



Business Process Manager

Advanced Edition Version 7.5

Configuring a Clustered Process Server

**BPM QA – proven
Paper Series**

Step-by-step Guide

**Learn how to set up a clustered Process Server including
Business Space and HTTP Server in a production environment
on Red Hat Enterprise Linux using Oracle**

August 2011

© IBM Corporation

LABpapers

Disclaimer

This document is subject to change without notification and will not comprehensively cover the issues encountered in all customer situation.

The information contained in this document has not been submitted to any formal IBM test and is distributed AS IS.

For updates or newer releases please contact the service team.

The Team of Authors

This document was written by the Business Process Management (BPM) Quality Assurance (QA) test team in Böblingen. The authors are:

Christoph Gremminger

Business Process Management Test – IT Specialist
IBM Software Group, Application and Integration Middleware Software

Marco Lezajic

Business Process Management Test – IT Specialist
IBM Software Group, Application and Integration Middleware Software

Sabine Sprengel

Business Process Management Test – IT Specialist
IBM Software Group, Application and Integration Middleware Software

Ekkehard Voesch

Business Process Management Test – BPM QA Test Architect
IBM Software Group, Application and Integration Middleware Software

We would like to thank all involved Business Process Management teams for their contributions to this document especially for the reviewing efforts spend by the L3, SWAT and ISSW team.

Preface

Scope

This document contains an overview of the tasks required for setting up a production environment of a Business Process Management solution with a main focus on the IBM Business Process Manager and in particular the Process Server. Additional Business Process Management components or products will be taken into consideration, especially if interactions with the Process Server are of interest.

This document introduces the topology of the chosen production environment and describes the different tasks with a series of click-by-click instructions including the installation, configuration and a verification for each main step.

The information provided in this document is related to a production environment with several hosts and clusters. Please notice that a single server setup will be significant less complex in terms of the WebSphere topology. Also the overall setup of a remote database system is much more complex in a production environment than in a single server setup where DB2 Express as a local database system might be used.

Business Space powered by WebSphere® to be used for an integrated and customizable user interface and IBM HTTP Server being essential for request distribution into cluster members and high availability are added to this production environment. They are part of the same cell and represented in different, additional clusters or servers. The related chapters might be skipped if these components or products are not needed. Further Business Process Management components or products, for example IBM Business Monitor, are currently not part of this documentation, but might be added in a later version of this document or published separately.

The general concepts for building cells and clusters apply to all releases, but several details might have been added or changed between the different releases. To make reading and understanding easier this document is related to the following explicit releases:

- IBM Business Process Manager V7.5 including Business Space powered by WebSphere® and IBM HTTP Server
- Oracle 11g Release 2
- IBM Tivoli Directory Server V 6.1

The operating system used for this documented setup is Red Hat Enterprise Linux. In general other operating systems especially UNIX based systems will operate in a similar way. From a configuration point of view there will be only minor differences, for example the default path names might be different.

Additional document sources being of interest

IBM Business Process Manager Information Center

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp>

IBM Redbooks

<http://www.redbooks.ibm.com/>

There are numerous publications available for WebSphere Business Process Management from which the following are of interest

- WebSphere Application Server V7 Administration and Configuration Guide (SG24-7615)
- WebSphere Application Server V7: Administration Consoles and Commands (REDP-4573)
- WebSphere Application Server V7: Concepts, Planning and Design (SG24-7708)
- WebSphere Application Server V6.1: System Management and Configuration (SG24-7304)
- WebSphere Application Server V6 System Management & Configuration Handbook (SG24-6451)
- WebSphere Application Server Network Deployment V6: High Availability Solutions (SG24-6688)
- WebSphere Business Process Management V6.2 Production Topologies (SG24-7732)
- WebSphere Business Process Management V7.0 Production Topologies (SG24-7854)

Summary of changes

This document is a logical successor of the document

Configuring WebSphere Process Server Version 7.0 for a Clustered Environment
which can be found at

<http://www.ibm.com/support/docview.wss?uid=swg27018621&wv=1>

The main differences to the successor document are:

- This document describes the setup of a IBM Business Process Manager Advanced 7.5 production environment with a focus on the Process Server.
- The chosen Oracle Release is 11g R2.
- The roles of the different involved administrators (BPM, DBA, SysAdmin) are reflected.
- The 64-bit versions of the BPM product and components are used.
- The preferred methods for the installation and configuration is silent with the use of response files.
- All received customer feedback on the published successor document has been evaluated and incorporated.

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. These and other IBM trademarked terms are marked on their first occurrence in this information with the appropriate symbol (® or ™), indicating US registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries.

A current list of IBM trademarks is available on the Web at

<http://www.ibm.com/legal/copytrade.shtml>

The following terms are trademarks of the International Business Machines Corporation in the United States, other countries, or both:

AIX®
AlphaBlox®
alphaWorks®
DataPower®
DB2 Universal Database™
DB2®
developerWorks®
HACMP™
IBM®

IMS™
Lotus®
Redbooks®
Redbooks (logo) ®
Tivoli®
WebSphere®
Workplace™
Workplace Messaging®
z/OS®

Trademarks

The following terms are trademarks of other companies:

Snapshot, and the NetApp logo are trademarks or registered trademarks of NetApp, Inc. in the U.S. and other countries.

SUSE, the Novell logo, and the N logo are registered trademarks of Novell, Inc. in the United States and other countries.

Oracle, JD Edwards, PeopleSoft, Siebel, and TopLink are registered trademarks of Oracle Corporation and/or its affiliates.

SAP NetWeaver, SAP, and SAP logos are trademarks or registered trademarks of SAP AG in Germany and in several other countries.

EJB, Enterprise JavaBeans, J2EE, Java, JavaBeans, JavaServer, JDBC, JMX, JSP, JVM, and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Intel, Intel logo, Intel Inside logo, and Intel Centrino logo are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Linux is a trademark of Linus Torvalds in the United States, other countries, or both. Other company, product, or service names may be trademarks or service marks of others.

How to read this document

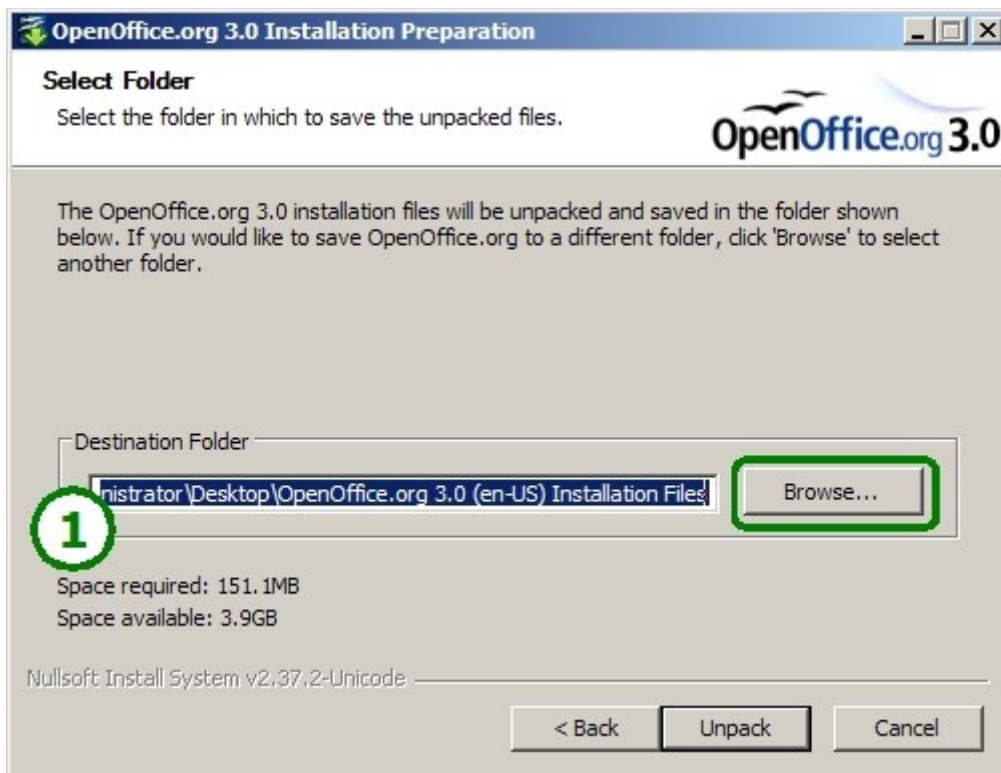
The intention of this document is to provide information which might be used to facilitate the setup of a production environment. To get a better understanding further documentation might be referenced.

This document contains numerous illustrations which are formatted as follows.

- **Graphical interactions**

Typical interactions with the system are performed on screens (or panels) and a description of how to interact is much easier if pictures are used as outlined here

Title of the screen



1. Special related instructions – maybe several items are available. They are marked with correspondend green bulleted numbers. In addition related areas are sometimes marked with green rounded rectangle.
2. The final instruction, e.g. press the Unpack button, is typically not highlighted.

- **Interaction via the console**

Mostly two types are of interest, one for the input requested on a console window sometimes mentioned as command line input and a second for the output provided on the console.

```
Console input (sometimes mentioned as command line input)
```

```
Console output
```

```
This might be several rows
```

```
In the case of large lists important aspects are highlighted in this way
```

- **Listings**

Whenever a list of parameters is necessary to be discussed they will look like this. Also file content will be formatted in this way. In the case of large lists **highlighting** might be added to put the focus on the major aspects.

```
Parameter1 = value1  
Parameter2 = value2  
Parameter3 = string1  
etc
```

- **Hyperlinks**

For making it easier to find references hyperlinks are used and formatted like the following link which leads to the IBM Redbooks homepage

```
http://www.redbooks.ibm.com/
```

- **Notices**

To emphasize information two types of formatted notices are used

```
Standard notice – typically used
```

```
Important notice – used in special cases
```

Table of Contents

Chapter 1 Introduction.....	14
1.1 The overall document structure.....	15
1.2 Overview on IBM BPM products, components and topologies.....	15
1.2.1 Business Process Management products.....	16
1.2.2 Major components of a BPM production environment.....	23
1.2.3 BPM related back end systems.....	27
1.2.4 BPM Runtime Environment Topologies.....	28
Part I:	
Installation and Configuration planning tasks	29
Chapter 2 Planning.....	30
2.1 Choose the Topology.....	31
2.2 Planning the production environment setup	32
2.2.1 Assign BPM components to the systems.....	32
2.2.2 Assign cell and cluster components to the systems	33
2.2.3 Select the operating system and prerequisites.....	36
2.2.4 Select the type of user directory for the cell.....	36
2.3 General statements regarding installation and configuration	37
2.4 Gather required installation and configuration information.....	38
2.4.1 BPM planning.....	39
2.4.2 Database Planning.....	47
Chapter 3 System Preparation.....	58
3.1 Install operating system.....	58
3.2 Prerequisite checking.....	58
3.3 Time server setup.....	59
3.4 Get the software packages.....	60
3.4.1 IBM Business Process Manager Advanced V7.5.....	60
3.4.2 Oracle 11g Release 2 (11.2.0.2.0).....	60
Part II:	
Combined BPM Administrator and Database Administrator (DBA) tasks.....	61
Chapter 4 Install the BPM binaries.....	62
4.1 Verify BPM binary installation.....	66
Chapter 5 Create the BPM database scripts.....	68
5.1 Create Scripts for BPC.....	70
5.2 Create Scripts for BPC Reporting function.....	77
5.3 Create Scripts for Performance Data Warehouse.....	83
5.4 Create Scripts for Process Server.....	88
5.5 Create Scripts for Business Space.....	93
5.6 Create Scripts for the common BPM functionality	99
5.7 Create Scripts for BPC Messaging.....	106
5.8 Create Scripts for Performance Data Warehouse Messaging.....	112
5.9 Create Scripts for Process Server Messaging.....	118
5.10 Create Scripts for Common Event Infrastructure Messaging.....	124
5.11 Create Scripts for SCA System Messaging.....	130

