**" to "**off**" or vice-versa is not supported and the changes will not be reflected.

5.4 Schema Validation

The SchemaValidation property is used to validate the input xml during run-time execution against the xsd created for the SAP Object. You need to set the property SchemaValidation in the **JCA Properties** page to "**on**", so that the input xml is validated before sending a request. If this property is not in compliance to xsd, you will get an error message.

5.4.1 Create a Project with Schema Validation:

- 1. Create an outbound project. (For more information, refer to the section "Configure the Adapter Component" under BPEL Outbound Process)
- 2. Set the SchemaValidation property in JCA Properties page to "on", as shown in Figure 5-23.

Adapter Configuration Wizard	l - Step 4 of 5	K
JCA Properties		*
Specify the Name and Value of all JC	A Adapter Properties.	
Properties		
Name	Value	
Interaction	stateless	
ExceptionFilter	off	
ichemaValidation	on	
ca.retry.count	9	
ca.retry.interval	1	
ca.retry.backoff	2	
ca.retry.maxInterval	120	
Help	< <u>B</u> ack <u>N</u> ext > Einish	Cancel

Figure 5-23 Schema Validation Property

3. Click Next and then Finish.

5.4.2 Testing the Schema Validation Project:

- 1. Deploy the project having schema validation on. (For more information, refer to the section "Deploy the Defined Process").
- 2. Enter any invalid payload input xml.
- 3. It will then give the error message as given below:

<faultcode>env:Server</faultcode>

<faultstring>Exception occurred when binding was invoked.

Exception occurred during invocation of JCA binding: "JCA Binding execute of Reference operation 'HOLIDAY_CHECK_AND_GET_INFO' failed due to: javax.resource.ResourceException: Invalid Input XML".

The invoked JCA adapter raised a resource exception.

Please examine the above error message carefully to determine aresolution.</faultstring>

```
<faultactor/>
<detail>
<exception>Invalid Input XML</exception>
</detail>
</env:Fault>
</env:Body>
</env:Envelope>
```

5.5 AutoSYSTAT Feature for IDoc RFC

The Adapter for SAP is able to send SYSTAT01 upon a successful reception of an IDoc message. For this, the AutoSYSTAT01 property in the **JCA Properties** page must be set to "**yes**". The Adapter for SAP is able to auto return SYSTAT01, based on the successful message receiving status in SAP.

5.5.1 Creating a Project with AutoSYSTAT01 Property

- 1. Create Inbound Endpoint for IDOC. For more information, refer to the section "Design an Inbound BPEL Process".
- 2. In the JCA Properties page, set the AutoSYSTAT01 property to "yes", as shown in Figure 5-24.

Adapter Configuration Wizard - S	ep 4 of 5 🛛 🔀
JCA Prop <mark>erties</mark>	010101010101010101010101010
Specify the Name and Value of all JCA Ac	apter Properties.
Properties	수 🗙
Name	Value
AutoSYSTAT01	yes
EncodeIDOC	flatfile
ProgramID	
jca.retry.count	9
jca.retry.interval	1
jca.retry.backoff	2
jca.retry.maxInterval	120
Help	< <u>B</u> ack <u>N</u> ext > Einish Cancel

Figure 5-24 AutoSystat Property

3. Complete the project.

5.5.2 Test the Project with AutoSystat Property

- 1. Deploy the project with AutoSystat property set to "yes". (For more information, refer to the section "Deploy the Defined Process").
- **2.** Send an IDoc from SAP. For example, a COSMAS IDoc sent through BD16 tcode, as shown in Figure 5-25.

Figure 5-25 Send Co	ost Center				
Send cost cen	ter				
Ø			日日 日日 日日	****	💥 🗾 🕐 ⊑
Send cost cen	ter				
•					
Controlling area		1000	to		•
Cost center		3040	to		-
Message type		COSMAS			
Target system		ORACLESAP			
Parallel processing	/				
Server group					
Cost centers per pr	DCess	20			

- **3.** Navigate to tcode WE02 of SAP.
- **4.** It will show the status IDoc coming from the Adapter as an acknowledgement of receiving the COSMAS IDoc, as shown in Figure 5-26.

Figure 5-26 SAP IDoc Display

SAP SAP				
		_		
IDoc display 🕞 🔂 IDoc 000000000857171			Technical short in	fo
Control Rec.	Total r		Direction Current status	2 Inbox 53 CO
Status records			Basic type	SYSTATO1
			Extension	
			Partner No.	ORACLESAP
			Partn.Type	LS
			Port	A00000068
			Content of selected	i segment
			Fld name Fld con	t.
				T

5.6 Encode IDoc

SAP uses a non-XML text-based format, called 'flat file IDoc format' for serializing IDoc messages to/from the file system. In a flat-file IDoc, all IDoc records including control and data are stored in lines of text separated by a line delimiter.

In SAP, file-based RFC destinations are used to read/write flat file IDoc. Oracle Adapter for SAP provides support for accepting flat file IDoc from non-JCO based input streams, e.g., file system. This feature helps in the integration scenarios where SAP or third-party generated flat file IDoc are used for inbound/outbound data.

For receiving IDocs in flat file format from SAP, you have to set the **encodeIDOC** property in the **JCA Properties** page.

5.6.1 Create a Project for Flat File IDoc

- 1. Create an Inbound Endpoint for IDoc. For more information, refer to the section "Design an Inbound BPEL Process" A file adapter can be used to receive the IDoc in flat file format.
- 2. In the JCA Properties page set the EncodeIDOC property to flatfile, as shown in Figure 5-27.

Adapter Configuration Wizard - Step 4 of 5	×
JCA Properties	010101010101010101010101010
Specify the Name and Value of all JCA Adapter Propert	ies.
Properties	수 ※
Name	Value
AutoSYSTAT01	no
EncodeIDOC	flatfile
ControlCharacter	encode
ProgramID	ORAQA1
jca.retry.count	9
jca.retry.interval	1
jca.retry.backoff	2
jca.retry.maxInterval	120
Help < Back	Cancel

Figure 5-27 Encode IDoc

3. Click Next and then Finish.

5.6.2 Test the Flat File IDoc Project

- 1. Deploy the project. For more information, refer to the section "Deploy the Defined Process".
- **2.** Test deployed project by sending an IDoc from SAP, for example, a MATMAS IDoc can be sent from BD10 tcode of SAP, as shown in Figure 5-28.

Figure 5-28 Send Material

Send Material				
		3 68 68 1 冬	8996	💥 🗾 I 🕜 🖬
Send Material				
🕀 🔁 🖬				
Material	40-110C	to		•
Class		to		.
Message Type (Standard)	MATMAS			
Logical system	ORACLESAP			
Send material in full				
Parallel processing				
Server group				
Number of materials per proces	20			

3. Check the received file. It will be in a flatfile format instead of XML, as shown in Figure 5-29.

Figure 5-29 FlatFile Format

EDI_DC SAPHR9	8000000	00000063	2750620	30MATMAS0	11FILEP(ORTJ I	LSORACLESAP				
LST90CLN1	090										
E2MARAMOO EA	58000000	00000063	27500000	01E2MARAM	0050000	00020	005MB03		200310	02BII	NS
LBR1.000		FTQ	0001		0	0	0.000				
0.000		0.000		0.00.0	0	0		0	0	0	
000000000	0000000										
0.0										в	
E2MAKTM00	18000000	00000063	27500000	02E2MAKTM	0010000	01030	0051ANNE KLEIN	(MAXWE	LL) t?	ZH	
E2MAKTM00	18000000	00000063	27500000	03E2MAKTM	0010000	01030	0053Toothpaste	(CaD)			
E2MAKTM00	18000000	00000063	27500000	04E2MAKTM	0010000	01030	0056S40 (Euro)				
E2MAKTM00	18000000	00000063	27500000	05E2MAKTM	0010000	01030	0057 900 MHz Wi	reless	Telep	hone	
E2MAKTM00	18000000	00000063	27500000	06E2MAKTM	0010000	01030	0058Watches & F	J			
E2MAKTM00	18000000	00000063	27500000	07E2MAKTM	0010000	01030	0059Alarms - Ar	go			
E2MAKTM00	18000000	00000063	27500000	08E2MAKTM	0010000	01030	005AFoodSaver V	ac 107	5 (Til	ia)	
E2MAKTM00	18000000	00000063	27500000	09E2MAKTM	0010000	01030	005BPT15 P-to	uch			
E2MAKTM00	18000000	00000063	27500000	10E2MAKTM	0010000	01030	005DLucent Fibe	rs (T	hor La	bs)	
E2MAKTM00	18000000	00000063	27500000	11E2MAKTM	0010000	01030	005EMAB Product	3			
E2MAKTM00	18000000	00000063	27500000	12E2MAKTM	0010000	01030	005FDasani (Cok	e)			
E2MAKTM00	18000000	00000063	27500000	13E2MAKTM	0010000	01030	005IPorcelain (Mannin	gton)		
E2MAKTM00	18000000	00000063	27500000	14E2MAKTM	0010000	01030	005JCore Switch	ing (L	ucent)		
E2MAKTM00	18000000	00000063	27500000	15E2MAKTM	0010000	01030	005K014795 R&W	BEEF N	OODLE	0.25	
E2MAKTM00	18000000	00000063	27500000	16E2MAKTM	0010000	01030	005NBacardi Lig	ht 75	Oml (c	harm	er
E2MAKTM00	18000000	00000063	27500000	17E2MAKTM	0010000	01030	005SMedig - ACS				
E2MAKTM00	18000000	00000063	27500000	18E2MAKTM	0010000	01030	005UWound Care	(J&J)			
E2MAKTM00	18000000	00000063	27500000	19E2MAKTM	0010000	01030	005WConsulting	(Novad	ligm)		
E2MAKTM00	18000000	00000063	27500000	20E2MAKTM	0010000	01030	005aLIds				
E2MAKTM00	18000000	00000063	27500000	21E2MAKTM	0010000	01030	005bSingulair	(Merck	:)		
E2MAKTM00	18000000	00000063	27500000	22E2MAKTM	0010000	01030	005cIndustrial	(Aceto)		
E2MARCM00	48000000	00000063	27500000	23E2MARCM	0040000	01030	0053000VEB		M	AB	
0.000	0.0	000	0		00000	000			0	.00	0
0.0	00000000	0.0	0 0.000)	0.00						
0		000001								000	00

5.7 Generic IDoc Support

The Adapter for SAP provides a generic IDoc message type to enables you to receive\send different native IDoc message type of SAP system by selecting single message type GENRIC_IDOC in design-time of the Adapter. For GENERIC_IDOC support, Adapter for SAP creates schema structure with element type "anyType", as shown in Figure 5-30.

Figure 5-30 Schema Structure with Element Type

This feature enables dynamic run-time changes on the content of IDoc message type at the SAP server without requiring to re-deploy/re-configure the SOA project. The downstream processing function can cast the IDoc message and processor can route it according to the correct IDoc message type.

Note: In case you are directly using the standard IDOCs and not as a GENERIC IDOC message type, any structure changes to the IDOC will need a re-configure/re-deployment of the SOA project to take effect.

5.7.1 Create Generic IDoc Inbound Endpoint

- Create Inbound Endpoint for IDoc. For more information, refer to the section "Design an Inbound BPEL Process for BAPI/RFC/IDOC" A file adapter can be used to receive the IDoc.
- 2. In the **Object Selection** page of the Adapter wizard, select **Generic IDOC**, as shown in Figure 5-31.

oject selection	010101010101010101010101010101010
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and de Hierarchical Alphabetical	scribe. Selected BAPI/RFC functions or IDOC message
SAP Business Objects (BAPIs) Function Modules (RFCs) ALE/EDI Messages (IDOCs) GENERIC_IDOC Generic IDOC CWM/MBGMCR CWM/SHP_IBDLV_CHANGE CWM/SHP_IBDLV_CONFIRM_DEC CWM/SHP_IBDLV_SAVE_REPLICA CWM/SHP_OPDLV_CHANGE	Server Se
CWM/SHP_OBDLV_CONFIRM_DEC /CWM/SHP_OBDLV_SAVE_REPLICA /CWM/SHP_OBDLV_SPLIT_DECENTRAL /CWM/STPPOD /DSD/HH_CONTROL /DSD/HH_CREDITDATA /DSD/HH_CUSTMASTEXT	Name Type Description

Figure 5-31 Generic IDoc Support

The XSD of the Generic IDoc look like as shown in Figure 8-32.

Figure 5-32 XSD of the Generic IDoc



3. Click Next and then Finish the project.

5.7.2 Test the Generic IDoc Inbound Endpoint

- 1. Deploy the project. For more information, refer to the section "Deploy the Defined Process".
- **2.** Test deployed project by sending an IDoc from SAP. For example, a MATMAS IDoc can be sent from BD10 tcode of SAP.
- **3.** Check the IDoc received through file adapter. The received xml will look like as shown in Figure 5-33.





5.7.3 Create Generic IDoc Outbound Endpoint

- 1. Create Outbound Endpoints for IDoc. For more information, refer to the section "Design an Outbound BPEL Process for BAPI/RFC/IDOC".
- 2. In the **Object Selection** page of the Adapter wizard, select **Generic IDOC** and click **Next** button, as shown in Figure 5-34.

bject Selection	01010101010101010101010
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and	l describe. Selected BAPI/RFC functions or IDOC messages
SAP Business Objects (BAPIs) Carbon Modules (RFCs) ALE/EDI Messages (IDOCs) Carbon Modules (RFCs) Carbon Magner Carbon	Image: Series Series (Series Series Serie
CWM/SHP_OBDLV_CONFIRM_DEC CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SPLIT_DECENTRAL CWM/STPPOD CMM/STPPOD CM/SD/HH_CONTROL CM/SD/HH_CREDITDATA DSD/HH_CUSTMASTEXT	Name Type Description

Figure 5-34 Object Selection Page

3. Click Next , Next and then Finish for the subsequest screens.

It will create an SAP endpoint with XSD/WSDL for Generic IDoc.

5.7.4 Test the Generic IDoc Outbound Endpoint

- 1. Deploy the Generic IDoc project. For more information, refer to the section "Deploy the Defined Process".
- 2. Send a Generic IDoc (for example: matmas01) to SAP system.
- **3.** The received IDoc status can be checked in SAP system through tcode WE02, as shown in Figure 5-35.

SAP			
	89991		1 🖧 🖏 🛒 🗾 🕜 📑
🕫 🗈 SAP			
IDoc display ▽ 🔂 IDoc 00000000855447		Technical short : Direction	info 2 Inhox
Control Rec.	Total r	Current status	53 00
D Data records	Iocai I	Basic type	MATMASO1
		Extension	
		Message type	MATMAS
		Partner No.	T90CLNT090
		Partn.Type	LS
		Port	SAPEQ6
		Content of select	ed segment
		rid name rid co	A
			•

Figure 5-35 SAP IDoc Display

This shows the IDoc was successfully received by SAP.

5.8 Revision IDoc Support

Idoc-ecmrev01 is an IDoc type, which contains object management record for an object (material or document) which is marked by a revision level. This data is necessary in order to correctly make, change and delete a revision level within engineering change management.

IDocs of this type are automatically sent when:

- An object (material or document) is distributed which is marked by the revision level.
- Distribution starts with a change indicator for an Integrated Distributed PDM Solution (ID PDM).

Note: Adapter for SAP supports this feature dynamically with the help of Generic IDoc functionality.

5.9 Sharing Program ID Feature

The Adapter for SAP enables multiple inbound IDoc message types to share an SAP connection using the same program ID. You can generate a WSDL port Type with multiple operations to receive individual IDoc message type.

The Adapter for SAP enables a program ID to be shared for different inbound data. For example, two or more IDoc types can be sent to the same program ID used by SOA inbound endpoints.

5.9.1 Create a Sharing Program ID Project:

- 1. Create Inbound Endpoint for IDoc. For more information, refer to the section "Defining an inbound BPEL Process".
- 2. Create multiple Inbound endpoints for different message types, as shown in Figure 5-36.



Figure 5-36 Multiple Inbound Endpoints

- **3.** Deploy project. For more information, refer to the section 7.6 "Deploy the Defined Process".
- Test Program ID registration using transaction sm59 in SAP GUI, as shown in Figure 5-37.



REC Destination	1	ORAOA1		
Connection Type	T	TCP/IP Connection	Description	
Description	had.			
Description 1	Des	tination for QA		
Description 2	1			
Description 3				

5. Send IDocs that were selected in the projects from SAP.

5.10 Multiple IDoc Support

Adapter for SAP enables the selection of multiple IDocs within single inbound endpoint of the Adapter. The Adapter once creates JCA, WSDL and xsd files for all selected IDocs.

5.10.1 Create a project for Multiple IDoc Support:

- 1. Create inbound IDoc project. For more information, refer to the section "Defining an inbound BPEL Process".
- Select multiple IDoc while creating the Adapter inbound endpoint, as shown in Figure 5-38.

ject Selection	nenenenenenenen (Alegora).
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and Hierarchical Alphabetical	describe. Selected BAPI/RFC functions or IDOC messag
SAPSLL/CUS_PED SAPSLL/CUS_PED SAPSLL/CUS_SCIPED SAPSLL/CUS_SCWPED SAPSLL/CUS_STA SAPSLL/CUS_VZAV SAPSLL/CUS_VZL SAPSLL/CUS_VZL SAPSLL/CUS_VAT SAPSLL/CUS_WAT SAPSLL/DEBMAS_SLL SAPSLL SAPSLL/DEBMAS_SLL SAPSLL SAPSLL/DEBMAS_SLL SAPSLL SAPSLL/DEBMAS_SLL SAPSLL SAPSL SAPSL	MATMASO1 Material Master
AFSLL/MATMAS_SLL MATMAS01 Material Master MATMAS02 Material Master MATMAS02 Material Master MATMAS03 Material Master MATMAS03 Material Master MATMAS03 Material Master MATMAS03 Material Master	Name CU_CS Description

Figure 5-38 Select Multiple IDoc

3. JCA file of the project will look like as shown in Figure 5-36.



	<pre>Kadapter-config name="sapService" adapter="sap" wsdlLocation="/WSDLs/sapService.wsdl" xmlns="http://wsdl.ocation="/WSDLs/sapService.wsdl" xmlns="/WSDLs/sapService.wsdl" xmlns="/WSDLs/sapService.wsdl" xmlns="/WSDLs/sapService.wsdl" xmlns="/WSDLs/sapService.wsdl" xmlns="/WSDLs/sapService.wsdl"</pre>
	<connection-factory location="eis/SAP/FMWDEMO" uiconnectionname="Prashant"></connection-factory>
	<pre><endpoint-activation operation="sapService" porttype="sapService_PT"></endpoint-activation></pre>
Θ	<activation-spec classname="oracle.tip.adapter.sap.inbound.SAPActivationSpecImpl"></activation-spec>
13	<property name="AutoSYSTAT01" value="no"></property>
	<property name="EncodeIDOC" value="no"></property>
	<property name="ListIDOC" value="MATMAS01,MATMAS02,MATMAS03,"></property>

- 4. Deploy project. For more information, refer to the section "Deploy the Defined Process".
- 5. Test deployed project by sending multiple IDocs from SAP. Adapter for SAP receives all different, selected IDocs using a single SAP endpoint.

5.11 Credential Mapping for Oracle SOA Suite (BPEL, Mediator, BPM or OSB)

Credential mapping is the process whereby a remote system's authentication and authorization mechanisms are used to obtain an appropriate set of credentials to authenticate users to a target resource. In the WebLogic Server security architecture, a Credential Mapping provider is used to provide credential mapping services and bring new types of credentials into the WebLogic Server environment. To pass user credentials to the Adapter for SAP, create a credential map from the Oracle WebLogic Server user credentials to the EIS user credentials (SAP R/3 adapter). Then associate a credential policy with a BPEL, Mediator, BPM or OSB Web service and invoke the Web service using Oracle WebLogic Server user credentials. These credentials are mapped to the EIS user credentials and then passed to the J2CA container, which uses them to connect with the EIS adapter (SAP R/3).

5.11.1 Setup Credential Mapping for the Adapter

Credential mapping consists of the following steps:

- 1. Install the Adapter for SAP. For more information, refer to the section Configuring the Adapter Run-Time Parameters on the WebLogic Server".
- 2. Create Mapping.

In WebLogic console, you can map the credentials of WebLogic user with SAP user credentials.

a. In the **Domain Structure** section in the left pane, click **Deployments**. The Deployments page is displayed in Figure 5-40.



Figure 5-40 Domain Structure Section

b. Select the **Adapter** from the list, as shown in Figure 5-41.

Figure 5-41 Deployments list



- c. Click on Security tab and then click on Outbound Credential Mapping tab.
- d. Click **New** button to create a new credential map, as shown in Figure 5-42.
Figure 5-42 Outbound Credential Mapping

1	Settings	for s	SAPA	dapter									
	Overvie	w	Deplo	yment Plan	Configuration	Secur	ity	Targets	Control	Te	sting	Mon	nitor
	Roles	Poli	cies	Outbound	Credential Map	pings	Int	oound Princ	ipal Mappin	gs	Princi	pals	

Outbound credential mappings let you map WebLogic Server usernames to usernames in the Enterpric adapter. You can use default outbound credential mappings for all outbound connection pools in the individual connection pools. This page contains the table of outbound credential mappings for this resc

Customize this table

Outbound Credential Mappings

Nev	v Delete		
	WLS User 🔗	EIS User	Outbound Con
		There a	re no items to dis
Nev	v Delete		

e. Select one of the Connection pool for which you are creating the credential mapping, as shown in Figure 5-43.

Figure 5-43 Create a New Security Credential Mapping

Create a New Security Credential Mapping

Back	Next	Finish	Cancel

Outbound Connection Pool

Which Outbound Connection Pool would you like the credential map to be associa Connection Pools in this resource adapter. Each Outbound Connection Pool can th

Customize this table

Create a New Security Credential Map Entry for:

	Outbound Connection Pool
	eis/SAP/FMWDEMO
	Resource Adapter Default
Back	Next Finish Cancel

f. Select **Configured User Name** radio box and enter your WebLogic username, as shown in Figure 5-44.

Figure 5-44 Create a New Security Credential Mapping

Create a New Security Credential Mapping	Create a Ne	N Security	Credential	Mapping	
--	-------------	------------	------------	---------	--

Back	Next	Finish	Cancel

WebLogic Server User

Select the WebLogic Server User that you would like to map an EIS user to. Selecting initial connections when the resource adapter is first started. Selecting 'Default User' v user that does not have a credential mapping specifically for them. Selecting 'User for WebLogic Server user. If you select 'Configured User' you must type in the WebLogic

User for creating initial connections

- Default User
- Unauthenticated WLS User
- Configured User Name

WebLogic Server Use	Name:	weblogic
Back Next Finis	Cancel	

g. Enter the SAP username and password and click **Finish**, as shown in Figure 5-45.

Figure 5-45 Create a New Security Credential Mapping

Create a New Security Credential Mapping	
Back Next Finish Cancel	
EIS User Name and Password	
Configure the EIS User Name and Password that you would * Indicates required fields	like to map the WebLogic Ser
Enter the EIS User Name:	
* EIS User Name::	SAP_USER_NAME
Enter the EIS Password:	
* EIS Password::	•••••
* Confirm Password::	•••••
Back Next Finish Cancel	

Credential mapping setup is done. Now you can use the same mapping in SAP SOA/OSB projects.

5.11.2 Setup Credential Mapping for SOA

To pass the user credentials to the SAP resource adapter, create a credential map from the Oracle WebLogic Server user credentials to the EIS user credentials (SAP R/3 adapter). For more information, refer to the section "Setup Credential Mapping for the Adapter". Now associate a credential policy with a Web service and invoke the Web service using Oracle WebLogic Server user credentials. These credentials are mapped to the EIS user credentials and then passed to the Adapter container, which uses them to connect with the EIS adapter (SAP R/3).

5.11.2.1 Creating SOA Project for Credential Mapping

To create SOA project for credential mapping, follow the provided steps:

- 1. Create the Adapter outbound endpoint. For more information, refer to the section "Design an Outbound BPEL Process".
- 2. Deploy the project. For more information, refer to the section "Deploy the Defined Process".
- 3. Attach policy with project:
 - a. Open EM console and navigate till your deployed project, as shown in Figure 5-46.

Figure	5-46	Target	Navigation

Target Navigation	Test_ZBAPI_ALLDAT [1.0] ()
View 👻	ela SOA Composite ▼
View View Application Deployments SOA SOA Gefault G	Active Retire Shut Down Test Settings Dashboard Composite Definition Flow Instances Unit Tests Policies Components Name BPELProcess1 Services and References Name
	Sopressical Contraction Contra

b. Click on **Policies** tab, as shown in Figure 5-47.

Active	Retire	Shut Dov	vn	Test	Setting	ls ▼	3		
Dashboar	d Composite	Definition	Flow In:	stances	Unit Tests	Policies			
Policy Na	me			Attach	ed To		Statu:	s	Category
Dolicy Ma	me			Attach	ed To		Statu:	s	Categor

Figure 5-47 Policies Tab

c. Click on **Attach To/Detach From** drop-down and select **bpelprocess1_client_ep** to attach the policy.

This navigates to the policy selection page, as shown in Figure 5-48.

Figure 5-48 Policies Tab

Dashboard Com You can view and r View 🕶 🧼 A	nanage the list of	Flow Ins	tances	Unit Tests to the web ser	Policies	gs and components of th
You can view and r View 👻 🥔 A	nanage the list of	f policies at	ttached t	to the web ser	rvice binding	gs and components of th
View 🔻 🧔 A	ttack Ta (Datack					20. 25.
	ttach 10/Detach	From 🔻				
Policy Name	PELProcess 1		Attache	ed To	Policy Reference	
Na policina a	Subpelprocess 1_client_ep					Status
No policies a	apReference					

d. Search policy with name **oracle/wss_username_token_service_policy** in the policy page.

The **oracle/wss_username_token_service_policy** policy appears in the search result area, as shown in Figure 5-49.

< [III			
Directly Attached Policies				
Name		Category	Enabled	Description
oracle/wss_username_token_servi	ce_policy	Security	~	This policy u
Aurikhla Dalisias	Attach	4	Detach	
Available Policies	Attach		Detach	
Available Policies View - 💽 🚮 Detach 🔗 oracle/wss_username_token_serv	Attach		Detach	

- e. Select the searched policy and click **Attach to** button.
- f. Click **Ok** button.
- g. Click **Test** button to start testing this project, as shown in Figure 5-50.

Figure 5-50 Test Project

Û	CompCo	de_GetLis	st [1.0]	i						_		
9	SOA Comp	osite 🔻								Page R	Refresh	ed
	Active Re	etire	Shut Do	wn	Test		Setting	gs 🔻		S		
	Dashboard	Composite	Definition	Flow Ins	stances	Unit	Tests	Policie	s			
	You can vie 'Attach To/	w and manag Detach From	ge the list ' to update	of policies e the list o	attacheo f attach	d to th ed po	ne web licies.	service b	indi	ngs and compo	nents	of t
	View 👻	Attach	To/Detac	h From								
	Policy Nam	e			Attache	ed To				Policy Refer Status	rence	Ca
	oracle/wss	_username_t	oken_servi	ce_policy	🢁 bpel	proce	ss1_clie	nt_ep		Disable		Se
							-					

h. Click on **Request** tab and select **Security**, as shown in Figure 5-51.

Figure 5-49 Search Policy

Figure 5-51	Request Tab)					
Request	Response	е					
Secu	Security						
👂 Quali	ty of Serv	ice					
⊳ нттр	Header						
Di Addi	tional Test	Options					
🛛 Input	t Argumen	its					
Tree	View 💌	Enable Validation	1				
SOAP	Body						
Name	ł			Туре			
⊳*p	arameters			parameters			

 Select OWSM Security Policy radio button and select oracle/wss_username_token_client_policy from Other Client Policies table, as shown in Figure 5-52.

Request Response						
⊿ Security						
● OWSM Security Policies						
Compatible Client Policies Other Client Policies						
🖉 All	All					
No policy found						
	oracle/wss_sami_token_bearer_over_ssi_client_policy					
	oracle/wss_sami_coken_bearer_over_ssi_client_policy					
	✓ oracle/wss_username_token_client_policy					
	oracle/wss_username_token_over_ssl_client_policy					
Configuration Properties						
	JKS Keystore					
* Username weblogic	Location					
* Password	JKS Keystore					
	Password					
Advanced Options						
Quality of Service						
> HTTP Header						
> Additional Test Options						
Input Arguments						
Tree View 💌 Enable Validation 🖉						

Figure 5-52 Request Tab

- j. Under **Configuration Projects**, enter Username and Password (that you mapped with SAP user credential in the credential mapping).
- k. Click Test Web Service button to test the service, as shown in Figure 5-53.

Figure 5-53	Test Web Service	
		Test Web Service
e farm. To test a od, and then sele	Web service, enter the WSDL or WADL and click Parse WSDL or WADL. When the p ct the Operation/Media type that you want to test. Specify any input parameters,	age refreshes with and click Test Web
ALLDAT/bpelproce	ss1_dient_ep?WSDL Q Parse WSDL or WADL	
)AT/bpelprocess	Edit Endpoint URL	

5.12 Stateful/Stateless Interaction

Stateless interaction

A server processes requests based solely on information provided with each request and does not rely on information from earlier requests. The server does not need to maintain state information between requests.

Stateful interaction

A server processes requests based on both the information provided with each request and information stored from earlier requests. The server needs to access and maintain state information generated during the processing of an earlier request. This is in case when update /Insertion of data needs to be done in SAP with standard BAPIs

The Adapter for SAP has a design-time property "Interaction", stateless / stateful, as shown in Figure 5-54.

CA Properties	01010101010101010101010101010
pecify the Name and Value of all JCA Ad	lapter Properties.
roperties	순 🗙
Vame	Value
nteraction	stateful
xceptionFilter	off
chemaValidation	off
ca.retry.count	9
a.retry.interval	1
ca.retry.backoff	2
ca.retry.maxInterval	120

Figure 5-54 JCA Property Page

When stateful property is set in the JCA properties page of the Adapter wizard, the following operations are automatically created, as shown in Figure 5-55.

- OSA_CMD_STATEFUL_OPEN
- SELECTED_BAPI
- BAPI_TRANSACTION COMMIT
- BAPI TRANSACTION ROLLBACK
- OSA_CMD_STATEFUL_CLOSE

Figure 5-55 Stateful BAPI



This ensures when the selected BAPI is executed, upon successful execution, automatically an explicit commit is called using bapi_transaction_commit to commit the changes done to SAP database, else a transaction rollback happens using bapi_transaction_commit. The

operation osa_cmd_stateful open and osa_cmd_stateful_close ensure that all the operations happen in the same session.

This feature is useful for BAPIs that do not contain an implicit commit statement which will commit the changes done to SAP database table.

All outbound Endpoints are stateless by default.

5.12.1 Create a Stateful BAPI project

- 1. Create an outbound endpoint. (For more information, refer to the section "Configure the Adapter Component" under BPEL Outbound Process).
- Select a BAPI in the object selection page of the Adapter wizard, which does not have internal commit in it. For example, Flight_Customer. Change (BAPI_FLCUST_CHANGE).
- 3. Set the Interaction property in JCA Properties page to "stateful", as shown in Figure 5-56.

Figure 5-56 Stateful Property

Adapter Configuration Wizard - Ste	o 4 of 5	01	
Specify the Name and Value of all JCA Adap	ter Properties.		
Properties			÷ 🗶
Name	Value		
Interaction	stateful		
ExceptionFilter	off		
5chemaValidation	off		
ica.retry.count	9		
ca.retry.interval	1		
ca.retry.backoff	2		
jca.retry.maxInterval	120		
Holp	< Back	Next > Einish	Cancel

4. Click Next and then Finish.

- 5. It creates an SAP endpoint with 5 operations, as mentioned below:
- OSA_CMD_STATEFUL_OPEN
- OSA_CMD_STATEFUL_CLOSE
- BAPI_TRANSACTION_COMMIT
- BAPI_TRANSACTION_ROLLBACK

BAPI_FLCUST_CHANGE

6. Create a BPEL process and add:

- A receive activity for BAPI_FLCUST_CHANGE
- An invoke to invoke OSA_CMD_STATEFUL_OPEN
- Create the SID variable to store the session ID
- An assign to copy session ID (SID) from response to a SID variable
- An assign to copy SID to BAPI_FLCUST_CHANGE request
- An invoke to invoke BAPI_FLCUST_CHANGE request
- An assign to copy SID to BAPI_TRANSACTION_COMMIT request
- An invoke to invoke BAPI_TRANSACTION_COMMIT request
- An assign to copy SID to OSA_CMD_STATEFUL_CLOSE request
- An invoke to invoke OSA_CMD_STATEFUL_CLOSE request
- A reply to return BAPI_FLCUST_CHANGE response.
- 7. Finish and save the project.
- 8. The jca file of the project looks like as shown in Figure 5-57.

Figure 5-57 JCA File

```
<connection-factory location="eis/SAP/FMWDEM0" UIConnectionName="DefaultClient"/>
<endpoint-interaction portType="STATEFUL_BAPI_PT" operation="BAPI_TRANSACTION_COMMIT">
 <interaction-spec className="oracle.tip.adapter.sap.outbound.SAPInteractionSpecImpl">
   <property name="Interaction" value="stateful"/>
  <property name="ExceptionFilter" value="off"/>
   cyroperty name="RFC" value="BAPI TRANSACTION COMMIT"/>
   <preperty name="Type" value="RFC"/>
  </interaction-spec>
</endpoint-interaction>
<endpoint-interaction portType="STATEFUL_BAPI_PT" operation="BAPI_TRANSACTION_ROLLBACK":
  <interaction-spec className="oracle.tip.adapter.sap.outbound.SAPInteractionSpecImpl">
   <property name="Interaction" value="stateful"/>
   <property name="ExceptionFilter" value="off"/>
   <preperty name="RFC" value="BAPI_TRANSACTION_ROLLBACK"/>
   <property name="Type" value="RFC"/>
  </interaction-spec>
</endpoint-interaction>
<endpoint-interaction portType="STATEFUL BAPI PT" operation="BAPI FLCUST CHANGE">
  <interaction-spec className="oracle.tip.adapter.sap.outbound.SAPInteractionSpecImpl">
   <property name="Interaction" value="stateful"/>
   <property name="ExceptionFilter" value="off"/>
   cproperty name="RFC" value="BAPI FLCUST CHANGE"/>
   <property name="Type" value="BAPI"/>
    <property name="BAPI" value="FlightCustomer.Change"/>
  </interaction-spec>
</endpoint-interaction>
<endpoint-interaction portType="STATEFUL BAPI PT" operation="OSA CMD STATEFUL OPEN">
  <interaction-spec className="oracle.tip.adapter.sap.outbound.SAPInteractionSpecImpl">
   <property name="Interaction" value="stateful"/>
   <property name="ExceptionFilter" value="off"/>
```

5.12.2 Test the Stateful BAPI Project:

- 1. Deploy the project having Interaction property as "stateful".
- **2.** Enter a value for the inputs to the BAPI, also provide a session ID variable number and execute.
- **3.** You can see that the changes are reflected in the corresponding SAP database table. For example, the changes for BAPI "bapi_flcust_change" is reflected in SAP table 'scustom' in SE11 tcode.

5.13 Error Handling

When an adapter raises an exception during run-time, the SOAP agent produces a SOAP fault element in the generated SOAP response. The SOAP fault element contains fault code and fault string elements. The fault string contains the native error description from the adapter target system. Since adapters use the target system interfaces and APIs, whether an exception is raised depends on how the target systems interface or API treats the error condition. If a SOAP request message is passed to an adapter by the SOAP agent and that request is invalid based on the WSDL for that service, then the adapter may raise an exception yielding a SOAP fault.

Figure 5-58 shows the sample of SOAP Fault.

```
Figure 5-58 SOAP Fault
```

```
<env:Fault>
     <faultcode>env:Server</faultcode>
     <faultstring>
        Exception occurred when binding was invoked.
        Exception occurred during invocation of JCA
        binding: "JCA Binding execute of Reference
        operation 'BAPI COMPANYCODE GETDETAIL' failed
        due to: com.sap.conn.jco.JCoException: (126)
        JCO ERROR ABAP EXCEPTION:
        Company code 1212 does not exist".
        The invoked JCA adapter raised a resource exception.
        Please examine the above error message carefully to
        determine a resolution.
    </faultstring>
     <faultactor/>
     <detail>
        <exception>Company code 1212 does not exist</exception>
     </detail>
 </env:Fault>
```

5.14 SOA Debugger Support

You can test and debug SOA composite applications with the SOA debugger in Oracle JDeveloper. The SOA debugger reduces the development cycle for an SOA composite application by providing a troubleshooting environment within the Oracle JDeveloper. This implies that you do not need to build an SOA composite application in Oracle JDeveloper, deploy it to the SOA Infrastructure, launch a console to test or view audit trails and flow traces, and then return to Oracle JDeveloper to repeat the exercise. Instead, you can set breakpoints in Oracle JDeveloper for troubleshooting on the following components:

- Binding components and service components in SOA composite applications.
- Synchronous and asynchronous BPEL processes.
- BPM processes.

Note the following guidelines when using the SOA debugger:

- Debugging is limited to design view in Oracle JDeveloper.
- You cannot debug cross-language features, such as a Java exec activity, XSLT and XQuery transformations, and so on.
- You can debug SOA composite applications on servers where Oracle SOA Suite is installed. For example, if Oracle SOA Suite runs on managed servers, clients must connect using the managed server host and port.
- Only one client at a time can connect to the debugger.
- Multiple instances of a SOA composite application cannot be debugged. Only a single instance can be debugged.
- Adapter endpoint errors are not displayed in the SOA debug.

5.14.1 SOA Debugger for Inbound

Perform the following steps for SOA debugger for inbound endpoint:

1. Click on the **Debug** icon on JDeveloper toolbar and use the default, as shown in Figure 5-59.



Figure 5-59 SOA Debugger for Inbound

2. Enter the Host IP and click OK.

JDeveloper deploys the SOA project for debugging, Once JDeveloper connected to SOA debugger running on SOA run-time, it shows several SOA debugger windows, as shown in Figure 5-60.





3. Right-click on the endpoint connector to show breakpoint options, once selected, breakpoint icons will be added, as shown in Figure 5-61.

Figure 5-61 Breakpoint Options



4. Trigger the inbound from SAP that hits the breakpoint. To proceed to the next breakpoint, click on the step over, as shown in Figure 5-62.

Figure 5-62 Breakpoint Options



It hits the next breakpoint, as shown in Figure 5-63.

Applications Application Servers -	▲ 철 프 ▶ 🌞 📕 ♦ 온 탁 김 팀 D II 암 🗡 😞 🍇 🛦 역 Inboard project
Acakation Servers Acakation Servers Acakation Servers Acakation Servers Discreptator/velc.op/cover (domain unconfigured) Galaxies Discreptator/velc.op/covers Discreptator/velc.op/covers	In the second
a at hourd_project (Default 1.0) at the Services	Debugging Inboard (Industry) Debugging Inboard (Industry) Watches Data Smart Data Dreakpoints
Conservation of the second seco	C(t) Instanto Saturation S

Figure 5-63 Breakpoint Options

5. Click on **Detach** button to detach the debugger, as shown in Figure 5-64.





5.14.2 SOA Debugger for Outbound

Perform the following steps for SOA debugger for outbound endpoint:

1. Click on the **Debug** icon on JDeveloper toolbar and use the default, as shown in Figure 5-65.



Figure 5-65 SOA Debugger for Outbound

6. Enter the Host IP and click OK.

JDeveloper deploys the SOA project for debugging.Once JDeveloper gets connected to SOA debugger running on SOA run-time, it shows several SOA debugger windows, as shown in Figure 5-66.

Figure 5-66 SOA Debugger Windows



Debugger accempting to connect to remote process at 10.30.32.80 St Debugger connected to remote process at 10.30.32.80 S004. Debuggee process virtual machine is S0A Debugger. 7. Right-click on the endpoint connector to see the breakpoint options, as shown in Figure 5-67.

📲 Outbound_project 👘 😤 sapReference.xsd test.xml 🗸 👎 🖶 🖨 🗶 🕲 🖏 🖓 🙆 🖸 Composite: Outbound_project[Read-on 0 € De 🕩 111 Create Request Breakpoin fileService sapReference X Remove Breakpoints Operations: Operations: RFC_GET_MATERIAL Read

Figure 5-67 Breakpoint Options

8. Right-click on the endpoint connector to see breakpoint options, as shown in Figure 5-68.



Figure 5-68 Breakpoint Options

Once selected, the breakpoint icons will be added, as shown in Figure 5-69.





Debugger connected to remote process at 10.30.32.80 5004.

Debuggee process virtual machine is SOA Debugger.

9. Send test message and the debugger will break at, e.g., the request message, as shown in Figure 5-70.





10. Click on the step over to proceed to the next breakpoint, as shown in Figure 5-71.



Figure 5-71 Breakpoint Options

It will hit the next breakpoint, as shown in Figure 5-72.

📲 Outbound_project 💉 🔒 sapReference.xsd 💉 🕑 t	est.xml ×
🗸 🚏 🗄 🖶 🏟 🗶 🖓 🖏 🚯 🗿 🖉	Composite: Outbound_project[Read-only]
FileService Operations: Read	BPELProcess1
Design Source History Debugging: Outbound_project.jpr - Log Watches D	ata × Smart Data Breakpoints
N	📖 📴 🛄
Name	Value
(C) completionPersistPolicy	
- (c) ecid	C962T473-9542-4284-8094-86700F8632C8-00003231
(c) masterConversation1d	nul
- (C) MESH_METRICS	nul
the second	
H-Q DMS_CLASS_DATA	10.1105
	40-110C
H- SAP_FIELD_DATA	
schemaLocation	urn:sap-com:document:sap:rfc:functions SOA/Schemas/sapRefe
(a) priority	0
cc) reply to Port type	null
(A) subject	weblogic, Administrators
(x) XID	reame=ut_JB com.collaxa.cube.engine.epi.impl.bpel.8PELDelivery8ean BEA1-36D25561C246E50C6CCB(615191801)

Figure 5-72 Breakpoint Options

11. It will hit the Response Breakpoint, as shown in Figure 5-73.

Figure 5-73 Response Breakpoint



12. Click on Detach button to detach the debugger, as shown in Figure 5-74.

Figure 5-74 Detach Debugger



5.15 Non_Xml Characters Handling Feature

The Adapter for SAP provides Non-Xml character handling for the data that is coming from SAP system to the Adapter. XML does not support all characters defined in Unicode. For example, control characters, some of the control character not supported by XML 1.0.

Unicode code points in the following ranges are valid in XML 1.0 documents:

- U+0009, U+000A, U+000D: these are the only C0 controls accepted in XML 1.0.
- U+0020–U+D7FF, U+E000–U+FFFD: this excludes some (not all) non-characters in the BMP (all surrogates, U+FFFE and U+FFFF are forbidden).
- U+10000–U+10FFFF: this includes all code points in supplementary planes, including non-characters.

The preceding code points ranges contain the following controls which are only valid in certain contexts in XML 1.0 documents, and whose usage is restricted and highly discouraged:

 U+007F–U+0084, U+0086–U+009F: this includes a C0 control character and all but one C1 control.

Any character in payload if not supported by XML 1.0, either can be removed or can be escaped. The Adapter for SAP provides one of the JCA property "ControlCharacter" as JCA property, which have following option to be operated on non-xml character. This property is available in case of Inbound Project.

- **remove:** This will remove character from payload.
- **space:** This will replace character with space.
- encode: This will encode character with its decimal format.

In Outbound project case in request payload, if any XML character already escaped, will be unescaped before sending payload to the Adapter for SAP.

You can see **ControlCharacter** property in SAP design-time in the properties page, as shown in Figure 5-75. This property is included in the JCA properties in case of Inbound project.

Figure 5-75 ControlCharacter Property

Adapter Configuration Wizard - Step 4 of 5	×
JCA Properties	01010101010101010101010101010
Specify the Name and Value of all JCA Adapter Propertie	s. 🔶 🗙
Name	Value
Addoststato1	10
ControlCharacter	lio
ProgramID	encode
ica.retry.count	remove
ica.retrv.interval	space
ica.retry.backoff	2
jca.retry.maxInterval	120
Help < Back	Next > Einish Cancel

Note that encoding of the control characters like (ctrl+shift+underscore) is not supported and hence for such characters, **ControlCharacter** property has to be set to either "**remove**" or "**space**".

6

Complete Walkthrough of the Adapter Configuration Wizard

This chapter explains how to configure an Adapter for SAP in design-time. It contains the following topics:

- Section 6.1, "Overview"
- Section 6.2, "The Adapter Wizard in JDeveloper"
- Section 6.3, "Specifying the Service Name"
- Section 6.4, "Connecting to SAP"
- Section 6.5, "Select SAP Objects from Objects Selection"
- Section 6.6, "JCA Properties Page"
- Section 6.7, "Finishing with Adapter Configuration Wizard"

6.1 Overview

The design-time plug-in enables you to access the SAP server, browse SAP repository, and generate SCA artifacts such as XSD, WSDL, and JCA properties for SAP endpoints directly within the composite designer of JDeveloper for SAP RFC, BAPI, and IDoc objects. It also enables you to test BAPI and RFC directly in the JDeveloper.

6.2 The Adapter Wizard in JDeveloper

To use Adapter for SAP in JDeveloper Composite, open Oracle JDeveloper and drag and drop the Adapter from Component to the Composite either on Exposed Services pane or External Reference pane, as shown in Figure 6-1.

OR

Right-click on **Exposed Services** pane or **External Reference**, Select **Insert** and select the **Adapter for SAP** from the list available.

Figure 6-1 Adapter Component

에법 Project2 → ✔ 《위 🛃 💥 📫 ()] 🖸	🙆 晴 号 🍓 硼	Project2	Components Q.		×	-
Exposed Services	Components	External References	SOA	Socket	UMS	•
			Applications E-Business	S JDE World	G SAP R/3	
•			Suite Custom/Third P	arty	Adapter	-
	To create resources, drag and drop an icon		Cloud			- U

6.3 Specifying the Service Name

When the Adapter for SAP is drag and dropped to the Composite, the first page appears for the Adapter configuration wizard, as shown in Figure 6-2.

Figure 6-2 Adapter Configuration Wizard

Adapter Configuration Wizard	- Step 1 of 3		
SAP Adapter Service			*
Welcome to the Adapter (Configuration Wiza	ard	
his wizard helps you create a service define an operation for the service.	e using a SAP Adapter. You	u will be asked to specify co	onfiguration parameters and
nter a Service Name.			
lame: sapService			
and babaanaa			
Help	< <u>B</u> ack	Next >	nish Cancel

Provide a service name and when the wizard completes defining an adapter service, a WSDL file by this name will appear in the Application Navigator.

6.4 Connecting to SAP

A Connection Information page opens up next to define the SAP connection for the adapter. This page enables you to create a new connection or update/edit an existing connection. Connection summary with JNDI name is displayed on the page, as shown in Figure 6-3.

Use the default Java Naming and Directory Interface (JNDI) name or specify a custom name. This connection enables you to configure the adapter during design-time and to connect to the SAP server during run-time.

Adapter Configuration Wizard - Step 2 of 3 **Connection Information** A SAP R/3 connection is required to configure this adapter. Select a SAP R/3 connection already defined in your project or create a New Connection. Connection: DefaultClient Client: 800 Add Application Server: 10.30.32.42 System Number: 00 0 JNDI Name: eis/SAP/FMWDEMO Help < Back Next > Cancel

Figure 6-3 Connection Information Page

Edit SAP Connection: Edit SAP Connection button can be used to edit SAP connection details, as shown in Figure 6-4. You can also use **Import** button to set connection parameters. Refer to the section "Note" mentioned in the section.

Figure 6-4 Import Button

DEdit SAP R/3 Co	onnection	×
Connection Name	e: DefaultClient	<u>I</u> mport
User Conne	ection	
User Logon Pa	arameters:	
User Name:		
Pass <u>w</u> ord:		
Client:	800	
Language:	en	

Delete SAP Connection: Delete SAP Connection button can be used to delete any existing connection from the Connection list. Once clicked, it shows **Delete SAP R/3 Connection** page, as shown in Figure 6-5.

Figure 6-5 Delete SAP R/3 Connection

Connection Information	010101010101010101010101010
A SAP R/3 connection is required to configure this adapter. Se project or create a New Connection.	ect a SAP R/3 connection already defined in your
Connection: DefaultClient	
Client: 800 Application Server: 10.3	
System Number: 00 JNDI Name: eis/SAP/FMWI	t?
ОК	Cancel

6.4.1 Define a Connection Name

To create a new SAP R/3 connection, click on the + icon. A new connection dialog appears where user needs to provide **Connection Name** or can use default name, as shown in Figure 6-6.

Figure 6-6 Create New SAP R/3 Connection Page

Create SAP K/3 Connection		
Connection Name: DefaultClient	<u>I</u> mport	
User Connection		
User Logon Parameters:		

6.4.2 Define the Connection Parameters to the Connection Name

Provide the **SAP User Logon Parameters** (Username, Password, Client, and Language) in the **User** tab, as shown in Figure 6-7.

- User Name: The user name on the SAP system, this value is case sensitive. The Adapter for SAP preserves the case of the value that the user enters for the user name when it opens a connection on the SAP system.
- **Password:** The password for the user on the SAP system, this value is case sensitive. The Adapter for SAP preserves the case of the value that the user enters for the password when it opens a connection on the SAP system.
- Client: The SAP system client ID. Default is 800.
- Language: The current logon language of SAP. Default is English.

Create SAP R/3	Connection	
Connection Nam	e: DefaultClient	<u>I</u> mport
User Conne	ection	
User Logon Pa	arameters:	
User Name:	JCA_DEV	
Password:	•••••	
Client:	800	
Language:	en	

Figure 6-7 User Logon Parameters

Note: User can import the connection parameters from a properties file by selecting the Import button and can test the connection. In that case, default connection name would be same as properties file name, as shown in Figure 6-8.

х

Create SAP R/3	Connection				23
Connection Name	e: DefaultClient			Import	
Open	action			×	
Location:	Server_connection	۵		D- D- D-	
🖹 DevSer	rver.txt				I
					I
					I
File <u>N</u> ame:	DevServer.txt				
File <u>N</u> ame: File <u>T</u> ype:	DevServer.txt All Files				
File <u>N</u> ame: File <u>T</u> ype:	DevServer.txt All Files		Qpen	▼ Cancel	
File <u>N</u> ame: File <u>T</u> ype:	DevServer.txt All Files		Qpen	▼ Cancel	

If you click on **Open** button, it will set the values of properties file, as shown in Figure 6-9.

Figure 6-9 Set the Values of Properties File

👌 Edit SAP R/3 Co	onnection X
Connection Name	e: DevServer Import
User Conne	ection
User Logon Pa	arameters:
User Name:	JCA_DEV
Pass <u>w</u> ord:	•••••
Client:	800
Language:	en

6.4.3 Connect to a Defined SAP connection

SAP Connection can be defined in the **Connection** tab by selecting either of **Direct Connection** or **Load Balanced** option.

- Direct Connection: For direct connection to a single application server. Direct connection is by Default.
- Load Balanced Connection: For connecting the Adapter with load balance.

Direct Connection

When connecting using **Direct Connection** option, you need to provide following parameters, as shown in Figure 6-10.

- Application Server: Define system application server (Host name or IP Address of SAP system).
- **System Number:** It is SAP instance of the SAP application server. This property should be used when you are not using SAP load balancing.

Figure 6-10 Direct Connection

SAP Connection Para	ameters:	
Connection Type:	Direct Connection	🔿 Load Balanced
Application Server:	10.30.32.42	
System Number:	00	

Load Balanced Connection

When connecting using **Load Balanced** connection option for load balancing, you need to provide following parameters, as shown in Figure 6-11.

- Message Host: Message Host is the IP of message server host.
- Message Service: Message Service is the service name of the load balancer service.
- **R/3 Name:** R/3 Name is the System ID/Name of SAP system.
- Server Group: Select any one of logon group to which you want to connect. This is the name of the group that is logging in to the SAP system.

Figure 6-11 Load Balanced

SAP Connection Par	ameters:		
Connection Type:	O Direct Connection	Load Balanced	
Application Server:	10.30.32.42		
System Number:	00		
Message Host:			
Message Service:			
<u>R</u> /3 Name:			
Server Group:			

SAP Route String

In addition, there is an option for **SAP Route String**, as shown in Figure 6-12, which describes a connection required between two hosts using one or more SAP routers.

To connect to an SAP server from the internet, one uses SAP router as a proxy between the SAP GUI and the SAP server.

Note: Load balancing enables the administrator to distribute logins evenly between several application servers. It also allows configuring a bigger system landscape transparently, since the client does not need to know the address of all application servers, but only the address of the message server (load balancer).

Primarily used when you want more than one user to be able to log in to the SAP system.

Test Connection

A Test Connection button is also available on Connection tab, as shown in Figure 6-12. The **Test Connection** button test the connection to SAP with the Specified parameters.

Figure 6-12	Connection	Tab
-------------	------------	-----

Connection Type:	Direct Connection Load Balanced	
Application Server:	10.30.32.42	
System Number:	00	
Message Host:		
Message Service:		
<u>R</u> /3 Name:		
Server Group:		
SAP Route String: Server 🔽 Securit	y Trace Management Additional	Test Connection
st connection succe	ssful w/parameters:	

Optional tabs can be added by selecting the corresponding check boxes:

- Server tab (Note: In case of outbound adapter, this tab is disable.)
- Security tab
- Trace tab
- Management tab
- Additional tab

Server Tab

This tab appears in case of Inbound adapter. Parameters available in this tab is useful in inbound communication with SAP, as shown in Figure 6-13.

Connection Name: DefaultClient	Import
User Connection Server	
Server Parameters: (Only required when accepting SAP	Pinput)
Gateway Host:	
G <u>a</u> teway Service:	
Program ID:	
Connection Count:	
Repo Destination:	
Server Security Trace Management	Additional <u>T</u> est Connection
Server Security Trace Management	Additional <u>T</u> est Connection

Figure 6-13 Server Tab

Table 6-1 lists the parameters available in **Server** tab.

Table 6-1

Element	Description
Gateway Host	Enter Gateway host name of the sender system.
Gateway Service	Gateway service of the sender system. This can be the numeric description of the service port in the sender system or the alphanumeric equivalent (e.g., sapgwXX, where XX is the system number of the sender system).
Program ID	Program ID of the registered server program in SAP. The selected program ID must uniquely describe the RFC sender channel in the configured gateway (Application Server (Gateway) and Application Server Service (Gateway) parameters).
Connection Count	Number of initial connections required between sender system and adapter.
Repo Destination	The repository used by the server to lookup the definitions of an incoming function call.

Note: The server tab is not supported in the current release. This will be implemented for future releases.

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Trace Tab

Trace Parameters (Optional)

To change the logging level of SAP JCo using following parameters, specify trace level based on JCo level or individual level like RFC Trace Level, CPIC Trace Level or Server Trace Level, as shown in Figure 6-14.

Figure 6-14 Trace Tab

Create SAP R/3 Connection	X
Connection Name: DefaultClient	Import
User Connection Server Trace	
Trace All Connections:	
JCO Trace Level:	
Trace Individual Connection:	
RFC Trace Level: 0	
CP <u>I</u> C Trace Level: 0 ▼	
Trace Server Connections:	
Server Trace Level:	
(*) Note: select 0 to disable trace	
Server Security Trace Management Additional	Test Connection
Kala	OK Capital
Ūsh	UK Cancel

JCo Trace Level

Use this procedure to trace JCo calls coming from the SAP systems. The JCo Traces write information about the invocated methods and the data passed through the underlying communication layers throughout the call.

Note: The activation of JCo Traces significantly slows down the communication. Therefore, you must only activate them if necessary

Trace level of 0 means disabled and 1 means enabled.

JCo Trace Level: Select values from 0 or 1.

RFC Trace Level

Using the RFC trace, users can track which remote calls application or the SAP System triggers and on which instance these calls are executed. Users can display and further analyze the trace records logged in the trace file.

From the time users turn on the RFC trace function, to the time they turn it off again, all RFC calls occurring either for a specific user or for a user group are recorded.

From the recorded trace, user can deduce:

- Which function modules have been called remotely by the program to be analyzed.
- Whether the RFC was executed successfully.
- The total time used to process the remote call.
- The marking of the RFC communication (RFC client or RFC server).
- On which instance the remote call was executed.
- With which technical parameters this instance is characterized.
- The number of bytes sent and received during the RFC.

RFC Trace Level: Select this if user wants the RFC level trace to be either 0 or 1.

CPIC Trace Level

Common Programming Interface - Communication (CPIC) tracing. This is the communication layer under JRFC (or JCo). You can choose a trace level from 0 to 3, where 3 is the highest and most detailed level of tracing.

Since JCo is internally using the RFC and CPIC libraries, the related traces of these components are also sometimes required for an error analysis.

CPIC Trace Level: Select one of the given trace level for CPIC tracing from 0 to 3.

Management Tab

Management Parameters (Optional)

This tab provides parameters that help in managing the connection life. You can define connection pool size and other parameters to ensure connection life, as shown in Figure 6-15.

Create SAP R/3 Connec	tion	antar Cortos	
Connection Name: Deta			Import
User Connection	Server Security Trace Ma	nagement	
Connection Management	nt Parameters:(Optional)		
Pool Capac <u>i</u> ty:			
Pe <u>a</u> k Limit:			
Max Wait (ms):			
Expi <u>r</u> ation Time (ms):			
Expiration Period (ms):			
✓ Server ✓ Security	✓ Trace ✓ Management Addi	tional	Test Connection

Figure 6-15 Management Tab

- 1. **Pool Capacity:** Maximum number of connections which will be kept open by the pool for possible reuse. These connections will be automatically closed if they cannot be reused for more than the **Connection Timeout** period. A value of 0 has the effect that there is no connection pooling, i.e. connections will be closed after each request.
- 2. Peak Limit: Maximum number of connections which can be allocated from the pool. This enables the user to create more connections as specified by the Peak Limit parameter, e.g. for temporary peak usage times. If the value for Maximum connections is less than the value of the parameter Peak Limit, the parameter will automatically be reset to the value of Peak Limit. All allocated connections exceeding the Peak Limit will be closed immediately, if they are released from the application to the pool again.
- **3.** Max Wait (ms): Defines the maximum time to wait to obtain a requested connection. If the connection pool is exhausted (that means the Maximum Connections limit is reached) and another thread is requesting an additional connection, this is the time that is being waited for some connection to be released by another thread so that that one can be handed out to the waiting thread. If the maximum waiting time is reached, and no connection became available in the mean time, then a JCO.Exception with the key *JCO_ERROR_RESOURCE* is thrown. The default value for the Maximum Waiting Time is 30 seconds (30,000 ms).
- 4. Expiration Time (ms): Time in ms after which the connections held by the internal pool can be closed.

5. Expiration Period (ms): Enter expiration period in milliseconds, this is the interval in ms with which the timeout checker thread checks the connections in the pool for expiration.

Note: The Management tab is not supported in the current release. This will be implemented for future releases.

Security Tab

SAP Security Parameters

The Adapter for SAP uses the Java Connector (JCo) to communicate with the SAP. You can have the SNC connection in the case of both inbound and outbound. The JCo needs the information as mentioned below to be able to use SNC for the connection.

Prerequisite for SNC Communication (Inbound or Outbound)

You have an SNC communication between the client server (Adapter for SAP) and the SAP, only once the SNC configuration is done on both the partner sides and the required certificates are exchanged according to the procedure mentioned by SAP.

SNC parameters for Outbound

SNC Parameters required for Outbound Connection to the SAP Server, as shown in Figure 6-16.

Create SAP R/3 Connection
Connection Name: DefaultClient Import
User Connection Server Security Trace
Security Parameters:(Optional)
SNC Mode:
SNC Level: 1
SNC Name:
SNC Partner:
SNC Library:
Server Security Parameters:(Optional)
SNC Level: 1
SNC Name:
SNC Library:
Server Security Trace Management Additional <u>T</u> est Connection
Help OK Cancel

Figure 6-16 Security Tab

Table 6-2 lists the parameters available in **Security** tab.

Table 6-2

Parameter	Description
SNC mode (Required field)	This is a flag for activating SNC. Check the checkbox for enabling and uncheck for disabling the SNC connection.
SNC library	This specifies the path and file name of the external library (SAP Cryptographic library file downloaded from the SAP). The sample path is 'C:\SAPNW_AS_Java\SAPCryptolib\sapcrypto.dll'.
SNC Level	 This specifies the level of protection to use for the connection. Default value is 3. Possible values of this field are as mentioned below: Authentication only. Integrity protection. Privacy protection (default). 8: Use the value from profile parameter '<i>snc/data_protection/use</i>' maintained on the SAP server. Use the value from profile parameter '<i>snc/data_protection/max</i>' maintained on the SAP server.
SNC Name	This specifies the SNC name of the environment where user is testing SNC
	communication. The sample name is 'p:CN=AS Java, O=MyCompany, C=US'.
-------------	--
	Although this parameter is optional, use it to make sure that the correct SNC name is used for the connection.
SNC Partner	This specifies the AS ABAP's SNC name. The sample name is 'p: CN=EQ6, OU=I0020070395, OU=SAP Web AS, O=SAP Trust Community, C=DE'.

SNC Parameters for Inbound

Prerequisite for Inbound SNC Communication

Inbound SNC communication after defining the RFC options for the Program ID that you have used for the connection and enabling the SNC by activating the same in the corresponding RFC destination. This can be done in the tcode SM59. The parameters to be passed in the 'SNC options' are as follows:

- 1. In the **RFC Destination**, select the **SNC** button in the **Logon & Security** tab. Pass the below values:
 - **QoP:** Select any of the values of 1,2,3,8 & 9 as displayed in the drop-down box. This specifies the level of protection to use for the connection.
 - Partners: The RFC server program's SNC name has to be specified here. For e.g., 'p: CN=RFC, OU=IT, O=CSW, C=DE'.
 - Save the parameters.
- **2.** Activate the SNC by selecting the radio button **Active** in the **Logon & Security** tab of the RFC destination.

Table 6-3 shows the SNC Parameters required for Inbound Connection to the SAP Server:

 Table 6-3
 SNC Parameters required for Inbound Connection

Element	Description
SNC Level (Optional field)	This specifies the level of protection to use for the connection for the inbound connection from SAP. Default value is '3'.
	 Possible values of this field are as mentioned below: 1: Authentication only. 2: Integrity protection. 3: Privacy protection (default). 8: Use the value from profile parameter '<i>snc/data_protection/use</i>' maintained on the SAP server. 9: Use the value from profile parameter '<i>snc/data_protection/max</i>' maintained on the SAP server.
SNC Name (Optional field)	This Specifies the SNC name of the environment where user is testing SNC communication. The sample name is 'p:CN=AS Java, O=MyCompany, C=US'. Although this parameter is optional, set it to make sure that the correct SNC name is used for the connection.
SNC library (Optional field)	This Specifies the path and file name of the external library (SAP Cryptographic library file downloaded from the SAP).

The sample path is 'C:\SAPNW_AS_Java\SAPCryptolib\sapcrypto.dll'.

The Properties in the WebLogic console can be used for run-time SNC communication of Adapter for SAP. The corresponding parameters in the DT and RT are given in the Table 6-4.

Table 6-4Parameters in the DT and RT

Parameters in Design-Time	Corresponding Parameters for Run-time			
Client Security Parameters:				
SNC mode	DestinationDataProvider_JCO_SNC_MODE			
SNC library	DestinationDataProvider_JCO_SNC_LIBRARY			
SNC Level	DestinationDataProvider_JCO_SNC_QOP			
SNC name	DestinationDataProvider_JCO_SNC_MYNAME			
SNC Partner	DestinationDataProvider_JCO_SNC_PARTNERNAME			
Server Security Parameters:				
SNC Level	ServerDataProvider_JCO_SNC_QOP			
SNC name	ServerDataProvider_JCO_SNC_MYNAME			
SNC library	ServerDataProvider_JCO_SNC_LIBRARY			

Additional Tab

This tab enables you to provide extra JCo connection parameters that are not defined in the other tabs of the Connection page in the wizard. In **Property Name** provide JCo property and in **Property Value** column provide value of that particular JCo parameter.

When these properties are defined in the Additional tab, the same is used for connection. These properties and corresponding values are also reflected while checking the parameters through **Test Connection** button, as shown in Figure 6-17.

Edit SAP R/3 Connection	
Connection Name: DefaultClient	Import
User Connection Management Add	litional
Additional Parameters:(Optional)	
Property Name	Property Value
jco.client	sknjdnfkiwsndfsandsnkodnfksndnknfskndskjdnks
Add Remove	
Server Security Trace V Manage	ement 🔽 Additional <u>T</u> est Connection
Server Security Trace Manage	ement ✔ Additional Test Connection
Server Security Trace Manage Test connection successful w/parameters: {jco.client.user=JCA_DEV, jco.client.lang=en,	ement 🔽 Additional <u>T</u> est Connection
Server Security Trace Manage Test connection successful w/parameters: {jco.client.user=JCA_DEV, jco.client.lang=en, sap.connection.name=DefaultClient, sap.connection.name=DefaultClient,	ement 🔽 Additional <u>T</u> est Connection
Server Security Trace Manage	ement 🗹 Additional <u>T</u> est Connection
Server Security Trace Manage	ement 🔽 Additional <u>T</u> est Connection

Figure 6-17 Additional Tab

6.5 Select SAP Objects from Objects Selection

Once connected to an SAP server using the connection definition, the **Object Selection** page appears which enables you to select SAP BAPI, RFC, or IDoc objects.

This wizard has three panels, as shown in Figure 6-18.

- 1. Object panel.
- 2. Selected BAPI/RFC functions or IDoc messages panel.
- 3. Definition panel.

ect Selection)(2	* =r
elect SAP objects, BAPI, RFC, or IDoc, o ret Hierarchical Alphabetical SAP Business Objects (BAPIs) Function Modules (RFCs)	rieve and describe. Selected BA	PI/RFC function	ns or IDOC messag
ALE/EUT MEssages (IDOCS)	3 Name: Name	Туре	Description

Figure 6-18 Object Selection Page

6.5.1 Object Panel

The Object Panel shows two tabs, that is, Hierarchical and Alphabetical.

 Hierarchical: This tab shows all the SAP Objects (RFC/BAPI/IDoc) available in that SAP system in hierarchical form, as shown in Figure 6-19.

For each of the root notes BAPI/RFC/IDoc, The hierarchy is arranged with the Application Components, Subcomponents, Business Object types, Business Objects, Methods with the levels of hierarchy directed from the root node to leaf node.

Figure 6-19 Hierarchical Tab



Alphabetical: This tab shows all the Business Objects available in that SAP system in the alphabetical form(A to Z), as shown in Figure 6-20.

🔁 SAP		
🖨 🗁 Busine:	ss Objects (BAPIs)	
🛓 🗀 🛆 A		
🖶 🔂 🛅 🖪		
🚊 🗠 🚞 C		
🔁 🔂 D		
🖶 🗠 🛅 E		
🖶 🗀 F		
🕀 🙆 G		
🕀 🙆 Н		
😟 🖂 I		
👜 🖓 🔁 🕽		
😟 🗀 K		
🕀 🖓 🕒		
🕀 🙆 🕀		
🕀 🗠 🔁 🛛		
🕀 🙆 O		-

Figure 6-20 Alphabetical Tab

You can select any option for browsing the SAP business objects. This can be done by clicking on + icon that establish a connection to SAP and displays all the objects of the expanded node as shown in Figure 6-21.

Figure 6-21 Expanded Node

bject Selection	Hard on a state of the state of	-
Select SAP objects, BAPI, RFC, or IDoc, to re Hierarchical Alphabetical	trieve and describe. Selected BAPI/RFC	C functions or IDOC messages
SAP Business Objects (BAPIs) Please wait Function Modules (RFCs) CALE/EDI Messages (IDOCs)		
Connecting Connecting to S	AP	escription

Once the SAP connection is established and all objects are displayed, you can search and select the desired object using **Search SAP Repository** and providing exact or pattern matched string.

To search the object, select the required object, right-click and select **Search** option as shown in Figure 6-22.

Figure 6-22 Search Option

🗁 SAP		
🖨 🗁 E	Business Objects	(BAPIs)
÷(Accounting	C III
⊕ •(Application	Select
÷.	칠 Auto-ID In 📗	Search
	🛅 Basis Comp	Test
(🔁 Controlling	

The object can be searched by two ways, Name or Description, as shown is Figure 6-23.

- Name: If you select the Name radio button, the search occurs only on the basis of name of the object.
- Description: If you select the Description radio button, the search occurs only on the basis of description of the object.

To search any object, the search criteria needs to be passed in the **Find** field. Once you provide the criteria and have clicked on **OK** button, the objects matching the search criteria is displayed in the text area just below to the **Find** field.

Once the objects are displayed in the text area, you can select the objects by clicking on **OK** button.

Figure 6-23 Search SAP Repository

Search SAP Repository	Name ODescription
ind: CompanyCode	
CompanyCode.ExistenceCheck [BAPI_	COMPANYCODE_EXISTENCECHK]
CompanyCode.GetDetail [BAPI_COMP/	ANYCODE_GETDETAIL]
CompanyCode.GetList [BAPI_COMPAN	YCODE_GETLIST]

Once the desired object is selected, it is moved to **Selected BAPI/RFC functions** or **IDoc messages** panel.

After identifying the required object in the Hierarchy/Alphabetical list, below three operations can be performed on object, as shown in Figure 6-24.

Select the required object, right-click and select Select, View Schema, or Test option.

• Select: Once Select is clicked, the selected object is added to the Selected BAPI/RFC

functions or IDoc messages panel.

ONLINE_SPLITTER		BAPI_COMPA	NYCODE_G	ETDETAIL Comp
ORG_UNITS	8			
PLANNING				
STATKEYFIGURE	3			
P_XI_PROXY	S			
CORE		46))
OSING				
RC		Definition: BAPI_C	OMPANYCC	DE_GETDETAIL
		Name	Tune	Description
CORE		COMPANYCOD	СНАР	Company Code
002		COMPANYCOD	STRUCT	Company Code
BAPI_COMPANYCODE_GET_PERIOD For Com		COMPANYCOD	STRUCT	Company Code.
BAPI_COMPANYCODE_GETLIST List of Compa		RETURN	STRUCT	Return Code
BAPI_CCODE_GET_LASTDAY_FYEAR For Con		The root of	on coorn	ite control of the
BAPI_COMPANYCODE_GETDETAIL Company				
	act			

Figure 6-24 Select, View Schema, and Test

- View Schema: You can view the created xsd schema of the object in the **Definition** panel, as shown in Figure 6-25.
- **Test:** You can test the created schema by this option. This feature is supported only for BAPI and RFC.

Figure 6-25 Select and View Schema Result



Once the **Test** option is clicked, a popup window appears, with **Test Input** and **Test Output** tabs, as shown in Figure 6-26.

1. Test Input: Test Input tab has three columns as mentioned bellow:

- Name: Name of the object.
- Value: Value is given by the user as an input to test the created schema of the selected object.
- **Description:** Description of the each field of the object.

Figure 6-26 Test Input Tab

Test SAP RFC/BAPI Method		
Test Input Test Output		
Name	Value	Description
BAPI_COMPANYCODE_GETDE	ETAIL (Company Code Details
	1000	Company Code

2. Test Output: Once you have provided the input and clicked on **Run Test**, this option tests the created schema of the selected object and displays the result in the text area of the **Test Output** tab, as shown in Figure 6-27.

Figure 6-27 Test Output Tab

Test SAP RFC/BAPI Method	×
Test Input Test Output	
<pre><?xml version = '1.0' encoding = 'UTF-8' standalone = 'yes'?> <bapi_material_get_detail> </bapi_material_get_detail></pre>	
<input/> <material>40-110C</material> <material_evg></material_evg>	
<material_ext></material_ext> <material_vers></material_vers> <material_vers></material_vers>	
<valuationarea></valuationarea> <valuationtype></valuationtype>	
<output> <materialplantdata></materialplantdata></output>	
<pur_group></pur_group> <issue_unit></issue_unit>	
<pre></pre>	
<moving_pr>0.0000</moving_pr> <std_price>0.0000</std_price>	r
Help Run Test Done	

You can close the test window by clicking on Done button.

6.5.2 Selected BAPI/RFC functions or IDoc messages panel

This panel contains the selected BAPI/RFC functions or IDoc messages, as shown in Figure 6-28. Once you select the desired object, the selected object can be added or removed from

the **Selected BAPI/RFC functions or IDoc messages** panel by clicking on the icons mentioned in Table 6-5.

Table 6-5 Add/Remove Object Icon

lcon	Description
8	This icon gets enabled when you select only one object to shifts into the selection panel.
\$	This icon gets enabled when you select only one object to remove from the selection panel.
*	This icon gets enabled when you select more than one object to shift into the selection panel.
~	This icon gets enabled when you select more than one object to remove from the selection panel.

Once any corresponding object is selected in the **Search** window, it will be automatically added to this panel.

Note: If you select the RFC Object while creating an outbound endpoint, an option is available to define type (sRFC, tRFC, qRFC) of RFC connection you wanted to use while executing this object. A popup window appears, where you can choose the RFC type when you right-click on the selected RFC Object.

bject Selection	oreansis foreigner	2596967676	
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and de Hierarchical Alphabetical	scribe. Selected BAPI/RF	C function	is or IDOC messages
→ □ FAGL_ONLINE_SPLITTER → □ FAGL_ORG_UNITS → □ FAGL_PLANNING → □ FAGL_STATKEYFIGURE → □ FAIS → □ FAVOP_XI_PROXY → □ FBOCCORE → □ FB_CLOSING → □ FB_ICRC	Definition: BAPI_COMP	COMPANY	CODE_GETDETAIL
	Name	Туре	Description
	COMPANYCOD	CHAR	Company Code
BAPI_CCODE_GET_LASTDAY_FYEA	COMPANYCOD COMPANYCOD RETURN	STRUCT.	Company Code Company Code Return Code

Figure 6-28 Selected BAPI/RFC functions or IDoc messages panel

6.5.3 Definition panel

This panel contains the further definition of the selected object. Object Schema Details are visible in this panel. Definition panel has three columns: **Name**, **Type**, and **Description** which defines the fields of the selected object, as shown in Figure 6-29.

ject Selection	
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and de Hierarchical Alphabetical	scribe. Selected BAPI/RFC functions or IDOC messag
FAGL_ONLINE_SPLITTER FAGL_ORG_UNITS FAGL_PLANNING FAGL_STATKEYFIGURE FAGL_STATKEYFIGURE FAIS FAUOP_XI_PROXY FBOCCORE FB_CLOSING FB_ICRC	Definition: BAPI_COMPANYCODE_GETDETAIL
FBAS FBASCORE FBASCORE FBASCORE FOR SOUL FOR	Name Type Description COMPANYCOD CHAR Company Code COMPANYCOD STRUCT Company Code COMPANYCOD STRUCT Company Code RETURN STRUCT Return Code

Figure 6-29 Definition panel

6.6 JCA Properties Page

JCA properties page enables the user to define JCA properties of the SAP endpoint. This page has two tabs i.e. + (ADD) and \mathbf{x} (REMOVE). You can Add, Delete and Update the properties and respective values, as shown in Figure 6-30.