5.12	Create Scripts for SCA Application Messaging.....	136
5.13	Create Scripts for XA recovery.....	142
5.14	Providing the Scripts for execution	143
Chapter 6	Install the Oracle binaries.....	144
6.1	Oracle installation prerequisites.....	144
6.1.1	Oracle operating system requirements.....	144
6.1.2	The Linux operating system user for Oracle.....	152
6.1.3	Creating the directories for Oracle.....	155
6.2	Installing the Oracle binaries.....	155
6.2.1	Create the oraInst.loc file.....	156
6.2.2	Prepare a response file.....	157
6.2.3	Run Oracle Universal Installer in silent mode.....	158
Chapter 7	Configure the Oracle database.....	160
7.1	Run Net Configuration Assistant in silent mode.....	160
7.1.1	Verifying the created listener.....	161
7.2	Run Database Configuration Assistant.....	162
7.3	Database listener configuration.....	187
7.4	Configuring database initialization parameters.....	188
Chapter 8	Generate the BPM database objects.....	190
8.1	Generate database objects for BPC	191
8.2	Generate database objects for BPC Reporting function.....	194
8.3	Generate database objects for Performance Data Warehouse.....	198
8.4	Generate database objects for Process Server.....	201
8.5	Generate database objects for Business Space.....	205
8.6	Generate database objects for the common BPM functionality	209
8.7	Generate database objects for BPC Messaging.....	212
8.8	Generate database objects for Performance Data Warehouse Messaging....	214
8.9	Generate database objects for Process Server Messaging.....	216
8.10	Generate database objects for Common Event Infrastructure Messaging...	218
8.11	Generate database objects for SCA System Messaging.....	220
8.12	Generate database objects for SCA Application Messaging.....	222
8.13	Generate database objects for XA recovery	224
Chapter 9	Create the profiles	225
9.1	Copy the Oracle driver to the BPM machines.....	225
9.2	Create the Deployment Manager profile.....	226
9.2.1	Port considerations.....	227
9.2.2	Security considerations.....	228
9.2.3	Verification.....	229
9.3	Create the Custom profiles.....	230
9.3.1	Security considerations.....	231
9.3.2	Verification.....	232
9.4	Start the Deployment Manager.....	233
9.5	Federate the Custom nodes.....	234
Part III:		
BPM Administrator (BPM Admin) tasks.....		237
Chapter 10	Create and configure the deployment environment.....	238
10.1	Create the deployment environment.....	238
10.2	Configure deployment environment.....	258

10.2.1 Bootstrap Process Server.....	258
10.2.2 Configure bus security.....	259
10.2.3 Verify data sources.....	260
10.3 Verify host aliases.....	261
Chapter 11 Additional configuration steps.....	264
11.1 Map the BPM XA recovery authentication aliases.....	264
11.2 Share transaction and recovery logs	266
11.3 Configure Messaging startup policy	272
11.4 Verification.....	292
11.4.1 Verify messaging cluster	292
11.4.2 Verify the support cluster	296
11.4.3 Verify the application target (BPEL) cluster	299
11.4.4 Verify the web application cluster.....	303
11.4.5 Verify transaction and recovery logs	305
Chapter 12 Optional Configuration steps.....	307
12.1 Configure a shared user repository.....	307
12.2 Install and configure IBM HTTP Server v7.0.....	312
12.2.1 Install IHS binaries (silent-mode).....	314
12.2.2 Configure SSL for the HTTP server.....	315
12.2.3 Add IHS to the WPS cell.....	320
12.2.4 Verify HTTP server management configuration.....	325
12.2.5 Map Web modules to HTTP server.....	327
12.2.6 Update HTTP Plug-in configuration.....	329
12.2.7 Configure SSL for the HTTP Plug-in.....	330
12.2.8 Verify the HTTP server configuration.....	343
12.2.9 Configure BFM and HTM REST endpoints.....	344
Chapter 13 Final verification.....	346
13.1 Deploy the Claims Handling sample application.....	346
13.2 Run the Claims Handling sample application.....	350
13.3 Verify the Business Space.....	356
13.4 Deploy Procurement sample application.....	364
13.5 Run Procurement sample application.....	368
Appendix	375
Chapter 14 How To and Planning Information.....	376
14.1 BPM How To.....	376
14.1.1 Save changes and synchronize nodes.....	376
14.1.2 Start/stop the deployment manager and the node agents.....	378
14.2 IHS How To.....	382
14.2.1 Starting and stopping the HTTP server.....	382
14.2.2 Starting and stopping the HTTP admin server.....	382
14.2.3 Verification/Configuration How To.....	383
14.3 Oracle How To.....	385
14.3.1 Starting and stopping the database listener.....	385
14.3.2 Starting and stopping the database.....	387
14.3.3 Starting and stopping the Oracle Enterprise Manager Console.....	389
14.3.4 Resetting a user password in the Oracle database.....	390
14.3.5 Compute database statistics.....	391
14.3.6 Work with Redo Log Groups.....	392

14.4	Planning Information.....	394
14.4.1	Diagrams of Setup Sequence.....	394
14.4.2	BPM planning.....	397
14.4.3	Database Planning.....	403

Chapter 1 Introduction

The intention of this document is to provide a detailed description to setup a IBM Business Process Manager production environment with a special focus on the Process Server. The audience is the planning and the administrative personnel being responsible for establishing and maintaining the production environment. Typically involved are different roles for the business process management, database and operating system including infrastructural aspects. Each role will contribute to the planning, installation and configuration tasks. The instructions given in this document are provided on a step-by-step basis covering a predefined topology and showing the expected results of all major steps. The outlined sequence of steps regarding a task like 'install the product' are collected in chapters and followed by a set of verification steps to ensure the correctness of the setup as soon as possible. At the end of the document a final verification will be outlined to ensure all detailed tasks are working properly together.

The IBM Business Process Manager (BPM) can be installed and configured in multiple different setups according to the business needs. To chose a setup which will fulfill the business need it is necessary to collect the detailed requirements and to analyze potential affecting dependencies to the existing environment including the back end systems. To get a complete picture on the dependencies the different mentioned administrative roles, and maybe more, should at the least participate in the planning tasks.

The overall structure of this document is derived from the installation and configuration road map outlined in the Information Center

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp?
topic=/com.ibm.wbpm.imuc.doc/topics/cins_wbpm_roadmap.html
```

For simplification and setting up a real production environment this document assumes the following administrative roles only. Depending on the local organization and available skills more roles might be introduced or sometimes combined.



The Business Process Management administrator (BPM Admin)



The Database administrator (DBA)



The System administrator (SYS Admin)

At the beginning of each main chapter these icons will indicate the main responsibility.

1.1 The overall document structure

This document is split into three major parts which also reflect the different involved administrative roles.

Part I:

Installation and Configuration planning tasks (with involvement of all administrative personnel)

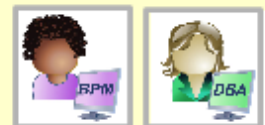
Hardware selection and prerequisite evaluation is included



Part II:

Combined BPM Administrator and Database Administrator (DBA) tasks

BPM installation and Database installation and configuration



Part III:

BPM Administrator (BPM Admin) tasks

All tasks needed to complete the production environment



For the planning tasks all administrative roles should be involved. Depending on the complexity it might be necessary to add more skilled people to cover for example network and security related aspects. After the planning has been completed the Business Process Management and the Database administrator will start the installation and configuration tasks. In the third part the Business Process Management administrator will complete the setup.

As a preparation for the planning it is useful to get familiar with the used terminology, products, components and topologies. This introduction chapter provides a brief overview on these aspects.

More details on the three listed parts will be outlined at the beginning of the related parts since the overview descriptions outlined here will help to get a better understanding on the details.

In addition at the beginning of each chapter it will be indicated which user role is responsible for the described tasks and a list will be given of the involved hosts where the tasks will take place.

1.2 Overview on IBM BPM products, components and topologies

Here a very brief overview on the IBM Business Process Management products is given. The chapter will then provide an overview on the components of interest in the context of setting up a production environment. The focus is on the IBM Business Process Manager Advanced and especially the Process Server.

Based on the customer requirements a topology consisting of numerous components needs to be selected. The last subject in this chapter should help to understand how to select the needed topology.

1.2.1 Business Process Management products

Information related to the IBM Business Process Management products especially a general overview can be found here

<http://www.ibm.com/software/info/bpm/>

In this chapter for several products some introductory information is given. For understanding this document it is optional to study these product overviews, but it is recommended to study the outlined information in chapter 1.2.2 Major components of a BPM production environment

1.2.1.1 IBM Business Process Manager V7.5

IBM Business Process Manager (BPM) is a comprehensive Business Process Management platform giving you visibility and insight to manage business processes. It scales smoothly and easily from an initial project to a full enterprise-wide program. IBM Business Process Manager harnesses complexity in a simple environment to break down silos and better meet customer needs.

- IBM Business Process Manager Advanced provides visibility and management of business processes with support for high-volume automation and extensive system integration.
- IBM Business Process Manager Standard is ideal for multi-project improvement programs with high business involvement and a focus on workflow and productivity.
- IBM Business Process Manager Express is ideal for that initial process improvement project that requires business involvement and a quick turnaround.

In this document the focus will be on IBM Business Process Manager Advanced providing complete visibility and management of business processes with support for high-volume automation, with high quality-of-service.

IBM Business Process Manager Advanced combines simplicity, ease-of-use and task management capabilities with support for enterprise integration and transaction process management requirements as part of an overall Services Oriented Architecture (SOA).

For more details on features and benefits refer to

<http://www.ibm.com/software/integration/business-process-manager/advanced/features/>

Since the scope of the document is on the IBM Business Process Manager Advanced edition with a focus on the Process Server it is optional to read the other product overview information outlined in the following sections.

However it is recommended to study the outlined information in chapter 1.2.2 Major components of a BPM production environment

1.2.1.2 IBM Business Process Manager Industry Packs V7.5

IBM BPM Industry Packs is a set of prebuilt assets to help accelerate delivery of standards-based industry solutions for banking, healthcare, and telecommunications with BPM. Each industry-specific pack integrates seamlessly with BPM components and provides a variety of prebuilt assets to help accelerate and enhance process optimization through BPM solution delivery.

- Provides prebuilt assets to accelerate delivery of standards-based industry solutions using BPM.
- Library of banking assets for core banking, payments, customer care, and integrated risk management
- Out-of-the-box new account opening solution scenario serves as a starting point for proof of concept (POC) and solution implementations
- Library of healthcare assets for enrollment, case management, employer and group management, claims management, and provider collaboration
- Out-of-the-box benefits eligibility solution scenario serves as a starting point for POC and implementations
- Library of telecom assets for fulfillment, assurance, billing, customer interaction, inventory, catalog, and media life cycle processing
- Out-of-the-box order handling and incidence and problem management solution scenarios serve as starting points for POCs and solution delivery.

For more details on features and benefits refer to

<http://www.ibm.com/software/integration/business-process-manager/industry-packs/features>

1.2.1.3 IBM Business Process Manager Tools and Add-Ons V7.5

IBM Business Process Manager Tools and Add-Ons provides a set of SharePoint WebParts to access tasks and reporting.

IBM Business Process Manager Tools and Add-Ons makes it easier to get everyone involved in process management—no matter what their role. Workers can create execute and manage processes built with IBM Business Process Manager using the familiar SharePoint or Microsoft Outlook environment.

-
- Drag and drop special IBM Business Process Manager webparts onto your SharePoint web pages to launch processes, perform assigned tasks, and monitor performance.
 - Manage in-flight IBM Business Process Manager processes, including starting and stopping process instances, viewing process diagrams, and reassigning tasks to balance workload.
 - View real-time reports showing performance ScoreBoards for individuals, teams and/or business processes.
 - Common security and authentication model provides seamless interaction between SharePoint and IBM Business Process Manager.
 - Install without having to change or reconfigure your SharePoint Server setups
 - Integrated process toolbar for all user actions.
 - Launch your tasks or view process performance reports directly from inside Outlook.
 - IBM Business Process Manager task folders integrated into Outlook folders.
 - Common security and authentication model provides seamless interaction between Outlook and IBM Business Process Manager.
 - Install without having to change or reconfigure your Exchange Server setups.

For more details on features and benefits refer to

<http://www.ibm.com/software/integration/business-process-manager/tools/features/>

1.2.1.4 IBM Integration Designer V7.5

IBM Integration Designer simplifies integration and accelerates the adoption of SOA by rendering current IT assets as service components for reuse and efficiency.

It is the Eclipse-based tool for building SOA-based BPM and integration solutions across WebSphere Process Server, WebSphere ESB, and WebSphere Adapters.

- Simplifies integration with rich features that accelerate the adoption of SOA by rendering existing IT assets as service components, encouraging reuse and efficiency.
- A simplified authoring experience that accelerates solution development, including enhanced mediation tooling support.
- Constructs process and integration solutions using intuitive drag-and-drop technology to visually define the sequence and flow of business processes.
- Integrates testing, debugging, and deployment for solution development.
- Enables Business-Driven Development, fully integrating with WebSphere Business Modeler to import models for rapid implementation.
- Supports generation of human interaction user interfaces that can be easily customized.

For more details on features and benefits refer to

<http://www.ibm.com/software/integration/integration-designer/features/>

1.2.1.5 IBM Business Monitor V7.5

IBM Business Monitor V7.5 (formerly IBM WebSphere Business Monitor) is cross-process, cross-system business activity monitoring (BAM) software.

IBM Business Monitor provides end-to-end business process and activity monitoring along with dashboards representing insight that can be used in process optimization.

- Provides a high-performance business activity monitoring solution for processes and applications running in disparate environments which may or may not be implemented using any BPM technology.
- Built-in tools and runtime support for integrated Business Activity Monitoring of IBM Business Process Manager
- Fully integrated Cognos Business Intelligence Server 10.1 for advanced analysis and reporting on historical data
- Fine-grained security to enable or prevent anyone to see a wide range of information depth or detail
- Enhanced business user customization of data filtering and dashboard controls & reports.
- Enable views of KPIs, metrics, and alerts through Web interfaces, mobile devices, and corporate portals.
- Available for distributed platform and z/os.

For more details on features and benefits refer to

<http://www.ibm.com/software/integration/business-monitor/features/>

1.2.1.6 IBM Blueworks Live

The fastest way to take your process improvement efforts to the next level.

- Quick to start
With a simple sign-up process and over a dozen short instructional videos, you can get your first processes documented and automated in less than an hour. IBM Blueworks Live is designed with the business user in mind, allowing everyone in your organization to participate in process discovery, mapping and automation right from their web browser. Home to over 200,000 processes, Blueworks Live is an easy to use and affordable way to get your organization thinking about and acting on process improvement. Start right now by signing up for a free trial and see what Blueworks Live can do for you and your team
- Quick to scale
Do you want to drive broader participation in process improvement? With Blueworks Live you can rapidly add users to your account at any time. Let IBM do the heavy lifting while you roll out access to the software with nothing to install and no specialized IT knowledge required. In addition, your team will be able to leverage the built in collaboration features and the public community of BPM industry experts to grow your process improvement efforts in a big way.
- Quick to change the way you work
Want to make sure that the right work gets done by the right people at the

right time? Stop managing work through your inbox and start getting better consistency, visibility, and control over the tasks your organization does every day. With Blueworks Live you can build a Process App in as little as 90 seconds that allows you to assign and monitor tasks that are currently scattered across multiple email inboxes.

For more details on features and benefits refer to

<https://www.blueworkslive.com/corp/gettingstarted/features.html>

1.2.1.7 IBM Case Manager V5.0

IBM Case Manager unites information, process, and people to provide a 360-degree view of case information and achieve optimized outcomes.

With Case Manager, knowledge workers can extract critical case information through integrated business rules, collaboration, and analytics - all of which enhance decision making ability and leads to more successful case outcomes. Case Manager:

- Provides a foundation for capturing organizational best practices through templates and an extensible infrastructure for meeting specific vertical and horizontal needs, reducing the time-to-value. Leveraging modern Web 2.0 concepts, dynamic case-oriented applications can be assembled or reassembled from components, fostering reuse and rapid deployment.
- Improves time-to-value through business user focused design capabilities, including reusable templates and interview-style interfaces for case construction.
- Capitalizes on organizationally established business process management facilities. Case workers can easily create and participate in ad-hoc workflow as well as structured processes.
- Empowers knowledge workers with real-time and historical case metrics as well as integrated sentiment and content analysis to optimize case workloads and help remediate situations affecting cases.
- Provides sophisticated decision management capabilities through a simplified and integrated business rules management approach.
- Maximizes case worker productivity by simplifying collaboration through integrated social networking and communications capabilities.

For more details on features and benefits refer to

<http://public.dhe.ibm.com/common/ssi/ecm/en/lbd03004usen/LBD03004USEN.PDF>

1.2.1.8 IBM WebSphere Business Events V7.0

IBM WebSphere Business Events V7.0 is a comprehensive Business Event Processing system which helps businesses detect, evaluate, and respond to the impact of business events based on the discovery of actionable event patterns.

-
- Improves line-of-business insight and awareness around event driven business conditions
 - Enables business users to define and manage business events that facilitate taking timely, proactive actions
 - Reduces total cost of ownership (TCO) through codeless implementations, enacted by business users, often without incurring IT development or implementation costs
 - Provides the ability to detect, decide, and dynamically react to simple and complex relationships between people, events, and information
 - Increases business agility by enabling faster responsiveness to customers, suppliers, and changing market needs
 - Reduces TCO for composite applications requiring the combination of event pattern detection, traditional workflow, and activity monitoring functionality
 - Enhances existing Business Process Management (BPM) and service-oriented architecture (SOA) infrastructures

For more details on features and benefits refer to

<http://www.ibm.com/software/integration/wbe/features/>

1.2.1.9 WebSphere Decision Server V7.1

WebSphere Decision Server combines business rules management and business event processing technologies in a single offering. By bringing these technologies together, organizations can flexibly create solutions that use event-based data patterns to initiate automated decision responses such as determining risk, fraud, promotions, and prioritizations.

- Detect event-based business situations occurring across applications and systems.
- Automate precise, context-specific decisions in response to detected event patterns.
- Easily implement changes for event and knowledge-based rules.
- Initiate actions across transactional and process-oriented business syst

For more details on features and benefits refer to

<http://www.ibm.com/software/integration/business-rule-management/decision-server/about/>

1.2.1.10 IBM WebSphere ILOG Jrules V7.1

IBM WebSphere ILOG JRules provides functionality to build and deploy rule-based applications for Java, mainframe and SOA-based environments.

Developers can easily build and deploy rule-based applications that automate fine-grained, variable decisions used by business systems, while reducing the time, effort and cost of application development and ongoing maintenance.

-
- A comprehensive development environment for rule-based applications that is built on the Eclipse IDE (Rule Studio).
 - Powerful functionality, including: auto correction in rule editing; conflict and redundancy detection; wizards and configuration tools for creating testing frameworks; and source code control integration.
 - The ability to easily extend rule projects for ongoing management to business users through IBM WebSphere ILOG Rule Team Server.
 - A robust, scalable and secure execution engine for rule-based applications, with a managed deployment and monitoring environment (Rule Execution Server).
 - A complete set of execution capabilities, including: a high-performance and scalable rule engine, providing either inference or sequential-based rule execution; hot deployment of changes into production without having to restart the server; one-click deployment of rulesets as web services for SOA-based integration; monitoring through the administration web console or through JMX-based connectivity to enterprise system management tools, such as IBM Tivoli.

For more details on features and benefits refer to

<http://www.ibm.com/software/integration/business-rule-management/jrules-family/about/>

1.2.1.11 WebSphere Business Compass V7.0.0.4

WebSphere Business Compass is a collaborative Web-based tool for designing and developing business process assets

Users can view and comment on published draft processes, and collaborate with various stakeholders to define best practice process models and optimize processes.

- Capture business intent through strategy, capability and process maps.
- Record important changes, and comments on models by subject matter experts.
- Define business vocabularies, specify organizational maps, and perform process walkthroughs to ensure a common understanding of the business.

For more details on features and benefits refer to

<http://www.ibm.com/software/integration/business-compass/features/>

1.2.1.12 WebSphere Business Modeler Advanced V 7.0.0.4

IBM WebSphere Business Modeler Advanced is IBM's premier advanced business process modeling and analysis tool for business users.

It offers process modeling, simulation, and analysis capabilities to help business users understand, document, and deploy business processes for continuous improvement.

- Enables business users to design, model, and deploy vital business processes.
- Allows users to make informed decisions before deployment through advanced simulation capabilities based on modeled and actual data.

-
- Provides integrated industry content to help business users jumpstart solution development.
 - Accelerates process optimization by allowing users to visualize and identify bottlenecks and inefficiencies in processes.
 - Provides enhanced integration with the IBM BPM Suite and WebSphere Dynamic Process Edition through role-based business spaces, a unified end user interface that integrates BPM content for a holistic management of business processes.
 - Enables subject matter experts to share models and collaborate to translate business intent into process models using a Web browser with WebSphere Business Compass.

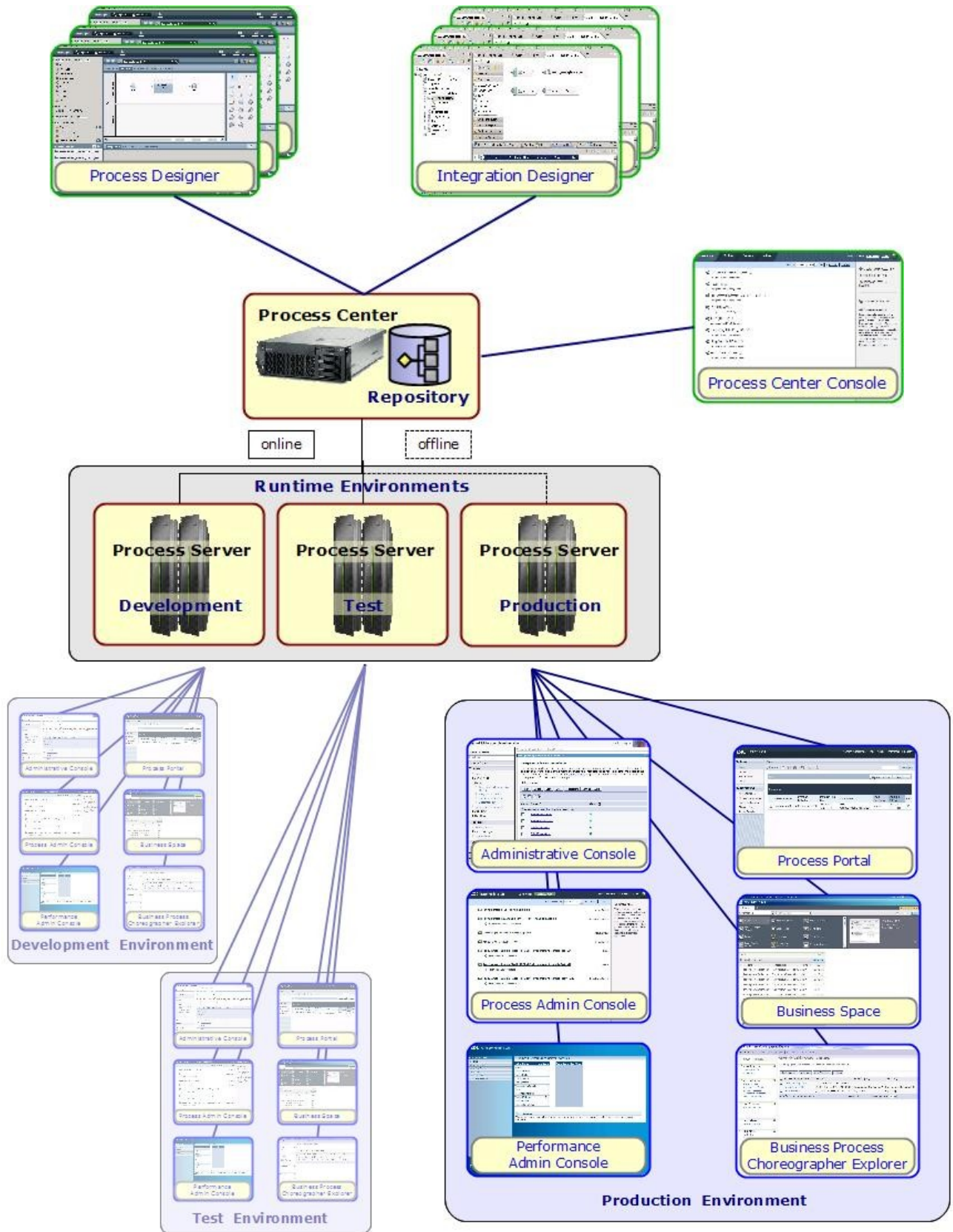
For more details on features and benefits refer to