ICA Properties		
Specify the Name and Value of all JCA A	dapter Properties.	
Properties		
Name	Value	
nteraction	stateless	
exceptionFilter	off	
SchemaValidation	off	
ca.retry.count	9	
ca.retry.interval	1	
ca.retry.backoff	2	
ca.retry.maxInterval	120	

6.6.1 Interaction of JCA Properties (Outbound to the Adapter) Interaction

Stateless

This treats each request as an independent transaction that is unrelated to any previous request so that the communication consists of independent pairs of requests and responses. This does not require the server to retain session information or status about each communications partner for the duration of multiple requests. Note that the default value is **Stateless**.

Stateful

The state of the session is maintained in the session ID for the duration of the conversation between the client and the stateful session. If user selects **Interaction pattern** as stateful then the following extra operations automatically get added.

This is required in case you are creating or changing data in SAP through Standard/Custom BAPI/RFC which does not support an internal commit to database.

ExceptionFilter

On

This property enables the user to set a custom exception filter class that implements the interface:

oracle.tip.adapter.api.exception.ExceptionFilter

The exception filter is supported only for outbound processes. This class name is defined in the .jca file to filter the generated exceptions and categorizes them into the following categories:

- PCRetriableResourceException A remote fault.
- PCResourceException A binding fault.

This exception can then be handled by the SOA composite fault policy files.

Off

In this case, no exception filter class is added in the .jca file and no exceptions like *PCRetriableResourceException/PCResourceException* are thrown in case of remote or binding faults. Note that the default Value is **off**.

SchemaValidation

On

SchemaValidation **ON** is used to validate the Input XML document with the schema in the WSDL document during run-time. On failure, the XML record is rejected with the error **Invalid Input Xml**. This can be configured in a .jca file.

Off

No Validation of Input XML is done with the xsd. Anything wrong in the input XML is rejected with the JCO exception. Note that the default value is **off**.

Queue Name

Queue Name needs to be specified to serialize the data that is being sent, like function modules which depend on each other (such as update and then change) i.e. Queued RFC (QRFC) connections are used to transport outbound messages to SAP through the queue. This queue needs to be configured in SAP first, and is given in the **Queue name** field of the configuration wizard.

Note that the default value is blank. This is applicable for IDOCs.

jca.retry.interval

This property specifies the time interval between each retry.

jca.retry.maxInterval

This property specifies the maximum value of retry interval, i.e. a cap if backoff>1.

jca.retry.count

This property specifies the number of times that user wants the retry to be carried out.

jca.retry.backoff

This property specifies the retry interval growth factor (positive integer). The user have to wait for increasing periods of time between retries 9 attempts with a starting interval of 1 and a back off of 2 will lead to retries after 1, 2, 4, 8, 16, 32, 64, 128, and 256 (28) seconds.

6.6.2 Activation of JCA Properties (Inbound to the Adapter) ControlCharacter

The Adapter for SAP provides Non-Xml character handling for the data that is coming from SAP system to the adapter. XML does not support all characters defined in Unicode. For example, control characters, some of the control character not supported by XML 1.0.

encode

Any character in payload if not supported by XML 1.0, will encode character with its decimal format.

remove

Any character in payload if not supported by XML 1.0, will remove character.

space

Any character in payload if not supported by XML 1.0, will replaces the character with space.

AutoSYSTAT01

Yes

In this case, Adapter for SAP is able to auto return the sent SYSTAT01 IDoc back to SAP with a positive response (code 53) upon a successful reception of an IDoc message.

No

In this case, nothing is sent back to SAP by the Adapter upon a successful reception of an IDoc message. Note that the default value is **No**.

EncodelDoc

Flatfile

SAP uses a non-XML text-based format, called the Flatfile IDoc format, for serializing IDoc messages to file system. In a Flatfile IDoc, all IDoc records including control record and data record are stored in lines of text separated by a line delimiter.

No

SAP uses the XML format to send IDoc records the field names and complete data.

Note that the default value is **No**.

programID

The programID specified at the DT level overrides with RT.

6.6.3 Generation of Corresponding (JCA) Artifacts (WSDL/XML Schemas)

SCA artifacts such as XSD, WSDL, and JCA properties are generated for SAP endpoints directly within the composite designer of JDeveloper. The .xsd defines the schema definition for the selected object whereas .jca file contains all the JCA properties for that project like

ConnectionFactory JNDI name UIConnectionName, portType operation and various properties like ExceptionFilter, SchemaValidation, QueueName, and object type along with the respected values, as shown in Figure 6-31.

Figure 6-31 Generation WSDL/ XML Schemas Screen



6.7 Finishing with Adapter Configuration Wizard

The finish page provides a summary of the SAP endpoint definition and location of generated interface files, as shown in Figure 5-32.

Figure 6-32 Finish Page

Adapter Configuration Wizard ·	Step 5 of 5			X
Finish				*
You have finished definin When you dick Finish, the wizard will D:\jdev_RC3_mywork\mywork\Stage directory.	g the SAP Adaj create the 20_RC1\SAP_Adapter	pter Service : s	sapReference rence.wsdl file in yo	ur project
Help	< <u>B</u> ack	Next >	Einish	Cancel

7

Configuring the Adapter Run-Time Parameters on the WebLogic Server

This chapter describes the procedure to configure the Oracle Adapter for SAP on the Oracle WebLogic Server. This chapter contains the following topics:

Section 7.1, "Adapter Integration with Oracle WebLogic Server"

Prerequisites:

- The WebLogic Application server is running.
- SAP JCo jars and library is installed in the WebLogic application server.

7.1 Adapter Integration with Oracle WebLogic Server

Oracle Adapter for SAP is deployed within an Oracle WLS container during installation. All client applications run within the Oracle WLS environment. In a run-time service scenario, an Enterprise Java Bean, servlet, or Java program client makes the Common Client Interface (CCI) calls to resource adapters. The adapters process the calls as requests and send them to the EIS. The EIS response is then sent back to the client.

7.1.1 Configure Run-time Parameters for the Adapter for SAP

1. To configure run-time parameters for the Adapter, navigate to the setting page of the deployed adapter. This page displays basic information about this resource adapter, as shown in Figure 7-1.

Settings for	SAPAdapter							
Overview	Deployment Plan	Configuration	Security	Targets	Control	Testing	Monitoring	Notes
Save								
This page d	lisplays basic informa	tion about this re	source ada	oter deployr	ment.			
Name:				SAP	Adapter			
Source Pat	h:			/ ora	ide/ Oracle	/ SAPAdap	ter. rar	
Deploymer	nt Plan:			(no p	olan specifi	ed)		
Staging Mo	ode:			(not	specified)			
Plan Stagir	ng Mode:			(not	specified)			
Security M	odel:			DDO	inly			
街 Deploy	ment Order:			10	0			
🕂 Deploy	ment Principal Na	me:						

Figure 7-1 Setting Page

2. Open the SAP JCA Adapter Configuration panel and select Outbound Connection Pools tab, a default javax.resource.cci.ConnectionFactory is available, as shown in Figure 7-2.

Figure 7-2 Outbound Connection Pools Tab

Settings fo	r SAPAdapt	er						
Overview	Deploymen	t Plan	Configuration	Security	Targets	Control	Testing	Monitoring
General	Properties	Outb	ound Connection	Pools	Admin Object	ts Workl	oad Ins	trumentation
This page connectio name of a	displays a tal n factory inte a group or inst d Connectio	ble of O rface a tance to n Pool	utbound Connectio nd the instances and configure it. Autor Configuration Ta	n Pool groi e listed by matically ge able	ups and insta their JNDI na enerated Con	nces for th ames. Expa nection Po	is resource nd a group ols are not	adapter. The to obtain conf displayed in th
Gro	oups and Ins	tance	s 🗞					
Đ j	avax.resource	e.cci.Co	nnectionFactory					
New	Delete							

3. Click New to create a new outbound connection.

- **4.** Select **Outbound Connection Group** in which user want to create outbound connection group.
- 5. Select *javax.resource.cci.ConnectionFactory* and click on Next button, as shown in Figure 7-3.



eat	e a New Outbound Connection
Bacl	k Next Finish Cancel
Out	tbound Connection Group
in v	which outbound connection group do you want to create an instance?
Dut	tbound Connection Groups
	Outbound Connection Group 🗞
0	javax.resource.cci.ConnectionFactory

6. Enter a JNDI name, e.g., *eis/FMW2SAP* in the JNDI Name field and then click on Finish button, as shown in Figure 7-4.

Figure 7-4 Create a New Outbound Connection

Create a New Outbound Connection	
Back Next Finish Cancel	
JNDI name for Outbound Connection Instance	
Enter the JNDI name that you want to use to obtain the new co * Indicates required fields	onnection instance
The Outbound Connection instance represents a connection pool	l. The JNDI name can be used to obtain the
伊금 * JNDI Name:	eis/FMW2SAP
Back Next Finish Cancel	

- 7. Click OK.
- 8. Click Save.
- 9. Click the *eis/FMW2SAP* ConnectionFactory, as shown in Figure 7-5.

Figure 7-5 Outbound Connection Properties

Settings f	or javax.resou	urce.cci.Conne	ectionFactory		
General	Properties	Transaction	Authentication	Connection Pool	Logging

This page allows you to view and modify the configuration properties of this outbound connection pool. Properties yo

Outhound	Connection	Properties

Save		
Property Name 💫	Property Type	Property V
DestinationDataProvider_JCO_ALIAS_USER	java.lang.String	
DestinationDataProvider_JCO_ASHOST	java.lang.String	10.30.0.26
DestinationDataProvider_JCO_CLIENT	java.lang.String	800
DestinationDataProvider_JCO_CODEPAGE	java.lang.String	
DestinationDataProvider_JCO_CPIC_TRACE	java.lang.String	
DestinationDataProvider_JCO_DEST	java.lang.String	
DestinationDataProvider_JCO_EXPIRATION_PERIOD	java.lang.String	
DestinationDataProvider_JCO_EXPIRATION_TIME	java.lang.String	
DestinationDataProvider_JCO_GETSSO2	java.lang.String	
DestinationDataProvider_JCO_GROUP	java.lang.String	

10. You have to update the mandatory connection properties:

For Outbound connection:

- DestinationDataProvider_JCO_ASHOST
- DestinationDataProvider_JCO_CLIENT
- DestinationDataProvider_JCO_LANG
- DestinationDataProvider_JCO_PASSWD
- DestinationDataProvider_JCO_PEAK_LIMIT
- DestinationDataProvider_JCO_POOL_CAPACITY
- DestinationDataProvider_JCO_SYSNR
- DestinationDataProvider_JCO_USER

For Inbound connection(apart from above):

- ServerDataProvider_JCO_CONNECTION_COUNT
- ServerDataProvider_JCO_GWHOST
- ServerDataProvider_JCO_GWSERV
- ServerDataProvider_JCO_PROGID
- **11.** Click **Save** to save the connection configuration and then return and click on the **Deployments** panel.
- **12.** Select the **Adapter** from the list and click **Update** to redeploy the SAP JCA adapter with updated configuration, as shown in Figure 7-6.
- 13. Plan.xml would be updated with the latest connection configuration parameters.

Figure 7-6	Updated Applicatio	n Assistant
Update App	plication Assistant	
Back	ext Finish Can	cel
Locate n	ew deployment files	
You have	elected to update the	SAPAdapter application.
O Update	e this application in p	lace with new deployment plan changes. (A deployment plar
Deployme	nt plan path:	/oracle/stage9/Middleware/soa/soa/Plan.xml Change Path
Redep	loy this application u	sing the following deployment files:
Source pa	ith:	/oracle/stage9/Middleware/soa/soa/connectors/SAPAdapter.rar
Deployme	nt plan path:	/oracle/stage9/Middleware/soa/soa/Plan.xml Change Path
Back	ext Finish Can	cel

The Adapter for SAP is now configured for desired connection in the WebLogic Application Server.

8

Integration Scenarios in Oracle SOA Suite

This chapter demonstrates how to create composites to perform Inbound and Outbound communication with SAP using the Adapter for SAP. The different components used in this chapter are BPEL, Mediator, OSB, and BPM. You will use different components for orchestration, transformation and routing, and interact with SAP using the The Adapter for SAP to create the end-to-end processes.

This chapter contains the following topics:

- Section 8.1, "Integration Overview"
- Section 8.2, "The Adapter Integration with SOA Service Components"
- Section 8.3, "The The Adapter Integration with BPM Service Components"
- Section 8.4, "The Adapter Integration with Oracle Service Bus (OSB)"
- Section 8.5, "Deploy the Defined Process"
- Section 8.6, "Test the Deployed Process"

8.1 Integration Overview

The Oracle Adapter for SAP enables middleware components to interact and exchange data with the SAP R/3 system. Similar to other WebLogic adapters and applications, the Adapter should be deployed in WebLogic console under Deployments. SOA/OSB can be successfully deployed to SOA/OSB server after deployment WSDL is generated in JDeveloper which is used for both inbound and outbound communication. After deployment to server, the application can be controlled from EM/Console.

8.2 The Adapter Integration With SOA Service Components

Tool required for the design-time configuration of an Oracle SOA process:

Oracle JDeveloper 12.1.3.

8.2.1 Create a New Application Server Connection

Follow the below steps to create a new Application Server connection in Oracle JDeveloper 12.1.3.

1. Open Oracle JDeveloper 12.1.3.

2. Click Window from the menu bar and select Application Servers to view the Application Server Navigator pane on the JDeveloper IDE, as shown in Figure 8-1.

Figure 8-1 Application Server Navigator

_				
a <u>m</u>	Tools	Window	Help	
\triangleright	- 🍅	🚽 Appli	ication Ser <u>v</u> ers	Ctrl+Shift-G
		🚑 Appli	ications	Ctrl+Shift-A
RJ_R	EQUIRE	Book	marks	Ctrl+Shift-K
		●≣ <u>B</u> rea	kpoints	Ctrl+Shift-R
		Com	ponents	Ctrl+Shift-P
DT 1	Versio	<u>D</u> ata	base	
P1_1	PU_KEL	Debu	Jgger	

The Application Server tab is displayed, as shown in Figure 8-2.

Figure 8-2 Application Server

Applications	Application Servers ×	🔹 🕐 Start Page 🔺
🔁 । 🗶		🖌 (la) 🔜 🕀 (
	n Servers <u>N</u> ew Application	Server
	Import Export	
	🝓 <u>R</u> efresh	Ctrl-R

3. Right-click **Application Servers** and select **New Application Server.** A pop-up wizard appears which will help you to create an Application Server Connection, as shown in Figure 8-3.

O Create Application S	erver Connection - Step 1 of 3
Usage	
Vsage Name and Type Finish	Indicate how the application server will be used.
Help	J < <u>B</u> ack <u>N</u> ext > Einish Cancel

Figure 8-3 Create Application Server Connection Wizard

4. Leave the default selection on the wizard screen. Click Next, as shown in Figure 8-4.

Name and Type	
Name and Type	Specify a unique name and type for the connection. The name must be a valid Java identifier. Create connection in: IDE Connections Connection Name: Machine_Name Connection Type: WebLogic 12.x
Help	< <u>Back Next</u> > Einish Cancel

Figure 8-4 Name and Type Page

5. The Name and Type screen appears, as shown in Figure 8-5.

Figure 8-5	Name and Type	Window
i iguic o o	Manie and Type	maon

Create Application	Server Connection - Step 2 of 3
Name and Type	
Name and Type	Specify a unique name and type for the connection. The name must be a valid Java identifier. Create connection in: IDE Connections Connection Name: Machine_Name Connection Type: WebLogic 12.x
Help	< Back Next > Einish Cancel

6. Give the name to the connection server and set connection type as WebLogic12.x and click Next. The Authentication page is displayed, as shown in Figure 8-6.

Figure 8-6 Authentication Page

of Create Application	Server Connection - Step 3 of 6	
Authentication		Fy.
Usage	Specify a username and password to authenticate the connection.	
Mame and Type	Username:	
Authentication	weblogic	
Configuration	Password:	
V Test	••••••	
5 Finish		7.5
Heip	< <u>B</u> ack <u>N</u> ext > <u>Fi</u> nish	Cancel

- **7.** Enter a valid user name and corresponding password for the application server connection that you have mentioned during installation. This will be used to connect to the application server.
- 8. Click Next. The Configuration page is displayed, as shown in Figure 8-7.

Treate Application S	erver Connection - Step	4 of 6		×
Configuration			0101010101010101010101010	
Vage Name and Type	WebLogic Server connectio Domain of the target will be WebLogic H <u>o</u> stname (Admin localhost	ns use a host nan e verified nistration Server):	me and port to establish a connection. The	
Configuration <u>Test</u> Finish	Port: 7001 Always use SSL WebLogic Domain: base_domain		SSL Port: 7002	
Help	<	Eack	Next > Finish Cancel	

Figure 8-7 Configuration Page

- **9.** Enter the host name of the machine where Oracle WebLogic server has been installed. Provide the Port and Domain name as defined during the WebLogic installation and configuration process.
- 10. Click Next. The Test page is displayed as shown in Figure 8-8.

Figure 8-8 Test Page

est		
Usage Name and Type Authentication	Click Test Connection to determine if the in connection with the application server. Test Connection	formation specified successfully establishes
Einish	Testing J3R-160 Runtime Testing J3R-160 DomainRuntime Testing J3R-160 DomainRuntime Testing HTTP Testing HTTP Testing HTTP Authentication Testing J3R-88 Testing J3R-88-LOCAL Testing App Controller Testing J3R-88-DEP-MGR Testing J3R-88-DEP-MGR Testing J3R-88-DEP-MGR-LOCAL 12 of 12 tests successful.	SUCCESS SUCCESS SUCCESS SUCCESS SUCCESS SUCCESS SUCCESS SUCCESS SUCCESS SUCCESS SUCCESS

- 11. Click on the Test Connection button.
- 12. The status should return **Success** for all tests.
- **13.** This completes the connection configuration for a new Application Server Connection in JDeveloper 12.1.3. Click **Next**. The Finish page is displayed as shown in Figure 8-9.

Figure 8-9 Finish Page

o Create Application	server Connection - Step 6 of 6
Finish	
Usage Name and Type Authentication Configuration <u>Test</u>	You have completed creating the connection. To open your connection, expand the connection node in the Application Server Navigator.
Help	< Back Next > Einish Cancel

14. Click on the **Finish** button.

15. The New Application Server is listed under the Application Servers tab as shown in Figure 8-10.



8.2.2 Create an Empty Composite for SOA

Perform the following steps to create an empty composite for SOA:

- 1. You can either use an existing SOA Application or create a new SOA application. To create a new SOA Application, click on **File** tab from the JDeveloper menu.
- 2. Select File > New > Application as shown in Figure 8-11.

Figure 8-11 New Application Page

1)racle	JDeve	loper 12c	- MModule	e.jws :	PRJ_PO_I	RELAS	E_REL	INFO.j	pr
File	Edit	View	Application	Refactor	Search	Navigate	Build	Run	Tea <u>m</u>	Tools
	New			•	🔁 Ap	plication				
	Open		Ctr	1-0	D Pro	oject				

The New Gallery page is displayed, as shown in Figure 8-12.

Figure 8-12 New Gallery Page



3. From the listed items, select SOA Application and click OK as shown in Figure 8-13.

🕜 Create SOA Applicati	ion - Step 1 of 3	×
Name your application	01	B
	Application Name:	
	testApp	
Project Name	Directory:	
O Project SOA Settings	D:\orade_stage11\middleware\jdeveloper\testApp	Browse
	Application Package Prefix:	
Help	< Back Next > Finish	Cancel

Figure 8-13 Name Your Application Page

4. Enter a name for the SOA Application. You may choose the source directory for the application by clicking on the **Browse** button. By default it chooses the default workspace of the JDeveloper. Click **Next.**

TheName your project page is appears, as shown in Figure 8-14.

Figure 8-14 Name Your Project Page

🔿 Create SOA Applicati	on - Step 2 of	3			X
Name your project					E
Application Name Project Name	Project Name:	Project1 D:\oracle_stage11\mid	dleware\jdeveloper\	testApp\Project1	Bro <u>w</u> se
Project SOA Settings	Project Feature SOA Suite SOA Suite is a	es: suite of tools to model	SOA(Service Oriente	ed Architecture) app	plications.
Help		< <u>B</u> ack	Next >	<u>F</u> inish	Cancel

5. Enter a project name of your choice and click Next.

The Configure SOA settings page appears, as shown in Figure 8-15.



👩 Create SOA Applicati	on - Step 3 of 3			
Configure SOA settir	ngs	austrial prove of		6
Application Name Project Name Project SOA Settings	Composite Name: Project1 Start from: Standard Com Empty Composite Composite With Mediator Composite With BPEL Proce Composite With BPEL Proce Composite With Human Ta Composite With Subproces Composite With Business R Composite With Business R Composite With Spring	posite SOA Template		
Help	Qustomizable	ack [Next >]	Einish Cance	el

 Enter a Composite Name of your choice. A list of templates is displayed on the wizard screen. From the Standard Composite template list, select Empty Composite and click Finish.

8.2.3 Design an Outbound BPEL Process for BAPI/RFC/IDOC

This section describes how to design an outbound BPEL process, which consists of the following stages:

- 1. Create an Empty Composite
- 2. Configure an Adapter Component.
- 3. Configure an Outbound BPEL Process Component.

Create an Empty Composite

To create an empty composite, you can follow the same procedure that is described in "Create an Empty Composite"

Configure an Adapter Component

- **1.** Open JDeveloper.
- **2.** Click on the Application created in previous section "Create an Empty Composite". Click on the SOA project created under this application.
- **3.** Double-click on the composite.xml for this project. The Design space for the composite appears in the JDeveloper.
- 4. Drag and drop the Adapter component from the **Application Adapters** pane to the **External References** pane, as shown in Figure 8-16.

Figure 8-16 Adapter Component



The Welcome page of the Adapter configuration wizard is displayed, as shown in Figure 8-17.

O Adapter Configuration Wizard -	Step 1 of 4			
SAP Adapter Reference				*
Welcome to the Adapter Confi This wizard helps you create a service using define an operation for the service.	iguration Wiz a SAP Adapter. Yo	zard ou will be asked to s	pecify configuratio	n parameters and
Name: sapReference				
Help	< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

Figure 8-17 Adapter Configuration Wizard

5. Enter a reference name for the Adapter reference in the Name field and then click Next.

The Connection information page is displayed, as shown in Figure 8-18.

Connectio	n Information		*
A SAP R/3 con project or crea	nection is required to configure this a ate a New Connection.	dapter. Select a SAP R/3 connection already	defined in your
Connection:	DefaultClient		- + / 🗙
Client:	800		
Applicatio	on Server: 10.30.32.42		
System N	lumber: 00		
JNDI Name:	eis/SAP/FMWDEMO		Q .
1.0.0			

Figure 8-18 Connection Information Page

6. On the **Connection Information** page, click + icon which is located to the right of the **Connection** field, to create a new connection, as shown in Figure 8-19.

Note: Use the default JNDI name.





The Create SAP R/3 Connection page is displayed, as shown in Figure 8-20.

Connection Nar	ne: DefaultClient	Import
User Conr	nection	
User Logon F	Parameters:	
User Name:	JCA_DEV	
Pass <u>w</u> ord:		
Client:	800	
Language:	en	
Language:	en	<u>T</u> est Connection

Figure 8-20 Create SAP R/3 Connection Page

- 7. Under the User tab, enter a user name for the SAP connection.
- 8. Enter a password for the SAP connection in the **Password** field.
- 9. Enter the SAP system client ID in the **Client** field.
- 10. Select language. Default is en (English).
- **11.** Click on **Connection** tab on the wizard screen. Enter the Application Server host details, as shown in Figure 8-21.
- 12. Enter a connection name as DefaultClient in the Connection Name field.

User Connection		
SAP Connection Para	ameters:	
Connection Type:	O Direct Connection O Load Balanced	
Application Server:	xx.xx.xx	
System Number:	00	
Message Host:		
Message Service:		
D/2 Name:		
NJ Name.		
Server Group:		
SAP Route String:		
SAP Route String:		
SAP Route String:	y 🗌 Trace 🗌 Management 🗌 Additional	Test Connection
SAP Route String:	:y 🗌 Trace 🗌 Management 🗌 Additional	Test Connection
SAP Route String:	y 🗌 Trace 🗌 Management 🗌 Additional	Test Connection

Figure 8-21 Create SAP R/3 Connection Page

13. Enter a value for the **System Number**.

14. Test the SAP connection by clicking the Test Connection button.

15. On successful connection test, click OK.

You are returned to the Connection Information page, as shown in Figure 8-22.
Connectio	n Information			
A SAP R/3 cor project or crea	nection is required to config ate a New Connection.	ure this adapter. Se	lect a SAP R/3 connect	tion already defined in your
Connection:	DefaultClient			- + / ×
Client:	800			
Applicatio	on Server: 10.30.32.42			
System N	lumber: 00			
JNDI Name:	eis/SAP/FMWDEMO			Q .
Help		< Back	Next >	Finish Cancel

Figure 8-22 Connection Information Page

16. Click Next.

The Object selection page is displayed, as shown in Figure 8-23.

Dject Selection	ve and describ	e.	and an Island	
Hierarchical Alphabetical SAP Business Objects (BAPIs) Function Modules (RFCs) ALE/EDI Messages (IDOCs)	> >> < < <	Selected BAP	I/RFC functior	is or IDOC messages
		Name	Туре	Description

Figure 8-23 Object Selection Page

17. Click the **Hierarchical** tab, and then click on + icon to expand the node.

This tab shows all the SAP Objects (RFC/BAPI/IDoc) available in the SAP system that you are connected to, in a hierarchical form, as shown in Figure 8-24.

Figure 8-24 Hierarchical Tab



18. Select one or more Business Object from the list and click on > or >> icon to move the selected object(s) from 'Select SAP objects, BAPI, RFC, or IDoc, to retrieve and describe' pane to 'Selected BAPI/RFC functions or IDOC messages' pane as shown in Figure 8-25. You will see that the definition of the selected BAPI appears on the lower right of the Object Selection page.

bject Selection				*
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and	describe.			
Hierarchical Alphabetical	Sele	ected BAPI/RF	C function	s or IDOC messages
SAP	8	Appropriatio	nRequest.	Create [BAPI_APPRI
			· ·	
🚊 🦾 🗁 Acco Select				
i	8			
Search loc				
Test				
AcctngEmplyeeExpnses	4) /
AcctngEmplyeePaybles	D-4	Contraction		
AcctngEmplyeeRcvbles	Der	inition: Create	:	
AcctngGLPosting	Na	me	Туре	Description
AcctngGoodsMovement	AP	PREQUEST	CHAR	Appropriation
	AP	PROPRIATI	CHAR	Variant of App
	API	PROPRIATI	CHAR	Appropriation
AcctngPurchaseOrder	CO	NTROLLIN	CHAR	Responsible C
	LAI	NGUAGE	CHAR	Language in S
L L L L L L L L L L L L L L L L L L L	LAI	NGUAGE_ISO	CHAR	Language Acc
	MA	STER DATA	STRUC	Description of

Figure 8-25 Objects Selection Page

19. Retain the defaults and Click **Next**.

The JCA Properties page is displayed, as shown in Figure 8-26.

Figure 8-26 JCA Properties Page

🗿 Adapter Configuration Wizard - Step	4 of 5	×
JCA Properties	0101010101010101010104040404	
Specify the Name and Value of all JCA Adapter Pro	operties.	
Name	Value	
Interaction	stateless	
ExceptionFilter	off	
SchemaValidation	off	_
jca.retry.count	9	
jca.retry.interval	1	
jca.retry.backoff	2	
jca.retry.maxInterval	120	
Help	< Back Next > Einish Cancel	

20. Click Next.

The Finish page is displayed, as shown in Figure 8-27.

Figure 8-27 Finish Page



21. Click Finish.

For more information on how to configuring an Adapter Component, refer to the section "Using the Adapter for SAP in JDeveloper Composite".

Configure an Outbound BPEL Process Component

Perform the following steps to configure an Outbound BPEL Process Component:

 In the design window for the same composite created and used above in section ("Create an Empty Composite"). Drag and drop the BPEL Process component from the Service Components -> SOA pane to the Components pane, as shown in Figure 8-28.

Figure 8-28 BPEL Process Component



The Create BPEL Process dialog is displayed, as shown in Figure 8-29.

Figure 8-29	Create BPE	Process Dialog
-------------	------------	----------------

A BPEL process business pro	s cess is a service orchestra ocess (or large grained se	ation, based on the BPEL specification, used to describe/execute a ervice), which is implemented as a stateful service.	2
BPEL 2.0 S	pecification O BPEL 1.1	Specification	
lame:	BPELProcess1	1	
lamespace:	http://xmlns.orade.com	/MModule/Project4/BPELProcess1	
Directory:	D:\oracle_stage11\midd	lleware \jdeveloper \mywork \Project4\SOA \BPEL	9
emplate:	Base on a WSDL	•	0
Gervice Name:	bpelprocess1_client		Ba
	Expose as a SOAP se	ervice	Cre
	WSDL URL:	1	-
	Port Type:		
	Callback Port Type:	•	

- 2. Enter a name for the new outbound BPEL process component in the Name field.
- 3. The Namesapce is automatically generated as you type the name of the BPEL process.
- **4.** Choose a **Directory** for the new BPEL process component by clicking on **Browse**. The default Directory would be the workspace of the JDeveloper.
- 5. Select Base on a WSDL from the Template drop-down list.
- 6. To select WSDL URL, click the Browse icon as shown in Figure 8-30. You need to select a WSDL from the project source directory,



WSDL URL:	🗎 🖗

- Click on File System, expand the SOA\WSDLs folder and select the WSDL of the Adapter reference, sapReference created above in section Configure an Adapter Component, as shown in Figure 8-31.
- 8. Click OK.

You are returned to the Create BPEL Process dialog, as shown in Figure 8-32. The **Port Type** is automatically filled from the chosen WSDL. Click **OK**.

Create BPE	L Process	Companya (La	×
BPEL Process A BPEL proc business pro	s cess is a service orc ocess (or large grai	hestration, based on the BPEL specification, used to describe/execute a ned service), which is implemented as a stateful service.	•
BPEL 2.0 Sp	pecification () BPE	L 1.1 Specification	
<u>N</u> ame:	BPELProcess1		
Namespace:	http://xmlns.orad	e.com/Application1/Project3/BPELProcess1	
Directory:	C:\JDEVs\stage10	_withoutSAP \mywork \Application 1 \Project3 \SOA \BPEL	Q (
Template:	襘 Base on a WS	DL	• 3
Service Name:	bpelprocess1_clier	nt	
	Expose as a SC	DAP service	
	T <u>r</u> ansaction: requ	ired	• 3
	WSDL URL:	$ut SAP \verb mywork Application1 Project3 SOA WSDLs sapReference.wsdl $	۵ 🕼
	Port Type:	sapReference_PT 🔹	
	Callback Port Type	: No Callback 💌	
Help		OK C	Cancel

Figure 8-31 Create BPEL Process Dialog

You are returned on the below screen, as shown in Figure 8-32.

Figure 8-32 Create BPEL Process Dialog



9. Create a connection between the BPELProcess1 component and sapReference component, as shown in Figure 8-33.





10. Double-click the outbound BPEL process component in the Components pane, as shown in Figure 8-34.





 Drag and drop the Invoke activity component to the Components pane and place it between the receiveInput activity component and the replyOutput activity component, as shown in Figure 8-35.



Figure 8-35 Adding Invoke Activity

12. Create a connection between the new Invoke activity component (Invoke1) and the sapReferenc component, as shown in Figure 8-36.

Figure 8-36 Wiring Invoke activity to sapReference



The Edit Invoke dialog is displayed, as shown in Figure 8-37.

leaders Do	cumentation	Skip Condition	Targets	Sources	
General	Correlations	Properti	es /	Assertions	Annotations
<u>N</u> ame:	Invoke 1				
Conversation I	D:				J _x
<u>D</u> etail Label:					
	Invoke a	as Detail			
<u>I</u> nteraction	n Type: 🔞 Pa	rtner Link 💌			
Partner <u>L</u> ink	: sapReference	e			0
Port Type:	🐺 sapRefe	rence_PT			•
Operation:	BAPI_CO	OMPANYCODE_GE	TDETAIL		•
Input (Dutput				
	nts <u>M</u> apping) <u>I</u> nput Variable			0
Input: In	voke1 BAPI C	OMPANYCODE GE	TDETAIL I	nputVariable	- 4 Q
		_			

Figure 8-37 Edit Invoke Dialog

13. Under the **Input** tab, click on the **Input Variable** radio button. To configure a new input variable, click '+' icon located to the right of the **Input** field. The **Create Variable** popup appears, as shown in Figure 8-38.

Figure 8-38 Create Variable

👌 Create	Variable 🗾
<u>N</u> ame:	Invoke1_BAPI_ACC_BILLING_CHECK_InputVariable
Type:	{http://xmlns.oracle.com/pcbpel/adapter/sap/SOA_NLS/SOA_NLS/sapRe
	Global Variable Local Variable
<u>H</u> elp	OK Cancel

14. Accept the default values and click **OK**. You are returned to the Edit Invoke dialog, as shown in Figure 8-39.



Figure 8-39 Edit Invoke Window Dialog

15. Click on **Output** tab.

16. Click on the Output Variable radio button. To configure a new output variable, click the '+' icon, which is located to the right of the Output field. The Create Variable dialog is displayed, as shown in Figure 8-40.



17. Select the default values and click OK. You are returned to the Edit Invoke dialog.

- 18. Click Apply and then OK.
- **19.** Drag and drop the Assign activity from under the **BPEL Constructs** in the **Component** pane between the **Receive** activity (receiveInput) and the **Invoke activity** (Invoke1), as shown in Figure 8-41.



Figure 8-41 Assign Activity Component

20. Double-click the new Assign activity (Assign1). The **Edit Assign** dialog is displayed, as shown in Figure 8-42.

Figure 8-42 Edit Assign Dialog



- **21.** Expand **InputVariable** and then select **ns2.COMPANYCODEID**, which is available under **Variables** in the left pane.
- **22.** Drag and map the selected inputVariable element ns2.COMPANYCODEID on the left pane over to the selected Invoke1_GetDetail_InputVariable element ns2.COMPANYCODEID. A wire shows the mapping between the two selected elements.
- 23. Click Apply and then OK.

24. Drag and drop the Assign activity from BPEL Constructs from the Component Pane between the Invoke activity (Invoke1) and the Reply activity (replyOutput), as shown in Figure 8-43.



Figure 8-43 Assign Activity Component



Figure 8-44 New Assign Activity



The Edit Assign dialog is displayed, as shown in Figure 8-45.



Figure 8-45 Edit Assign Dialog

- 26. Expand Invoke1_BAPI_COMPANYCODE_OutputVariable, and then select ns2:BAPI_COMPANYCODE_GETDETAIL_RESPONSE, which is available under Variables in the left pane.
- **27.** Expand outputVariable under the right side variable list and select ns2:BAPI_COMPANYCODE_GETDETAIL_RESPONSE.
- **28.** Drag and map left side ns2:BAPI_COMPANYCODE_GETDETAIL_RESPONSE to right ns2:BAPI_COMPANYCODE_GETDETAIL_RESPONSE.
- 29. Click OK. The below screen appears, as shown in Figure 8-46.

Figure 8-46 Composite.xml

30. From the JDeveloper menu bar, click the **Save All** icon to save the new outbound BPEL process, as shown in Figure 8-47.

Figure 8-47 Save All Icon



You are now ready to deploy the BPEL outbound process.

Deploy the BPEL Outbound Process

To deploy the BPEL outbound process, you can follow the same procedure which is described in "Deploy the Defined Process".

Test the BPEL Outbound Process

After deploying the BPEL outbound process, you are ready to test the BPEL outbound process. To test the process, you should follow the same procedure that is described in "Test the Deployed Process".

8.2.4 Design an Inbound BPEL Process for BAPI/RFC/IDOC

This section describes how to design an inbound BPEL process, which consists of the following two stages:

- 1. Configure an Adapter Service Component
- 2. Configure an Inbound BPEL Process Component

Configure an Adapter Service Component

1. Drag and drop the Adapter component from the **Application Adapters** SOA component palette to the **Exposed Services** pane, as shown in Figure 8-48.

Figure 8-48 Adapter Component

Exposed Services	Components	External References	SOA			•
Lipoon corriero			SOAP	Socket	UMS	-
			Applications			- 11
				÷	e	
			E-Business	JDE World	SAP R/3	
_			Custom/Third P:	arty	Adapter	
(⊕) ←───			(Stony Hind Po	2107		
			Third Party			
			Cloud			
	To create resources, drag and drop an icon		Ca			-
						~

The Welcome page of the Adapter configuration wizard is displayed, as shown in Figure 8-49.

Figure 8-49 Adapter Configuration Wizard

👌 Adapter Configuration Wizard -	Step 1 of 3			×
SAP Adapter Service		01010101010	1010101010101010101	*
Welcome to the Adapter Confi This wizard helps you create a service using define an operation for the service.	iguration Wi a SAP Adapter. Ye	zard ou will be asked to s	specify configuratio	n parameters and
Enter a Service Name.				
<u>N</u> ame: <u>sapService</u>				
Help	< <u>B</u> ack	Next >	Finish	Cancel

2. Enter a service name for the Adapter Service component in the Name field and then click Next.

The Connection information page is displayed, as shown in Figure 8-50.