```
http://www.ibm.com/software/integration/webphere-business-  
modeler/advanced/features/
```

1.2.2 Major components of a BPM production environment

The components of IBM Business Process Manager provide a unified BPM repository, tooling for authors, administrators, and users, and a runtime platform. Different configurations of the product support different levels of complexity and involvement with business process management.

The following diagram illustrates a typical IBM Business Process Manager Advanced configuration:



The Process Server provides a single BPM runtime environment that can support a range of business processes, service orchestration, and integration capabilities. Depending on the overall operational needs the BPM runtime environment can consist of a single server running on a single machine, several independent servers running on multiple machines administered from a central administrative point (referred as managed servers), or it may consist of several servers combined to clusters running on several machines. All servers being part of the BPM runtime environment are collected into a single administrative unit referred to as a cell. Within a cell multiple clusters and multiple managed servers are allowed and are referred as deployment targets.

Typical multiple BPM runtime environments will be dedicated to be used for staging (development), test and production. The individual BPM runtime environments are established in their own cells and are more or less independent from each other. A further cell contains the Process Center being connected on-line or offline to the BPM runtime environments.

Additional BPM products might be available and will enlarge the BPM runtime environment by typically adding more cells. For example the IBM Business Monitor can also consist of a single server running on a single machine, several independent servers running on multiple machines administered in a cell (referred as managed servers), or it may consist of several servers combined to a cluster running on several machines.

For a production environment several aspects like controlled change management, reliability, scalability and perhaps other quality of service aspects are of interest. In nearly all these aspects a single system will not fulfill these requirements. To understand the details how multiple machines are to be installed and configured some constructs need to be introduced and will be briefly described in the following sections. These Varied constructs build a cell which may also be referred as a network deployment topology.

1.2.2.1 Cell

A WebSphere cell is a logical unit containing all elements being required for operation. In other words it is a management domain for a distributed environment of elements that are centrally managed and have access to shared resources in the cell. The key elements are briefly described in the following paragraphs. In physical terms a WebSphere cell typically involves multiple systems.

1.2.2.2 Node

A WebSphere node is an element within a cell which typically contains one or more application servers. A managed node consists of a node agent managing the the node and all application servers hosted on that node. An unmanaged node does not have a node agent and will be used to administer the IBM HTTP server (also referred as WebServer). A WebSphere node resides on a single host, but on a host it is possible to configure multiple nodes having then multiple node agents.

1.2.2.3 Node Agent

A WebSphere node agent is an architectural component that enables the deployment manager for the cell to remotely manage the node, its application servers, and their applications. The node agent represents the node in the management cell and keeps the configuration up-to-date.

1.2.2.4 Deployment Manager

A WebSphere deployment manager is a special application server whose only task is the management and configuration of all elements in the cell in which it exists. The deployment manager requires no node agent. The deployment manager runs a single application, a Web-based configuration front-end known as the Integrated Solutions Console or Administrative Console.

When J2EE™ applications are deployed within a cell, they are deployed to a server, cluster or multiple instances of both being referred to as the deployment target.

1.2.2.5 Application Server

A WebSphere application server hosts zero or more applications. An application server instance can be configured as follows:

- Stand-alone application server
A stand-alone application server does not belong to a cell and runs its own administrative console.
- Managed application server
A managed application server is part of a cell and is managed by a deployment manager residing on a separate node. A managed application server is not part of a cluster.
- Application server as member of a cluster
An application server that is a cluster member resides on a node belonging to a cell, and is managed by a deployment manager residing on a separate node. The application server is part of a cluster.

1.2.2.6 Cluster

A WebSphere cluster is a logical collection of application servers configured to perform the same task as a team. The members of a cluster can be distributed across one or more nodes in any configuration. Clusters are typically used for scalability, workload and high availability aspects.

1.2.2.7 Service Integration Bus

A Service Integration Bus often mentioned as SIBus supports applications using message-based and service-oriented architectures. A bus is a group of interconnected servers and clusters that have been added as members of the bus. Applications connect to a bus at one of the messaging engines associated with its bus members. A messaging engine is a server component that provides core messaging functionality of a service integration bus. A messaging engine manages bus resources and provides a connection point for applications.

Each messaging engine is associated with a server or a server cluster that has been added as a member of a bus. When you add an application server or a server cluster as a bus member, a messaging engine is automatically created for this new member.

If you add the same server as a member of multiple buses, the server is associated with multiple messaging engines (one messaging engine for each bus). You can create additional messaging engines for use with server clusters that are bus members, for availability and scalability reasons. However, in its simplest form a single engine can realize a bus.

1.2.2.8 Profile

Each profile defines a separate run-time environment, with separate command files, configuration files, log files, and so on. Profiles enable you to have more than one runtime environment on a system, without having to install multiple copies of the system files. In WebSphere there are three kinds of profiles:

- The stand-alone server profile
- The deployment manager profile
- The custom profile.

The profile management tool will be used to built one of these profile types. In a cell the profile for the deployment manager is the first one followed by the custom profiles. After a custom profile has been created it needs to become a known element in the cell. This is achieved by federating the node into the cell. Please note that typically profiles have a one to one relation ship to nodes.

When additional products like the IBM Business Process Manager or the IBM Business Monitor are installed, the profiles need to be augmented to be able to serve the additional functions.

1.2.3 BPM related back end systems

In a production environment several back end systems are involved. They can be categorized into optional like a message queuing system used for interactions and mandatory back end systems.

A database system for persisting BPM related data and a user directory for handling secured access are mandatory.

1.2.3.1 Database

In a production environment typically various data exist which need to be stored persistently. Within WebSphere accessing a database is transparent. It will be accessed via a JDBC implementation related to the used database system. All required database variables like name, location, user, password, etc are collected in the data source and are administered via the deployment manager. Within IBM Business Process Manager several components persist data. Depending on the overall used database conventions this results in several independent databases or in several database schema managed all in one database or maybe a mix of both.

1.2.3.2 Tivoli Directory Server

To ensure authenticated access only to the system an integrated file based method can be used. In a production environment typically a central user repository is used. In this document the IBM Tivoli Directory Server software providing a reliable platform for the enterprise security initiatives is used and correspondent described.

This enterprise identity management software from Tivoli uses Lightweight Directory Access Protocol (LDAP) to provide a trusted identity data infrastructure for authentication.

- Provides identity management for companies that want to deploy a robust and scalable identity infrastructure.
- Uses LDAP identity infrastructure software and meets LDAP v3 industry compliance standards.
- Enhances proxy server capabilities with flow control for managing requests and paging search results for single and multiple partitions and a smart fail-back mechanism to restore servers safely.
- Maintains high availability with master/subordinate and peer-to-peer replication capabilities and scheduled online or offline backup and remote restore.
- Supports virtual list views so that you can scroll forward or backward through entries in a large sorted data set and can record deleted entries.
- Supports leading platforms, including IBM AIX®, i5/OS®, z/OS®, Sun Solaris, Microsoft® Windows® Server, HP-UX, and SUSE and Red Hat Linux distributions.

For more details on features and benefits refer to

```
http://www.ibm.com/software/tivoli/products/directory-server/features.html?S_CMP=rnav
```

1.2.4 BPM Runtime Environment Topologies

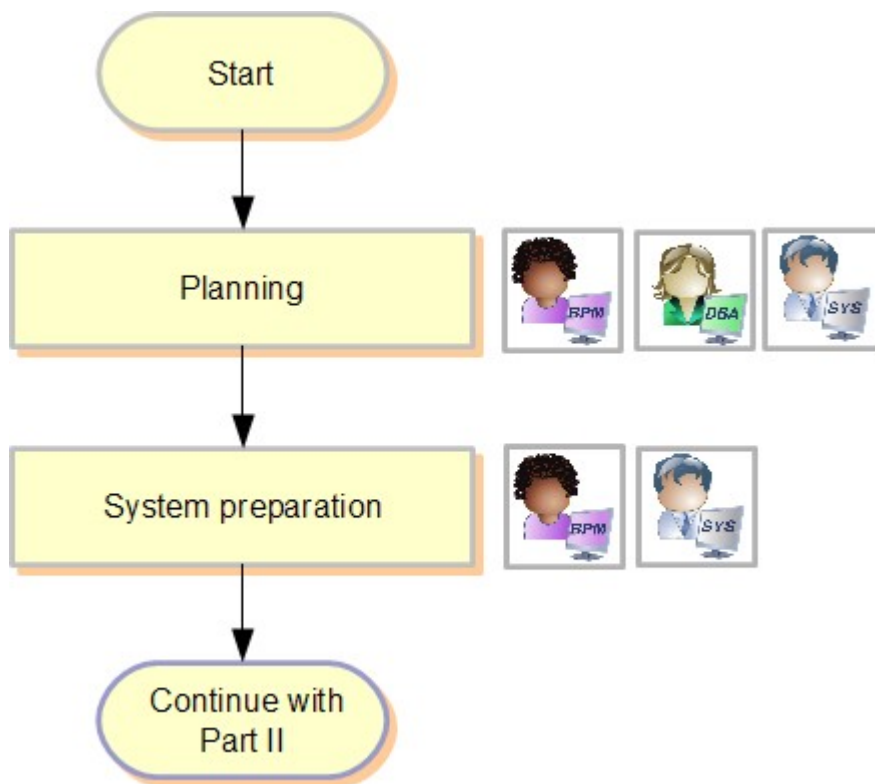
The term topology is often mentioned and may be interpreted differently. In IBM Business Process Manager several different layouts exists. In general a topology is the physical layout of the deployment environment required to meet the business needs for capacity, availability, and scalability. According to the business needs especially in a production environment the topology layouts for the Process Server and the Process Center will be different.

For more information on topologies and deployment environment patterns refer to



```
http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp?topic=/com.ibm.wbpm.imuc.doc/topics/cpln_bpm_top_types.html
```

In this document the focus will be on the Process Server and especially on a four cluster topology with an application cluster and remote clusters for messaging, support and web applications.

Part I: Installation and Configuration planning tasks



Chapter 2 Planning

			Involved systems: none:
-----------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	-----------------------------------

This part of the document contains all planning information and provides the base for the consecutive installation and configuration steps. The values of the planning section are referenced instead of duplicated in the following chapters.

Note: To allow efficient interactions between all involved person roles and to avoid delays or need of corrective actions, it is highly recommended to plan the entire setup before start working on the systems. For reuse convenience, the appendix chapter holds a planning form and the configuration sequence charts as a printable set of pages.

Some general terminology thoughts, described briefly here, should be understood before starting with the planning.

The term system is used in multiple different facets depending on the author, industry, functional area etc. In the Information Technology (IT) world itself various interpretations also exist. A common understanding does not really exist, but often the term system is a synonym for a machine or a set of machines, e.g. a server or personal computer. Furthermore the term system is used to specify a combination of a machine and installed software used to build a solution. From a usage perspective such solutions (systems including software) are often referenced as service. An application server, especially the IBM Business Process Manager, might be understood as a system providing services.

Depending on the requirements related to performance and scalability the service can be implemented on a single machine or it might be necessary to use a set of machines where the term machine in this context is a server. On large machines, e.g. IBM Power Systems, the overall power might be distributed in partitions where each partition will be referenced as an independent system. Another option might be to configure the software multiple times on a single machine where it is usual to reference each configuration as a system.

When multiple configurations of the IBM Business Process Manager reside on the same machine they are sometimes referenced as instances.

In this document the term system is used to define a machine where an instance of the IBM Business Process Manager is installed and configured.

Another aspect being related for the planning are the different involved administrative roles. The most important ones are the BPM administrator (BPM Admin), the database

administrator (DBA) and the system administrator (SYS Admin). For the overall planning steps being outlined in the picture above it is important that the correspondent administrators are participating.

This planning chapter is divided into choosing the right topology followed by planning the production environment setup details. At the end all planning details will be collected and summarized for the later installation and configuration steps.

2.1 Choose the Topology

Choosing the right topology depends on the requirements to be fulfilled like expected workload, scalability, high availability and several other quality of service aspects.

It is highly recommended to study the corresponding information provided in the Information Center:

"Topologies and deployment environment patterns":

http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp?topic=/com.ibm.wbpm.imuc.doc/topics/cpln_bpm_top_types.html

"Considerations for selecting a topology":

http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp?topic=/com.ibm.wbpm.imuc.doc/topics/cpln_bpm_considerations_top_selection.html

In this document the Business Process Management runtime environment especially the Process Server in a production environment will be described. As the topology a setup with four clusters is outlined. In case the selected topology differs this document may still be used but it needs to be adapted accordingly.

Nevertheless it is highly recommended to describe the actual selected topology being planned including the back end systems in detail.

2.2 Planning the production environment setup

A cell setup planning is more complex compared to a single server setup. A single server contains all required elements in one unit so that no communication between the different components across systems is necessary. However with the scaling limitations of a single server, and with more complex requirements a single server might not be sufficient. In this case a cell with multiple server instances should be used.

Just adding more single servers will not fit all aspects. Especially synchronous administration as well as controlled communication are not covered. This can be achieved by using the WebSphere Application Server Network Deployment solution which provides several additional capabilities.

The following list of tasks and sub-tasks should be completed in order to enable a straightforward cell setup including clusters :

2.2.1 Assign BPM components to the systems

This task comprises multiple subtasks based on the topology selection, including:

- IBM Business Process Manager software level selection (e.g. version 7.5.0.0)
- Database system selection, database tuning, and database distribution (e.g. DB2 version 9.7 FP3, Oracle 11g Release 2)
- Number of systems, hardware and operating system
- Establish new systems (hardware) or reuse/adapt existing ones
- Provide hardware and operating system requirements
- Check conflicts when using existing systems (e.g. ports, applications, firewalls)
- Plan hostnames (used during IBM Business Process Manager configuration)

For further more detailed information related to concepts, architecture and background aspects please check the following documentation.

IBM Business Process Manager Information Center

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp>

WebSphere Business Process Management V7.0 Production Topologies

<http://www.redbooks.ibm.com/redpieces/abstracts/sg247854.html?Open>

When this paper has been written a new version was not available.

2.2.2 Assign cell and cluster components to the systems

In general numerous topologies are possible and a decision on the best solution depends on the appropriate customer needs. In this document a topology is chosen which has an average complexity and is suitable for showing the various configuration steps.

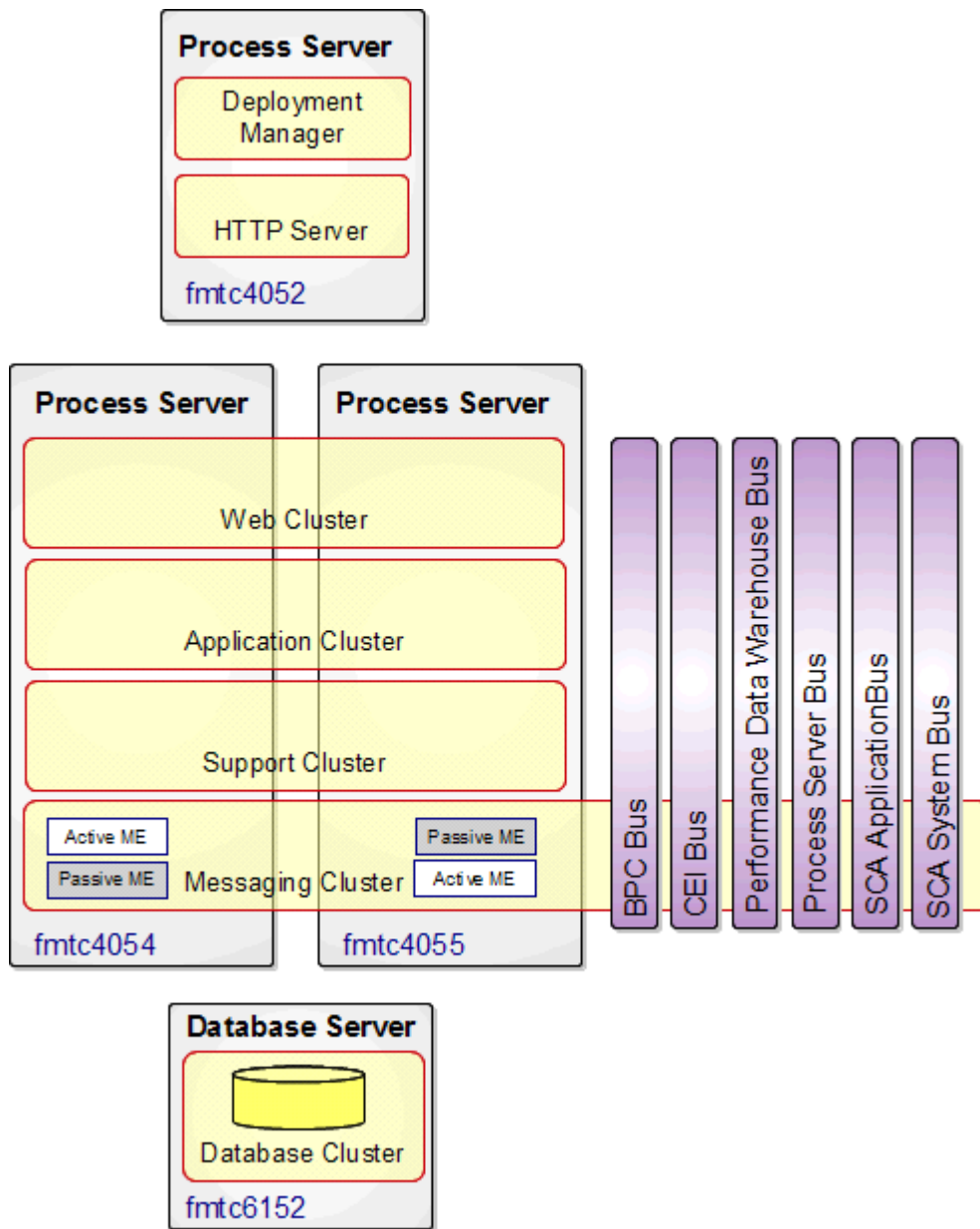
The selected Business Process Manager topology described in this document is a Process Server cell. The cell contains several clusters.

The Business Process Manager clusters:

- **Application Cluster ("Application Target Cluster")**
Contains the business process applications (i.e BPD & BPEL Processes).
- **A dedicated Message Engine Cluster ("Messaging Cluster")**
Contains the messaging engines.
- **Support Cluster**
Contains the Performance Data Warehouse, the Common Event Infrastructure (CEI), the Business Process Explorer and the Business Space.
- **Web Application Cluster**
Contains the Business Rules manager, the Business Process Choreographer Explorer and the Business Space

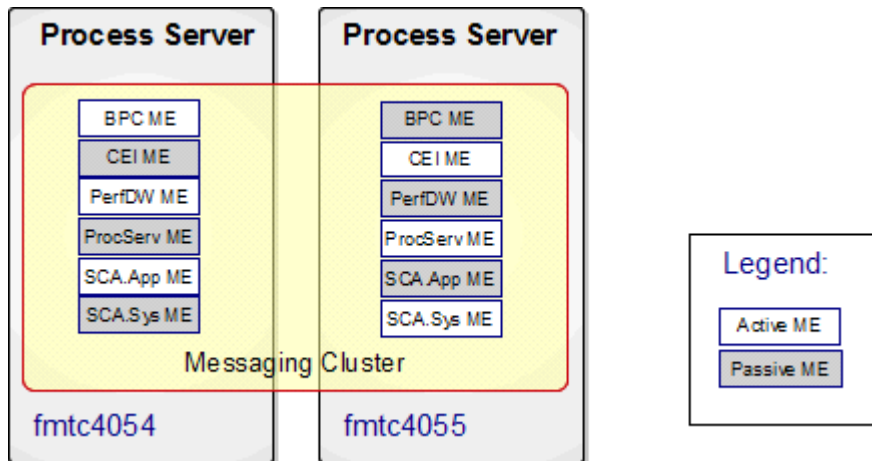
The cluster environment is established on 3 dedicated physical machines, the database on a separate fourth machine. As security is also a mandatory requirement, an existing user directory (IBM Tivoli Directory Server – in this document typically mentioned as LDAP) is attached to the cluster. The LDAP machine is not shown in the picture below.

In this setup the deployment manager and the HTTP Server are configured on one machine. In a production environment it is reasonable to use a dedicated machine for the HTTP Server. To achieve high availability the HTTP Server will be configured twice on separate hosts and potentially enhanced with load balance capabilities but this will not be addressed in this document.



The setup is built on four dedicated machines, one hosting the database installation, the others hosting the deployment manager, the HTTP Server and the Process Server nodes building up the cell. In this topology the messaging engines are separated from the applications. Therefore the messaging will be done in a separate cluster, the "Messaging Cluster". Also the support and web functions are on separate clusters.

Note: The hostnames (e.g. `fmtc4052`) in the figure are those being used during testing the described setup. They might be visible in several screen shots.



For workload distribution reasons the active and passive message engines can be distributed across the two messaging cluster members.

2.2.3 Select the operating system and prerequisites

Depending on the customers business preferences one of the supported operating systems may be used. In this document the systems used will be Linux systems.

Detailed hardware and software requirements for IBM Business Process Manager Advanced V7.5 can be found here:

<http://www.ibm.com/support/docview.wss?uid=swg27021019&wv=1>

Another important requirement is to ensure all involved systems are using a synchronized time. Typically this will be achieved by a timeserver providing system time for all systems.

2.2.4 Select the type of user directory for the cell

General options are: Federated repository, IBM Tivoli Directory Server (LDAP) or one of the other supported custom registries. The federated repository enables the support of multiple repositories which can be file-based, LDAP, database, and custom registries.

In the various documents an additional option (local operating system) is mentioned, but in a cell or clustered environment (which is the scope of this document) it is not supported.

Select what fits your needs best. As most environments already maintain a user directory which can be attached easily.

Note: If you intend to use the Business Space component it is mandatory to use the federated repository.

2.3 General statements regarding installation and configuration

This chapter lists several basics that apply to the way the environment described in this paper is set up. Further, it gives advice on how the instructions in this paper are supposed to be followed. Please note that depending on the local needs other decisions might be taken.

- **Using 64-bit software**

Current operating systems do support 64-bit software including the JDK used here. The main advantage is the usage of real memory beyond the 4GB boundary. Especially when numerous applications should be concurrent available in the application server it becomes absolutely essential to use the 64-bit version instead of the 32-bit version.

- **Silent binary installation and profile creation**

Typically the installation and configuration tasks are done by using the graphical user interface. As an alternative a command line based method can be used. Especially when these task should be automated or if change management is of importance this is the preferred method. Since the WebSphere Application Server does not offer a 64-bit version of the profile management tool and it is also not available within the Business Process Manager this document describes as much as possible in the silent mode.

- **Installation and configuration with root authority**

The installation of software requires typically root authority whereas the configuration and the operation might be possible with another administrative user. This is also supported by the IBM Business Process Manager and detailed described in the Information Center. On configurations where a complete systems will be used for the IBM Business Process Manager it is not necessary to introduce a dedicated administrative user and will not be part of this document.

- **Process Center offline connected to the Process Server**

In general the connection can be online and offline. The online mode offers a graphical user interface based method for the application deployment. In a production environment typically the test and development setups are separated. This can be achieved by using the offline connection only. Since the deployment in this case needs to be done with command line based utilities change management can be achieved easily.

- **How to read this document (BPM Admin sections vs. DBA sections)**