👌 Adapter Co	onfiguration Wizard - Ste	p 2 of 3			×
Connectio	n Information		01010101010	101010101010101	*
A SAP R/3 con project or crea	nection is required to config ate a New Connection.	gure this adapter. S	Gelect a SAP R/3 cor	nnection already de	fined in your
Connection:	DefaultClient				- 🕂 🖊 🗶
Client:	800				
Applicatio	on Server: 10.30.32.42				
System N	Number: 00				
JNDI Name:	eis/SAP/FMWDEMO				Q
<u>H</u> elp		< <u>B</u> ack	<u>N</u> ext >	<u>F</u> inish	Cancel

Figure 8-50 Connection Information Page

3. On the **Connection Information** page, click + icon, which is located to the right of the **Connection** field, to create a new connection, as shown in Figure 8-51.

Note: Use the default JNDI name.

Figure 8-51 Create New SAP Connection



The Create SAP R/3 Connection page is displayed, as shown in Figure 8-52.

Connection Nam	e: DefaultClient	Import
User Conn	ection	
User Logon P	arameters:	
User Name:	JCA_DEV	
Password:		
Client:	800	
Language:	en	
Server	Security 🗌 Trace 🗌 Management 🗌 Additional	Test Connection
Server	Security Trace Management Additional	Test Connection

Figure 8-52 Create SAP R/3 Connection Page

- 4. Enter a connection name as DefaultClient in the Connection Name field.
- 5. Enter a user name for an SAP system (for example JCA_DEV) in User Name field.
- 6. Enter a password for an SAP system (for example ORACLEABCD) in the **Password** field.
- 7. Enter the SAP system client ID in the **Client** field.
- 8. Select language. Default is en (English).
- 9. Click on Connection tab.
- 10. Enter Application Server details and System Number, as shown in Figure 8-53.

User Connection		
SAP Connection Para	ameters:	
Connection Type:	Direct Connection Load Balanced	
Application Server:	xx.xx.xx	
System Number:	00	
Message Host:		
Message Service		
D/2 Nemes		
K/S Name:		
Server Group:		
SAP Route String:	y Trace Management Additional	Test Connection
Server Securit		

Figure 8-53 Create SAP R/3 Connection Page

- **11.** After entering the details, you can click on the **Test Connection** button to test if the SAP connection is successful.
- 12. Click OK.

You are returned to the Connection Information page, as shown in Figure 8-54.

Connectio	n Information			1 - S
A SAP R/3 cor project or crea	nection is required to configure thi ate a New Connection.	s adapter. Select a SA	P R/3 connection already de	efined in your
Connection:	DefaultClient			- + / ×
Client:	800			
Applicatio	on Server: 10.30.32.42			
System N	lumber: 00			
NDI Name:	eis/SAP/FMWDEMO			Q.

Figure 8-54 Connection Information Page

13. Click Next.

The **Object Selection** page is displayed, as shown in Figure 8-55.

🗿 Adapter Configuration Wizard - Step 3 of	4			
Object Selection				*
Select SAP objects, BAPI, RFC, or IDoc, to retrieve a Hierarchical Alphabetical	nd describe	». Selected BAPI	/RFC function:	s or IDOC messages:
 Business Objects (BAPIs) Function Modules (RFCs) ALE/EDI Messages (IDOCs) 	 (%) (%)			
		Name:	Туре	Description
Help < Bac		Next >	Finish	Cancel

Figure 8-55 Object Selection Page

14. Click the Hierarchical tab, and then click on + icon to expand the node.

This tab shows all the SAP Objects (RFC/BAPI/IDoc) available in that SAP system in hierarchical form, as shown in Figure 8-56.



Figure 8-56 Hierarchical Tab

15. On the **Object Selection** page, expand the **ALE/EDI Messages** (**IDOCs**) node and search **MATMAS01**, as shown in Figure 8-57.



Figure 8-57 Object Selection Page

16. Right-click on ALE/EDI Messages (IDOCs) node and select Search, as shown in Figure 8-58.

Figure 8-58 Search Page



17. In the Search window, search for matmas01, as shown in Figure 8-59.

Serch SAP Repository	
Serch SAP Repository	Name ODescription
Find: matmas01	
ATMAS01 Material Master	â
MATMAS01 AII Material IDoc	
C MATMAS01	
MATMAS01 Master Material for SDM	
MATMAS01 Material master	
MATMAS01 Material Master	
MATMAS01 test	
MATMAS01 PFS master material	
ATMAS01	
MATMAS01 Material Master	
MATMAS01 test 01	-
Help	OK Cancel
Toh	Current

Figure 8-59 Search SAP Repository Page

18. Select MATMAS01-Material Master from the search result, and click OK.

You are returned to the **Object Selection** page, as shown in Figure 8-60.

Figure 8-60	Object Selection Page
-------------	-----------------------

oject Selection		
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and desc	ribe. Selected BAPI/REC f	unctions or IDOC messages
SAPSLL/CUS_EXP_EIVI SAPSLL/CUS_EXP_MAT SAPSLL/CUS_EZL SAPSLL/CUS_FIN SAPSLL/CUS_INBOUND SAPSLL/CUS_PCS SAPSLL/CUS_PED SAPSLL/CUS_SCIPED SAPSLL/CUS_SCIPED SAPSLL/CUS_SCWPED	Name:	aterial Master
SAPSLL/CUS_STA SAPSLL/CUS_VZAV SAPSLL/CUS_VZAV SAPSLL/CUS_VZL SAPSLL/CUS_WAT SAPSLL/DEBMAS_SLL SAPSLL/MATMAS_SLL AMATMASO1 Material Master	Name T	ype Description

- **19.** Click '>' icon to move the object to the right side under the **Selected BAPI/RFC functions or IDOC messages**.
- 20. Click Next. The JCA Properties page is displayed, as shown in Figure 8-61.

Figure 8-61	JCA Properties Page
-------------	---------------------

Specify the Name and Value of all JCA Adapter Properties. Properties Image: Control Control Control Control Character Value ProgramID no Control Character encode ProgramID jca.retry.count 9 jca.retry.interval 1 jca.retry.maxInterval 120 120 120
Properties Image Value Name Value AutoSYSTAT01 no EncodeIDOC no ControlCharacter encode ProgramID i jca.retry.count 9 jca.retry.interval 1 jca.retry.backoff 2 jca.retry.maxInterval 120
NameValueAutoSYSTAT01noEncodeIDOCnoControlCharacterencodeProgramID9jca.retry.count9jca.retry.backoff2jca.retry.maxInterval120
AutoSYSTAT01noEncodeIDOCnoControlCharacterencodeProgramID9jca.retry.count9jca.retry.interval1jca.retry.backoff2jca.retry.maxInterval120
EncodeIDOC no ControlCharacter encode ProgramID 9 ica.retry.ount 9 ica.retry.hackoff 2 ica.retry.maxInterval 120
ControlCharacter encode ProgramID 9 (ca.retry.count 9 (ca.retry.hackoff 2 (ca.retry.maxInterval 120
ProgramIDca.retry.count9ca.retry.interval1ca.retry.backoff2ca.retry.maxInterval120
ca.retry.interval 1 ca.retry.backoff 2 ca.retry.maxInterval 120
ca.retry.interval1ca.retry.backoff2ca.retry.maxInterval120
ca.retry.maxInterval 2 120
ca.retry.maxInterval 120

21. Click Next, the Finish page is displayed, as shown in Figure 8-62.

Figure	8-62	Finish	Page
riguie	0-02	1 1111311	raye

🗿 Adapter Configuration Wizard -	Step 5 of 5			
Finish				*
You have finished defining the When you click Finish, the wizard will create D:\prade_stage11\middleware\jdeveloper\m directory.	e SAP Adapt	er Service : sa OA\WSDLs\sapServi	apService ice.wsdl file in your	project
Help	< <u>B</u> ack	Next >	Finish	Cancel

22. Click Finish.

The Adapter for SAP is created and displayed in the **Exposed Services** pane, as shown in Figure 8-63.



Exposed	a Servi	ces
□ (Ĵ- sap Service		(
sap Service		

You are now ready to configure an inbound BPEL process component.

Configuring an Inbound BPEL Process Component

Perform the following steps to create an inbound BPEL process component:

- 1. Create an Empty composite. Refer to section "Create an Empty Composite"
- 2. Drag and drop the **BPEL Process** component from the **SOA Components** palette to the **Components** pane in the composite, as shown in Figure 8-64.

Figure 8-64 BPEL Process Component



The Create BPEL Process dialog is displayed, as shown in Figure 8-65.

Figure 8-65 Create BPEL Process Dialog

🕜 Create BP	EL Process	×				
BPEL Process A BPEL process is a service orchestration, based on the BPEL specification, used to describe/execute a business process (or large grained service), which is implemented as a stateful service.						
③ BPEL 2.0	Specification O BPEL 1.1 Specification					
<u>N</u> ame:	BPELProcess 1					
Namespace:	http://xmlns.oracle.com/BAPI_BPEL/Project5/BPELProcess1					
Directory:	X:\oracle_stage11\middleware\jdeveloper\mywork\BAPI_BPEL\Project5\SOA\BPEL	_ 🔍				
Template:	Contract Con	- 0				
	Define Service Later An empty BPEL process will be created.	No interface				
Help	ОК	Cancel				

- **3.** Enter a name in the **Name** field to identify the new inbound BPEL process component (for example, matmas_inbound).
- 4. Click OK.

The Inbound BPEL process component is created and displayed in the Components pane, as shown in Figure 8-66.

Figure 8-66 BPEL Process Component

Exposed Services	Components	External References
apService	BPELProcess1	
Operations: MATMAS01	\mathbf{P}	

5. Create a connection between the Adapter Service component (MATMAS01) and the Inbound BPEL process component (matmas_inbound), as shown in Figure 8-67.

Figure 8-67 Create Connection Dialog



8.2.5 Deploy the Composite with Inbound BPEL Process

To deploy the Composite with Inbound BPEL Process, you can follow the same procedure as described in "Deploy the Defined Process".

8.2.6 Generate an Event in SAP R/3 and Process It by the SOA Composite

Once an event message is triggered through SAP GUI, it invokes the Adapter Service which in-turn initiates a BPEL process instance. BPEL process invokes the File Adapter Service and the input received from the SAP event is written as the output XML in a file in the location that was specified for the File adapter service component. For more information on Generate events in SAP R/3, refer to the section "Generate an Event in SAP R/3".

8.2.7 Define an Outbound Mediator Process

This section describes how to define an Outbound Mediator process, which consists of the following stages:

- 1. Create an Empty Composite for SOA
- 2. Configure an Adapter Component
- 3. Configure an Outbound Mediator Process Component
- 4. Configure the Routing Rules

Create an Empty Composite

To create an empty composite, you can follow the same procedure as described in "Create an Empty Composite"

Configure an Adapter Component

For more information, refer to the section "Configure an Adapter Component" as described in "<u>Define an outbound BPEL Process</u>".

Configure an Outbound Mediator Process Component

Perform the following steps to configure an Outbound Mediator process component:

- 1. Open the composite created above in JDeveloper 12.1.3.
- 2. Drag and drop the **Mediator Process** component from the **SOA Components** palette to the **Components** pane, as shown in Figure 8-68.

SOA External References Components Components ۲ Å BPEL Process Human Task **Business Rule** \$ **b** Å Mediator Subprocess Spring Technology ø ÷ ٩ ADF-BC B2B AO ::: ش ÷ > ∎ 🔅 BAM 11g Database Coherence sapReference < 8 -Operations \$ BAPI_COMPANYCODE File Direct EJB 8**-**8 6 £ FTP HTTP Healthcare 1 繬 12

Figure 8-68 Mediator Process Component

The Create Mediator dialog is displayed, as shown in Figure 8-69.

Create	e Mediator		×			
Mediator Component						
Create	a mediator componen	t to perform routing, filtering, and transformations.	\G			
<u>N</u> ame:	Mediator 1					
Directory:	D:\oracle_stage11\n	niddleware \jdeveloper \mywork \Project4\SOA \Mediati	ors			
Template:	懮 Interface Defini	ion from WSDL	▼ @			
	Expose as a SOA	P service	Interfac Creates a			
	WSDL URL:		۵ ال			
	Port Type:		-			
	Callback Port Type:		-			
			Port type name for th			
Help			OK Cancel			

Figure 8-69 Create Mediator Dialog

- **3.** Click the drop-down icon to the right of **Template** field and select **Interface Definition** from WSDL.
- 4. Click the **Find existing WSDLs** icon, which is located to the right of the **WSDL URL** field.
- 5. Select an inbound WSDL file from the following directory:

Project path directory\SOA\WSDLs, as shown in Figure 8-70.

🗿 WSDL Choose	er						
Application Server	File System	Oracle Acadia Server	Project Libraries	SOA-MDS	UDDI	WSIL	
Location:	D:\orade	_stage11\middlewa	re\jdeveloper\m	ywork\Project4\S0	DA\WSDLs	- 🗘 🗘 😭	E
i 🚔 🍵	sapRefere	nce.wsdl					
Work							
Project							
Application							
	File Name: sap	Reference.wsdl					
Home			-1 (4 10				
	Hie Type: We	eb Service Definition	n Files (*.wsdl)				
Selection: file:/D:/	oracle_stage11	/middleware/jdevel	per/mywork/Pr	oject4/SOA/WSDL	s/sapReference.	wsdl	
Help						ОК	Cancel

Figure 8-70 WSDL Chooser Dialog

6. Click OK. You are returned to the Create Mediator dialog, as shown in Figure 8-71.

Figure 8-71 Create Mediator Dialog

🗿 Create Mediator 🛛 🛛 🔀							
Mediator Component Create a mediator component to perform routing, filtering, and transformations.							
<u>N</u> ame:	Mediator 1						
Directory:	D:\oracle_stage11\middleware\jdeveloper\mywork\Project4\SOA\Mediators						
<u>T</u> emplate:	泡 Interface Defin	ition from WSDL	0				
	Expose as a SOA	P service					
	WSDL URL:	lleware\jdeveloper\mywork\Project4\SOA\WSDLs\sapReference.wsdl	ه 🕼				
	Port Type:	sapReference_PT					
	Callback Port Type:	No Callback					
Help		ОКСА	ancel				

- 7. Click OK.
- 8. Create a connection between the Outbound Mediator process component (CompanyCode_GetDetail) and the Adapter Service component (GetDetail), as shown in Figure 8-72.

Figure 8-72 Create Connection Dialog



You are now ready to configure the routing rules.

Configuring the Routing Rules

Perform the following steps to configure the routing rules for the Outbound Mediator process component:

1. Double-click the Outbound Mediator process component (CompanyCode_GetDetail) in the Components pane, as shown in Figure 8-73.

Figure 8-73 Mediator Process Component





Translate From Native	< <no needed="" translation="">></no>	>			-	1		
Callout To	< <java callout="" class="">></java>							
<	ession>>	9	В	🞏 sapReferer	ce::BAPI_COMPANY	CODE_GETDETAIL		Sequent
		Validate Sem	nantic				1 8	5
		Translate To N	lative	< <no td="" translati<=""><td>on Needed>></td><td></td><td></td><td>5</td></no>	on Needed>>			5
		Transform	Using	< <transforma< td=""><td>tion Map>>> para</td><td>meters</td><td>- 8</td><td>8</td></transforma<>	tion Map>>> para	meters	- 8	8
		Assign V	alues/				- 0	0
		Override	Using				-	•
Synchr	onous Reply		-	*Initial Caller*:	BAPI_COMPANYCO	DE_GETDETAIL:out	put 🥳	>
		Transform	Using	< <transforma< td=""><td>tion Map>>> para</td><td>meters</td><td>- 8</td><td>8</td></transforma<>	tion Map>>> para	meters	- 8	8
		Assign V	alues/				-	6

Figure 8-74 Routing Rules Dialog

2. In the <<Filter Expression>> area, click the icon to the right of the **Transform Using** field.

The Request Transformation Map dialog is displayed, as shown in Figure 8-75.

Figure 8-75 Request Transformation Map Dialog

🗿 Request	Transformation Map	
Transformatio	n from request message BAPI_COMPANYCODE_GETDETAIL_MSG to message BAPI_COMPANYCODE_GETDETAIL_MS	G.
To Part:	parameters	
Mapper File:		< < /> </td
Help	ОК	Cancel

3. Click on '+' to create a new Transformation map.

The Create Transformation Map page is displayed, as shown in Figure 8-76.

Figure 8-76 Create Transformation Map

7 Create	Transformation Map		
Transforma To Part: <u>Type</u> :	ation from request message BAPI_COMPANYCODE_GETDETAIL_MSG to message BAPI_COM parameters XSLT	IPANYCODE_GETD	ETAIL_MSG.
Ele Name:	BAPI_COMPANYCODE_GETDETAIL_To_BAPI_COMPANYCODE_GETDETAIL1.xsl		
Directory:	D:\prade_stage11\middleware\jdeveloper\mywork\Project4\SOA\Transformations		Q
Help		ОК	Cancel

4. Click OK.

The Request Transformation Map dialog is displayed, as shown in Figure 8-77.

Figure 8-77 Request Transformation Map

🕜 Request	Transformation Map		X
Transformatio	on from request message BAPI_COMPANYCODE_GETDETAIL_MSG to message BAPI_COMPANYCODE_	GETDETAIL_MS	G.
To Part:	parameters		
Mapper File:	Transformations/BAPI_COMPANYCODE_GETDETAIL_To_BAPI_COMPANYCODE_GETDETAIL1.xsl		l 🔍 🖶 🖊 🗙 🛛
Help		OK	Cancel

5. Click OK.

The following Mapping page is displayed, as shown in Figure 8-78.

Figure 8-78 Mapping Page



6. Map the **CompanyCode.GetDetail** source element to the **CompanyCode.GetDetail** target element.

The Auto Map Preferences dialog is displayed, as shown in Figure 8-79.

🔿 Auto Map Preferences 🛛 🛛 🔀					
Con <u>fi</u> rm Auto Map Results Prompt for Preferences before Auto Map					
Mode: Basic 💌					
During Auto Map:					
 Match Elements with Similar Names Match Elements with Exact Names 					
 Match Elements with Exact Types Match Elements Considering their Ancestor Names 					
Insert xsl:if: <u>N</u> ever Check source node e <u>x</u> ists					
Check source node is not empty					
Show Dictionaries >>					
☑ <u>E</u> nable Auto Map					
Help OK Cancel					

Figure 8-79 Auto Map Preferences Dialog

7. Retain the default values and click **OK**.

You are returned to the Mapping page, as shown in Figure 8-80.

Figure 8-80 Mapping Dialog

ml 🕑 untitled2.xml × 🖓 Project4 × 🍕 Mediator1.mplan × 🕅 BAPJ	I_COMPANYCODE_GETDETAIL_To_BAPI_COMPANYCODE_GETDETAIL1.xxl 🗠 💽 💟
XSLT map 🔹 🗣 🔹 🗟 😨	Q Search XSLT Map XSLT
sources>	xsl:stylesheet 🕺
Monthead And Anthead Anthea	xsl:template(match=/) 🛄 😑
ns0:COMPANYCODEID	ns0:BAPI_COMPANYCODE_GETDETAIL 🚸 🚊
Variables	ns0:COMPANYCODEID 🚷

- 8. Select Save All from the menu bar to save and close the mapping.xsl file.
- **9.** In the **Synchronous Reply** area, click the icon to the right of the **Transform Using** field, as shown in Figure 8-81.

98 C	
BAPI_COMPANYCODE_GETDETAIL Priority 4 Validate Syn Translate From Native < <no needed="" translation="">> • Callout To <<java callout="" class="">> •</java></no>	itax (XSD) 🛆 🔻 🧩
E < <filter expression="">> S</filter>	Reference::BAPI_CC
Validate Semantic	
Translate To Native	< <no neede<="" td="" translation=""></no>
Transform Using	< <transformation td="" 💌<=""></transformation>
Assign Values	
Override Using	→
Synchronous Reply 🛶	Caller*::BAPI_COMPAN
Transform Using	< <transformation< td=""></transformation<>
Assign Values	

Figure 8-81 Synchronous Reply Dialog

The Reply Transformation Map dialog is displayed, as shown in Figure 8-82.

Figure 8-82 Reply Transformation Map

🕜 Reply Tr	ansformation Map	
Transformation BAPI_COMPA	on from reply message BAPI_COMPANYCODE_GETDETAIL_RESPONSE_MSG to message NYCODE_GETDETAIL_RESPONSE_MSG.	
To Part:	parameters	
Mapper File:		< + / ×
Help		OK Cancel

10. Click on + to create the new target mapping file.

The following Create Transformation Map page is displayed, as shown in Figure 8-83.

Figure 8-83 Create Transformation Map

🚺 Create	Transformation Map	
Transforma BAPI_COM To Part: Type:	ation from reply message BAPI_COMPANYCODE_GETDETAIL_RESPONSE_MSG to message PANYCODE_GETDETAIL_RESPONSE_MSG. parameters	
Elle Name:	BAPI_COMPANYCODE_GETDETAIL_RESPONSE_To_BAPI_COMPANYCODE_GETDETAIL_RESPONSE 1.xsl	
Directory:	D:\prade_stage 11\middleware\jdeveloper\mywork\Project4\SOA\Transformations	Q
Indude	Request in the Reply Payload	
Help	ОК	Cancel

11. Click OK.

You are returned to the Reply Transformation Map dialog, as shown in Figure 8-84.

Figure 8-84 Reply Transformation Map

Reply Transformation Map			
Transformation from reply message BAPI_COMPANYCODE_GETDETAIL_RESPONSE_MSG to message BAPI_COMPANYCODE_GETDETAIL_RESPONSE_MSG.			
To Part: parameters			
Mapper File: sformations/BAPI_COMPANYCODE_GETDETAIL_RESPONSE_To_BAPI_COMPANYCODE_GETDETAIL_RESPONSE1.xsl 🔍 🏪 🥓 💥			
Help	ОК	Cancel	

12. Click OK.

You are returned to the Mapping page, as shown in Figure 8-85.

Figure 8-85 Mapping Page

ml 🖓 Project4 × 🧐 Mediator 1.mplan × 🔣 BAPI_COMPANYCODE_GET	DETAIL_RESPONSE_To_BAPI_COMPANYCODE_GETDETAIL_RESPONSE1.xs/ 🐣 🗾 🚺 💽 💟
XSLT map 🔹 🚽 🖌 🖓 😨 🖺	Q Search XSLT Map XSLT
🚼 <sources></sources>	xsl:stylesheet 🕸
S0:BAPI_COMPANYCODE_GETDETAIL_RESPONSE	xsl:template(match=/) 🛄 🖷
ns0:COMPANYCODE_ADDRESS	aso:BAPI_COMPANYCODE_GETDETAIL_RESPONSE 🚷 🛕 📄
Is0:COMPANYCODE_DETAIL	ns0:COMPANYCODE_ADDRESS 🔞 🖽
🗄 🚱 ns0:RETURN	ns0:COMPANYCODE_DETAIL
Variables	ns0:RETURN 🔞 🖷

13. Drag and map the ns0:BAPI_COMPANYCODE_GETIDETAIL_RESPONSE variable from left pane to the ns0:BAPI_COMPANYCODE_GETIDETAIL_RESPONSE variable in the right pane, as shown in Figure.

The Auto Map Preferences dialog is displayed, as shown in Figure 8-86.
🔨 Auto Map Preferences 🛛 🛛 🔀
Con <u>fi</u> rm Auto Map Results Prompt for Preferences before Auto Map
Mode: Basic
During Auto Map:
 Match Elements with Similar Names Match Elements with Exact Names
 Match Elements with Exact Types Match Elements Considering their Ancestor Names
Insert xsl:if: <u>N</u> ever Check source node e <u>x</u> ists
Check source node is not empty
Show Dictionaries >>
✓ Enable Auto Map
Help OK Cancel

Figure 8-86 Auto Map Preferences Dialog

14. Retain the default values and Click OK.

The mapping is completed, as shown in Figure 8-87.

Figure 8-87 Completed Mapping

ml 📲 Project4 × 🍕 Mediator 1.mplan × 🖁 BAPI_COMPANYCODE_GET	DETAIL_RESPONSE_T0_BAPI_COMPANYCODE_GETDETAIL_RESPONSE1.xsl 🐣 🔣 💽 😒
XSLT map 🔹 🗣 🔹 l 🍇 🛐 🔯 🖺	Q Search XSLT Map XSLT
sources>	xsl:stylesheet 🕺
	xsl:template(match=/) 🛄 🛁
Image: Second Address	ns0:BAPI_COMPANYCODE_GETDETAIL_RESPONSE 🔇
Iso:COMPANYCODE_DETAIL	xsl:if 💊 🕁
😥 🔞 ns0:RETURN	xsl:if 💊 🕀
Variables	xsl:if 💊 🕀

15. Click the **Save All** icon in the menu bar to save the new outbound Mediator process component that was configured.

You are now ready to deploy the Outbound Mediator process.

Deploy the Mediator Outbound Process

To deployment the Mediator Outbound Process, you can follow the same procedure that is described in "Deploy the Defined Process".

Test the Mediator Outbound Process

After deploy the Mediator Outbound Process, you are ready to test the Mediator outbound process, you can follow the same procedure that is described in "Test the Deployed Process".

8.2.8 Define an Inbound Mediator Process

This section describes how to define an Inbound Mediator process, which consists of the following stages:

- 1. Configuring an Adapter Component
- 2. Configuring an Inbound Mediator Process Component With a File Adapter
- 3. Configuring the Routing Rules

Configuring an Adapter Component

For more information on how to configure an Adapter Component for SAP, refer to the section "Configure an Adapter Component" under "Defining an inbound BPEL Process".

Configuring an Inbound Mediator Process Component with a File Adapter

Perform the following steps to configure an Inbound Mediator process component with a File adapter.

1. Drag and drop the **Mediator Process** component from the **Service Components** pane to the **Components** pane, as shown in Figure 8-88.

Figure 8-88 Mediator Process Component



The Create Mediator dialog is displayed, as shown in Figure 8-89.

O Create Mediator	×
Mediator Component Create a mediator component to perform routing, filtering, and transformations.	¢
Name: Mediator 1	
Directory: D:\oracle_stage11\middleware\jdeveloper\mywork\Project3\SOA\Mediators	۹
Template: 🔅 Define Interface Later	• @
Help	OK Cancel

Figure 8-89 Create Mediator Dialog

- 2. Click the drop-down icon to the right of **Template** field and select **Define Interface** Later.
- 3. Click OK.

The new Mediator process component is added to the Components pane, as shown in Figure 8-90.

 Wediator1_ep

 Operations:

 BAPI_COMPANY CODE...

Mediator Process Component

4. Drag and drop the **File Adapter** component from the Service Adapters pane to the External References pane.

The File Adapter Configuration Wizard is displayed, showing the Service Name page, as shown in Figure 8-91.

Figure 8-91 Adapter Configuration Wizard

Figure 8-90

FILE Adapter Configuration Wiz	ard - Step 1 of	4		
File Adapter Reference		0101010101010	1010-1910-1910-191	*
Welcome to the File Adapter This wizard helps you create a File Adapter operation for the adapter.	Configuration	n Wizard to specify configuration	on parameters and	d define an
Enter a Reference Name.				
Name: fileReference				
Help	< <u>B</u> ack	<u>N</u> ext >	Finish	Cancel

5. Type a name for the new File adapter in the Name field and click Next.

The Adapter Interface page is displayed, as shown in Figure 8-92.

Figure 8-92	Adapter Inte	erface Page
-------------	--------------	-------------

🔿 FILE Adapter Confi	guration Wiza	rd - Step 2 of	4		
Adapter Interface			01010101010	10101919191919191	*
The adapter interface is de this wizard. Optionally, the	fined by a wsdl the adapter interfact	nat is generated us ie may be defined	sing the operation n by importing an exis	ame and schema(s sting WSDL.) specified later in
Interface: ③ Define from	operation and sch	nema (specified lat	er)		
◯ <u>I</u> mport an e	kisting WSDL				
WSDL URL:					1
Port Type:					-
Operation:					-
Help		< <u>B</u> ack	<u>N</u> ext >	<u>F</u> inish	Cancel

- 6. Ensure that the **Define from operation and schema (specified later**) option is selected.
- 7. Click Next.

The Operation page is displayed, as shown in Figure 8-93.



7 FILE Adapter Configuration Wize	ard - Step 4 of	7		X
Operation				*
The File Adapter supports five operations. system, a Write File operation that creates contents of a file, a List Files operation that synchronously reads file data in chunks and be defined using this wizard.	There is a Read Fil outgoing files, a S lists file names in s l can be used ONLY	e operation that po ynchronous Read F specified locations, ′ with BPEL. Only or	olls for incoming file ile operation that r and a Chunked Re ne operation per Ad	s in your local file eads the current ad operation that dapter Service may
Operation Type: <u>R</u> ead File				
() <u>W</u> rite File				
Synchronous Read File	e			
🗌 List Files		1.01		
Chunked Read	on is a synchronou	s read file		
Operation Name: Write				
Add Output <u>H</u> eader				
Help	< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

- 8. Select Write File from the list of Operation Type options and specify an Operation Name (for example, Write).
- 9. Click Next.

The File Configuration page is displayed, as shown in Figure 8-94.

FILE Adapter Configuration Wiza	rd - Step 5 of 7	,		×
File Configuration				*
Specify the parameters for the Write File op	eration.			
Directory specified as Oirectory specified as Oirectory for Outgoing Files (physical path): /oracle/Outbound_Results	n O <u>L</u> ogical Name	•		Browse
File Naming Convention (po_%SEQ%.txt):	Output.xml			
Append to existing file				
Γ Write to output file when any of these con	ditions are met ——			
Number of Messages Equals: 1				
Elapsed Time Exceeds:			minutes	-
File Size Exceeds: 1000			kilobytes 💌	
Help	< <u>B</u> ack	Next >	Finish	Cancel

Figure 8-94 File Configuration Page

10. Specify a location on your file system where the output file is written.

11. In the File Naming Convention field, specify a name for the output file.

12. Click Next.

The Messages page is displayed, as shown in Figure 8-95.

Figure 8-95 Messages Page

🔞 FILE Adapter Configurati	on Wizard - Step 6 of 7			
Messages				*
Define the message for the Write I defines the messages in the outgo 'Schema is Opaque', then you do n	File operation. Specify the Sch ing files. Use the Browse butto not need to specify a Schema.	ema File Location n to find an exist	and select the Sch ing schema definitio	ema Element that on. If you check
Message Schema				
Native format translation is no	ot required (Schema is Opaque))		
				Q 🔅
Schema Element				browse for
Help	< <u>B</u> ack	Next >	Einish	Cancel

13. Click Browse, which is located to the right of the URL field.

The Type Chooser dialog is displayed, as shown in Figure 8-96.

Type Chooser	2	
	案 💩	
Type Explorer Project Schema Files SapService.xsd MATMASOI Project WSDL Files		
<u>Type:</u> {urn:sap-com:document:sap:idoc}MATMAS01		
Show Detailed Node Information		
<u>H</u> elp	OK Cancel	

Figure 8-96 Type Chooser Dialog

- **14.** Expand Project WSDL Files and select the available schema.
- 15. Click OK.

You are returned to the Messages page, as shown in Figure 8-97.

Figure 8-97 Messages Page

FILE Adapter	Configuration Wiz	ard - Step 6 o	f 7		
Messages				1010101010101010101	*
Define the message defines the message 'Schema is Opaque',	for the Write File oper es in the outgoing files. , then you do not need	ation. Specify the Use the Browse b to specify a Schen	Schema File Locat utton to find an ex na.	ion and select the S iisting schema defin	Chema Element that ition. If you check
_Message Schema ·					
Native <u>f</u> ormat t	ranslation is not require	ed (Schema is Opa	que)		
URL	/Schemas/sapService	e.xsd			🔍 🖓 👘
Schema Element	MATMAS01				-
<u>H</u> elp		< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

16. Click Next.

The **Finish** page is displayed, as shown in Figure 8-98.

Figure 8-98 Finish Page



17. Click Finish.

- **18.** Create a connection between the Inbound Mediator process component and the SAP service component.
- **19.** Create a connection between the Inbound Mediator process component and the File adapter component, as shown in Figure 8-99.

Figure 8-99 Created Connection



You are now ready to configure the routing rules.

Configuring the Routing Rules

Perform the following steps to configure the routing rules for the Inbound Mediator process component:

1. Double-click the Inbound Mediator process component in the Components page, as shown in Figure 8-100.

Figure 8-100 Inbound Mediator Process Component



The Routing Rules dialog is displayed, as shown in Figure 8-101.

Operations						ą
MATMAS01		Priority 4	Ualidate Syntax (XSD)		▼	4
Translate From Native < <no n<="" td="" translation=""><td>leeded>></td><td></td><td></td><td></td><td></td><td></td></no>	leeded>>					
Callout To < <java callout="" cla<="" td=""><td>\$\$>></td><td></td><td></td><td></td><td></td><td></td></java>	\$\$>>					
Resequence Off						
Resequence Off	9 8	- fileReferer	nce::Write		a	Sequent
Resequence Off	Y-Mate Connet	- fileReferer	nce::Write		0	Sequent
Resequence Off	Yalidate Semantic	➡ fileReferer	nce::Write	•	8	Sequent
Resequence Off	Validate Semantic Translate To Native	= fileReferer	ion Needed>>	•	© 	Sequent
Resequence Off	Validate Semantic Translate To Native Transform Using	fileReferer < <no td="" translat<=""> <<transformation< td=""></transformation<></no>	ion Needed>> ation Map>>> body	•	© & **	Sequent
Resequence Off	Validate Semantic Translate To Native Transform Using Assign Values	fileReferer fileReferer <	ion Needed>> ation Map>>> body	•	© & • •	Sequent

Figure 8-101 Routing Rules Dialog

2. In the <<Filter Expression>> area, click the icon to the right of the **Transform Using** field.

The Request Transformation Map dialog is displayed, as shown in Figure 8-102.

Figure 8-102 Request Transformation Map Dialog

Request Transformation Map	X
Transformation from request message MATMAS01_MSG to message Write_msg.	
To Part: body Mapper File:	♀. ∔ ∥ %
Help	OK Cancel

- 3. Click '+' icon to create a new transformation map and then click **OK**.
- 4. Give the name to the mapping file, as shown in Figure 8-103.

🗿 Create	Transformation Map		X
Transforma	tion from request message MATMAS01_MSG to message Write_msg.		
To Part:	body		
<u>Type</u> :	XSLT -		
<u>File Name:</u>	MATMAS01_To_MATMAS011.xsl		
Directory:	D:\oracle_stage11\middleware\jdeveloper\mywork\Project3\SOA\Transformations		Q
Help		ОК	Cancel

Figure 8-103 Create Transformation Map

- 5. Click **OK** by accepting the default name, as shown in Figure 8-104.
- Figure 8-104 Request Transformation Map

7 Request	Transformation Map		X
Transformatio	n from request message MATMAS01_MSG to message Write_msg.		
To Part:	body		
Mapper File:	Transformations/MATMAS01_To_MATMAS011.xsl		Q 🖶 🖊 🗙
Help		ОК	Cancel

6. Click OK.

The mapping page is displayed.

7. Map the MATMAS01 source element to the MATMAS01 target element, as shown in Figure 8-105.

Figure 8-105 Mapping Page

TE 💿 untitled1.xml 🛛 😔 untitled2.xml 🔺 🍕 Project4 🖄 🍕 Mediator.	
XSLT map 🔹 📌 🝷 l 💩 🛐	Q Search XSLT Map XSLT
Image: Sources> Image: Sources> Image: Sources> Image: Sources> Image: Sources Ima	xsl:stylesheet 20 xsl:template(match=/) ☐⊟ hc0:MAIIMAS01 (2024) bid 202 ns0:IDOC-ENCODED (2020) ns0:IDOC [2020]

The Auto Map Preferences dialog is displayed, as shown in Figure 8-106.

🚺 Auto Map Preferences 🛛 🛛 🔀
Con <u>fi</u> rm Auto Map Results <u>Prompt for Preferences before Auto Map</u>
Mode: Basic 💌
During Auto Map:
 Match Elements with Similar Names Match Elements with Exact Names
 Match Elements with Exact Types Match Elements Considering their Ancestor Names
Insert xsl:if: <u>N</u> ever Check source node e <u>x</u> ists Check s <u>o</u> urce node is not empty
Show Dictionaries >>
💌 <u>E</u> nable Auto Map
Help OK Cancel

Figure 8-106 Auto Map Preferences Dialog

- 8. Click OK.
- **9.** Click the **Save All** icon in the menu bar to save the new Inbound Mediator process component that was configured, as shown in Figure 8-107.

Figure 8-107 Save All

Edit View Application Refactor Search	<u>N</u> avigate <u>B</u> uild <u>R</u> un Tea <u>m</u> ▼ 🍰 🚵 🚵 🕨	Iools <u>W</u> indow <u>H</u> elp	
Applications × Application Servers	<mark>ଜାନ୍ସ</mark> <i>Project2</i> × ଜାନ୍ସ Project1 ×		
🔁 Demo 🔹 💌	🖌 🖓 🌌 🗶 🖏 i 🚯 🧕	🙆 🖶 🖶 🏟 🔞	Project2
Project3 Proje	Exposed Services	Components	External References
+ Application Resources			
1 Data Controls			· ·
± Recent Files	4		•

You are now ready to deploy the Inbound Mediator process.