As already outline in the introduction different administrative roles are involved. The structure in this document takes this into account by defining for each chapter the main administrative role being responsible with the exception of the planning chapter which is written for all administrative roles.

2.4 Gather required installation and configuration information

This goal of this section is to provide an overview on the relevant installation and configuration settings that need to be gathered before the environment can be created. Following data needs to be gathered:

- BPM planning
 - General BPM installation planning
 - BPM user directory planning
 - BPM nodes planing
 - BPM Deployment Environment planning

- Database planning
 - General Oracle installation planning
 - BPM database planning
 - BPM schema planning
 - BPM tablespaces planning
 - BPM user roles and privileges planning

2.4.1 BPM planning

This chapter depicts the concrete BPM related installation and configuration settings that are going to be used throughout the setup.

2.4.1.1 General BPM installation planning

The following general BPM installation settings will be used:

Description	Setting	
Linux BPM administrator (Linux system user for the BPM installation)	User name	password
	root	<root_password>
BPM administrator	User name	password
	admin	<admin_password>
BPM binary location (the location that the BPM binaries are extracted to)	/BPMtmp	
BPM installation location	/bpm75	
Oracle JDBC driver directory	/bpm75/jdbcdrivers/Oracle	
Installation Manager installation location	/opt/IBM	
BPM Process Server features	wps.client.feature, wps.server.feature, wps.samples.feature	

2.4.1.2 BPM user directory planning

To demonstrate how to use ldap, an existing user directory server (IBM Tivoli Directory Server 6.1) will be used. The following LDAP settings will be used:

Description	Setting
LDAP server host	looma1.boeblingen.de.ibm.com
LDAP server port	389
Base realm entry 1	dc=usaa,dc=com
Base realm entry 2	o=ibm.com
LDAP anonymous bind	Allowed

Several methods exist to explore a LDAP directory.

A useful tool which might be an alternative is the LDAP Explorer Tool on Sourceforge (available for Windows and Linux):

<http://sourceforge.net/projects/ldaptool/>

2.4.1.3 BPM nodes planning

Values for the following nodes will be specified:

- fmtc4052CellManager01 (Deployment Manager node).
- fmtc4054Node01 (first BPM custom node).
- fmtc4055Node01 (second BPM custom node).
- ihsnode (unmanaged node).

2.4.1.4 BPM Deployment Manager planning

The following settings for the BPM Deployment Manager will be used:

Description	Setting	
Profile name	Dmgr01	
Profile path	/bpm75/profiles/Dmgr01	
Template path	/bpm75/profileTemplates/BPM/dmgr.procsvr.adv	
Server type	DEPLOYMENT_MANAGER	
Cell name	fmtc4052Cell01	
Node name	fmtc4052CellManager01	
Host name	fmtc4052.boeblingen.de.ibm.com	
Enable service	false	
Enable admin security	true	
DB type	Oracle	
DB hostname	fmtc6152.boeblingen.de.ibm.com	
DB server port	1521	
DB name	ORA11DB	
DB design enabled	false	
DB delay config	true	
DB driver type	ORACLE_THIN	
DB JDBC classpath	\${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle	
DB create new	false	
Admin user name	User name	password
	admin (use the BPM administrator user name as default)	<admin_password> (BPM administrator password)

2.4.1.5 First BPM Custom Node planning

The following settings for the first BPM custom node will be used:

Description	Setting
Profile name	Custom01
Profile path	/bpm75/profiles/Custom01
Template path	/bpm75/profileTemplates/BPM/managed.procsvr.adv
Cell name	fmtc4054Cell01
Node name	fmtc4054Node01
Host name	fmtc4054.boeblingen.de.ibm.com
DB type	Oracle
DB JDBC classpath	\${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle

2.4.1.6 Second BPM Custom Node planning

The following settings for the second BPM custom node will be used:

Description	Setting
Profile name	Custom01
Profile path	/bpm75/profiles/Custom01
Template path	/bpm75/profileTemplates/BPM/managed.procsvr.adv
Cell name	fmtc4055Cell01
Node name	fmtc4055Node01
Host name	fmtc4055.boeblingen.de.ibm.com
DB type	Oracle
DB JDBC classpath	\${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle

For more information related to **“Naming considerations for profiles, nodes, hosts, and cells”** refer to the Information Center:

http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp?topic=/com.ibm.wbpm.imuc.doc/topics/cins_naming.html

2.4.1.7 IBM HTTP server node planning

The following settings for the HTTP server node will be used:

Description	Setting	
Node type	Unmanaged Node	
Node name	ihsnode	
Server name (WAS)	httpserver1	
Server type	IBM HTTP Server	
Host name	fmtc4052.boeblingen.de.ibm.com	
IHS installation location	/ihs70	
Plug-in installation location	/ihs70/Plugins	
HTT port	443	
HTTP administration port	8008	
Create user ID for IHS administration	true	
Setup IHS administration server	true	
Install IHS plug-in for WAS	true	
Webserver name (IHS)	httpserver1	
Admin user name IHS	User name	password
	ihsadmin	<ihsadmin_password>
Admin user name admin server	User name	Group
	ihsadmin	ihsgroup

2.4.1.8 BPM Deployment Environment planning

The following settings for the BPM Deployment Environment will be used:

Note: The Oracle schemas (=user names) listed in this section will be explained in detail in the next chapter ("Database planning").

Description	Setting						
Deployment Environment name	BPMP5						
Deployment Environment features	BPMP5 (BPM Advanced Process Server)						
Deployment Environment pattern	Remote messaging, remote support and web (four clusters)						
Utilized nodes	fmtc4054Node01, fmtc4055Node01						
Cluster member/node ratio	1 (one cluster member per node)						
Application cluster name	BPMP5.AppTarget						
Application cluster member names	Node fmtc4054Node01: BPMP5.AppTarget.fmtc4054Node01.0 Node fmtc4054Node01: BPMP5.AppTarget.fmtc4055Node01.0						
Messaging cluster name	BPMP5.Messaging						
Messaging cluster member names	Node fmtc4054Node01: BPMP5.Messaging.fmtc4054Node01.0 Node fmtc4054Node01: BPMP5.Messaging.fmtc4055Node01.0						
Support cluster name	BPMP5.Support						
Support cluster member names	Node fmtc4054Node01: BPMP5.Support.fmtc4054Node01.0 Node fmtc4054Node01: BPMP5.Support.fmtc4055Node01.0						
Web Application cluster name	BPMP5.WebApp						
Application cluster member names	Node fmtc4054Node01: BPMP5.WebApp.fmtc4054Node01.0 Node fmtc4054Node01: BPMP5.WebApp.fmtc4055Node01.0						
System REST Service Endpoints	No dedicated configuration during deployment environment configuration (default values will be used). Final configuration will applied in an additional step (Chapter "Optional configuration steps").						
Database Settings	Data Source name	Database name	Schema	Create tables	User name	Password	Server
	Business Process Choreographer data source	ORA11DB	BPC4052C01	No	BPC4052C01	<BPC4052C01_password>	fmtc6152.boeblingen.de.ibm.com
	Business Process Choreographer Messaging Engine data source	ORA11DB	BPCMSG4052C01	No	BPCMSG4052C01	<BPCMSG4052C01_password>	fmtc6152.boeblingen.de.ibm.com
	Business Process Choreographer reporting function data	ORA11DB	BPC4052C01	No	BPC4052C01	<BPC4052C01_password>	fmtc6152.boeblingen.de.ibm.com

	source						
	Business Space data source	ORA11DB	BSP4052C01	No	BSP4052C01	<BSP4052C01_password>	fmtc6152.boeblingen.de.ibm.com
	CEI Messaging Engine data source	ORA11DB	CEIMSG4052C01	No	CEIMSG4052C01	<CEIMSG4052C01_password>	fmtc6152.boeblingen.de.ibm.com
	Performance Data Warehouse data source	ORA11DB	-	No	PDW4052C01	<PDW4052C01_password>	fmtc6152.boeblingen.de.ibm.com
	Performance Data Warehouse Messaging Engine data source	ORA11DB	PDWMSG4052C01	No	PDWMSG4052C01	<PDWMSG4052C01_password>	fmtc6152.boeblingen.de.ibm.com
	Process Server data source	ORA11DB	-	No	PSS4052C01	<PSS4052C01_password>	fmtc6152.boeblingen.de.ibm.com
	Process Server Messaging Engine data source	ORA11DB	PSSMSG4052C01	No	PSSMSG4052C01	<PSSMSG4052C01_password>	fmtc6152.boeblingen.de.ibm.com
	SCA System Bus Messaging Engine data source	ORA11DB	SCASYSMSG4052C01	No	SCASYSMSG4052C01	<SCASYSMSG4052C01_password>	fmtc6152.boeblingen.de.ibm.com
	SCA Application Bus Messaging Engine data source	ORA11DB	SCAAPPMSG4052C01	No	SCAAPPMSG4052C01	<SCAAPPMSG4052C01_password>	fmtc6152.boeblingen.de.ibm.com
CEI JMS authentication alias	User name			password			
	admin (use the BPM administrator user name as default)			<admin_password> (BPM administrator password)			
SCA authentication alias	User name			password			
	admin (use the BPM administrator user name as default)			<admin_password> (BPM administrator password)			
Business Process Choreographer authentication alias	User name			password			
	admin (use the BPM administrator user name as default)			<admin_password> (BPM administrator password)			
Process Server / Process Center online configuration	The BPM Process Server environment won't be online connected to any potential BPM Process Center environments						
JMS API authentication	User name			password			
	admin (use the BPM administrator user name as default)			<admin_password> (BPM administrator password)			
Escalation user authentication	User name			password			
	admin (use the BPM administrator user name as default)			<admin_password> (BPM administrator password)			
Administration job user authentication	User name			password			
	admin (use the BPM administrator user name as default)			<admin_password> (BPM administrator password)			

	name as default)	password)
Enable e-mail service	No	
Context root	Business Process Choreographer	Business Process Choreographer Rules Manager
	/bpc	/br
NFS mount point for log sharing (transaction log & recovery logs)	/BPMdata	
Shared logs top folder (transaction log & recovery logs)	/BPMdata/SharedLogs	
Transaction log folder AppTarget Custom Node 1	/BPMdata/SharedLogs/tranlogs/BPMPS.AppTarget.fmtc4054Node01.0	
Transaction log folder AppTarget Custom Node 2	/BPMdata/SharedLogs/tranlogs/BPMPS.AppTarget.fmtc4055Node01.0	
Transaction log folder Messaging Custom Node 1	/BPMdata/SharedLogs/tranlogs/BPMPS.Messaging.fmtc4054Node01.0	
Transaction log folder Messaging Custom Node 2	/BPMdata/SharedLogs/tranlogs/BPMPS.Messaging.fmtc4055Node01.0	
Transaction log folder Support Custom Node 1	/BPMdata/SharedLogs/tranlogs/BPMPS.Support.fmtc4054Node01.0	
Transaction log folder Support Custom Node 2	/BPMdata/SharedLogs/tranlogs/BPMPS.Support.fmtc4055Node01.0	
Transaction log folder WebApp Custom Node 1	/BPMdata/SharedLogs/tranlogs/BPMPS.WebApp.fmtc4054Node01.0	
Transaction log folder WebApp Custom Node 2	/BPMdata/SharedLogs/tranlogs/BPMPS.WebApp.fmtc4055Node01.0	
Recovery log folder AppTarget Custom Node 1	/BPMdata/SharedLogs/recoverylogs/BPMPS.AppTarget.fmtc4054Node01.0	
Recovery log folder AppTarget Custom Node 2	/BPMdata/SharedLogs/recoverylogs/BPMPS.AppTarget.fmtc4055Node01.0	

Based on this planning information several artifacts will be generated through various configuration steps. At the end of a dedicated configuration task, which might consist of a series of detailed steps, a verification task will be outlined. Especially the generated data sources including the database authentication settings will be verified. During this step a list of all data sources will be used.

2.4.2 Database Planning

This chapter depicts the real database (Oracle) related installation and configuration settings that are going to be used throughout the setup.

2.4.2.1 General Oracle installation planning

The following general Oracle installation settings will be used:

Description	Setting	
Oracle DB Admin (Linux system user for the database installation)	User name	password
	oracle	<oracle_password>
Oracle DB SYSDBA (User for the DB objects creation)	User name	password
	sys	<sys_password>
Oracle Inventory Group	oinstall	
Oracle Admin Group	dba	
Oracle DB Host	fmtc6152.boeblingen.de.ibm.com	
Oracle DB Port	1521	
Oracle DB Name (SID)	ORA11DB	
ORACLE_BASE	/opt/oracle	
ORACLE_HOME	/opt/oracle/product/11.2.0	
Oracle Inventory Location	/opt/oracle/oraInventory	
Oracle DB File Location	/opt/oracle/oradata/ORA11DB	
Oracle Temp Directory (to unzip the install binaries)	/tmp/db11202	

2.4.2.2 BPM database planning

The following database settings will be used:

Description	Setting
Oracle DB SGA Size	1800 MB
Oracle DB PGA Size	1000 MB
Oracle DB Processes	500
OPEN_CURSORS	1000
SESSION_CACHED_CURSORS	1000
FAST_START_MTTR_TARGET	900
Tablespace SYSAUX	600 MB
Tablespace SYSTEM	700 MB
Tablespace TEMP	200 MB
Tablespace UNDOTBS1	1500 MB
Tablespace USERS	150 MB
Redo Log File Size	1500 MB

2.4.2.3 BPM schema planning

When using Oracle it is common practice to use one database (SID) with several schemas, each schema representing a specific BPM component (In contrast to DB2 where usually one dedicated database per component is used).