8.2.9 Deployment of Inbound Mediator Process

To deploy the Inbound Mediator process, you can follow the same procedure as described in "Deploy the Defined Process".

8.2.10 Generate an Event in SAP R/3 for Testing Mediator Inbound and Outbound Process

Once event messages are triggered through SAP GUI, output XML is received in the location that was specified for the File adapter component. For more information on Generate events in SAP R/3, see "Generate an Event in SAP R/3".

8.3 The Adapter Integration with BPM Service Components

Oracle Integration Adapter for SAP R/3 seamlessly integrates with Business Process Management (BPM) to facilitate the Web Service integration. Oracle BPM is based on the Service-Oriented Architecture (SOA). It consumes the adapter services that are exposed as Web Service Definition Language (WSDL) documents.

8.3.1 Deployment of Adapter

Oracle Integration Adapter for SAP R/3 should be deployed on soa_server in the WebLogic console under deployments.

The following tools are required to complete your outbound design-time configuration:

Oracle JDeveloper BPM Designer (JDeveloper) or Eclipse

8.3.2 Create an Empty Composite for BPM

Perform the following steps to create an empty composite for BPM:

1. Create a new BPM application, as shown in Figure 8-108.

~	
Categories:	Items: Show All Description:
Service Bus Tier	Association (ADF Business Components)
·····Services ····Interfaces	BAM Connection (Connections)
·····Transformations	Bean Data Control (Data Controls)
·····Utility	Bean Form (Swing/AWT)
System	beans.xml (Contexts and Dependency Injection) (Contexts and Dependency Inj
Faults	BPA Server Connection (Connections)
Interfaces	BPEL 2.0 Subprocess (Service Components)
Tests	BPEL Process (Service Components)
Transformations/Translations	BPM Application (Applications)
	Creates a BPM application. The application consists of one BPM project. This project has also SOA technology
·····JSF/Facelets	BPM Model Simulation (Simulation)
Servlets	BPMN 2.0 Process (Business Components)
All Items	BPM Project (Projects)

Figure 8-108 New Gallery Page

2. Enter a name for the new BPM application and click Next, as shown in Figure 8-109.

Figure 8-109 Name Your Application Page

O Create BPM Application	- Step 1 of 3			×
Name your applicatio	n			5
Application Name Project Name Project SOA Settings	Application Name: BpmApplication_user Directory: [C:\BPM\middleware\jdevelope Application Package Prefix:	er \mywork\BpmApplication	_user	Browse
Help	< <u>B</u> a	ck <u>N</u> ext >	<u>F</u> inish	Cancel

The Name your project page is displayed, as shown in Figure 8-110.

O Create BPM Application	- Step 2 of 3
Name your project	
Application Name Project Name	Project Name: BpmProject Directory: leware\jdeveloper\mywork\BpmApplication_user\BpmProject Browse
Project SOA Settings	Project Features: BPM BPM Technology SOA Suite SOA Suite is a suite of tools to model SOA(Service Oriented Architecture) applications.
Help	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish Cancel

Figure 8-110 Name Your Project Page

3. Enter a Composite Name (for example, BpmProject) and click **Next**. The **Configure SOA settings** page is displayed, as shown in Figure 8-111.

Figure 8-111 Configure SOA Settings Page

Create BPM Application	- Step 3 of 3	_			×
Configure SOA settin	gs			01010101040010400	5
Application Name Project Name Project Son Softial	Composite N <u>a</u> me: BpmProject Start from: () <u>S</u> tanda	ard Composite () SOA <u>T</u> emplate		
	Composite With BP Composite With BP Composite With Su Composite With Su Composite With Sp Composite With BP Composite With BP Composite With Ca	EL Process iman Task ibprocess iring ediator MN Process ase Management isiness Rule			
Help	Qustomizable	< <u>B</u> ack	Next >	<u>F</u> inish	Cancel

4. From the **Composite Template** list, select **Empty Composite** and click **Finish**.

8.3.3 Define a BPM Outbound Process

This section describes how to define a BPM outbound process, which consists of the following stages:

- **1.** Configure an Adapter Component
- 2. Configure an Outbound BPM Process Component

Configure an Adapter Component

For more information, refer to the section "Configure an Adapter Component" that is described in "Define an Outbound BPEL Process".

Configuring an Outbound BPM Process Component

Perform the following steps to configure an Outbound BPM process component:

1. Drag and drop the **BPMN Process** component from the **Service Components** pane to the **Components** pane, as shown in Figure 8-112.

Figure 8-112 BPMN Process Component



The BPMN 2.0 Process Wizard dialog is displayed, as shown in Figure 8-113.

🔿 в	PMN 2.0 Process Wizar	rd	x
BP	MN 2.0 Process W	izard	
•	Definition	Name: Process	۲
	Arguments Initial Implementation Advanced	Description:	۲
		Directory: vare \jdeveloper \mywork \BpmApplication_user \BpmProject \SOA \processes	٩
		Synchronous Service Creates a process with an asynchronous interface definition Image: Start start End Synchronous Service	Ĵ
_			
	Help	< <u>B</u> ack <u>N</u> ext > <u>Finish</u> Cance	

Figure 8-113 BPMN 2.0 Process Wizard

2. Select the default option that is selected under **Type** area (Asynchronous Service) and click **Finish**. The BPMN Process component is created, as shown in Figure 8-114.

Figure 8-114 BPMN Process Component



3. Double-click the BPMN Process component in the Components pane. The BPMN process is displayed, as shown in Figure 8-115.

Figure 8-115 BPMN Process

Applications ×	?	Start	t Page 🔺 🖬	a test 💉 🛛	BpmPi	roject	🗟 Proc	cess ×	
🔁 BpmApplication_user 🔹 💌	6	-	- (2)	- 🖂	0.	0.	÷ +	🖌 -	
🖃 Projects 💽 🔞 - 🍸 - 🏣 -	Act	vity	Interactive	Notification	Catch	Throw	Gateway	Artifacts	
WSDLs WSDLs WSDLs SapReference.wsdl BomProject Kpis.kpi ProcessDocumentation.xml	Process			Start		+C			
Application Resources									

4. Click the Activity icon, as shown in Figure 8-116.

Figure 8-116 Activity Icon

jca 🐼 untitled 1. xml 🛛	white d₂.xm	l 🛛 🔗 fileRe	ference_file.jca	× olg test ×	S Process ×	
Activity Interactive Notifie	tation Catch Th	· ↔ · row Gateway	Artifacts	Q Search		 1
Activity Manual Constraints Manual Constraints Manual Constraints Manual Manual Manual Manual Manual Manual Manual Manual Manual Manual Manual Manual Script Call Manual Constraints	Business Rule	End				

5. Click on Activity icon from the menu bar and drop the Service icon on the wire between the Start and End event components, as shown in Figure 8-117.

Figure 8-117 Activity Icon



The Properties – Service Task dialog is displayed, as shown in Figure 8-118.

🕜 Pro	perties - Se	rviceTask			
Basic	Implementat	ion			
NOS	şçi	Name:	ServiceTask	۲	۲
		Description:			
		Is Draft:			
		 Sampling 	Point		
Help				ОК	Cancel

Figure 8-118 Properties – Service Task

- 6. Click the Implementation tab, as shown in Figure 8-119.
- Figure 8-119 Implementation Tab

🕜 Pro	perties - ServiceT	ask		
Basic	Implementation			
Implen	nentation Type: 🔯 Se	ervice task		•
Fo Mess	rce commit after execut	ion		
Туре	e: Not Implemente	d		•
	ata Associations	DD Correlations	Log Handlers	
* 🗆 <u>M</u>	essage Headers	Service Properties		
Help			ОК	Cancel

- 7. Select Service task from the Implementation Type list.
- 8. Select Service Call from the Type list, as shown in Figure 8-120.

Properties - Service	Task	
Basic Implementation		
Implementation Type:	Service task	
Force commit after exec	ution	
Type: 🥳 Servi	e Call	•
Conversation: Default Service Call Service: Operation: Default Default Default Message Headers	Correlations Service Properties	Log Handlers
Help		OK Cancel

Figure 8-120 Properties – Service Task Dialog

9. Click the Browse icon to the right of the Service field, as shown in Figure 8-121.

Figure 8-121 Browse Icon

Properties - ServiceT	ask	
Basic Implementation Implementation Type: SS Force commit after execu Message Exchange Type: Service Conversation: (a) Default	ervice task tion : Call () Advanced	
Service Call Service: Operation: Data Associations	© <u>Correlations</u>	Browse
Carl Message Headers	Service Properties	
Help		OK Cancel

10. Select the SapReference that has been created from Service field and click OK.

11. Select the input operation (for example, bapicompanucodegetdetail) from **Operation** drop-down.

12. Click on the **Data Associations** link, as shown in Figure 8-122.

Figure 8-122 Data Associations Link

Properties	s - ServiceTask	$\overline{\mathbf{X}}$
Basic Impler	nentation	
Implementation Force comm Message Excl Type: Conversation Service Cal	n Type: Service task nit after execution hange Service Call O Default Advanced	•
Service:	SapReference	Q
Operation:	bapicompanycodegetdetail ciations Image: Correlations leaders Service Properties	Log Handlers
Help		OK Cancel

The Data Associations Dialog is displayed, as shown in Figure 8-123.

	. . .		
Process ☐ Data Objects ☐ Predefined Variables ☐ Solution of the second seco	ServiceTask Arguments 📬 bapicompanycodegetdetail 🙀 🛓		
	+ % ☆ ∛		
From	То		
Validate target after assigning input	data associations		

Figure 8-123 Data Associations Dialog

13. Right-click on Data Objects and create input object.

The Create Data Object is displayed, as shown in Figure 8-124.

Figure 8-124 Create Data Object

🕜 Cre	eate Data Object	×
Name:	InputDO	
Type:	abc string	-
	📎 boolean	-
	99E double	
Help	1999 decimal	
	ateTime	

- **14.** Enter a name in the **Name** field (for example, InputDo) and then click the drop-down button in the **Type** field and select <Component> from the list.
- 15. Select Browse option and choose the input.
- 16. Click OK.

The Data Associations dialog, as shown in Figure 8-125.

Data Associations		X
Input Output		
		. . .
😪 Process		ServiceTask 🚌
🗇 🗠 🔁 Data Objects		Arguments 🚞 🛁
		bapicompanycodegetdetail
		companycodeld and
—		
	2000000	
		+ × + 3
-		
From	To	
Validate target after assigning input data	aassociations	
Help		OK Cancel

Figure 8-125 Data Associations Dialog

 Map the InputDO created in the above step. To map it, select Companycode under InputDO node in the left pane and drag it to the Companycodeid input on the right side, as shown in Figure 8-126.

Figure 8-126 Map Dialog Box

O Data Associations	
Input Output	
😪 Process	ServiceTask 👜
🖨 🗁 Data Objects	Arguments 🛅 … 🚊
🖻 🖓 InputDO	bapicompanycodegetdetail 🚜 🚊
abc companycodeid	companycodeid abc
🗄 🗠 🗁 Predefined Variables	

18. Click **OK**.

The Service Task is created between the Start and End Event components, as shown in Figure 8-127.

Figure 8-127 Service Task



19. Double-click on Start point.

The Properties-Start dialog is displayed, as shown in Figure 8-128.

Figure 8-128 Properties-Start Dialog

nplementation Type Message Exchange	ion Message	•
Type:	Define Interface	•
Conversation: () Define Interface Arguments Defin	Default () Advanced	₽ ∕×
Name	1 Edit Argument	
	Name: Input Type: BAPI_COMPANYCODE_GETDETAIL	
Operation Name:	s Help OK Cancel	
S Data Association	s DD Correlations	andlers
Message Header	s Service Properties	
Help	ſ	OK Cancel

- 20. Click the Implementation tab.
- 21. Select Define Interface from the Type list.
- 22. Click the '+' icon to the right of the Arguments Definition field.
- **23.** Enter a name in the **Name** field, click the drop-down button in the **Type** field and browse the input operation.
- 24. Click OK.
- 25. Click on the Data Associations Link.

26. Drag the **Input Argument** from the left pane to the **Data Object** to the right pane, created during the service task configuration, as shown in Figure 8-129.

🗿 Data Associations Output 🖪 📾 🔀 Start Process 😒 🖨 🗠 🛅 Arguments Data Objects 🛅 🚊 🛓 🖓 Input InputDO 🙀 😑 eid abc - abc c 🗄 😽 Process Predefined Variables 🛅 🕀 BpmProject 😽 🗄 To: InputDO.companycodeid 📴 🕂 ¥ 🕆 🤚 Сору From: Input.companycodeid То From abc Input.company abc InputDO.co Validate target after assigning output data associations Help OK Cancel

Figure 8-129 Data Associations Dialog

27. Click OK.

You are returned to the Properties-Start dialog, as shown in Figure 8-130.

🗿 Properties - Start	×
Basic Implementation	
Implementation Type: 💿 Message	-
Message Exchange	
Type: 😡 Define Interface 💌	
Conversation: Default Advanced 	
Define Interface	
Arguments Definition 🕹 🕹 💥	
Name Type	
Input BAPI_COMPANYCODE_GETDETAIL	
Operation Names start	
Operation Name. Start	
🛱 Data Associations 🥢 🕅 Correlations 📃 Log Handlers	
Message Headers	
Help OK Cance	4

Figure 8-130 Properties-Start Dialog

28. Click OK.

Service Task dialog is displayed, as shown in Figure 8-131.

Figure 8-131 Service Task Dialog



29. Double-click on the Service Task point.

The Data Associations dialog is displayed, as shown in Figure 8-132.

1 Data Associations	×
Input Output	
Sprocess □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	Drag objects here ServiceTask Arguments bapicompanycodegetdetail bapicompanycodegetdetail
Predefined Variables	
Copy From: InputDO.companycodeid	d 📴 To: bapicompanycodegetdetail.company 🗓 🕂 🗙 🕆 🤚
From	То
abc InputDO.companycodeid	abc bapicompanycodegetdetail.companycodeid
Validate target after assigning input data associations	
Нер	OK Cancel

Figure 8-132 Data Associations Dialog

30. Click on the **Output** tab, as shown in Figure 8-133.

31. Create the Data Object on the right side to hold the response.

Figure 8-133 Output Tab

Tota Associations		X
Input Output		
		🖩 🔜 K
👸 ServiceTask		Process 😒
🖨 🛅 Arguments	Drag objects here:	Data Ob 🔮 New
🖃 🐺 bapicompanycodegetdetailresponse		InputDQ
		Predefined Varia Expand All
🗄 🖓 companycode_detail		BpmProject regroe
🗄 🖳 💦 return		_
🗄 🖓 Process		

32. Right-click the **Data Object** node and select **New** from the context menu, as shown in Figure 8-134.

rigule e let	
F _{ac}	1
	Process 😒
Data Ob	New
InputDC Predefined Varia	Expand All
BpmPro	ject 📷 🖷 🛨

Figure 8-134 Data Object

The Create Data Object dialog is displayed, as shown in Figure 8-135.

Figure 8-135 Create Data Object Dialog



33. Enter a name in the **Name** field (for example, OutputDO) and then click the drop-down button in the **Type** field and select

BAPI_COMPANYCODE_GETDETAIL_RESPONSE from the list.

34. Click OK.

You are returned to the Data Associations dialog, as shown in Figure 8-136.

Figure 8-136 Data Associations Dialog



35. Drag the **bapicompanycodegetdetailresponse** to the **OutputDO**, as shown in Figure 8-137.

Figure 8-137 Data Associations Dialog

Input Output	
	E. 🛋 🔀
👸 ServiceTask	Process 🗺
🖨 🗠 🧰 Arguments	Data Objects 🛅 🖷 🖨
🖮 🙀 bapicompanycodegetdetailresponse —	InputDO 🌉 👾
Companycode_address	OutputDO 🙀 🖷
	companycode_address 🔝 🕀
🗄 🖓 return	companycode_detail 💦 🕀
	return 🛃 🕀
	Predefined Variables 🛅 🕀
	BpmProject 🔜 🗄

36. Click OK.

You are returned to the **Properties-ServiceTask** dialog, as shown in Figure 8-138.

🗿 Properties - Servi	iceTask
Basic Implementation	
Implementation Type:	💮 Service task 🔹
Force commit after e	xecution
Message Exchange	
Type: 🛷 Se	ervice Call
Conversation: Def 	ault 🔾 Advanced
Service Call	
Service: SapRefe	erence 🔍 🖓 🏈
Operation: bapicon	npanycodegetdetail 🔹
🗱 Data Associations	Correlations Log Handlers
Construction Message Headers	E Service Properties
Help	OK Cancel

Figure 8-138 Properties - ServiceTask Dialog

37. Click **OK**.

You are returned to the Process Workspace area, as shown in Figure 8-139.

Figure 8-139 Process Workspace Area



38. Double-click on **End** icon.

The Properties-End dialog is displayed, as shown in Figure 8-140.

Basic Implementation Implementation Type: Message Force commit after execution Message Exchange Type: We Define Interface Conversation: Default () Advanced Define Interface Arguments Definition Name Type Implementation Asynchronous () Synchronous Define Interface Implements Definition Implement Solution Implement Solution	×
Implementation Type: Message Force commit after execution Message Exchange Type: Define Interface Conversation: Define Interface Arguments Definition	
 □ Force commit after execution Message Exchange Type:]
Message Exchange Type: Image: Conversation: Image: Default () Advanced Define Interface Arguments Definition Image: Name Image: Type	
Type: Define Interface Conversation: Default Advanced Define Interface Arguments Definition Prype Name Type Asynchronous Synchronous	
Conversation: Default Advanced Define Interface Arguments Definition Name Type O Asynchronous Synchronous	
Define Interface Arguments Definition Name Type Image: Synchronous Synchronous	
Arguments Definition	
Name Type Image: Synchronous Synchronous	
Asynchronous Synchronous	
Asynchronous Synchronous	
Asynchronous Synchronous	
Caliback Operation Name: end	
2011 Data Associations De Correlations	
Message Headers Ervice Properties	
Help OK Cancel	7

Figure 8-140 Properties-End Dialog

- **39.** Click on **Implementation** tab, as shown in Figure 8-141.
- **40.** Click the + icon to the right of the **Arguments Definition** field, the **Create Argument** dialog is displayed.
- **41.** Enter a name in the **Name** field (as Output) and then click the drop-down button in the **Type** field and select BAPI_COMPANYCODE_GETDETAIL-RESPONSE from the list.
- 42. Click OK.

🕜 Properties - End 🛛 🗙
Properties - End Basic Implementation Implementation Type: Message Force commit after execution Message Exchange Type: Vipue Oefine Interface Conversation: Define Interface Conversation: Define Interface Vipue Mame: Dutput Name: Dutput Type: BAPI_COMPANYCODE_GETDETAIL_RESPONSE Help OK Cancel
Message Headers
Help OK Cancel

Figure 8-141 Implementation Tab

43. Click on Data Associations link.

You are returned to the **Data Associations** dialog, as shown in Figure 8-142.

O Data Associations	×
Input	
	🗈 📾 🔀
Process	End 🔘
🖨 🗁 Data Objects	Arguments 🗁 🛁
	companycode detail
	return 🔬 🕀
Copy From: Out	tpu 💀 To: Output 💀 🕂 🗙 🐨 🕭
From	То
🗐 🐉 OutputDO	🚜 Output
Validate target after assigning i	input data associations
Help	OK Cancel

Figure 8-142 Data Associations Dialog

44. Drag the OutputDO node in the left pane to the Output node in the right side.45. Click OK.

You are returned to the **Properties - End** dialog, as shown in Figure 8-143.

1 Properties - End	
Basic Implementation	
Implementation Type: 🔘 Message	▼
Force commit after execution	
Message Exchange	
Type: 😡 Define Interface	_
Conversation: Default Advanced 	
Define Interface	
Arguments Definition	+ / ×
Name	Туре
Output	BAPI_COMPANYCODE_GETDETAIL_RESPONSE
 Asynchronous	
Callback Operation Name: end	
🗱 <u>Data Associations</u> 🧳 🛛 🕅 <u>Correlation</u>	IS E Log Handlers
Message Headers Ervice Pro	operties
Help	OK Cancel

Figure 8-143 Properties - End Dialog

46. Click OK.

47. Click the **Save All** icon in the menu bar to save the new outbound BPM process component that was configured, as shown in Figure 8-144.

Figure 8-144 BPM Process Component



8.3.4 Design a BPM Inbound Process

This section describes how to define an Inbound BPM Process, which consists of the following stages:

- 1. Creating an Empty Composite for BPM
- 2. Defining a BPM Inbound Process

Create an Empty Composite for BPM

For more information, refer to the section "Create an Empty Composite for BPM".

Define a BPM Inbound Process

This section describes how to define a BPM inbound process, which consists of the following stages:

- 1. Configuring an Adapter Service Component
- 2. Configuring an Inbound BPM Process Component

Configuring an Adapter Service Component

For more information, refer to the section "Configure an Adapter Component" that is described in "Define an inbound BPEL Process".

Configuring an Inbound BPM Process Component

Perform the following steps to configure an inbound BPM process component:

1. Drag and drop the **BPMN Process** component from the Service Components pane to the Components pane, as shown in Figure 8-145.

Figure 8-145 BPMN Process Component

		Components		
	Composite: BpmProject	Q.* (
Components	External References	SOA Components BPEL Process	eg BPMN	Busine
		Case Properties	Process	Mec
(Q Find		

The BPMN Process wizard is displayed, as shown in Figure 8-146.
0 E	PMN 2.0 Process W	fizard	×
BP	MN 2.0 Process W	fizard	
Q	Definition	Name: Process	۲
-00	Arguments Initial Implementation Advanced	Description:	٢
		Directory: [jdeveloper\mywork\BPM_Test_Project\BpmInboundProject\SOA\processes]	٩,
		Asynchronous Service Creates a process with an asynchronous interface definition Start End Synchronous Service	Ĵ
_	Help	< <u>Back</u> <u>Next</u> > <u>F</u> inish Cance	1

Figure 8-146 BPMN Process Wizard

2. Click Next. The Arguments page is displayed, as shown in Figure 8-147.

Figure 8-147 Arguments Page

O BPMN 2.0 Process Wi	izard			×
Arguments				
<u>Definition</u> Arguments	Input Output Arguments Definition			₽ ⁄ ×
Advanced	Name		Туре	
Help		< <u>B</u> ack <u>N</u> e	ext > E	inish Cancel

3. Click Next. The Initial Implementation page is displayed, as shown in Figure 8-148.

O BPMN 2.0 Process Wi	zard			×
Initial Implementation	n			
Openition				🕂 🗘 🕹 🗙
<u>Arguments</u>	Name	Description	Implementation Type	Role
Initial Implementati				
<u>Advanced</u>				
Help		< <u>B</u> ack	<u>N</u> ext > <u>F</u> inish	Cancel

Figure 8-148 Initial Implementation Page

4. Click Next. The Advanced Settings page is displayed, as shown in Figure 8-149.

Figure 8-149	Advanced Setting Page
1 iguie 0-143	Auvanceu belling i age

O BPMN 2.0 Process Wi	zard
Advanced Settings	
Definition Arguments Initial Implementation Advanced	Advanced Process Sampling Points: Inherit project default Generate for Interactive(s) only Generate for All activities Do Not generate Is Primary Process Suspend instance on data association failure Service namespace: http://xmlns.orade.com/bpmn/bpmnProcess/Process
Help	< Back Next > Finish Cancel

5. Click Finish.

The following screen appears, as shown in Figure 8-150.

Figure 8-150 BPMN Process



6. Double-click on the Start icon. The Properties - Start dialog is displayed, as shown in Figure 8-151.

👩 Prope	rties - Start			
Basic I	mplementation			
Name:	Start		۲	
Descriptio	n:			۲
Is Draft:				
Help			OK	Cancel

Figure 8-151 Properties - Start Dialog

- 7. Click the **Implementation** tab.
- 8. Select Use Interface from the Type list.
- **9.** Click on the **Browse** icon to the right of the **Reference** field, under **Use Interface** section, as shown in Figure 8-152.

👩 Properties - Start 🛛 🔀
Basic Implementation
Implementation Type: 💿 Message 🔹
Message Exchange
Type: 🐝 Use Interface 💌
Conversation: Default Advanced
Use Interface
Reference:
Operation:
Correlations
Message Headers Ervice Properties
Help OK Cancel

Figure 8-152 Implementation Tab

The Service dialog is displayed, as shown in Figure 8-153.

- 10. Select SapService from Search Results.
- 11. Click OK.
- Figure 8-153 Service Dialog

O Service	×
Search:	
Search Results:	
@ SapService	
Help	OK Cancel

You are returned to the Properties - Start dialog.

19. Click on the **Data Associations** link.

The Data Associations dialog is displayed, as shown in Figure 8-154.

Data Associations Output Output Generation Generation	Drag objects here	Process Data Objects Predefined Variables BpmInboundProject
From	То	+ × + -
Validate target after assigning output	it data associations	OK Cancel

Figure 8-154 Data Associations Dialog



Figure 8-155 Create Data Object

🗘 Data Associations		X
Output		
		B. M. H
Start Arguments	Dragrobjects here	Process 😒
🗄 🖓 matmas01		Predefined Variables
⊞ 🐨 Process		BpmInboundProject 😴 🗄

21. Right-click on Data Object and select New.

The Create Data Object dialog is displayed, as shown in Figure 8-156.

22. Enter a name in the **Name** field (for example, InputDO) and then click the drop-down button in the **Type** field and select **MATMAS01** from the list.

```
Figure 8-156 Create Data Object Dialog
```

🕜 Create Data Object		×	
Name:	InputDO		
Type:	MATMAS01		-
	🗸 Auto initialize		
Help	þ	ОК	Cancel

23. The InputDO is created, as shown in Figure 8-157.

Figure 8-157 Data Object

. 🛤 🔀
Process 😪
Data Objects 🛅 🚊
InputDO 🚁
idoc] <>>
idocencoded 📓 ·····
tid abc
Predefined Variables 🛅 🖳 🔅
BpmInboundProject 😪 🖽

24. Drag the **matmas01** argument of the start to the **InputDO** of the Process, as shown in Figure 8- 158.

f_x 💿 Start Process 😽 🗟 🖞 🛅 Arguments Data Objects 🛅 🖳 🚊 inputDO 🖓 🗄 🗄 🖓 matmas01 idoc[] ⊕ idoc] 🚷 🗄 idocencoded idocencoded tid abc abc tid E S Process Predefined Variables 🛅 🕀 BpmInboundProject 😽 🗄

Figure 8-158 Data Association Dialog

25. Click OK.

26. Double-click on the **End** icon.

The **Properties - End** dialog is displayed, as shown in Figure 8-159.

🕜 Pro	pertie	s - End						X
Basic	Impler	nentation						
Name:	E	nd			۲			a
Descrip	otion:							
Is Draf	ft:]						
Help						ОК	Cance	el

Figure 8-159 Properties - End Dialog

27. Click the **Implementation** tab.

28. Select None from the Implementation Type list, as shown in Figure 8-160.



Figure 8-160 Implementation Type

29. Click OK.

The File Not Used dialog is displayed, as shown in Figure 8-161.

Figure 8-161 File Not Used Dialog



- 30. Click Yes.
- **31.** Click the **Save All** icon in the menu bar to save the new inbound BPM process component that was configured, as shown in Figure 8-162.

SapService Operations: MATMAS05

Figure 8-162 Inbound BPM Process Component

You are now ready to deploy the Inbound BPM Process.

Deployment Inbound BPM Process

To deployment the Inbound BPM Process, you can follow the same procedure as described in "Deploy the Defined Process".

8.4 The Adapter Integration with Oracle Service Bus (OSB)

The Oracle Integration Adapter for SAP R/3 seamlessly integrates with Oracle Service Bus (OSB) to facilitate the Web service integration. OSB is based on the Service-Oriented Architecture (SOA). It consumes the adapter services that are exposed as Web Service Definition Language (WSDL) documents.

8.4.1 Create an Empty Composite for OSB

Perform the following steps to create an empty composite for OSB:

 Create a new OSB application, Select File > New > Application, as shown in Figure 8-163.

Figure 8-163 New Application Page

() ())racle	JDeve	loper 12c	- MModul	e.jws :	PRJ_PO_F	RELAS	_REL	INFO.j	pr
<u>F</u> ile	Edit	<u>V</u> iew	Application	Refactor	Search	Navigate	Build	<u>R</u> un	Tea <u>m</u>	Tools
	New			Ì	🖻 Ap	plication				
0	Open		Ctr	1-0	D Pro	oject				

The New Gallery page is displayed as shown in Figure 8-164.

Figure 8-164	New Gallery Page
--------------	------------------

Q service bus	8	
<u>C</u> ategories:	Items:	Show All Description
Service Bus Tier Services Interfaces	Service Bus Application (Application and the implication is needed for the implication is nee	pplications) cation without a project. Useful when a Service Bus port of a Service Bus configuration jar.
·····Transformations ·····Security	🔁 Service Bus Application with Ser	rvice Bus Project (Applications)
Utility System	Service Bus Configuration (Depl Service Bus Project (Deployment	loyment Profiles) 1t Profiles)
Faults	Service Bus Project (Projects)	

2. Enter a name for the new SOA Application and click Next, as shown in Figure 8-165.*Figure 8-165 Name Your Application*

🕜 Create Service Bus App	lication - Step 1 of 1		23
Name your applicati	on		19444966540
	Application Name:		
Application Name	ServiceBusApplication3		
	Directory:		
	C:\JDeveloper\mywork\ServiceBusAp	plication3	Browse
	Appli Refresh		
Help	< <u>B</u> ack	Next >	<u>F</u> inish Cancel

3. Create a new OSB application, Select File > New > Project, as shown in Figure 8-166.

λ service bus	8	
ategories:	Items:	Show All Description
 Service Bus Tier Services Interfaces Transformations Security Utility System SOA Tier Faults Interfaces Service Components Tests Transformations/Translations Web Tier HTML JSF JSF/Facelets 	 Service Bus Application (Applications) Service Bus Application with Service Bus Project (Ap Service Bus Configuration (Deployment Profiles) Service Bus Project (Deployment Profiles) Service Bus Project (Projects) Create a new Service Bus Project 	plications)
Servlets		

Figure 8-166 New Project Page

4. The Name Your Project page is displayed, as shown in Figure 8-167.

Figure 8-167 Name Your Project Page

🕜 Create Service Bus Proje	ect - Step 1 of 1	-	×
Name your project		01	
🔎 Project Name	Project Name: Dir <u>e</u> ctory:	SEProject1 C:\JDeveloper\mywork\ServiceBusApplication3\SBProject1	Bro <u>w</u> se
	Project Featu	res:	
	Service Bus Service Bus is mediate, and and multiple e network.	s a proven, lightweight SOA integration platform. It is designe manage interactions between heterogeneous services, lega enterprise service bus (ESB) instances across an enterprise-w	d to connect, cy applications, ide service
Help		< Back Next > Finish	Cancel

5. Click Finish.

8.4.2 Define an OSB Outbound Process

This section describes how to define an OSB outbound process, which consists of the following stages:

- 1. Configure the Component of Apdapter for SAP.
- 2. Configure an Outbound OSB Process Component.

Configure the Component of Adapter for SAP

- 1. Open JDeveloper.
- 2. Drag and drop the Component of Apdapter for SAP from the **Resources Components** pane to the **External Service** pane, as shown in Figure 8- 168.

Figure 8-168 Component of Apdapter for SAP Configuration Wizard



The **Welcome** page of the Adapter configuration wizard is displayed, as shown in Figure 8-169.

Figure 8-169	Welcome Page				
👌 Adapter Config	guration Wizard - Step	o 1 of 3			×
SAP Adapter	Reference		0101010101010	0101919191919191	*
Welcome to	the Adapter Con	figuration W	lizard		
and define an oper	ration for the service usin	ig a SAP Adapter.	You will be asked to s	specity configurati	on parameters
Enter a Reference	Name.				
<u>N</u> ame:	sapReference				
Service Directory:	C:\JDeveloper\mywork	\ServiceBusApplica	ation3\SBProject1		Q
				Trick (Grand
Help		< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

3. Enter a reference name for the Adapter for SAP reference in the **Name** field and then click **Next**.

The Connection information page is displayed, as shown in Figure 8-170.

Figure 8-170	Connection Info	rmation Page			
Adapter Co	onfiguration Wizard - S	tep 2 of 3			×
Connectio	n Information				*
A SAP R/3 con project or crea	nection is required to con ate a New Connection.	figure this adapter. S	Select a SAP R/3 con	nection already de	fined in your
Connection:	jco				- 🕂 🖊 🗶
Client :	800				
Applicatio	on Server: 10.30.32.42				
System N	lumber: 00				
JNDI Name:	eis/FMW2SAP				Q
Help		< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

- **4.** On the Connection Information page, select the connection to use and the default JNDI name.
- 5. Click Next.

The **Object Selection** page is displayed, as shown in Figure 8-171.

Adapter Configuration Wizard - Step 3 of 4		³³
Object Selection		*
Select SAP objects, BAPI, RFC, or IDoc, to retrieve Hierarchical Alphabetical SAP Hierarchical Business Objects (BAPIs) Hierarchical Business (BAPIs) Hierarchical B	e and describe. Selected BAPI/RFC functions or II	DOC messages:
Connecting Connecting to SAP		scription
Help < Bac	ack Next > Einish	Cancel

Figure 8-171 Object Selection Page

6. Click the **Hierarchical** tab and then click on + icon to expand the node.

This tab shows all the SAP Objects (RFC/BAPI/IDoc) available in that SAP system in hierarchical form, as shown in Figure 8-172.

Figure 8-172 Hierarchical Tab



 Select business object from the list and click on > or >> icon to move the selected object(s) from Select SAP objects, BAPI, RFC, or IDoc, to retrieves and describe field to Selected BAPI/RFC functions or IDOC messages field, as shown in Figure 8-173.

ject Selection				0101010101010101010	t ing
Select SAP objects, BAPI, RFC, or IDoc, to retrieve	e and describ	e.			
Hierarchical Alphabetical		Selected BAPI/RFC function	ons or IDOC mess	sages:	
	- >	BAPI_COMPANYCOD	E_GETDETAIL (Company Code Details	
L_LEDGER_CUST					
	8				
CLOSING		Definition: BAPI_COMPAN	IYCODE_GETDET/	AIL	
CD C		Name	Type	Description	
CRC		COMPANYCODEID	CHAR	Company Code	
5		COMPANYCODE_ADD	STRUCTURE	Company Code Addre	
SCORE		COMPANYCODE_DETAIL	STRUCTURE	Company Code Detail	
S S SCORE 0002		_		Return Code	
LCC 5 SCORE 0002 (2 BAPI_COMPANYCODE_GET_PERIOD For Co	m	RETURN	STRUCTURE		
S SCORE 0002 BAPI_COMPANYCODE_GET_PERIOD For Co BAPI_COMPANYCODE_GETLIST List of Com	om Ipa	RETURN	STRUCTURE		
S SCORE 0002 BAPI_COMPANYCODE_GET_PERIOD For Co BAPI_COMPANYCODE_GETLIST List of Com BAPI_COMPANYCODE_GETDETAIL Compan	om Ipa V	RETURN	STRUCTURE		

- 8. Click Next.
- 9. The JCA Properties page is displayed, as shown in Figure 8- 174.

Figure 8-174 JCA Properties Page

Specify the Name and Value of all JCA Adapter Proper Properties Name Interaction ExceptionFilter SchemaValidation	rties. Value stateless off	\$ ×
Properties Name Interaction ExceptionFilter SchemaValidation	Value stateless	ት ×
Name Interaction ExceptionFilter SchemaValidation	Value stateless	
Interaction ExceptionFilter SchemaValidation	stateless	
ExceptionFilter SchemaValidation	off	
SchemaValidation	VII I	
	off	
jca.retry.count	9	
ca.retry.interval	1	
jca.retry.backoff	2	
jca.retry.maxInterval	120	

10. Click Next.

The Finish page is displayed, as shown in Figure 8-175.

Adapter Configuration Wizard - S	step 5 of 5				
Finish					
You have finished defining When you dick Finish, the wizard will cri file in your project directory.	the SAP Adapter S eate the C:\JDeveloper\myv	ervice : sa vork\ServiceBus	pReference Application3\SBProje	ect1\Resources\sap	pReference.wso
114				Finish	Cancel

Figure 8-175 Finish Page

Configure an Outbound OSB Process Component

Perform the following steps to configure an Outbound OSB Process Component:

1. Drag and drop the **Pipeline Process** component from the **Resources Components** pane to the **Pipelines/Split Joins** pane, as shown in Figure 8- 176.

Figure 8-176 Pipeline Component





Create Service		
Create Service	General Service Name: Location: Description	Pipeline C:\JDeveloper\mywork\ServiceBusApplication3\SBProject1
	Definition	

Figure 8-177 Create Service Page

- 2. In the Service Name field, enter a name to identify the pipeline name and select the corresponding location of the project.
- 3. Click Next and select the Service Type as WSDL, as shown in Figure 8-178.

Figure 8-178 Type Page

Create Service Type WSDL: Binding: Any SOAP: SOAP 1.1 Any XML Messaging: Reguest: Response: VExpose as a Proxy Service Proxy Ngme: PipelineProxyService Proxy Location: C: \Developer\mywork\ServiceBusApplication3\SEProject1 Proxy Transport: Messages: AWSDL resource must be specified.	Гуре		0101010101010101010101	•	
Binding: ▼ Any SOAP: SOAP 1.1 Any XML Messaging: Reguest: Response: Proxy Name: PipelineProxyService Proxy Location: C:\Developer\mywork\ServiceBusApplication3\SBProject1 Proxy Transport: http Messages: Messages:	<u>Create Service</u> <u>Type</u>	Service Type: V	VSDL-based service	1	4
Messaging: Reguest: Response: ▼ Expose as a Proxy Service ▼ Proxy Name: PipelineProxyService Proxy Location: C:\JDeveloper\mywork\ServiceBusApplication3\SBProject1 Proxy Iransport: http Messages: ▼ Messages: ▼		○ Any <u>S</u> OAP:	SOAP 1.1		
✓ Expose as a Proxy Service Proxy Name: PipelineProxyService Proxy Location: C:\JDeveloper\mywork\ServiceBusApplication3\SBProject1 Proxy Iransport: http Messages: Messure: A WSDL resource must be specified.		O Messaging:	Reguest: Response:		
Proxy Location: C:\JDeveloper\mywork\ServiceBusApplication3\SBProject1 Proxy Iransport: http Messages:		Expose as a	Proxy Service		
Messages:		Proxy Location:	C:\Developer\mywork\ServiceBusApplication3\SBProject1	0	
OA WSDL resource must be specified.		Messages:	ιπαρ		
		🔇 A WSDL resou	rce must be specified.		_

4. Click **Browse** icon, which is located to the right of the WSDL URL to select WSDL from file system.

 Select the appropriate WSDL file from the Application -> Resources, as shown in Figure 8- 179.



6. Click OK.

The selected WSDL and corresponding binding is displayed, as shown in Figure 8-180. *Figure 8-180 Type Page*

e			₹
Create Service	Service Type: W	VSDL-based service	
Туре	() <u>W</u> SDL:	SBProject1/Resources/sapReference-concrete	0
		Binding: sapReference_PT-binding	
	O Any SOAP:	SOAP 1.1	
	◯ Any <u>X</u> ML		
	O Messaging:	Reguest:	
		Response:	
	✓ Expose as a	Proxy Service	
	Proxy Name:	PipelineProxyService	
	Proxy Location:	C:\JDeveloper\mywork\ServiceBusApplication3\SBProject1	Q
	Proxy <u>T</u> ransport:	http 👻	
	Messages:		

- 7. Select checkbox for Expose as a Proxy Service.
- 8. Select Proxy Transport as http.
- 9. Click Finish.

The Pipeline component is displayed as shown in Figure 8-181.

Figure 8-181 Pipeline Component



10. Connect sapReference to the Pipeline, as shown in Figure 8-182.

Figure 8-182 Pipeline Component



11. Open the pipeline which shows the default routing. Verify the service and corresponding operation is displayed in the **Routing-Properties**, as shown in Figure 8- 183.

× 🖣 SBProject × 🕴 Pipeline.pipeline ×		Routing - Properties	
2 Pipeline		Q Find C Routing Service:* SBProject/sapReference.bix)
RouteNode1	ļ	Operation:* O RFC_READ_TABLE Ise inbound operation for outh General	bo
Request Action Response Action			
	-		
Zoom: 100 🖨 👘 🕅 R	eset		
uration			

Figure 8-183 Routing Properties

The outbound endpoint is ready to be deployed.

Deployment Outbound OSB Process

Perform the following steps to deploy the outbound OSB Process:

1. Select the project and **Deploy to Service Bus Server**, as shown in Figure 8-184.

Figure 8-184 Deployment Action Page

Deploy ServiceBusApplic	cation3_Project1_ServiceBusProjectProfile
Deployment Action	
Deployment Action	Select a deployment action from the list below.
Select Server	Deploy to Service Bus Server
O Summary	
	Deploy a Service Bus project to a Weblogic server which includes a Service Bus runtime.
Help	< <u>B</u> ack <u>N</u> ext > Einish Cancel

2. Select the already configured Application Server and click **Next**, as shown in Figure 8-185.

Deploy ServiceBusApp	lication3_Project1_Ser	viceBusProject	Profile		X
Select Server					
Deployment Action Select Server Summary	Application Servers: 110_STAGE6_OSB_ IntegratedWebLogic server-80	7065 :Server (domain	unconfigured)		
Help	Overwrite modul	es of the same n < Back	ame Next >	Finish	Cancel

Figure 8-185 Select Server Page

3. Check the deployment summary and click Finish, as shown in Figure 8-186.

Figure 8-186 Summary Page



4. The Project is successfully deployed, as shown in Figure 8-187.

Figure 8-187 Success Message Page

Build - Issues			
😮 0 🛕 0 🕕 0 🖉 • 📌			
Description	File	Location	Project
Success! Bui	ld completed with 0 errors,	0 warnings, 0 infos	

The successfully deployed project can be tested from service bus console.

5. Open the Service Bus Console and enter User ID (weblogic) and Password (welcome1), as shown in Figure 8- 188.

Figure 8-188 Service Bus Console

ORACLE' Service Bus Console 12c	
	Sign In
	User ID Weblogic Password
	Sign In

6. All the deployed projects are displayed under All Projects, as shown in Figure 8-189.

ORACLE' Service Bus Console 1	12c		Links ▼ Help ▼ weblogic ▼
			Create Discard
•	sapReference ×		F 🗊 🕄
Resources Admin	Business Service Defin	tion Sl & Mert Bilder	1 🖓 🗁 ⊿
▲ M Projects > B RT_BA_06_\$5111_T0001 > G RT_BA_06_\$500_TC0001 > G RT_BF_06_\$501_T0001 > G RT_FF_06_\$304_T0001 ▲ G SProject1 > Resources ↓ Ppeline ▲ apReference © System	General Transport Transport Detail Message Handling Performance	General Description Transport (ca Service Type WSOL Based Service - SOAP 1.1 WSOL S9Project/LResources/gapReference-concrete Binding sapReference_PT-binding	

7. Open the deployed project and click on **sapReference**, as shown in Figure 8-190.

Figure 8-190	Business Service	Definition
--------------	------------------	------------

	Business Service Definit	tion
	Configuration Security S	SLA Alert Rules
▲ All Projects	General	General
 	Transport Transport Detail Message Handling	Description
Resources Pipeline PipelineProxyService	Performance	Transport jca Service Type WSDL Based Service - SOAP 1.1 WSDL SBProject1/Resources/sapReference-concrete
System		Binding sapReference_PT-binding

8. Option for **Launch Test Console** (Green arrow button) is displayed for testing the outbound endpoint, as shown in Figure 8- 191.

Figure 8-191 Launch Test Console



9. Launching Test Console opens new window displaying Business Service and the operation to test along with Execute, Execute-Save, Reset and Close button, as shown in Figure 8- 192.

Figure 8-192 Business Service Testing Page

🕽 Oracle Service Bus Console 12c : Business Service Testing - sapReference - Google Chrome	Σ
10.30.32.110:7065/lwpfconsole/testdialog.portal?_nfpb=true&_pageLabel=ServiceTestDialogPage&ServiceTestDialogPortletref_fullname=SBProject	1%2
Business Service Testing - sapReference	elp
Execute Execute-Save Reset Close	
© Service Operation	
Operation: BAPI_COMPANYCODE_GETDETAIL -	
E Request Document	
Form XML	
SOAP Header: <pre><soap:header xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"> </soap:header></pre>	1
* Payload: Choose File No file chosen	
<urr:bapi_companycode_getdetail xmlns:urr="urn:sap-com:document:sap:rfc:functions"> <urr:companycodeid>1500</urr:companycodeid> </urr:bapi_companycode_getdetail>	

Request Document section contains the Request Payload.

10. Provide the input and click on **Execute** button.

This would send the payload to SAP and the response is displayed under **Response Document** section, as shown in Figure 8- 193.



8.4.3 Define an OSB Inbound Process

This section describes how to define an OSB Inbound process, which consists of the following stages:

- 1. Configure the Component of Apdapter for SAP.
- 2. Configure an Inbound OSB Process Component

Configure the Component of Apdapter for SAP

- 1. Open JDeveloper.
- 2. Drag and drop the Component of Apdapter for SAP from the **Resources Components** pane to the **Proxy Services** pane, as shown in Figure 8-194.



Figure 8-194 Adapter for SAP Configuration Wizard

The **Welcome** page of the Adapter Configuration Wizard is displayed, as shown in Figure 8-195.

Figure 8-195 Welcome Page

🚺 Adapter Config	guration Wizard - Step 1 of 3			X
SAP Adapter	Service		410101010101010101010101010101010101010	*
Welcome to	the Adapter Configuration Wi	zard		
This wizard helps y operation for the s	vou create a service using a SAP Adapter. Y service.	'ou will be asked to spe	ecify configuration parameters	and define an
Enter a Service Na	me.			
<u>N</u> ame:	sapService			
Service <u>D</u> irectory:	C:\JDeveloper\mywork\ServiceBusApplica	tion3\Inbound_Project	t	٩
Help		< <u>B</u> ack	Next > Einish	Cancel

3. Enter a service name for the Adapter for SAP reference in the **Name** field and then click **Next**.

The Connection Information page is displayed, as shown in Figure 8-196.

Figure 8-196	Connection Inform	nation Page			
👌 Adapter Co	nfiguration Wizard - Ste	p 2 of 3			X
Connection	1 Information		01010101010	010102020000000000000000000000000000000	*
A SAP R/3 conn project or creat	nection is required to config te a New Connection.	ure this adapter. S	elect a SAP R/3 cor	nection already de	fined in your
Connection:	jco				- 🕂 🖊 🗶
Client :	800				
Application	n Server: 10.30.32.42				
System Nu	umber: 00				
JNDI Name:	eis/FMW2SAP				Q
Help		< <u>B</u> ack	Next >	Einish	Cancel

- **4.** On the **Connection Information** page, select the connection to use and the default JNDI name.
- 5. Click Next.

The Object selection page is displayed, as shown in Figure 8-197.

ject Selection			101019191919191	F
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and de	scribe.	DEC functions or ID()C managana	
SAP Constant of the second s	Name:			
CWM/SHP_OBDLV_CONFIRM_DEC CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SPLIT_DECENTRAL CWM/STPPOD CM /DSD/HH_CONTROL CM /DSD/HH_CREDITDATA CM /DSD/HH_CUSTMASTEXT CM /DSD/HH_DDTVEDMAST CM /DSD/HH_DDTVEDMAST	Name	Туре	Description	

Figure 8-197 Object Selection Page

6. Click the **Hierarchical** tab and then click on + icon to expand the node.

This tab shows all the SAP Objects (RFC/BAPI/IDoc) available in that SAP system in hierarchical form, as shown in Figure 8-198.

Figure 8-198 Hierarchical Tab

Hierarchical	Alphabetical		
🗁 SAP			
🖨 🗁 Busine	ss Objects (BAP	Is)	
🕀 🧰 🛆 Ac	counting - Gene	eral	
🕀 🧰 Ap	plication Platfor	m	
😟 🗀 Au	ito-ID Infrastruc	ture	
🕀 🗀 Ba	sis Components		
🕒 🗀 Co	ntrolling		
🕀 🙆 Cr	oss-Application	Components	
🗄 💼 🗀 Cu	stomer Service		
🕀 🗀 En	terprise Control	ling	
🗄 🗀 En	terprise Portal		
🕀 🗀 En	vironment, Heal	lth and Safety	
🕀 🗀 Fir	nancial Accountin	ng	
🕀 🗀 Fir	nancial Services		
🕀 🗀 Fir	nancial Services		
🕀 🙆 Fir	nancials		
🕀 🗁 🖬	vestment Manaç	gement	
i de Part	1.12 0 1		2

- 7. On the Object Selection page, expand the ALE (IDOCs) node and search CREMAS05.
- Select business object from the list and click on > or >> icon to move the selected object(s) from Select SAP objects, BAPI, RFC, or IDoc, to retrieves and describe field to Selected BAPI/RFC functions or IDOC messages field, as shown in Figure 8-199.

ject Selection				-
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and d	escribe.			
Hierarchical Alphabetical	Selected BAPI/	RFC functions or ID	DC messages:	
	CREMASO	5 Distribute vendo	r master	
	382			
// /SAPMP/PPCC2PRETE	3			
/SAPMP/PPCC2PRETE_CLA	m			
	33			
🗄 🖓 🖆 /SAPSLL/ABI_INBOUND	News			
🕀 🗀 /SAPSLL/BP_TIN	Name:			
SAPSLL/CCECUS	Name	Туре	Description	_
SAPSLL/CREMAS_SLL				
CREMAS01 Distribute vendor master				
SAPSLL/CREMAS_SLL CREMAS01 Distribute vendor master CREMAS02 Distribute vendor master CREMAS02 Distribute vendor master				
SAPSLL/CREMAS_SLL CREMAS01 Distribute vendor master CREMAS02 Distribute vendor master CREMAS03 Distribute vendor master CREMAS03 Distribute vendor master				
SAPSLL/CREMAS_SLL CREMAS01 Distribute vendor master CREMAS02 Distribute vendor master CREMAS03 Distribute vendor master CREMAS03 Distribute vendor master CREMAS04 Distribute vendor master CREMAS05 Distribute vendor master				
Image: Sapest Control of the second secon				

Figure 8-199 Object Selection Page

9. Click Next.

10. The **JCA Properties** page is displayed, as shown in Figure 8- 200.

Figure 8-200 JCA Properties Page

CA Properties		101010101010101010101
Specify the Name and Value of all JCA A	dapter Properties.	
roperties		v ×
Name	Value	
AutoSYSTAT01	no	
incodeIDOC	no	
ControlCharacter	encode	
ProgramID		
ca.retry.count	9	
ca.retry.interval	1	
ca.retry.backoff	2	
ca.retry.maxInterval	120	
	and Nexts	Crist Court

11. Click Next.

Figure 8-201 Finish Page

The **Finish** page is displayed, as shown in Figure 8- 201.

, Maple comgastion main steps				
Finish				-
You have finished defining the When you dick Finish, the wizard will create th file in your project directory.	SAP Adapter Service : he C:\JDeveloper\mywork\Servic	sapReference eBusApplication3\SBPr	oject1\Resources\	sapReference.wsd
Help	< Back	Next >	Einish	Cancel

The Adapter for SAP is created and displayed in the **Proxy Services** pane, as shown in Figure 8-202.

Figure 8-202 Adapter for SAP

	Proxy Services	an a
sap Se	ervice)

12. Drag and drop the **Pipeline** component in **Pipeline/Split Joins** lane, as shown in Figure 8-203.



Figure 8-203 Drop Pipeline in Pipeline/Split



Figure 8-204 Create Service Page

👌 Create Pipeline Servic	e - Step 1 of 2					X
Create Service					IOTO LANAGASA	-
Create Service Type	General Service Name: Location: Description	Pipeline C:\JDeveloper\mywork	\ServiceBusApplicat	ion3\Inbound_Proje	:t	Q
	Definition					Q.
Help			< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

- 14. Click Next and select the Service Type as WSDL.
- **15.** Click on the **Browse** icon, which is located to the right of the **WSDL** field to select WSDL from file system, as shown in Figure 8- 205.

	atérétérété	
Service Type: W	VSDL-based service	
() WSDL:		6
	Binding:)
O Any SOAP:	SOAP 1.1]
O Any XML		
O Messaging:	Reguest:]
	Response:)
Expose as a	Proxy Service	
Proxy Name:	PipelineProxyService]
Proxy Location:	C: \JDeveloper\mywork\ServiceBusApplication3\Inbound_Project	Q
Proxy <u>T</u> ransport:	http 💌]
Managana		
	Service Type: V	Service Type: WSDL-based service • <u>W</u> SDL: Binding: • Any §OAP: SOAP 1.1 • Any §ML • Messaging: Reguest: • Resgonse: • Expose as a Proxy Service Proxy Name: PipelineProxyService Proxy Location: C: \JDeveloper \mywork\ServiceBusApplication3\Inbound_Project Proxy Transport: http

 Select the appropriate WSDL file from Application -> Resources folder, as shown in Figure 8- 206.

👌 Select WSDL		-				_	×
Application	Application Server	File System	Orade Acadia Server	Project Libraries	SOA-MDS	UDDI	WSIL
Descurse Cha							
	n						
inbou	 Ind_Project						
📄 🗍 🔂 🔁 R	esources						
	sapService.ws	sdl					
	SapService-co	ncrete.wsdl					
	CREMASUS_IN A OB S110 T00	01					
	A OB S111 T00	01					
📄 🖶 🛅 RT_R	F_OB_S301_T00	01					
🗄 💼 SBPro	oject1						
Selection: file:/C:	/JDeveloper/myw	vork/ServiceBusA	pplication3/Inboun	d_Project/Resou	rces/sapService-c	oncrete.wsdl	
Help						OK	Cancel
Thep						U.V.	Curree

Figure 8-206 Select WSDL

Type Page

Figure 8-205

17. Click OK.

The selected WSDL and corresponding binding is displayed, as shown in Figure 8-207.

уре		ararararararararararar		
Create Service	Service Type: W	/SDL-based service		
🔊 Туре	() WSDL:	Inbound_Project/Resources/sapService-concrete		
		Binding: sapService_PT-binding		
	O Any SOAP:	SOAP 1.1		
	◯ Any <u>X</u> ML			
	O Messaging:	Reguest:		
		Response:	J	
	Expose as a	Proxy Service		
	Proxy Name:	PipelineProxyService		
	Proxy Location:	C:\JDeveloper\mywork\ServiceBusApplication3\Inbound_Project	Q	
	Proxy <u>T</u> ransport:	http 👻		
	Messages:			

Figure 8-207 Type Page

18. Pipeline is displayed connected to sapService, as shown in Figure 8- 208.



Figure 8-208 Pipeline Component

Configuring the File Adapter

Perform the following steps to configure the File Adapter:

1. Drag and drop the **File Adapter** component from the **Technology Adapters** pane to the **External Services** pane. The FILE Adapter Configuration Wizard is displayed, showing the **File Adapter Reference** page, as shown in Figure 8- 209.

Figure 8-209 Welcome Page

FILE Adapter Configuration Wizard - Step 1 of 7	23
File Adapter Reference	0101010101010101010101010
Welcome to the File Adapter Configuration Wizard	1
This wizard helps you create a File Adapter. You will be asked to specify o adapter.	configuration parameters and define an operation for the
Enter a Reference Name.	
<u>N</u> ame: fileReference	
Service Directory: C:\JDeveloper\mywork\ServiceBusApplication3\Inbou	nd_Project

2. Type a name for the new file adapter in the Name field and click Next.

The Adapter Interface page is displayed, as shown in Figure 8-210.

Figure 8-210 Adapter Interface Page

FILE Adapter Configuration Wizard - Step 2 of 7	×
Adapter Interface	010101010101010101010
The adapter interface is defined by a wsdl that is generated Optionally, the adapter interface may be defined by importin	using the operation name and schema(s) specified later in this wizard.
pronony, are adopted interface may be defined by importan	
nterface: () Define from operation and schema (specified (later)
◯ Import an existing WSDL	
WSDL URL:	1
Port Type:	
Operation:	

- 3. Ensure that the **Define from operation and schema (specified later**) option is selected.
- 4. Click Next.

The File Server Connection page is displayed, as shown in Figure 8-211.

FILE Adapter Configuration Wizard - St	tep 3 of 7	×
•		
File Server Connection		
Specify the JNDI name for the File Adapter. I JNDI name with a set of configuration proper	The deployment descriptor for the deployment descriptor for the determined by the File Adapter to determine the file Adapter t	deployed instance of the File Adapter must associate this access the File Server at runtime.
File Server <u>J</u> NDI Name eis/FileAdapter		9
5. Click Next.		
The Operation page is dis	splayed, as shown in F	Figure 8- 212.
Figure 8-212 Operation Pag	e	
Operation		01010101010101010104000
The File Adapter supports five operations. T operation that creates outgoing files, a Synci that lists file names in specified locations, and ONLY with BPEL Only one operation per Ada	here is a Read File operation that hronous Read File operation that r d a Chunked Read operation that s nter Service may be defined using	polls for incoming files in your local file system, a Write File reads the current contents of a file, a List Files operation synchronously reads file data in chunks and can be used this wizard

Operation Type:	○ <u>R</u> ead File
	<u> <u> W</u>rite File </u>
	○ Synchronous Read File
	○ List Files
	○ Chunked Read
Operation Name:	Write
Add Output He	eader

- 6. Select Write File from the list of Operation Type options and specify an Operation Name (for example, Write).
- 7. Click Next.

The File Configuration page is displayed, as shown in Figure 8-213.

Figure 8-213 File Configuration Page

File Configuration Specify the parameters for the Write File of Directory specified as Directory for Outgoing Files (physical path) [/oracle/Check_Inbound]	operation. ath <u>Log</u> ical Name):		0101010101010	1019101010	\$ =5
Specify the parameters for the Write File of Directory specified as Directory for Outgoing Files (physical path) [/oracle/Check_Inbound]	operation. ath O Logical Name):				
Directory specified as <u>Physical Pa</u> Directory for Outgoing Files (physical path) [/oracle/Check_Inbound []	ath () <u>L</u> ogical Name):				
Directory for Outgoing Files (physical path) [oracle/Check_Inbound]):				
File Manine Converting (as . 8/ CEOR/ but)				Brows	e
File Naming Convention (po_%SEQ %, txt):	Inbound_cremas05.	kml			
Append to existing file					
Write to output file when any of these co	onditions are met				
✓ Number of Messages Equals: 1					
Elapsed Time Exceeds:		÷.	minutes	•	
File Size Exceeds: 1000			kilobytes 🔹 💌		

- 8. Specify a location on your file system where the output file is written.
- 9. In the File Naming Convention field, specify a name for the output file.
- 10. Click Next.

The Messages page is displayed, as shown in Figure 8-214.

Figure 8-214 Messages Page

Define the message for the Write File operation. Specify the Schema File Location and select the Schema Element that defines the messages in the outgoing files. Use the Browse button to find an existing schema definition. If you check 'Schema is Opaque', then you do not need to specify a Schema.

Message Schema -		
Native <u>f</u> ormat t	ranslation is not required (Schema is Opaque)	
URL		۵ 🧔
Schema Element		

11. Click Browse icon, which is located to the right of the URL field.

The Type Chooser dialog is displayed, as shown in Figure 8-215.
	28 🖻
🔧 Type Explorer	
- 🔁 Application Schema Files	
Inbound_Project	
SProject1	
vpe: {urn:sap-com:document:sap:idoc}CREMAS05	
Show Detailed Node Information	
_ Slow peraled Node Thornation	

Figure 8-215 Type Chooser

12. Expand Project WSDL Files and Select the available schema.

13. Click OK.

You are returned to the Messages page, as shown in Figure 8-216.

Figure 8-216 Messages Page

Define the message for the Write File operation. Specify the Schema File Location and select the Schema Element that defines the messages in the outgoing files. Use the Browse button to find an existing schema definition. If you check 'Schema is Opaque', then you do not need to specify a Schema.
r Message Schema
URL sapService.xsd
Schema Element CREMAS05

14. Click Next.

The Finish page is displayed, as shown in Figure 8-217.

Figure 8-217 Finish Page

	LE Adapter Configuration Wizard - Step 7 of 7
*	sh
ry.	u have finished defining the File Adapter Service : fileReference n you dick Finish, the wizard will create the Developer\mywork\ServiceBusApplication3\Inbound_Project\Resources\fileReference.wsdl file in your projec
) Developer\mywork\ServiceBusApplication3\Inbound_Project\Resources\fileReference.wsdl file in your projec

15. Click Finish.

The File Adapter service is created in the **External Services** pane, as shown in Figure 8-218.

16. Join Pipeline to fileReference

Figure 8-218 File Adapter Service



17. Open the pipeline which shows the routing. Verify the service and corresponding operation, in the **Routing-Properties**, as shown in Figure 8- 219.

Figure 8-219 Routing Properties Page



18. Select the project and deploy to Service Bus Server.

Deploying Inbound OSB Process

You are now ready to deploy the inbound OSB process. You can follow the same procedure as described in "Deployment Outbound OSB Process".

Generate an Event in SAP R/3 for Inbound OSB

Perform the following steps to generate an event in SAP R/3 for Inbound OSB:

- 1. Start the SAP Workbench.
- Log in to the SAP R/3 system and run the transaction BD14 to send Vendor, as shown in Figure 8- 220.

Figure 8-220 Send Vendor

♥ ◀ [] 🗞 🚱 📮 🕌 🏭 12 12 14 13 18 18 19 19 19 19
Send vendor	
⊕ ©	
Account number of vendor	3510 to 🖻
Class	to 🖻
Message type	CREMAS
Target system	ORAQA4

- **3.** Specify **Account number of the vendor**, **Message type** and **Target system** where the Vendor record is sent to the target (Program ID configured for destined Server project)
- 4. Click the Execute button or press F8 key, as shown in Figure 8-221.

Figure 8-221 Execute Option



Confirmation dialog is displayed, as shown in Figure 8-222.

Figure 8-222 Confirmation Dialog



5. Navigate to the **Server Directory** where the output was destined and verify the created file, as shown in Figure 8- 223.

Figure 8-223 Server Directory

🕼 Check_Inboun 🔻 🚰 😨 🛛 🖛 🔹 🖚 🔝 🏠 🌮 👫 Find Files 🔒							
🛿 🚰 Download 🙀 📝 Edit 🗶 🛃 🕞 Properties 📑 🕞 🗐 🛨 🖃 💟							
/oracle/Check_Inbound							
Name Ext	Size	Changed	Rights	Owner			
inbound_cremas05.xml	2,329 B	01-10-2013 01:24:51 01-10-2013 01:24:51	rwxrwxrwx rw-r	oracle oracle			

8.5 Deploy the Defined Process

Perform the following steps to deploy the process.

1. Right-click the project name in the left pane, select **Deploy** and then select project name, as shown in Figure 8-224



Figure 8-224 Navigation Screen

The Deployment Action page is displayed, as shown in Figure 8-225.

Figure 8-225	Deployment Action	Page
--------------	-------------------	------

Deploy Project4	×
Deployment Action	
Deployment Action Deploy Configuration Summary	Select a deployment action from the list below. Deploy to Application Server Deploy to SAR Deploy to sarchive to SOA configured Application server(s)
Help	< Back Next > Einish Cancel

- 2. Select Deploy to Application Server.
- 3. Click Next.

The **Deploy Configuration** page is displayed, as shown in Figure 8-226.

Figure 8-226 Deploy Configurations Page

Oeploy Project4		x	
Deploy Configuration			
Peployment Action	en Project4		
Deploy Configuration	Composite Revi	sion ID	
Select Server	Project:	Project4	
O Summary	Current Revision ID:	1.0	
	New Revision ID:	1.0	
	🗄 SOA Configurati	on Plan	
	Mark composite revisi	ion as default	
Mark composite revision as default.			
	Overwrite any existing composites with the same revision ID.		
	Use the following SOA configuration plan for all composites:		
<c> →</c>		Browse	
Help		< Back Next > Einish Cancel	

4. Click **Next** with the default values.

The Select Server page is displayed, as shown in Figure 8-227.



Deploy Project4		×
Select Server		
Deployment Action Deploy Configuration Select Server SOA Servers Summary	Application Servers: APP116 cluster132 IntegratedWebLogicServer (domain unconfigured) SOA110_stag6 SOA110_stage8	
Help	✓ Overwrite modules of the same name < Back Next >	<u>F</u> inish Cancel

5. From the list of application servers configured, select the respective SOA server to deploy and click **Next**.

The SOA Servers page is displayed, as shown in Figure 8-228.

Deploy Project4				
SOA Servers				
C Deployment Action	Choose the target SOA se this archive.	erver(s) and correspondir	ng partitions to v	which you want to deploy
Deploy Configuration	SOA Server:	Partition:	Status:	Server URL:
Select Server	✓ 3 soa_server1	default	RUNNING	http://10.30.32.110.
SOA Servers			_	
Summary				
<u></u>				
Help		< <u>B</u> ack <u>N</u> ext >	Ein	ish Cancel

Figure 8-2289 SOA Servers Page

6. Select a target SOA server and click Next.

The Summary page is displayed, as shown in Figure 8-229.

Figure 8-229 Summary Page

Deploy Project4		×
Summary	Deployment Summary: 	
Help	< <u>B</u> ack <u>N</u> ext >	Einish Cancel

7. Review and verify all the available information of the project and click **Finish**.

8. The successful compilation message is displayed in the Messages-log, once the process is deployed successfully, as shown in Figure7-230.

Figure 8-230 Successful Deployment Message

	Design Source History	
1	Build - Issues Messages - Log ×	
	Compilation of project 'Project4.jpr' finished. Check	
	<pre>'X:\oracle_stage11\middleware\jdeveloper\mywork\BAPI_BPEL\Project4\SOA\SCA-INF\classes\scac.log'</pre>	for
	[11:15:25 AM] Successful compilation: 0 errors, 0 warnings.	0
		Ŧ
	(Messages)	•
	Messages 🚜 BPEL × Extensions × 🐼 Deployment ×	•

8.6 Test the Deployed Process

This section describes the procedure for testing the deployed Outbound and Inbound Process.

8.6.1 Test the Outbound Process

Perform the following steps to test the Outbound Process.

8.6.1.1 Invoking the Input XML Document in the Oracle Enterprise Manager Console

Perform the following steps to invoke the input XML document in the Oracle Enterprise Manager console.

1. Login to the Oracle Enterprise Manager console using the link: http://localhost:port /em, as shown in Figure 8-231.



Figure 8-231 Oracle Enterprise Manager Console

- 2. Expand your domain in the left pane followed by the SOA folder.
- 3. Select the outbound deployed project (for example, Project4).
- 4. Click **Test** button, as shown in Figure 8-232.

Figure 8-232 Test Button

ORACLE' Enterprise M	anager Fusion Middleware Control 12c
📲 WebLogic Domain 👻 🚎 SOA Infras	itructure 👻
Target Navigation	Project4 [1.0] ③
 Application Deployments SOA Soa-infra (soa_server 1) default <lidefault< l<="" th=""><td>Active Retire Shut Down Test Settings Dashboard Composite Definition Flow Instar Test Service ts Components Name BPELProcess 1</td></lidefault<>	Active Retire Shut Down Test Settings Dashboard Composite Definition Flow Instar Test Service ts Components Name BPELProcess 1

5. A new pop-up is displayed. Click the **Request** tab, as shown in Figure 8-233.

Figure 8-233	Request Ta	b
--------------	------------	---

Request	Response				
> Securi	ty				
Quality	y of Servi	DE			
HTTP H	leade				
> Additi	onal Test	Optior			
📕 Input	Argument	t			
Tree Vie	Tree View 💌 Enable Validation 📝				
SOAP Bo	ody				
View -	P De	etach			
Name			Type		Value
⊳ * par	ameters		parameters		

6. Enter the input values in the Value field, as shown in Figure 8-234.

Request Response			
Security			
Diality of Servio	ce		
> HTTP Header			
> Additional Test	Options		
⊿ Input Argument	ts		
Tree View 💌 E	nable Validation 🕑		
SOAP Body			
Name		Туре	Value
* parameters		parameters	
* COMPANY	CODEID	string	

7. Click **Test Web Service** button, as shown in Figure 8-235.



The output response is received in the Oracle Enterprise Manager console, as shown in Figure 8-236.

Figure 8-236 Output Response

Request Response		
Test Status Reques Response Time (ms) 8483 Tree View	t successfully received.	are
Name		Value
⊽ payload	payload	
	5 BAPI0002_3	
ADDR_NO	string	000000121
FORMOFADDR	string	Firma
NAME	string	Ides AG
NAME_2	string	Martin Steiner, Kathrin Walther,
NAME_3	string	Bernd Zecha, Dondogmaa Lchamdondog
NAME_4	string	IDES intern
C_O_NAME	string	
CITY	string	Frankfurt
DISTRICT	string	

Perform the following steps to invoke the input XML document using XML View:

a. Select XML View from the list, as shown in Figure 8-237.

Request Respons	se .	
Test Status Requ Response Time (ms) 8483 XML View	perated. Launch	Flow Trace
Name XML View	Туре	Value
✓ paylod	payload RES BAPI0002_3	
ADDR_NO	string	000000121
FORMOFADDR	string	Firma
NAME	string	Ides AG
NAME_2	string	Martin Steiner, Kathrin Walther,
		Bernd Zecha, Dondogmaa Lchamdondog

Figure 8-237 Input Arguments List

- **b.** Enter the input XML document in the Input Arguments area and click **Test Web Service** button.
- **c.** The output response is received in the Oracle Enterprise Manager console, as shown in Figure 8-238.

Figure 8-238 Received Output Response

Request Response
> Security
≥ Quality of Service
> HTTP Header
> Additional Test Options
✓ Input Arguments
XML View 💌 Enable Validation 🕼
<soap:envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"> <soap:body> <ns1:bapi_companycode_getdetail xmlns:ns1="urn:sap-com:document:sap:rfc:functions"> <ns1:companycodeid>1000</ns1:companycodeid> </ns1:bapi_companycode_getdetail> </soap:body> </soap:envelope>

d. Click on Response tab, below screen appears, as shown in Figure 8-239.

Figure 8-239 Response Tab	
Request Response	
Test Status Request successfully received. Response Time (ms) 440 XML View	
A new flow instance was generated. Launch Flow Trace	
<env:body> <BAPI_COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:function
<companycode_address> <addr_no>0000000121</addr_no> <formofaddr>Firma</formofaddr> <name>Ides AG</name> <name_2>Martin Steiner, Kathrin Walther,</name_2> <name_3>Bernd Zecha, Dondogmaa Lchamdondog</name_3> <name_4>IDES intern</name_4> <c_0_name></c_0_name> <c_o_name></c_o_name> <city>Frankfurt</city> <district></district> <city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2></companycode_address></env:body>	s*>

8.6.2 Test the Inbound Process

Perform the following steps to test the Inbound Process.

8.6.2.1 Generate an Event in SAP R/3

Events are generated in SAP by some activity, for example, updating the material in SAP as in case of matmas.

The below section describes how to trigger an event in SAP R/3 and verify event integration using Oracle Integration Adapter for SAP R/3.

To trigger an event in SAP R/3:

1. Logon to the SAP R/3 system, as shown in Figure 8-240.

Figure 8-240 Workbench

^字 <u>M</u> enu <u>E</u> dit	<u>F</u> avorites E	xtr <u>a</u> s S <u>y</u> stem	<u>H</u> elp		
Ø [I	•	1 🗏 😋 🙆 🖗) 	L & 🔣 🕅 (9 🖪
SAP Easy A	ccess				
I 🕹 I 🔁 🔂	🛱 Other menu	😹 🔠 🥖	🔻 🔺 🗌 🚮 Create role	🕼 Assign users	B Documentation
• 🗀 Favorites					
SAP menu Office					
 Cross-A 	pplication Compo	onents			
Collabo	ration Projects				
	s tina				
 Human 	Resources				
🕨 🗋 Informa	tion Systems				

2. Run the bd10 transaction, a popup window appears, as shown in Figure 8-241.

rigure 0-247 Gena Material Window				
៤ <u>P</u> rogram <u>E</u> dit <u>G</u> oto S <u>y</u> stem	<u>H</u> elp			
V	😋 🥹 🚷 🖨 🖬 👪	1 2 1 4 4 1 👷 🔜 🖓 🖫		
Send Material				
🕀 🔁 🖪				
Material	40-110C to			
Class	to			
Message Type (Standard)	MATMAS			
Logical system	ORAQA2			
Send material in full				
Parallel processing				
Server group				
Number of materials per proces	20			

Figure 8-241 Send Material Window

Enter the following information in the Send Material window:

- In the Material field, enter a material number (e.g., 40-110C), as shown in Figure 8-242.
- In the Logical system field, enter the logical system (i.e. Program ID) that you are using with SAP R/3.
- 3. Use **F8** to execute the process.

Figure 8-242 Execute Option



Material master data is sent to the logical system specified.

Verifying the Results

To verify your results:

- 1. Logon to the Oracle Enterprise Manager console by using the following URL: http://localhost:7001/em
- 2. Expand your domain in the left pane followed by the SOA folder.
- **3.** Select an available inbound BPEL process (for example, project1), as shown in Figure 8-243.



Figure 8-243 Available Inbound BPEL Process

4. Recently received run-time event messages are displayed under Services and References, as shown in Figure 8-244.

Figure 8-244 Instances Tab

Audit trail will look like the same, as shown in Figure 8-245.

Figure 8-245 Audit Trail

Flow Trace > Instance of BPELProcess1	Paylo	ead for Activity: Receive1
This page shows BPEL process instance	Find	I Go to Line
Audit Trail Flow Sensors Actions → View → Highlight Fault ✓ <process> ✓ <main (38)=""> ✓ <main (38)=""> ✓ <process> ✓ <process> ✓ <process> ✓ <process> ✓ <pre>Process> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process></pre> ✓ <pre>Process> ✓ <pre>Process> ✓ <pre>Process> ✓ <pre>Process</pre> ✓ <pre>Process</pre> ✓ <pre>Process</pre> ✓ <pre>Process</pre> ✓ <pre>Process ✓ <pre>Process</pre></pre></pre></pre></pre></pre></process></process></process></process></main></main></process>	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	<pre><?xml version="1.0" encoding="UTF-8"?><Re <part xmlns:xsi="http://www.w3.org/200</th></pre>

<u>9</u>

Adapter for SAP Performance Tuning

This section provides SOA as well SAP JCo 3.0 tuning parameters. The section defines the tuning and performance environment and result of the same. These are the sample tuning parameters that can be used and compared with the result given in the result section.

This chapter contains the following topics:

- Section 9.1, "Tuning and Performance"
- Section 9.2, "Inbound Performance"

9.1 Tuning and Performance

This section describes about the performance consideration of Adapter for SAP. Tuning is required to make sure that the components involved should maximize the performance of Adapter for SAP.