Since schema equals user in Oracle, naming clashes or inconsistencies might occur when the same SID is planned to be used for multiple BPM setups. For instance if the SID ORCL is supposed to contain the schema for a BPM production environment on setup 1 and a BPM staging environment on setup 2, the following schema names (and thus users) could be used: **BPM1** and **BPM2**.

In order to avoid these ambiguities a clearly defined naming convention is used throughout this setup. A Oracle schema name (=user name) is build up as follows:

Digit 1-3: Represents the BPM component

Digit 4-7: Represents the host of the deployment manager (or server when running a standalone server).

Digit 8: Represents the type of setup. **C** is used for a clustered setup (where a deployment manager is used) or **S** when having a standalone server.

Digit 9-10: Represents the number of a deployment manager (or standalone server) profile which exists on one host (potentially more than one deployment manager or standalone profile can exist on the same host).

Example: There is one deployment manager which is set up on host **fmtc4052.boeblingen.de.ibm.com**. So the schema name (=user name) for the common BPM functionality would be **COM4052C01**:

Setting	Description
COM	Schema for the common BPM functionality
4052	Represents the deployment manager host which is fmtc4052.boeblingen.de.ibm.com .
C	A deployment manger has been set up (a clustered setup is going the be created)
01	the first deployment manager profile on host fmtc4052.boeblingen.de.ibm.com .

Based on the naming convention the following Schema (=users) will be used:

Component	Deployment Manager	Setup	Profile #	Schema	
				(=User name)	Password
Business Process Choreographer (BPC)	fmtc 4052 .boeblingen.de .ibm.com	C	01	BPC4052C01*	<BPC4052C01_password>
Performance Data Warehouse (PDW)	fmtc 4052 .boeblingen.de .ibm.com	C	01	PDW4052C01	<PDW4052C01_password>
Process Server (PSS)	fmtc 4052 .boeblingen.de .ibm.com	C	01	PSS4052C01	<PSS4052C01_password>
Business Space (BSP)	fmtc 4052 .boeblingen.de .ibm.com	C	01	BSP4052C01	<BSP4052C01_password>
Common BPM functionality (COM)	fmtc 4052 .boeblingen.de .ibm.com	C	01	COM4052C01	<COM4052C01_password>
BPC Messaging (BPCMSG)	fmtc 4052 .boeblingen.de .ibm.com	C	01	BPCMSG4052C01	<BPCMSG4052C01_password>
PDW Messaging (PDWMSG)	fmtc 4052 .boeblingen.de .ibm.com	C	01	PDWMSG4052C01	<PDWMSG4052C01_password>
PSS Messaging (PSSMSG)	fmtc 4052 .boeblingen.de .ibm.com	C	01	PSSMSG4052C01	<PSSMSG4052C01_password>
CEI Messaging (CEIMSG)	fmtc 4052 .boeblingen.de .ibm.com	C	01	CEIMSG4052C01	<CEIMSG4052C01_password>
SCA SYS Messaging (SCASYSMSG)	fmtc 4052 .boeblingen.de .ibm.com	C	01	SCASYSMSG4052C01	<SCASYSMSG4052C01_password>
SCA APP Messaging (SCAAPPMSG)	fmtc 4052 .boeblingen.de .ibm.com	C	01	SCAAPPMSG4052C01	<SCAAPPMSG4052C01_password>
XA Recovery (XAREC)	fmtc 4052 .boeblingen.de .ibm.com	C	01	XAREC4052C01	<XAREC4052C01_password>

*The tables for the Business Process Choreographer Reporting function will also be created under Schema **BPC4052C01**.

2.4.2.4 BPM tablespaces planning

The tables defined under the BPM schema have to be created in dedicated tablespaces. Here two types of tablespaces are distinguished:

Predefined tablespaces (PDT)

Predefined tablespaces are tablespaces that are created by generated scripts. Following BPM schemas make use of predefined tablespaces:

- BPC4052C01 (incl. Reporting function)
- BSP4052C01

User defined tablespaces (UDT)

User defined tablespaces are required for those BPM schema that do **NOT** provide predefined scripts for tablespace creation. User defined tablespaces are required for for following BPM schema:

- PDW4052C01
- PSS4052C01
- COM4052C01
- BPCMSG4052C01
- PDWMSG4052C01
- PSSMSG4052C01
- CEIMSG4052C01
- SCASYSMSG4052C01
- SCAAPPMSG4052C01

The following table shows the schema and their corresponding predefined and user defined tablespaces (for the tablespaces the naming convention is used as well):

Schema (=User name)	Tablespace		
	Name	Type	Description
BPC4052C01	BPC4052C01_AUDITLOG	PDT	Tablespace for audit log items
	BPC4052C01_INDEXTS	PDT	Tablespace for indexes for all tables
	BPC4052C01_INSTANCE	PDT	Tablespace for instance items
	BPC4052C01_LOBTS	PDT	Tablespace for large objects for all tables
	BPC4052C01_SCHEDTS	PDT	Tablespace for scheduler items
	BPC4052C01_STAFFQRY	PDT	Tablespace for staff query items
	BPC4052C01_TEMPLATE	PDT	Tablespace for template items
	BPC4052C01_WORKITEM	PDT	Tablespace for work item tables and indexes
	BPC4052C01_OBSVRIDX	PDT	Tablespace for Reporting function indexes
	BPC4052C01_OBSVRLOB	PDT	Tablespace for Reporting function large objects
BPC4052C01_OBSVRTS	PDT	Tablespace for Reporting function tables	
PDW4052C01	PDW4052C01_UDT	UDT	Tablespaces for Performance Data Warehouse tables
PSS4052C01	PSS4052C01_UDT	UDT	Tablespaces for Process Server tables
BSP4052C01	BSP4052C01_REGTABSPACE	PDT	Tablespaces for BusinessSpace function tables
	BSP4052C01_BSPACE	PDT	Tablespaces for BusinessSpace user data table
COM4052C01	COM4052C01_UDT	UDT	Tablespaces for common BPM functionality tables
BPCMSG4052C01	BPCMSG4052C01_UDT	UDT	Tablespaces for BPC messaging
PDWMSG4052C01	PDWMSG4052C01_UDT	UDT	Tablespaces for PDW messaging
PSSMSG4052C01	PSSMSG4052C01_UDT	UDT	Tablespaces for PSS messaging
CEIMSG4052C01	CEIMSG4052C01_UDT	UDT	Tablespaces for CEI messaging
SCASYSMSG4052C01	SCASYSMSG4052C01_UDT	UDT	Tablespaces for SCASYS messaging
SCAAPPMSG4052C01	SCAAPPMSG4052C01_UDT	UDT	Tablespaces for SCAAPP messaging

In order to avoid potential performance issues it is very important to plan the distribution of the BPM tablespaces as accurately as possible. Since the optimal tablespace distribution heavily depends on the type of application and configuration that predominantly will be used on the system it is not possible to provide any general recommendations. The intention of this chapter is rather to exemplify a coarse tablespace distribution based on a few sample conditions. In this sample a total of 7 file systems (/disk3,...,/disk9) is going to be used to host the tablespaces. The file systems (hard drives) are equal regarding capacity and performance.

Alternately to dedicated disks the tablespaces can be established on raid arrays (e.g. on a SAN system) where the distribution of data is managed by the raid controller. The pro and cons depend on numerous arguments and will not be discussed in this document.

The table on the next page lists several sample assumptions and the corresponding consequences regarding tablespace utilization and allocation. Following tablespace/disk distribution key is going to be used:

intensely frequented tablespaces:

2-3 tablespaces per disk (disk3, disk4, disk5)

moderately frequented tablespaces:

3-4 tablespaces per disk (disk6, disk7, disk8)

less frequented tablespaces:

4-5 tablespaces per disk (disk9)

Assumption	Tablespace					
	Name	Frequented			Size	File System
		intensely	moderately	less		
Automated and human centric BPC process are intensely operated in equal parts	BPC4052C01_WORKITEM	x			50 M	/disk3
	BPC4052C01_INSTANCE	x			500 M	/disk3
	BPC4052C01_STAFFQRY	x			10 M	/disk4
	BPCMSG4052C01_UDT	x			100 M	/disk5
Hybrid applications are intensely operated	PSS4052C01_UDT	x			100 M	/disk4
	PSSMSG4052C01_UDT	x			100 M	/disk5
Asynchronous SCA messaging is intensely used throughout all applications	SCASYSMSG4052C01_UDT	x			100 M	/disk5
Performance Data Warehouse is moderately used	PDW4052C01_UDT		x		100 M	/disk6
	PDWMSG4052C01_UDT		x		100 M	/disk6
BPC Reporting is moderately used	BPC4052C01_OBSVRIDX		x		250 M	/disk6
	BPC4052C01_OBSVRLOB		x		200 M	/disk7
	BPC4052C01_OBSVRTS		x		100 M	/disk7
BusinessSpace is moderately used	BSP4052C01_REGTABSPACE		x		100 M	/disk7
	BSP4052C01_BSPACE		x		100 M	/disk8
No expectations regarding the components related to the remaining tablespaces, therefore assuming moderate usage.	COM4052C01_UDT		x		100 M	/disk8
	BPC4052C01_INDEXTS		x		250 M	/disk8
	BPC4052C01_TEMPLATE		x		100 M	/disk8
Audit logging is likely not used	BPC4052C01_AUDITLOG			x	50 M	/disk9
Common Event Infrastructure is likely not used	CEIMSG4052C01_UDT			x	50 M	/disk9
Large Business Objects are likely not used in BPC processes	BPC4052C01_LOBTS			x	50 M	/disk9
custom JMS messaging (custom destinations) are likely not used	SCAAPPMSG4052C01_UDT			x	50 M	/disk9
The scheduler is likely not used	BPC4052C01_SCHEDTS			x	5 M	/disk9

Note: In order to determine the optimal configuration for your system it is recommended to run several performance tests with different configuration settings. For further information consider the BPM v7 performance redpaper: <http://www.redbooks.ibm.com/redpieces/pdfs/redp4664.pdf>

2.4.2.5 BPM schema roles and privileges planning

The following tables show an overview about all roles and privileges that are required.

Role	Description
CONNECT	Enables a user to connect to the database. Grant this role to any user or application that needs database access. If a user is created using Oracle Enterprise Manager Database Control, this role is automatically granted to the user.
RESOURCE	Enables a user to create, modify, and delete certain types of schema objects in the schema associated with that user. Grant this role only to developers and to other users that must create schema objects. This role grants a subset of the create object system privileges. For example, it grants the CREATE TABLE system privilege, but does not grant the CREATE VIEW system privilege. It grants only the following privileges: CREATE CLUSTER, CREATE INDEXTYPE, CREATE OPERATOR, CREATE PROCEDURE, CREATE SEQUENCE, CREATE TABLE, CREATE TRIGGER, CREATE TYPE. In addition, this role grants the UNLIMITED TABLESPACE system privilege, which effectively assigns a space usage quota of UNLIMITED on all tablespaces in which the user creates schema objects.
JAVAUSERPRIV	Enables a user to use Java, also see following technote: http://www.ibm.com/support/docview.wss?uid=swg21377372

System Privileges	Description
UNLIMITED TABLESPACE	Permits a user to use an unlimited amount of any tablespace in the database, grant the user the UNLIMITED TABLESPACE system privilege. This overrides all explicit tablespace quotas for the user. If the privilege is later revoked, then explicit quotas again take effect. This privilege can only be granted to users, not to roles.
CREATE VIEW	Enables a user to create a view in his own user schema.
FORCE ANY TRANSACTION	Enables a user to force the completion of any pending XA transaction.

Object Privileges	Description
EXECUTE ON DBMS_LOCK	Enables a user to execute SYS package DBMS_LOCK
SELECT ON DBA_PENDING_TRANSACTIONS	Enables a user to select data from SYS view DBA_PENDING_TRANSACTIONS
SELECT ON PENDING_TRANS\$	Enables a user to select data from SYS table PENDING_TRANS\$
SELECT ON DBA_2PC_PENDING	Enables a user to select data from SYS view DBA_2PC_PENDING
EXECUTE ON DBMS_XA	Enables a user to execute SYS package DBMS_XA

The following table shows the roles and privileges that are required by each BPM user.

User name (=Schema)	Roles	System Privileges	Object Privileges
BPC4052C01	CONNECT, RESOURCE, JAVAUSERPRIV	UNLIMITED TABLESPACE*	-
PDW4052C01	CONNECT, RESOURCE	UNLIMITED TABLESPACE*	EXECUTE ON DBMS_LOCK

PSS4052C01	CONNECT, RESOURCE	UNLIMITED TABLESPACE*	-
BSP4052C01	CONNECT, RESOURCE	UNLIMITED TABLESPACE*	-
COM4052C01	CONNECT, RESOURCE, JAVAUSERPRIV	UNLIMITED TABLESPACE*, CREATE VIEW	-
BPCMSG4052C01	CONNECT, RESOURCE	UNLIMITED TABLESPACE*	-
PDWMSG4052C01	CONNECT, RESOURCE	UNLIMITED TABLESPACE*	-
PSSMSG4052C01	CONNECT, RESOURCE	UNLIMITED TABLESPACE*	-
CEIMSG4052C01	CONNECT, RESOURCE	UNLIMITED TABLESPACE*	-
SCASYSMSG4052C01	CONNECT, RESOURCE	UNLIMITED TABLESPACE*	-
SCAAPMSG4052C01	CONNECT, RESOURCE	UNLIMITED TABLESPACE*	-
XAREC4052C01	CONNECT	FORCE ANY TRANSACTION	SELECT ON DBA_PENDING_TRANSACTIONS, SELECT ON PENDING_TRANS\$, SELECT ON DBA_2PC_PENDING, EXECUTE ON DBMS_XA,

* implicitly granted by RESOURCE role.

Chapter 3 System Preparation



Involved systems:

Database machine: fmtc6152.boeblingen.de.ibm.com
Deployment manager: fmtc4052.boeblingen.de.ibm.com
Custom node 1: fmtc4054.boeblingen.de.ibm.com
Custom node 2: fmtc4055.boeblingen.de.ibm.com

3.1 Install operating system

In this document it is assumed that a pre-installed Red Hat Enterprise Linux system can be used on all involved machines. Therefore the installation steps of the operating system are skipped.

Thus continue directly to check/provide the prerequisites.

Verify operating system level. Please note that this is only a sample and the output on the actual used system might be different.