9.1.1 Tuning Parameters

Tuning parameters should be defined to make sure that the environment components deliver maximum performance. These parameters are not fixed and the values will depend on various factors and the systems involved in the integration scenario. Few factors to be looked for are: server configurations, load expected by the system – peak and non-peak, payload sizes, etc.

9.1.1.1 SAP JCo Parameter Tuning

These JCo properties should be modified in Outbound ConnectionPools of Adapter for SAP. SAP JCO is tuned differently for inbound and outbound integration scenarios. In case of outbound from the Adapter for SAP, you should tune the following parameters.

JCO_PEAK_LIMIT - 300 JCO_POOL_CAPACITY - 50

In case of inbound to Adapter for SAP, you should tune the following JCo parameters:

JCO CONNECTION COUNT = 3

9.1.1.2 BPEL Infrastructure Tuning Parameters (These are provided at Enterprise Management (EM) level):

Table 9-1 lists and describes tuning parameters.

SOA Infrastructure Parameter	Old Value	New Value	Component
DispatcherEngineThreads	30	300	BPEL
DispatcherInvokeThreads	20	250	BPEL
DispatcherSystemThreads	2	50	BPEL
MaxNumberOfInvokeMessagesInCache	100000	2500000	BPEL
DispatcherMaxRequestDepth	600	1000	BPEL
AuditLevel	Inherit	Off	SOA-INFRA
LargeDocumentThreshold	100000	100000	BPEL

Table 9-1 Tuning Parameters

These properties can be modified in Enterprise Manager. For this, go to **BPEL Service Engine Properties** page in EM, as shown in Figure 9-1.

Figure 9-1 BPEL Service Engine Properties Page



Logger level tuning parameters

Logging is a very expensive activity when it comes to added performance overheads. Logging should be at the minimal level or off in order to enhance performance of the system. Recommended level for logging is ERROR:1 (SEVERE). You can modify logger level of Adapter for SAP in the following section of Enterprise Manager, as shown in Figure 9-2.

Figure 9-2 Logger level Tuning Parameters

Log Configuration

Use this page to configure basic and advanced log configuration settings.

Log Levels Log Files			
This page allows you to configure the log level for both persistent loggers and active runtime loggers. loggers that are saved in a configuration file and become active when the component is started. The loggers are persisted across component restarts. Runtime loggers are automatically created during run when a particular feature area is exercised. For example, oracle.j2ee.ejb.deployment.Logger is a runtir active when an EJB module is deployed. Log levels for runtime loggers are not persisted across compo			
View Runtime Loggers			
Search All Categories 💽 sap			
Logger Name	Oracle Diagnostic Logging Level (Java Level)		
oracle.soa.adapter.sap	ERROR:1 (SEVERE)		
oracle.soa.adapter.sap.connection	ERROR:1 (SEVERE) [Inherited f		
oracle.soa.adapter.sap.inbound	ERROR:1 (SEVERE) [Inherited f 💌		
oracle.soa.adapter.sap.outbound	ERROR:1 (SEVERE) [Inherited f		

JCoParameter Tuning

- Outbound performance:
 - JCO_MAX_GET_TIME = 2000ms
 - JCO_PEAK_LIMIT =100
 - JCO_POOL_CAPACITY = 40

9.1.2 System Configuration

9.1.2.1 Oracle Linux Server

This is the configuration of the system where you are running the WebLogic server.

- Release 6.3
- Kernel linux 2.6.39-200.24.1.el6uek.x86_64

9.1.2.2 Hardware

- As performance is dependent on various factors including the size of the system on which a process or an application runs, the hardware information here serves as a measuring gauge to help identify actual performance tuning criteria. These are the hardware level details of the system for which the above tuning settings are made. Memory : 31.5 GiB
- Processor 0 to 8 : Quad-Core AMD OpteronTM processor 2356

9.1.3 Outbound Performance

This section describes how to configure the environment to calculate the performance of the Adapter for SAP in case of outbound requests from adapter. This summary is based on BPEL project which is used to send an outbound call to SAP (Inbound to SAP system).

9.1.3.1 Performance Summary

The Adapter for SAP was subjected to high loads to test performance for two types of operations on an SAP system. One operation was to fetch information from SAP system and another was to insert information to the SAP system, both being outbound to SAP system from Adapter for SAP.

Further sections provide a summary of the performance of the server against the Fetch and Insert scenario.

Fetch Scenario

Individual performance of the adapter is tested for the fetch operation with 1 kb request and 43 kb of response under different user loads. Please note that the response times and transactions processed per second may vary with different system configuration and network speeds.

Apart from calculating the response times and tps (transactions per second), system and hardware parameters: CPU, Disk IO, Heap, GC, threads, Network IO was monitored for the server.

Execution Summary For Fetch Scenario

Table 9-2 lists and describes the execution summary.

#	User Load	Average response time(sec) Vs User Load	Transactions Per second
1	50	1.106	43.9
2	100	2.395	40.9
3	200	4.796	38.7
4	300	6.782	41.1
5	500	10.521	43.6
6	1000	19.901	44.6

Table 9-2Execution Summary

Insert Scenario

Individual performance of the adapter is tested for the insert operation with 5 kb request and 26 kb response under different user loads.

Execution Summary for Insert Scenario

Table 9-3 lists and describes the execution summary.

Table 9-3Execution Summary for Insert Scenario

Response Time Vs User Load -Insert Scenario (7kb request and 26 kb response)				
#	User Load	Average response time(sec) Vs User Load	Transactions Per second	

1	50	1.797	26.8
2	100	4.245	22.1
3	200	8.971	21.4

9.1.3.1 Enhanced Performance

The performance of the overall process using the Adapter for SAP can be enhanced by modifying various parameters on SOA as discussed in <u>section 9.1.1</u>. Post tuning the SOA layer and Adapter for SAP, the performance of the process increased. Table 9.4 shows the results after modifying the SOA parameters.

Table 9-4 lists and describes the execution summary

 Table 9-4
 Execution Summary for Insert Scenario

TPS Vs User Load - Fetch Scenario (1kb request and 43 kb response)			
#	User Load	Transactions per Second	
1	100	77.5	
2	200	67.5	
3	300	64.2	
4	400	64.1	
5	500	63.9	

9.2 Inbound Performance

This section describes how to measure Adapter performance for Inbound calls. This summary is based on the BPEL project which is used to receive an inbound call from SAP (Outbound to SAP system).

Note: You can look at configuring different work managers to increase throughput. The properties for work manager

SOAInternalProcessing_maxThread can be optimized for performance tuning as it will adjust the max number of threads available to the work manager.

To increase this value, go to WebLogic console-> Environment-> Work Managers-> SOAInternalProcessing_maxThreads and increase the value of **Count**, as shown in the Figure 9-3. Similarly for SOAIncomingRequests_maxThreads, go to WebLogic console-> Environment-> Work Managers-> SOAIncomingRequests_maxThreads and increase the value of Count.

Figure 9-3 Increase the value of	of Count
🏦 Home Log Out Preferences 🔤 Record	i Help
Home >Summary of Environment >Summary of Managers > SOAInternalProcessing_maxTh	of Deployments >SAPAdapter >Summary of Environment >Summary of Work Managers >SC reads
Settings for SOAInternalProcessing_ma	IXThreads
Configuration Targets Notes	
Save	
Use this page to configure properties for th	ne selected maximum threads <u>constraint</u> .
🏀 Name:	SOAInternalProcessing_maxThreads
Count:	32
🤁 Data Source:	
Save	

9.2.1 Performance Summary

Adapter Inbound performance summary in this environment:

Execution Summary

Table 9-5 lists and describes the execution summary.

Table 9-5	Execution	Summary

Property	Value
Total Number of iterations	50000
Event Output XML size	6kb
Configuration	Inbound BPEL Process
Adapter	SAP (JCA)
EIS Server Version	
IDoc	ALE(iDOCs) ->Material Management-> MATMAS Material master -> MATMAS01

Result:

Table 9-6 lists and describes the results.

Table 9-6 Results

Name	Avg TPS	No of Concurrent IDO
	25	208
SAP		

10 SOA Reports Integration

This section describes the Reports integration of the Adapter for SAP. Reports are useful in real-time monitoring of the Adapter for SAP. This feature comes up with Oracle Enterprise Manager. Using Oracle Enterprise Manager, you can see real-time adapter health report and connection monitoring, such as closed and open(ed) connections on particular session. You can see health of any deployed SAP endpoint connection created for that and which messages through this integration.

This chapter contains the following topics:

Section 10.1, "Adapter Health Report"

10.1 Adapter Health Report

You can check real-time monitoring statistics of SAP Endpoint in Adapter health report.

Perform the following steps to open Adapter health report:

- 1. Open Enterprise Manager.
- **2.** Go to **SOA** \rightarrow **soa-infra**.
- 3. Select the deployed the Adapter project that you want to see.

The Adapter Report tab is displayed as shown in Figure 10-1.

4. Select SAP service / reference.

-igure 10-1 Adapter Report Tab						
📲 SOA Compo	site 🔻					
🖑 RFC_C	оитвои	JND (Custom Ad	lapter) 🕕			
Dashboard	Policies	Properties Adap	ter Reports			
Diagnosib 🔺 🖗 Conf	o ility Re figuratio	ports 💿 🕅 E	Enable reports			
EIS Con	nectivity	,				
		2	IndiName eis/SAP/FN	IWDEMO		
	Destina	tionDataProvider_JCC	_CLIENT 800			
ServerD	ataProvide	er_JCO_CONNECTION	I_COUNT 2			
De	stinationD	ataProvider_JCO_PE	AK_LIMIT 10			
	Destina	ationDataProvider_JC	D_SYSNR 00			
	Serv	verDataProvider_JCO	PROGID ORADEV2			
	Serve	erDataProvider_JCO_	GWHOST 10.30.32.	42		
	Destir	nationDataProvider_JC	CO_LANG en			
	Destir	nationDataProvider_JC	CO_USER JCA_DEV			
Mon	itoring	Reports				
The table be	elow displa	ays real-time monitorin	g statistics for this er	ndpoint. (If an EIS conn	ection is down, click th	ne status icor
			Managed	Connections		
Noc	ae	Currently Open	Average Numbe Useo	r Currently Free	Maximum Pool Size	Las
📑 soa_	server1	200.0	0.0	200.0	400	

10.1.1 Configuration Report

Configuration reports contain the information of ConnectionFactory, activation and binding properties for the SAP endpoint. ConnectionFactory summary provides information about JCo parameters defined for run-time as well as JNDI name and pooling information. It also shows SOA binding properties.

Perform the following steps to see configuration report:

- 1. Go to **SOA** > **soa-infra** and select your project.
- 2. Select SAP service / reference.
- **3.** Click on **Adapter Reports** tab. To enable report, select **Enable Reports** check box, as shown in Figure 10-2.



10.1.1.1 EIS Connectivity

You can see ConnectionFactory configuration in **EIS Connectivity** section of health report. EIS Connectivity lists all properties of connection, as shown in Figure 10-3.

Figure 10-3 EIS Connectivity

Diagnosibility Reports 🛛 💌	🕑 Enable rep	orts
⊿ 🖗 Configuration Reports		
EIS Connectivity		
	JndiName	eis/SAP/FM

JndiName	eis/SAP/FMWDEMO
DestinationDataProvider_JCO_CLIENT	800
ServerDataProvider_JCO_CONNECTION_COUNT	2
DestinationDataProvider_JCO_PEAK_LIMIT	10
DestinationDataProvider_JCO_SYSNR	00
ServerDataProvider_JCO_PROGID	ORADEv2
ServerDataProvider_JCO_GWHOST	10.30.32.42
DestinationDataProvider_JCO_LANG	en
DestinationDataProvider_JCO_USER	JCA_DEV
ServerDataDrovider 100 GW/SERV	sandw00

Service/Reference Properties

Service properties tab lists all SOA properties that are used with this composite, as shown in Figure 10-4.

Figure 10-4 Service Properties Tab

 Reference Properties

 Definition Properties
 Tuning Properties

 SchemaValidation
 off

10.1.2 Monitoring reports

Health report displays real-time connectivity status of the adapter with EIS. This gives current connection status, incaseif it is connected to EIS, total open connections from pool, peak load, pool size etc. You can see connectivity report in monitoring reports, as shown in Figure 10-5.

```
Figure 10-5 Monitoring reports
```

Diagnosibility Report	5 💌 🗹	Enable reports
------------------------------	-------	----------------

Configuration Reports

🔟 🚾 Monitoring Reports

The table below displays real-time monitoring statistics for this endpoint. (If an EIS connection is down, click the					
	Managed Connections				
Node	Currently Open	Average Number Used	Currently Free	Maximum Pool Size	
引 soa_server1	200.0	0.0	200.0	400	

Image: Signapshot Reports

10.1.3 Snapshot Reports

This report shows how many messages have been consumed by this adapter instance, maximum size, average message size etc. You can also get historical data based on date selection, so you can define the time boundaries to get the message statistics, as shown in Figure 10-6.

Figure 10-6 Snapshots Reports

🔟 🔟 Snapsho	t Reports		
Snapshot reports	aggregate historical data ov	er a selected period of time.	
Message Statis	tics		
Retrieve Data	Recent time period 💌	Last 24 🗘 Weeks 💌 🔶	
	Server Name	Average Message Size (bytes)	Maximum Message Siz
No data found			

<u>11</u>

Troubleshooting and Error Messages

The Adapter for SAP enables the configurable logging for debugging connection and other related issues.

The Adapter for SAP supports the adapter diagnostic framework for reporting and alerting. This provides run-time adapter diagnostic information as read only reports in EM console. The framework also provides some alerting functionality.

The Adapter for SAP collects and provides reporting data per service/reference endpoint for each composite. Endpoint reports capture useful information like EIS connectivity, transaction, message, fault, downtime statistics etc.

The diagnostic reporting is configurable. There are knobs to turn it off when required. There is a generic alerting framework for sending normal alerts and rules based alerts. The Adapter for SAP provides design-time and run-time support to use the alerting framework.

This chapter mentions the possible errors that could occur while using the Adapter for SAP. These areas of error messages include SAP side error messages, Adapter Design-time issues and Adapter Run-time issues.

This chapter contains the following topics:

- Section 11.1, "Log file Information"
- Section 11.2, "Oracle Adapter for SAP Design-time JDeveloper"
- Section 11.3, "Oracle Adapter for SAP Run-time"
- Section 11.4, "SAP R/3"

11.1 Log file Information

Log file information that can be relevant in troubleshooting can be found in the following locations based the adapter installation:

For Oracle SOA Suite:

```
<ORACLE_HOME>\soa\user_projects\domains\${soa_server
domain}\servers\${soa_server name}\logs\soa-server_diagnostic.log
```

For OSB:

```
<ORACLE_HOME>\soa\user_projects\domains\${osb_server
domain}\servers\${osb_server name}\logs\osb-server_diagnostic.log
```

• The Oracle Adapter for SAP trace information can be found under the following directory:

For JCO trace at server level:

<ORACLE_HOME>\user_projects\domains\\${domain name}\tracename.trc

11.2 Oracle Adapter for SAP Design-Time JDeveloper

Table 11-1 shows the common errors faced while using Adapter for SAP in JDeveloper.

Error	Solution
SAP JCo library is not accessible.	The relevant SAP JCo jars should be kept in the design-time: <oracle_home>\soa\plugins\jd eveloper\integration\adapter s\lib folder and restart JDeveloper.</oracle_home>
Test connectionFAILED w/parameters: com.sap.conn.jco.JCoException: (103) JCO_ERROR_LOGON_FAILURE: Name or password is incorrect (repeat logon) on {IP ADDRESS} sysnr XX.	Check the SAP logon credentials and ensure correct parameters are entered.
ERROR partner {I.P. ADDRESS} not reached Exception Key = JCO_ERROR_COMMUNICATION Exception String = com.sap.conn.jco.JCoException: (102) JCO_ERROR_COMMU NICATION: Connect to SAP gateway failed Connection parameters: TYPE=A DEST=DefaultClient ASHOST= {I.P. ADDRESS} SYSNR=XX PCS=X.	Ensure that your SAP system is up and running and give correct credentials.
JCO_ERROR_LOGON_FAILURE: Client 080 is not available in this system on {I.P. ADDRESS}sysnr XX.	Check client number in the connection page of the Adapter wizard.
Parameter logon language ('lang') code 'enn' is invalid.	Check language entered in the connection page of the Adapter wizard.
SAPConnector: missing or invalid property.	Check whether you have missed out any mandatory field value in the connection page.
JCO_ERROR_COMMUNICATION: Connect to message server host failed.	Check message server credentials.
JCO_ERROR_COMMUNICATION:	Check message service name in connection

Table 11-1 Adapter for SAP in JDeveloper

Connect to message server host failed ERROR service 'SFVSDD' unknown.	page.
JCO_ERROR_COMMUNICATION: Connect to message server host failed. ERROR Group PUBLI not found	Check your server group name in connection page.
Object selection page fails to load the SAP objects with error "Failed to connect to SAP R/3 system".	Check whether connection to SAP is successfully established using test connection.
RFC_ERROR_PROGRAM: Configuration of destination DefaultClient is incomplete: Parameter SNC partner name ('snc_partnername') is missing.	Check your SNC name and the partner name.

Failed to connect to SAP R/3 system at the Object Selection window of the design-time, as shown in Figure 11-1. This is because SAP is not reachable at the given connection credentials on the Connection Information page of design-time.

Figure 11-1 Failed to Connect to SAP R/3 System Error



11.3 Oracle Adapter for SAP Run-Time

Table 11-2 shows the common errors faced in the SOA server Run-time.

Table 11-2 Error in SOA server Run-time

Error	Solution
Client 080 is not available in this system on {IP ADDRESS} sysnr XX	Enter correct DestinationDataProvider_JCO_CLIENT .in the WebLogic console-JNDI properties.
Connect to SAP gateway failedConnection parameters: TYPE=A DEST=dummyFactory ASHOST= {I.P ADDRESS}SYSNR=XX PCS=X	Enter correct DestinationDataProvider_JCO_ASHOST in the WebLogic console –JNDI properties.

<exception>Select one of the installed languages on {I.P ADDRESS} sysnr XX</exception>	Enter correct DestinationDataProvider_JCO_LANG in the WebLogic console - JNDI properties.
No credential provided	Check that the JNDI name is correct while deploying the project.
<exception>Name or password is incorrect (repeat logon) on {I.P ADDRESS} sysnr XX</exception>	Enter correct DestinationDataProvider_JCO_PASSWD or DestinationDataProvider_JCO_USER in the WebLogic console - JNDI properties
<exception>ZRFC_EXEC_BD14 not found in SAP.</exception>	Check whether the object exists in SAP.
Error deploying the composite on soa_server1: Composite with same revision ID already exists: default/ANCD!1.0.	Check whether the project is already deployed on the server.
java.net.ConnectException: Connection refused: connect; No available router to destination.	Check whether the SOA server is up and running.

Note: In BAPIs and RFCs, if the Sap Object is returning a record with error code 'E' in the in the export(return) table, then the BAPI will fail at runtime by throwing the error message. This is applicable even if the Sap Object returns the error message along with the output data.

In the scenario, where the SAP Object (RFC/BAPI) returns an exception and data, Adapter for SAP returns only data in runtime. But in design time test functionality, only exception is thrown.

In the scenario, where the SAP Object (RFC/BAPI) returns only exception without any data in output tables, Adapter for SAP throws the exception both in runtime and designtime

Note: For some BAPIs we need to pass internal versions of the inputs as these BAPIs will execute some conversion routines to convert the input values to their internal versions (like adding the required no. of zeroes.) and these routines do not get executed when they are called externally via Adapter.

For the SAP Object (RFC/BAPI), if any meta data changed in SAP side, then need to restart the server to reflect the changes in current Adapter instance.

When the user is posting multiple IDOC in one request, the Adapter will split those individual IDOCs and post in SAP.In the 12.1.3 release this feature will not work with schema validation on . User should pass multiple Idocs in such format like, each control record has to be followed by its corresponding data record.

The Adapter for SAP doesn't support SAP custom objects with optional table structure .User needs to change from optional to mandatory.All SAP standard objects only support table structure as mandatory parameter.

If the user is processing the data by using queue and the queue is not existing at SAP side ,the message will not get processed, since the queue will be created in SAP system but has to be activated manualy each time to reprocess the data.

11.4 SAP R/3

Table 11-3 shows the common errors returned back from SAP JCo and can be seen in the SOA server logs:

Table 11-3 Error in SOA Server Logs

Error	Solution
com.sap.conn.jco.JCoException: (103) JCO_ERROR_LOGON_FAILURE: Client XXX is not available in this system on {I.P ADDRESS} sysnr XX".	Enter correct DestinationDataProvider_JCO_CLIENT in the WebLogic console-JNDI properties.
com.sap.conn.jco.JCoException: (102) JCO_ERROR_COMMUNICATION: Connect to SAP gateway failed	Connection parameters: TYPE=A DEST=dummyFactory ASHOST= {I.P. ADDRESS} SYSNR=XX PCS=X Enter correct DestinationDataProvider_JCO_ASHOST

Table 11-4 shows the loss of message issues commonly faced in case of inbound and outbound processing:

Table 11-4 Issues in Inbound/Outbound Message Transactions

Error	Solution
IDoc's triggered from SAP are not received by SOA or the Adapter.	To verify ALE configuration, Check in we02 to verify for the IDoc status to be in Status 03 and validate the port, partner,
IDoc's are successfully sent with status 03 in we02, and still the IDoc's are not received by SOA.	Perform the connection test of the RFC Destination where the program ID is assigned and check if it is successful.
IDoc status is we02 is 03 and Connection test is successful. But still the IDoc's are not received by SOA.	Go to SMGW, check for number of servers which are connected to the program ID. If there are multiple servers connected to same Program ID, then the IDocs might be going to different server.

IDoc status is we02 is 03 and Connection test is successful and also there is only one server has registered to that program ID. But still the IDoc's are not received by SOA.	Check in SM58, if the IDoc's stuck in the transactional pool.
---	---
12 Migration Support

The SOA and OSB projects with iWay SAP Endpoints can be migrated over to Oracle Adapter for SAP using a migration utility within JDeveloper.

This chapter contains the following topics:

- Section 12.1, "Migration of SAP Endpoints in SOA Projects"
- Section 12.2, "Migration of SAP Endpoints in OSB Projects"
- Section 12.3, "You would see the iWay related specifications in the jca file, as shown in Figure 12-12.

Oracle JDeveloper 12c Development Build - ServiceBu	ssApplication.jws : RT_ID_OB_S1801_TC0001.jpr : C:\/IDEVs\stage9\mywork\ServiceBusApplication\RT_ID_OB_S1801_TC0001\wsdl\MATMAS05_receive.jca	- 0 <mark>- X</mark>
Eile Edit View Application Refactor Search N C - C - C - C - C - C - C - C - C - C -	avigate Build Bun Soyrce Team Iools Window Help 🎨 🚱 🏦 🏥 🤐 🕨 🎍	Q+ (Search
Applications ×	🕑 Start Page 🐇 SYS 130 🗧 🚾 MATMASOS_receive.jca 🛸	Comp Re ×
🔁 ServiceBusApplication 🔹 💌	• Q• Find III	* Q* Name
🖃 Projects 💽 🖓 • 🍸 • 💯 •	Adapter-config wsdlLocation="MATMAS05 receive.wsdl" name="MATMAS05" adapter="SAP Adapter" xmlns="http://platform.inte	- My Catalogs
Control C	<pre>cresource-adapter classima=""""""""""""""""""""""""""""""""""""</pre>	Link to frequently-used resources in a private favorites list. Marce
MATHASS receive request.xd MATHASS receive request.xd MATHASS receive.xd MATHASS receive.xd MATHASS receive.wdd max request.xd max req		UDE Connections
	Source_interve_	
H Recent Files	Messages Extensions *	· · · · · · · · · · · · · · · · · · ·

Figure 12-12 Specifications in jca

1. After migration, now you can migrate this iWay format project into the SAP Adapter project using SAP Adapter Migration Tool from the context menu.



2. Once you clicked on SAP Adapter Migration Tool from context menu, the Confirmation Window appears.





3. Once the user click on OK, give the appropriate JNDI name.

Figure 12-15 JNDI Naming Window



4. Once you confirmed the JNDI name, project will migrate into the SAP Adapter with a summary.

Figure 12-16 Confirmaion Window

SAP Adapter M	igration Tool
i	The following files have been migrated successfully wsdl\MATMAS05_receive.jca
	ОК

- **5.** Now open the Concrete WSDL of iWay project, you can observe that the JNDI name is not updated with the current JNDI name, change this mannually to **eis/SAP/FMWDEMO** in place of eis/OracleJCAAdapter/DefaultConnection.
- 6. The project is successfully migrated into the SAP Adapter project.

Note: After deploying the project, if the user observes any entry related to eis/OracleJCAAdapter/DefaultConnection JNDI in the diagnostic log, JDeveloper clean is required. After cleaning the JDeveloper, redeploy the project.

- Deploying the Adapter Migrated Project"
- Section 12.4, "Execution Steps for Deployed Migrated Projects"

Prerquisites:

- The IWAY projects to be migrated should have WSDL location in the JCA file. Absence of this will cause incorrect migration.
- The IWAY project to be migrated should be working on the 12c environment. If the input project is incorrect, the migrated project will be malformed too.

Note: Although the migration tooling does not report all possible errors in the input IWAY projects but it performs a basic check and reports errors detected in the migration or deployment process. For e.g., JCA or any other files not migrated with correct/required value or a WSDL file missing during deployment etc.

12.1 Migration of SAP Endpoints in SOA Projects

The Adapter for SAP must provide tooling to assist the user converting from the OEM version of iWay SAP Endpoints in SOA composite application to ones based on the Oracle Adapter for SAP.

Given an existing SOA project with iWay generated SAP endpoints, the migration tooling must help to the user convert SAP endpoints in the SOA composite. After the conversion, the migrated project must:

- Reuse iWay generated XSD and WSDL files to minimize component interface changes required within the SOA composite.
- Generate a new JCA property file to replace the iWay SAP endpoint in the SOA composite.
- Work in the SOA run-time without the iWay adapter.

Steps to migrate iWay Adapter into The Adapter for SAP from JDeveloper:

1. Open iWay project in to 12.1.3 JDeveloper, as shown in Figure 12-1.

Figure 12-1 Open iWay project in 12.1.3 JDeveloper

Applications		×	3 Start Page ×	
🖪 Iway-Migratio	'n	• •		
Projects		Image: Section 1 = 1 = 1 Image: Section 1 = 1 </td <td>JDEVELOPER</td> <td></td>	JDEVELOPER	
Extended_	Idoc			
extended_	matmas_outbound		Lang & Evalue	
±∎ SOA			Learn & Explore	
	🕜 Open			
	Location	n: C:\prashant\jdeveloper_project\JDe	eveloper \mywork \Iw 🔻 😮 💿 🕼 😭 📰 🔤	ed Tutoi
	ê î	CA-INF	ng	Started w
	Work		юр	ing Rich \
			E Contraction of the second seco	
	Project	.designer		a util
			ue	2
		composite.xml	r.	maven.
	Application	extended_matmas_outbound.jpr		
		MATMAS01.ZMATMAS01_EXT_invoke	e123.wsdl	index.p
		MATMAS01.ZMATMAS01_EXT_invoke	e123_3P.jca z.	maven.
	Home	MATMAS01.ZMATMAS01_EXT_invoke	e123_request.xsd	proper
		MATMAS01.ZMATMAS01_EXT_invoke	e123_response.xsd	
Application Res	Decktor			
+ Recent Files	Desktop	File Name: extended matmas outbound	l.jpr	
Extended_ldoc.jp		File Type: All files (*.*)		
	<u>H</u> elp		Open Cancel	

2. Once you click **Open** button, JDeveloper will try to migrate 11g project to 12.1.3 format. JDeveloper will popup a confirmation window, as shown in Figure 12-2.

Figure 12-2 Open Warning



3. After 12.1.3 migration, JDeveloper will show up a migration summary pop-up, as shown in Figure 12-3.

Figure 12-3 Migration Status

👩 Migratic	on Status	x
i	Migration successfully completed for the following file(s): C: \prashant\jdeveloper_project\jDeveloper \mywork\I\way-Migration\extended_matmas_outbound_iway\extended_matmas_outbound\e	exten

4. After 12.1.3 migration, now you can migrate this 12.1.3 iWay format project in to the Adapter project using **Adapter Migration Tool** from context menu highlighted by red rectangle, as shown in Figure 12-4.

🔁 Iway-Migration	• •	🖌 🖓 🌌 💥 🐝 🖓 I 🚺	J 🛛 I 🖶	E 🐽 🖓
Projects Q No + Extended_Idoc Extended_matmas_outbound	₩ • ﷺ • New	Exposed Service	s	Components
SOA SOA SOA Solution Solut	Edit Project Edit Project SOA Find Project Show Clas Show Over Deploy Find Usage Make exter Rebuild ext	t Source Paths ect :t Files spath view :5 nded_matmas_outbound.jpr tended_matmas_outbound.jpr	Ctrl+Alt-U Ctrl+F9 Alt-F9	To create resources, drag and drop an icon from the component palette to the canvas or select one from the right-click context menu
	▶ <u>R</u> un 登 <u>D</u> ebug Refa <u>c</u> tor		•	
Application Resources Data Controls	Co <u>m</u> pare V Replace W	Nith ith))	
★ Recent Files extended_matmas_outboun × Tr	Restore fro	m Local History er Migration Tool le Compliance		pace and store definition in Iway-Migration/.adf/META-IN for the following file(s): stmas_outbound\extended_matmas_outbound\extended_matmas_

5. Once you clicked on **SAP Adapter Migration Tool** from context menu, confirmation window appears, as shown in Figure 12-5.

Figure 12-4 Migration Tool

Figure 12-5 Confirmation Window



6. Once you confirmed the migration, project will migrate into the Adapter for SAP with a summary, as shown in Figure 12-6.

Figure 12-6 Migration Successful Message Window

SAP Adapter N	Aigration Tool
i	The following files have been migrated successfully 1 - C:\prashant\jdeveloper_project\JDeveloper\mywork\lway-Migration\extend atmas_outbound_iway\extended_matmas_outbound\MATMAS01.ZMATMAS01_EXT_invoke123_3P.jca
	OK

7. Now your project is migrated successfully in to the Adapter project.

Notes:

- Adapter for SAP does not support migration of the projects that used the data types in XML-CDATA-ENVELOPED format.
- The Migrated projects do not have the jca property ProgramID at the design time level unlike the adapter projects.
- Changing/modifying the migrated project is not supported. The user can only deploy/run with the adapter in SOA run-time. If such a change is needed, the user need to remodel the project from scratch using Oracle's Adapter for SAP.

12.2 Migration of SAP Endpoints in OSB Projects

The OSB 11g projects consisting of an iWay adapter need to be migrated to 12.1.3 Adapter for SAP explicitly. The iWay adapter files in the project need to be updated to point to the new interaction specs and libraries pertaining to the Adapter for SAP in 12.1.3.

You can create a single configuration jar from OSB 11g sbconsole for multiple projects. The configuration jar for multiple projects can also be created using the Eclipse OEPE for OSB in 11g. This configuration jar when imported into 12.1.3 JDeveloper will import all projects and create directory structures for each.

Perform the following steps to migrate OSB 11g iWay projects to 12.1.3:

7. Create an 11g OSB configuration jar for the project (s) to be migrated, as shown in Figure 12-7.

ORACLE' Service Bus 11gR1						
Change Center	Welcome, weblogic	Connected to : osb_domain	🟠 Home	Oracle WLS Console	Logout	Help
 View Changes View All Sessions 	Export Resources					
Create Discard Exit	Export Projects Export Resources					
Import/Export	Include Dependencies Resource Summary					
Import Resources	🛨 🛅 Name				Туре	
Export Resources	🕂 🔳 🍄 System				Project	
	🕂 📄 🖆 AQandSAP				Project	
UDDI	🕂 🗹 🕋 ImportOrders05				Project	
UDDI Registries	田 田 田 田 田 田 田 田 田 田 田 田 田 田 田 田 田				Project	
Import from UDDI	田 田 田 田 田 田 田 田 田 田 田 田 田 田 田 田 田				Project	
Auto-Import Status	Image: Heat State Image: Heat State <theat state<="" th=""> Image: Heat State I</theat>				Project	
Publish to UDDI					Project	
Auto-Publish Status	H C 28 RT_ID_OB_\$18012_TC0001				Project	
r	田 ■ ■ RT_ID_OB_S18013_TC0001 ■				Project	
Global Resources	H C RT_ID_OB_\$18013_TC0002			1	Project	
JNDI Providers	H 📄 🕋 RT_ID_OB_\$18013_TC0003				Project	
SMTP Servers	H C C RT_ID_OB_S18013_TC0004				Project	
Proxy Servers					Project	

Figure 12-7 Create an 11g OSB configuration jar

8. Create a new Service Bus Application in JDeveloper 12.1.3. Alternatively, you can also use an existing Service Bus Application, as shown in Figure 12-8.

Figure 12-8 Create new Service Bus Application

🕥 New Gallery		x
Q		
Categories:	Items: Show All Description	ons
UML XML	OEP Project	
Business Tier	Project from Existing Source Project from WAR File	
Business Rules Contexts and Dependency Injecti	Project Template	
Data Controls EJB	REST Web Service Project	
Enterprise Scheduler Metadata	Service Bus Project	
TopLink/JPA	Create a new Service Bus Project	
Web Services	SOA Project	
	SOAP Web Service Project	
Extension Development	D UML Project	

- **9.** Import the configuration jar in JDeveloper 12.1.3 into the Service Bus Application created. It creates OSB project directories under the application. These directories and files conform to the 12.1.3 structure.
 - a. Click on File menu and select Import.
 - b. Select **Service Bus Resources** from list and then click **OK** as shown in Figure 12-9.

Figure 12-9 Import Window



c. Select a type of resource to import. Click Next.

d. Browse for the Service Bus source by clicking on the Search icon.

e. Select the service bus source and then click **Open**, as shown in Figure 12-10.

Figure 12-10 Select an Service Bus Configuration Jar

- server a			_				
Location:	🗀 sbconfig	•	٤	<u> </u>	*	D-D- D-D-	8_
DSB11	gProjects_sbco	onfig.jar					
File <u>N</u> ame:	OSB11gProje	cts_sbconfig.jar					
File <u>N</u> ame: File <u>T</u> ype:	OSB11gProje	cts_sbconfig.jar					

f. Select the resources to be imported and click **Finish**, as shown in Figure 12-11.

1 Import Service Bus Res	ources - Step 3 of 3		×
Configuration			
Configuration	Select the resources to import and set parameters. Resource Select the resources to import and set parameters. Resource Select the resources to import and set parameters. Resource Select the resources to import and set parameters. Resource Select the resources to import and set parameters. Resource Select the resources to import and set parameters. Resource Select the resources Passphrase: Preserve Environment Settings- Resource Resource Resource Resource Resource Resource Resource R	Operation Create Create Create Create Create Create Create Create	
	Preserve security and policy settings Preserve credentials (username/password)		
Help	< Back	ext > Einish	Cancel

Figure 12-11 Select the Resources to Import

You would see the iWay related specifications in the jca file, as shown in Figure 12-12.

Figure 12-12 Specifications in jca

Oracle JDeveloper 12c Development Build - ServiceBu	rsApplication.jws : RT_ID_OB_S1801_TC0001.jpr : C:\JDEVs\stage9\mywork\ServiceBusApplication\RT_ID_OB_S1801_TC0001\wsdI\MATMAS05_receive.jca	- 0 -X-
Eile Edit View Application Refactor Search No	avigate <u>R</u> uild <u>Run</u> So <u>u</u> rce Tea <u>m</u> <u>T</u> ools <u>W</u> indow <u>H</u> elp	
	ee & - & 22 ≝ · · · · · · · · · · · · · · · · ·	∖ ≁(Search
Applications ×	3 Start Page × 🏦 SYS130 × 🕺 MATMAS05_receive.jca ×	Comp Re × 🗈
🔁 ServiceBusApplication 👻 💌	🕰 Find 🔚 🐺 i 🐘 i 🐘 i 🐘	A Qy Name
🖃 Projects 💽 🖓 • 🍸 • 💯 •	G <adapter-config adapter="SAP Adapter" and="" c<="" classical="" contexpectations="" name="MATMAS05" td="" wadllocation="MATMAS05_receive.wadl" xmlns="http://platform.inte</th><th></th></tr><tr><td>Generative Biology Constraints and Constr</td><td><pre>creation-statistic classion="><td>Lie to frequently under resorces to a prote favorise loc. <u>Bio E Connections</u> <u>1 IDE Connections</u> <u>2</u> resource-adapt(n). <u>0</u>, Find <u>3</u> o classitiane ?: <u>connicerce</u></td></adapter-config>	Lie to frequently under resorces to a prote favorise loc. <u>Bio E Connections</u> <u>1 IDE Connections</u> <u>2</u> resource-adapt(n). <u>0</u> , Find <u>3</u> o classitiane ?: <u>connicerce</u>
	Source, History	
+ Application Resources	Messages-Log	-
± Data Controls		÷
Recent Files	Kersanes Extensions *	* •
2	Provide Statements	

10. After migration, now you can migrate this iWay format project into the SAP Adapter project using SAP Adapter Migration Tool from the context menu.



11. Once you clicked on SAP Adapter Migration Tool from context menu, the Confirmation Window appears.





12. Once the user click on OK, give the appropriate JNDI name.

Figure 12-15 JNDI Naming Window



13. Once you confirmed the JNDI name, project will migrate into the SAP Adapter with a summary.

Figure 12-16 Confirmaion Window

SAP Adapter N	ligration Tool
i	The following files have been migrated successfully wsdl\MATMAS05_receive.jca
	ОК

- **14.** Now open the Concrete WSDL of iWay project, you can observe that the JNDI name is not updated with the current JNDI name, change this mannually to **eis/SAP/FMWDEMO** in place of eis/OracleJCAAdapter/DefaultConnection.
- 15. The project is successfully migrated into the SAP Adapter project.

Note: After deploying the project, if the user observes any entry related to eis/OracleJCAAdapter/DefaultConnection JNDI in the diagnostic log, JDeveloper clean is required. After cleaning the JDeveloper, redeploy the project.

12.3 Deploying the Adapter Migrated Project

To deploy the Adapter project, you can follow the same procedure asdescribed in section 7.6 "Deploy the Defined Process".

12.4 Execution Steps for Deployed Migrated Projects

Perform the following steps to execute the deployed migrated projects.

12.4.1 Inbound Project

After deploying the migrated projects, you are ready to test the migrated projects. You can follow the same procedure as described in section 7.7.2 "Test the Inbound Process".

12.4.2 Outbound Project

After deploying the migrated projects, you are ready to test the migrated projects. You can follow the same procedure as described in section 7.7.1 "Test the Deployed Process".

Α

SAP System Configurations for Remote Processing

The Oracle's Adapter for SAP can communicate with SAP system using three SAP message types: BAPI, RFC, and IDoc. Each user in SAP has set of authorization profiles associated with them. These authorization profiles represent the roles that the person undertakes in their day-to-day work. For example, an Accounts Payable clerk would have an authorization profile for making payments to vendors. This authorization profile consists of a number of SAP authorizations. Typically, a user would have several roles and hence have several authorization profiles. This is often described as the user profile.

This chapter explains the user roles and authorizations required to make an RFC communication.

It also describes the detailed steps for all the SAP side configurations required for communication with the adapter.

This appendix contains the following topics:

- Section A.1, "Roles and Authorizations"
- Section A.2, "RFC Authorization Object"
- Section A.3, "SAP Inbound Communication"
- Section A.4, "SAP Outbound Communication"
- Section A.5, "SAP User Authorizations for Adapter"

A.1 Roles and Authorizations

SAP users are assigned access to the system using a "role" or "roles" that are based on the tasks they perform in their departments. A user's role includes the access he/she has in the components of SAP.

When remote call happens for a function module in SAP an authorization check is performed if the profile parameter auth/rfc_authority_check is set to 1.

The authorization object S_RFC is used to check whether the user defined in the destination has RFC authorization for the function group.

A.2 RFC Authorization Object

The SAP RFC authorization object S_RFC performs security checks on RFC calls to the SAP

system. The way that the S_RFC authorization object is called can be controlled in the SAP System Parameters. It is not unusually to have this set up differently in sandpit systems as compared to production systems. You can review system parameters by running the SAP report RSPARAM using transaction SE38.

In the report, look for the entry for Auth/rfc_authority_check. This parameter determines how the object S_RFC is checked during RFC calls. The object has three fields: activity; the name of the function being called, and the function group in which the function resides. The parameter defines whether the S_RFC object is checked and if so, whether the function group field is included in the validation. There are three different settings for this value as shown below. The default value is "1".

- Value = 0, no check against S_RFC
- Value = 1, check active but no check for SRFC-FUGR
- Value = 2, check active and check against SRFC-FUGR

The SAP authorization object S_RFC can be used to restrict access to program groups, typically function group access. The authorization object contains three fields:

- RFC_TYPE
- RFC_NAME
- ACTVT

Some standard scenarios are described in the following section. For the scenarios in which a dynamic repository is used, the assumption is made that two different types of users are used: A dedicated user, who is responsible for repository accesses, and the application users, who execute the actual RFMs of the application. This is advisable for security reasons. If you only want to use one user in the external program, simply assign the user the union of both authorizations. The authorization profile of the user must contain the S_RFC authorization object, whereby the fields are filled as follows: ACTVT:6, RFC_TYPE: FUGR, and RFC_NAME: The list of the function groups executed below.

In the following list X is the name of the function group for which you want to call function modules, 3.1, and 4.0 are R/3 release number.

- Call a function module directly (For example, using the RFC library or JCo with static repository). Application user: R/3 release Function groups 3.11 SYST, X as of 4.0A SYST, SYSU, X
- 2. Call a function module directly using tRFC or qRFC (For example, using the RFC library or NW RFC SDK/JCo with static repository). Application user: R/3 release Function groups 3.11 SYST, ARFC, ERFC, X as of 4.0A SYST, SYSU, ARFC, ERFC, X
- 3. Send and receive IDocs (For example, with the SAP Java IDoc Library or the Business Connector). Application user (for sending IDocs): R/3 release Function groups 3.11 SYST, ARFC, ERFC, BD11 as of 4.0A SYST, SYSU, ARFC, ERFC, EDIN In addition, the user still requires the B_ALE_RECV authorization object, whereby the EDI_MESTYP field is filled with the list of the message types of the IDocs to be processed. The user also requires the S_IDOCDEFT authorization object, for example, using the "S_IDCDFT_DIS" authorization.

Note: If in the SAP System the auth/rfc_authority_check profile parameter has a value larger than "2", all users also require the authorization for the SRFC function group.

Authorization check as of SAP Release 7.10 As of Release 7.10 you can execute the RFC authorization check on individual function modules, instead of on entire function groups. You can also use the procedure described above, but if you want to refine the authorization check even further, fill the fields of the S_RFC authorization object as follows:

- ACTVT: 16
- RFC_TYPE: FUNC
- RFC_NAME: The list of the function modules executed below.

In the following section Y is the name of the function module that you want to call.

- 1. Call a function module directly Application user: RFCPING, SYSTEM_RESET_RFC_SERVER, Y
- Call a function module directly using tRFC or qRFC Application user: RFCPING, SYSTEM_RESET_RFC_SERVER, API_CHECK_TID, API_CREATE_TID, API_CLEAR_TID, ARFC_DEST_SHIP, ARFC_DEST_CONFIRM, Y
- 3. Send and receive IDocs Application user (for sending IDocs): RFCPING, SYSTEM_RESET_RFC_SERVER, API_CHECK_TID, API_CREATE_TID, API_CLEAR_TID, ARFC_DEST_SHIP, ARFC_DEST_CONFIRM, IDOC_INBOUND_ASYNCHRONOUS In addition, the user still requires the B_ALE_RECV authorization object, whereby the EDI_MESTYP field is filled with the list of the message types of the IDocs to be processed. The user also requires the S_IDOCDEFT authorization object, for example, using the "S_IDCDFT_DIS" authorization.

A.3 SAP Inbound Communication

In case of SAP inbound communication, Adapter for SAP acts as a client sending requests to SAP system.

Prerequisites:

Following entries need to be updated in the system where the Weblogic server is running:

1. Hosts File of the system (maintained in the 'etc' folder) should have the following entry:

<IP> <Hostname> <Hostname with domain name>

2. Service File of the system (maintained in the 'etc'folder) should have the following entries:

sapgw <sysnr></sysnr>	33 <sys no="">/tcp</sys>
sapdp <sysnr></sysnr>	32 <sys no="">/tcp</sys>

Here 'sysnr' is the system number of the SAP server.

To connect to SAP using Message server, following information need to be maintained in the Services File (maintained in the 'etc' folder) in addition to the above two entries:

sapms<SID> 36<sysnr>/tcp

Here SID is the system ID of SAP server. **ALE Inbound Configurations in SAP:**

The following steps are required for inbound IDoc processing:

- A.3.1 Configuring a Logical System.
- A.3.2 Configuring a Partner Profile.
- A.3.3 Configuring Inbound Process Code.
- A.3.4 Configuring a Distribution Model.

A.3.1 Configure a Logical System

Prerquisites:

1. To connect to SAP using hostname, following entries need to be maintained in the Hosts file:

<IP> <Hostname> <FQ Hostname>

2. To connect to SAP using MS, following info needs to be maintained in the Service file:

Sapms<SID>36<sysnr>/tcp

Logical system is used to identify an individual client in a system, for ALE communication between SAP systems.

To define a logical system:

1. From SAP easy access screen, navigate to the SALE transaction, as shown in Figure A-1.

Figu	re A	A-1 S	SALE Transac	tion
Mer	nu	Edit	Favorites	Ex
0	sal	e		٦

2. Open the basic settings and then the Logical systems node, as shown in Figure A–2.

Figure A–2 Basic Settings

▽ Basic Settings
🔜 🤂 IDoc Administration
🔜 🕁 Inbound SOAP for IDoc: Register Service
🔜 🕁 Perform Automatic Workflow Customizing
🔜 🕁 Activate event receiver linkage for IDoc inbound
🗢 🔜 Logical Systems
🔜 🕒 Define Logical System
🔜 🕀 Assign Logical System to Client
Convert Logical System Names in Application Tables

3. Click on Define Logical Systems, as shown in Figure A–3.

Figure A–3 Define Logical Systems

```
🕒 Define Logical System
```

A popup window appears with the message, Caution: The table is cross-client, as shown in Figure A–4.



🗠 Information 🛛 🔅	4
Caution: The table is cross-client	

- 4. Click on Enter button.
- 5. Click on New Entries, as shown in Figure A–5.

Figure A–5	New Entries Window
------------	--------------------



6. Enter the Logical System name and description, as shown in Figure A-6.

Figure A–6 Logical System Window

1	New Entr	cies:	Overview	of	Added	Entri	les
ł	72 B B B						
	Logical Sy	stems					
	Log.System	Name				11	
	ORACLESAP	Oracle	SAP adapter				
	Ľ	r					

7. Click on Save icon, as shown in Figure A–7.

Figure A–7 Save Icon



8. A popup window appears for saving the objects in a transport request, as shown in Figure A–8.

Prompt for Workbenc	h request		\boxtimes
View Maintenance: IV_	TBDLS		
Request	EQ6K900874	Workbench request	
Short Description	tr request for SAP	adapter	
🖌 🔗 🖪 🗋 0wn F	equests 🔀		

Figure A–8 Prompt for Workbench Request Dialog

9. Press Enter.

10. The entry for Logical System will now be visible in the table, as shown in Figure A-9.

Figure A–9 Logical System Entries Window

Change View "Logical Systems": 0	verview
🖅 New Entries 💼 📑 🐼 🖶 🖪	
Logical Systems	
Log. System Name	
ORACLESAP Oracle SAP adapter	
ORACLESAP1 Oracle SAP adapter	V

A.3.2 **Configure a Partner Profile**

In SAP, all partners systems involved in a distribution model have a profile. There exist several profile types such as customer's profiles, vendor's profiles, but this distinction between profiles is generally not necessary and you will create in most cases your partners profiles using a generic Logical System type.

To Creating a Partner Profile:

1. Run the we20 transaction, as shown in Figure A-10.

Figure A–10 we20 Transaction Ē)

we20

2. Click on, Partner Type LS, as shown in Figure A–11.

Figure A–11 Partner Type LS

🖓 🔂 Partner Type LS

3. Click on **Create** icon, as shown in Figure A–12.

Figure A–12 Create Icon



4. Enter the partner no. which is the logical system name that was created earlier, as shown in Figure A-13.

Figure A–13 Partner Pro	ofiles			
Partner profiles				
۲ ۲		œ œ ⊗ I 🗎	的品生的	🗄 🕼 🗱 🐺 🏹 🖗 📑
Partner profiles				
		1		
Partner	D	Partner No.	ORACLESAP	Oracle SAP adapter
IWAY_IN L23CLNT800	ALE 🔺 L23 👻	Partn.Type	LS	Logical system
LOCAL M13CLNT800	M13	Post pro	cessing: perm	itted agent
MDM55 MDM_001	MDM MDM		_	
MDM_002 MDM 003	MDM MDM	Ту.	0	Organizational unit
MDM_004	MDM	Agent Lang.	50010120 EN	EDI Department
mpm_005	MDM			

5. Click on Save icon, as shown in Figure A–14.

Figure A–14 Save Icon



6. Add the inbound parameters using Add icon, as shown in Figure A-15.

Figure A–15 Add Icon

For a sender partner system (inbound parameters are filled in), following important settings are set per message type in the partner profile:

- A process code used to indicate which function module will be used to convert the IDoc data to SAP data.
- The time of input of the IDoc: as soon as the IDoc is created in the system or on request (using program RBDAPP01).
- The post processing agent who will have to treat the data input errors if need be. The post processing agent may be either a user or any other HR organizational unit.
- 9. Enter the message types which need to be received from the partner systems, as shown in Figure A-16.

Figure A–16	Message	Туре
-------------	---------	------

Inbound parmtrs.

Partner R_	Message Type	Message va	MessageFun	Test	
	COSMAS				
	CREMAS				
	DEBMAS				•
	INVOIC				Ŧ
• •					

A.3.3 Configure Inbound Process Code

The process code contains the details of the Function Module that are used for IDoc processing. Message Type can be linked to the Process code.

To define the process code:

- 1. Click on the message type in inbound parameters.
- 2. Click on the process code and press F4 to get the process codes available in SAP system.
- 3. Choose the appropriate process code for that particular message type.
- **4.** Check the Trigger Immediately radio button and Cancel processing after syntax error check box, as shown in Figure A–17.

Figure A–17 Partner Profiles, Inbound Parameters

		F		
1				
Partner No.	ORACLESAP	Oracle SAP adapter		
Partn. Type	72	Logical system		
Partner Role				
堇 Message type	COSMAS	м	aster cost center	
Message code				
Message function		Test		
Inbound options	Post proces:	sing: permitted agent	Telephony	
Process code	COSM	🗗 Inbound Process Co	ode (1) 46 Entries found	
Cancel Processing	y After Syntax H	Restrictions		
			$\overline{\mathbf{v}}$	
Processing by Funct	tion Module	✓ 図 D H H &		
Processing by Funct OTrigger by backg	tion Module round program	✓ M D B B &	√ E Description of process	
Processing by Funct O Trigger by backg Trigger Immediat	tion Module round program sely	✓ ☑ □ (h) (k) ↓ Process code	V Description of process Inbound IDoc: Individual Processing	
Processing by Funct OTrigger by backg Trigger Immediat	tion Module ground program gely	Process code	V Description of process Inbound IDoc: Individual Processing Inbound IDoc: Mass Processing	
Processing by Funct O Trigger by backg () Trigger Immediat	tion Module round program sely	V N C C C C C C C C C C C C C C C C C C	V Description of process Inbound IDoc: Individual Processing Inbound IDoc: Mass Processing	
Processing by Funct O Trigger by backg () Trigger Immediat	tion Module ground program gely	V M C C C C C C C C C C C C C C C C C C	V Description of process Inbound IDoc: Individual Processing Inbound IDoc: Mass Processing Inbound BAPI IDoc: Package Processing	
Processing by Funct ○Trigger by backg ④Trigger Immediat	tion Module round program sely	Image: Contract of the second seco	V Description of process Inbound IDoc: Individual Processing Inbound IDoc: Mass Processing Inbound BAPI IDoc: Package Processing	
Processing by Func OTrigger by backg Trigger Immediat	tion Module round program ely	Process code APLI APLM BAPI_MDM_MATERIAL_RT BAPP BBPC CATT	V Description of process Inbound IDoc: Individual Processing Inbound IDoc: Mass Processing Inbound BAPI IDoc: Package Processing Application for Automatic Tests	
Processing by Func OTrigger by backg Trigger Immediat	tion Module round program ely		V Description of process Inbound IDoc: Individual Processing Inbound IDoc: Mass Processing Inbound BAPI IDoc: Package Processing Application for Automatic Tests	•
Processing by Func OTrigger by backg Trigger Immediat	tion Module round program ely			
Processing by Func OTrigger by backg Trigger Immediat	tion Module round program ely			
Processing by Func OTrigger by backg Trigger Immediat	tion Module round program .ely			
Processing by Func OTrigger by backg Trigger Immediat	tion Module round program .ely	Process code APLI APLM BAPI_MDM_MATERIAL_RT BAPP BBPC CATT CHS_LINKGEN COSM DOLMAS ECM_UPS ED00 ED00 XML		
Processing by Func OTrigger by backg Trigger Immediat	tion Module ground program sely	Process code APLI APLM BAPI_MDM_MATERIAL_RT BAPP BBPC CATT CMS_LINKGEN COSM DOLMAS ECM_UPS ED00 ED00_XML ED08		

5. Click on Save button.

A.3.4 Configure a Distribution Model

Distribution model determines the sender and receiver of the IDoc's and defines the transfer rules.

To create a distribution model:

1. Run the **bd64** transaction, as shown in Figure A–18.

Figure A–18 bd64 Transaction

bd64

2. Click Edit icon, as shown in Figure A–19.

۵ |

Figure A–19 Edit Icon



3. Click on the Create model view button, as shown in Figure A-20.

Figure A–20 (Create Model	View Icon
---------------	--------------	-----------

🗋 Create model view

4. Enter the distribution model name and description, as shown in Figure A–21.

Figure A–21 Distribution Model Name and Description

🗗 Create Model Vie	20	\boxtimes
Short text	Oracle JCA SAP Model View	
Technical name	ZORACLESAP	
Start date	19.11.2013	
End Date	31.12.9999	
✓ ×		

5. Highlight the model view created, as shown in Figure A-22.

Figure A–22 Model View

🔆 Oracle JCA SAP Model View

ZORACLESAP

- 6. Click on the Add message type button.
- Enter the Sender (Logical system maintained for that SAP system), Receiver (logical system name for partner system), and the Message Type which has to be sent to the partner system, as shown in Figure A–23.

Figure A–23 Add Message Type

🗗 Add Message T	уре	<u> </u>
Model view	ZORACLESAP	
Sender	T90CLNT090	
Receiver	ORACLESAP	
Message Type	MATMAS	
✓ ×		

- 8. Add all required message types.
- **9.** After adding all required message type, the model view will be look like, as shown in Figure A–24.

🗢 💥 Oracle JCA SAP Model View	ZORACLESAP
🗁 🌅 IDES ALE Central system (client 800)	T90CLNT090
🗢 🌅 Oracle SAP adapter	ORACLESAP
👂 🗓 ALEAUD	ALE: Confirmations for Inbound IDocs
D 🗓 COSMAS	Master cost center
D 🗓 CREMAS	Vendor master data distribution
🖻 📴 DEBMAS	Customer master data distribution
D 🗓 ECMREV	Revision level
🖻 🖞 MATMAS	Material master
🔁 STATUS	Message about status information transmission
μ zcosmas_extn	Logical Message type for ZCOSMASO1_EXT
ر ZMATMASO1_MSG	Message type for IDoc type ZMATMASO1
🔁 ZMATMAS_EXTN	Logical Message type for ZMATMASO1_EXT
	Message type for Sales Order Informatiom

Figure A–24 Oracle JCA SAP Model View

A.4 SAP Outbound Communication

In SAP outbound communication, the Adapter for SAP act as a server receiving requests from SAP System.

Configurations:

For outbound SAP communication following configurations are required:

- A.4.1 Configuring an RFC Destination and Program ID.
- A.4.2 Creating a Port.
- A.4.3 Configuring a Logical System.
- A.4.4 Configuring a Distribution Model.
- A.4.5 Configuring Partner Profile.

A.4.1 Configure RFC Destination and Program ID

An RFC destination may be seen as a set of settings necessary to connect to a system using the RFC protocol. These settings include the address and type of the partner system along with connection information such as the user ID and password to use.

The RFC destinations of all partners systems must be defined on all systems to include in the distribution model. The transaction to use for this purpose is SM59.

To define an RFC destination:

1. Navigate to the SM59 transaction, as shown in Figure A–25.



|--|

2. Click on TCP/IP connections, as shown in Figure A-26.

```
Figure A–26 TCP/IP Connections
```

	—	
$\overline{\nabla}$	TCP/IP connections	
	ORAQA7	
	1A_PRODUCTION	
	🖹 ALEMANU	
	AL_RFC2.1	

3. Click on Create icon, as shown in Figure A–27.

Figure A–27 Create Icon



4. Enter the RFC destination name and description along with program ID and click on **Registered Server Program**, as shown in Figure A–28.

Figure A–28 RFC Destination ORACLESAP

RFC Destination ORACLESAP	
🖉 🔹 🖞 🕄 🔍 🕄 🕄 🖉 🕄 🖉 🖉 🖉	20
RFC Destination ORACLESAP	
Connection Test Unicode Test	
RFC Destination ORACLESAP Connection Type T TCP/IP Connection Description	
Description	
Description 1 Destination for Oracle JCA]
Description 2 Description 3	-
Administration Technical Settings Logon & Security MDMP & Unit	code 🔸 🕨
Activation Type	<u>ا</u>
OStart on Application Server ③Registered Server Program	
○Start on Explicit Host	
O Start on Front-End Work Station	
Registered Server Program	
Program ID ORACLESAP	
Start Type of External Program	
Opfault Gateway Value	
ORemote Execution	
ORemote Shell	
O Secure Shell	

An RFC server program registers itself under the Program ID.

5. Enter the Gateway Host and Gateway Service name, as shown in Figure A–29.

Figure A–29 Gateway Options

Gateway Options	
Gateway Host	bcora008
Gateway service	sapgw20

6. Click on Save, as shown in Figure A–30.

Figure A–30 Save Icon



The RFC destination is now configured.

A.4.2 **Configure a Port**

IDoc Port contains the information about the way data is sent between the source or target system. The type of port defines the information contained within the port. For port type "Internet" Port will contain IP address of the target system. For port type "file", directory or file name information is maintained. "tRFC" port contains information about the RFC destination of the target system. For IDoc transmission using ALE "tRFC" ports are used.

To creating a tRFC port:

1. Run the well transaction, as shown in Figure A-31.

Figure A–31	we21 Transacti	on

we21 ۵)

2. Click on transactional RFC, as shown in Figure A–32.

```
Figure A–32
              Transactional RFC
```

Ports in IDoc proc	cessing
	6
Ports	Desc
🗢 🔂 Ports	
Transactional RFC	
🕨 🧰 File	
CPI-C	
🗀 ABAP-PI	
🕨 🧀 XML File	
🗀 XML HTTP	

3. Click on Create icon, as shown in Figure A–33.

Figure A-33 Create Icon



4. Click on Generate port name radio button or click on own port name radio button and enter your own port name, as shown in Figure A-34.

Figure A–34 Create tRFC Port

🔄 Create	tRFC port	\times
🕑 Generat	te port name	
Oown por	rt name	
Name		

5. Enter the description in the **Description** field and the **RFC destination**, as shown in Figure A–35.

Ports in IDoc proc	essir	ıg		
8 I	< ∎	😌 🖸 😧 🚨 🛗	Han 1 (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)	
Ports in IDoc processing				
Ports	D	Port	A00000068	
A00000031	ALD 14	Description	Port for ORACLESAP	
AUUUUUUU32	SRM 👻		1	
A00000033	RaD:			
A00000034	DC_(122	Version		
A00000035	DMZ	O IDoc rec.type:	s SAP Release 3.0/3.1	
400000037	TD3	Thos record to	mes SiD Delesse 4 v	
A00000038	DMJ		ipes sai heicuse 4.x	
A00000040	Proc			
A00000041	Proc			
A00000042	Tar	RFC destination	ORACLESAP	
A00000043	IDT			
A00000044	DEJ			
A00000045				
A00000047	ID3			
A00000048	DMU			
A00000050	DSD			

Figure A–35 RFC Destination

6. Click on Save.

A.4.3 Configure a Logical System

Configuration of Logical System is same as described in "Configure a Logical System" sections.

A.4.4 Configure a Distribution Model

Configuring a Distribution Model is same as described in "Configure a Distribution Model" sections.

A.4.5 Configure Partner Profile

For a receiver partner system (outbound parameters are filled in), following settings are specified in the partner profile:

- The receiver port to which the data will be sent.
- The sending method: one IDoc at a time or by packets.
- The IDoc type that will be sent to that partner. For a given message type, the IDoc type sent may vary depending on the receiver system. Indeed you may have different versions of SAP in your system landscape.

Create partner profile as described in "Configuring Partner Profile" section and follow the below steps:

1. Enter the outbound parameters by clicking on the Add icon, as shown in Figure A–36.

Fiaure A–36	Outbound	Parameters
	••••••	

.

Outbound parmtrs.										
	Partner R_	Message Type	Message va	MessageFun Test	3					
		ECMREV			1					
		MATMAS	0		1					
		STATUS			j					
		SYNCH			-					
	• •			< ▶						

2. Enter the **Message Type**, **Port name** and the **Basic type** for the particular message type, as shown in Figure A–37.

Partner profi	les: Outbound parameters
Prepare screen for grabbir press "Grab".	g, then 🤄 🕒 😋 😧 🔛 🔚 🛗 🛗 🖄 🖄 🖄 🔛 📰 📰 😰 🖉
Grab	xt Outbound parameters
*2	
Partner No.	ORACLESAP Oracle SAP adapter
Partn.Type	LS Logical system
Partner Role	
🛓 Message Type	MATMAS Material master
lessage code	
lessage function	
Outhound Ontions	Message Control Dost Processing: Dermitted Age
	Ressage conclus Fost Flotessing, Fermitted Age
Receiver port	A000000068 Transactional RFC Port for ORACLESAP
Pack. Size	1
Queue Processing	
Output Mode	
⊙Transfer IDoc Imm	ed. <u>Output Mode</u> 2
○Collect IDocs	
IDoc Type	
Basic type	MATMAS05 Enhancement: Distribution
Extension	
View	
Cancel Processing	; After Syntax Error
Seg. release in IDo	c type Segment Appl. Rel.

Figure A–37 New Entries: Overview of Added Entries Window

3. Click on Save.

The Inbound and Outbound configurations are now ready for IDOC exchange.

Now upon sending or receiving IDocs from SAP, you can see the inbound and outbound IDocs and their status in SAP tcode WE02, as shown in Figure A–38.

SAP											
◎ III ● ● ● ◎ III ● B B B II ● B B III ● B B III ● III ● III ● B B IIII ● B B III ● B B B III ● B B B III ● B B B III ● B B B B											
SAP											
3 1 1 1											
)ocs			86 1		29 T	The The	c.				
🗋 Selected IDocs			///								
🗢 🗋 Outbound IDocs	Selected IDo	cs									
ADRMAS	IDoc Number Segm	e Sta Sta	Part	ner	Basic type	Date	Time	Messa.	Direct	Port	
D COSMAS	000000001742918	17 03 000	LS/	/ORAOA2	MATMAS01	17.11.2013	00:01:48	ZMATMAS	Outbox	A000000074	
CREMAS	0000000001742919	17 03 000	LS/	/ORAOA2	MATMASO1	17.11.2013	00:04:29	ZMATMAS	Outbox	A00000074	
DEBMAS	000000001742920	17 03 000	LS/	/ORAOA2	MATMASOL	17.11.2013	00:07:03	ZMATMAS	Outbox	A00000074	
ECMREV	000000001742921	17 03 000	LS/	/ORAOA2	MATMAS01	17.11.2013	00:09:38	ZMATMAS	Outbox	A00000074	
MATMAS	000000001742922		LS/	/ORAGA2	MATMAS01	17.11.2013	00:12:11	ZMATMAS	Outbox	A00000074	
D ORDERS	000000001742923		LS/	/ORADA2	MATMASO1	17.11.2013	00:14:40	ZMATMAS	Outhox	A00000074	
D CI SCORNAG ENTRY	0000000001742924	5 03 000	LS/	/ORAGA2	ADRMAS03	17.11.2013	00:39:54	ADRMAS	Outhox	A00000074	
D COSHAS_EATN	0000000001742925	4 03 000	LS/	/ORADA2	CREMASO5	17.11.2013	00:39:54	CREMAS	Outhox	A00000074	
C ZANES ODDED WSG	000000001742926		LS/	/ORADA2	MATMASOI	17.11.2013	00:42:23	ZMATMAS	Outhox	A00000074	
D ZVISTAPM	000000001742927		LS/	/ORADA2	MATMASOI	17.11.2013	00:44:54	ZMATMAS	Outhox	A00000074	
V C Inhound IDocs	000000001742928		LS/	/ORADA2	MATMASOI	17.11.2013	00:47:25	ZMATMAS	Outhox	A00000074	
COSMAS	000000001742929		LS/	/ORAGA2	MATMAS01	17.11.2013	00:50:27	ZMATMAS	Outbox	A00000074	
CREMAS	0000000001742930	22 03 000	LS/	/ORAGA2	MATMASO1	17.11.2013	00:53:23	MATHAS	Outbox	A00000074	
Debmas	0000000001742931	22 03 000	LS/	/ORAGA2	MATMASO1	17.11.2013	01:20:51	MATHAS	Outhox	A00000074	
MATMAS	0000000001742932	22 03 000	LS/	/ORADA2	MATMASO1	17.11.2013	01:23:28	MATMAS	Outhox	A00000074	
MATMASGEN	000000001742933	22 03 000	LS/	/ORADA2	MATMASOI	17.11.2013	01:26:32	MATMAS	Outhox	A00000074	
Image: Status	000000001742934	22 03 000	LS/	/ORAOA2	MATMAS01	17.11.2013	01:30:18	MATMAS	Outbox	A00000074	
XA123	000000001742935	5 03 000	LS/	/ORAOA2	ZVISTAPMO1	17.11.2013	01:35:15	ZVISTAP	Outbox	A00000074	
Image: Constraint of the second se	000000001742936	5 03 000	LS/	/ORAGA2	ZVISTAPM01	17.11.2013	01:38:08	ZVISTAP	Outbox	A00000074	
ZVISTAPH	000000001742937	5 03 000	LS/	/ORAGA2	ZVISTAPM01	17.11.2013	01:41:14	ZVISTAP	Outbox	A000000074	
	000000001742938	5 03 000	LS/	/ORADA2	ZVISTAPMOL	17.11.2013	01:44:39	ZVISTAP	Outhox	A000000074	
	000000001742939	10 51 000	LS/	/T90CLNT09	DEBMAS05	17.11.2013	11:06:45	DEBMAS	Inbox	SAPE06	
	000000001742940	22 53 000	LS/	/T90CLNTO	MATMAS01	17.11.2013	17:02:55	MATMAS	Inbox	SAPE06	
	000000001742941	1 03 000	1.57	/ORACLESA	SVSTATOI	17 11 2013	17.02.56	PITTATE	Outhoy	400000068	
	Status Message for Se	lected IDoc									
	Status Text:										
	T100 Text:										

Figure A–38 Inbound IDocs Window

A.5 SAP User Authorizations for Adapter

The user must be having authorizations to execute RFC, BAPI, and IDoc from the Adapter for SAP. Some of the SAP tcodes and the corresponding authorizations required for them are listed in Table A-1.

SAP tcodes and the Corresponding Authorizations									
1	SE38	DISPLAY	S_TCODE	TCD	se38	Run/Edit ABAP programs			
			S_DEVELOP	ACTVT	3				
2	SE80	DISPLAY	S_TCODE	TCD	se80	Object Navigator (SAP Development workbench, most development functionality is available from this transaction)			
			S_DEVELOP	ACTVT	3				
3	SE11	DISPLAY	S_TCODE	TCD	SE11	ABAP Dictionary Maintenance			
			S_DEVELOP	ACTVT	3				
4	SE16	DISPLAY	S_TCODE	TCD	SE16	Data Browser			
			S_TABU_DIS	ACTVT	3				
5	SE37	DISPLAY	S_TCODE	TCD	SE37	ABAP Function Module			
			S_DEVELOP	ACTVT	3				

Table A-1	SAP Tcodes and the Corresponding Authorizations
-----------	---

6	SM59	CREATE, EDIT,DIS PLAY	S_TCODE	TCD	SM59	RFC Destinations
			S_RFC_ADM	ACTVT	01,02,03	
			S_ADMI_FC D	S_ADMI _FCD	No Authoriza tion	
			S_RFC	ACTVT	*	

Glossary

Adapter

Provides universal connectivity by enabling an electronic interface to be accommodated (without loss of function) to another electronic interface.

Agent

Supports service protocols in listeners and documents.

Channel

Represents configured connections to particular instances of back-end systems. A channel binds one or more event ports to a particular listener managed by an adapter.

Listener

A component that accepts requests from client applications.

Port

Associates a particular business object exposed by the adapter with a particular disposition. A disposition is a URL that defines the protocol and location of the event data. The port defines the end point of the event consumption.

Index

Α

Adapter configuration, 5-2, 5-24, 7-9 to 7-10 Adapter Health Report, 10-1 to 10-5 Additional Connection, 2-4 Additional Tab, 5-13 ALE interfaces, 1-4 Adapter Architecture, 0 Adapter Integration with SAP, 0 Additional Connection Parameters, 2.2.6 Additional JCA Properties for Inbound, 6.6.2 Application Server, 2-9, 5-11 AutoSystat Feature for IDoc RFC, 5-11

B

BAPI/RFC functions,6-22
BPEL Inbound Process, 7-27 to 7-52
BPEL Outbound Process, 7-9 to 7-27
BPEL Infrastructure Tuning Parameters, 9-1,
Business Application Programming Interfaces (BAPI), 3-1, 6-17
Business Process Management, 8-65

<u>C</u>

Configuration Report,10-2 Connection Count, 5-7 Connection Management,4-1, 4-2 Connection Name,6-4 Connection parameters, 2-1, 4-1 Connection Pooling, 4-2, 5-1 Connection Security Parameters (SNC), 2-11 Control records, 6-1

D

Data records, 6-1 Definition panel, 6-24 Delete SAP Connection, 6-2 Design-Time, 6-1 Direct Connection parameters, 2-9 Deploy Process, 8-126

Ε

Edit SAP Connection, 6-2 EIS connection names, 1-1 Enterprise Central Component, 1-1 Enterprise Management (EM), 9-1 Exception Filter, 5-12, 6-26 Expiration Period, 2-10, 5-10 EIS connection names, 1-4 EIS Connectivity, 10-3 Enterprise Central Component, 1-1 Enterprise Management (EM), 9-1 Error Messages, 11-1

F

Flatfile, 6-28 Fault string elements, 5-41 Fault code elements, 5-41

G

Gateway Host,2-10, 5-7 Gateway Service, 2-10, 5-7 Health Report, 10-1

l

Intermediate Documents (IDoc), 3-1, 6-25 Inbound processing, 1-1 Integration with SAP, 1-1, 1-3 Invokes, 11-1

<u>J</u>

Java Naming and Directory Interface (JNDI), 6-2 JCo Trace, 4-4 JCo traces, 5-8 JDeveloper, 6-1 ,8-1

L

Language, 2-9, 2-12 Linux Platforms, 2-12 Listener, 4-4, Load Balanced Connection Parameters, 2-9, 6-6

Μ

Management Parameters, 5-9 Management Tab, 5-9 Max Wait, 2-10, 5-10 Mediator Inbound Process, 8-52 Mediator Outbound Process, 8-42 Message Host, 2-10, 5-6 Message Service, 5-6 Migration Support, 12-1 Monitoring reports, 10-4

Ν

National Language Support (NLS) Support, 5-1

0

Object panel, 6-18 Object Selection, 6-17, 8-15 Oracle Application Adapter 1-1 Oracle database, 1-4 Oracle Service Bus 8-95 Oracle WebLogic Server, 1-4, 7-1 Outbound Processing, 1-1

Ρ

Partners, 5-13, 3-1 Peak Limit, 5-10 Pool Capacity, 5-10 Property Name, 6-18 Property Value, 6-18 Program ID, 5-13, 5-27

Q

Queued Remote Function Calls (qRFC), 5-1

R

Real-time, 1-1, 1-2, Remote Function Call (RFC), 1-1, 6-1, 5-1 Repo Destination, 5-7

<u>S</u>

Adapter Component, 6-1, 8-9 Adapter Connection Parameters, 2-1 SAP Java Connector, 1-1, 2-1, 4-1 SAP R/3 logon parameters, 2-1 SAP Route String, 2-10, 5-6 SAP Repository, 6-1 SAP Security Parameters, 5-11 SAP systems, 2-10, 3-2 Schema Validation, 6-26, 5-15 Security Tab, 5-7, 5-11 Server Group, 2-10, 5-6 Server Parameters, 2-10 Server Threads, 4-4 Service Name, 2-10, 6-1, 6-2, 8-42 Snapshots Reports, 10-4 SNC Communication, 5-11 to 5-131 SNC Level, 2-11, 5-12 to 5-15 SNC library, 2-11, 5-12 to 5-15 SNC mode, 2-11, 5-12 to 5-15 SNC Name, 2-11, 5-12 to 5-15
SNC Parameters, 5-12 to 5-15 SNC Partner, 2-11, 5-12 to 5-15 SOA Debugger, 5-42 Stateful / Stateless Interaction, 5-37 Stateful, 6-26, 5-37 Stateless, 6-26, 5-37 Status records, 2-12

T

Test Connection, 5-6, 6-17 tRFC, 5-2, 5-4 Trace Level Parameter, 4-4 Trace Parameters, 2-10, 5-8 Transactional Remote Function Calls (tRFC), 5-1, Troubleshooting, 11-1 Tuning Parameters, 9-1

<u>U</u>

User Logon Parameters, 2-8, 6-4 User Name, 2-8, 6-4,

V

View Schema, 6-18

W

Web Service Definition Language (WSDL), 8-65, 8-95, 5-27, 5-41 Web service integration, 8-95, 8-65 Web Service standards, 2-12 WSDL file, 6-2, 8-105

Х

XML documents, 6-26,