```
cat /etc/redhat-release
```

```
Red Hat Enterprise Linux Server release 5.6 (Tikanga)
```

```
cat /proc/version
```

```
Linux version 2.6.18-238.9.1.el5 (mockbuild@x86-002.build.bos.redhat.com)  
(gcc version 4.1.2 20080704 (Red Hat 4.1.2-50)) #1 SMP Fri Mar 18 12:42:39  
EDT 2011
```

3.2 Prerequisite checking

Check on all machines, that the BPM V7.5 required prerequisites are met. Do this using the information provided in the Information Center:

"Preparing to install and configure the software":

http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp?topic=/com.ibm.wbpm.imuc.doc/topics/cins_preparing.html

"Preparing Linux systems for installation":

http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp?topic=/com.ibm.wbpm.imuc.doc/topics/prep_bpm_os_lin.html

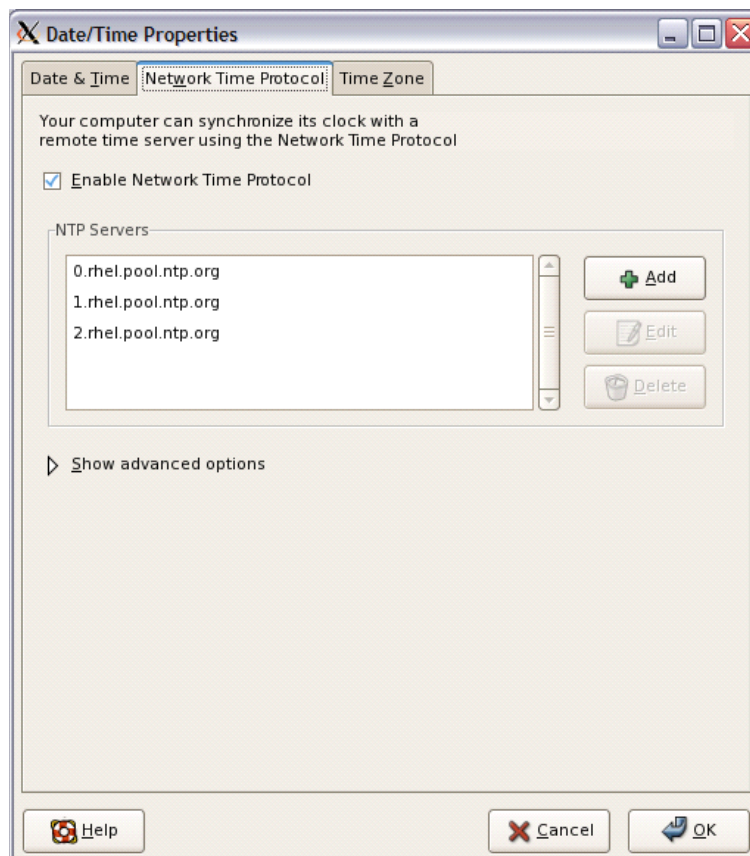
3.3 Time server setup

To avoid conflicts in a production environment caused by date/time mismatch in a cell, all machines running BPM components as well as the system hosting the database system are set up to receive their system date and time from a time server:

1. Logon as `root`
(if you are not using the native system console ensure x11 forwarding is enabled)
2. Start the graphical Configuration Tool `/usr/bin/system-config-time`
3. Select Tab "Network Time Protocol" and set
4. Servers (primary, secondary, tertiary): `0.rhel.pool.ntp.org`, `1.rhel.pool.ntp.org`, `2.rhel.pool.ntp.org`

Note: Alternately you may use other time servers.

5. Enable Network Time Protocol: selected
6. Click Ok.



3.4 Get the software packages

Obtain the required software packages of the desired product version and fix packs in a format that fits your needs best (DVD, CD, zip-pkg ...)

3.4.1 IBM Business Process Manager Advanced V7.5

When downloading IBM Business Process Manager from the IBM Passport Advantage Web site several assemblies can be found. The following table show the necessary information needed to get the right packages for IBM Business Process Manager Advanced V7.5 for Linux (it is contained in the Media pack # BA117ML).

IBM Business Process Manager Advanced Version 7.5 for Linux x86 32/x86 64bit eAssembly	CREW7ML		
Business Process Manager Advanced Version 7.5 Multiplatform Multilingual QSG	CI0KBML	1.7MB	BPM_Adv_QuickStartGuide.zip
Business Process Manager Advanced Version 7.5 for Linux x86 32/x86 64bit - 1 of 3	CI0BFML	1.9GB	BPM_Adv_V7.5_Linux_x86_1_of_3.tar.gz
Business Process Manager Advanced Version 7.5 for Linux x86 32/x86 64bit - 2 of 3	CI0BGML	1.2GB	BPM_Adv_V7.5_Linux_x86_2_of_3.tar.gz
Business Process Manager Advanced Version 7.5 for Linux x86 32/x86 64bit - 3 of 3	CI0BHML	1.4GB	BPM_Adv_V7.5_Linux_x86_3_of_3.tar.gz
WAS Network Deployment V7 Supplement for Linux on AMD 64b CD 1	C1G36ML	0.25GB	WASND70_Supplements_1_LinuxX86_64Bit_C1G36ML.tar.gz
WAS Network Deployment V7 Supplement for Linux on AMD 64b CD 2	C1G37ML	0.27GB	WASND70_Supplements_2_LinuxX86_64Bit_C1G37ML.tar.gz

For other platforms (operating systems including 32 and 64 bit architecture) similar assemblies and packages are available.

In addition check if mandatory or optional iFixes are available for downloading. On the following support page check for IBM Business Process Manager Advanced:

<http://www.ibm.com/support/entry/portal/Overview/>

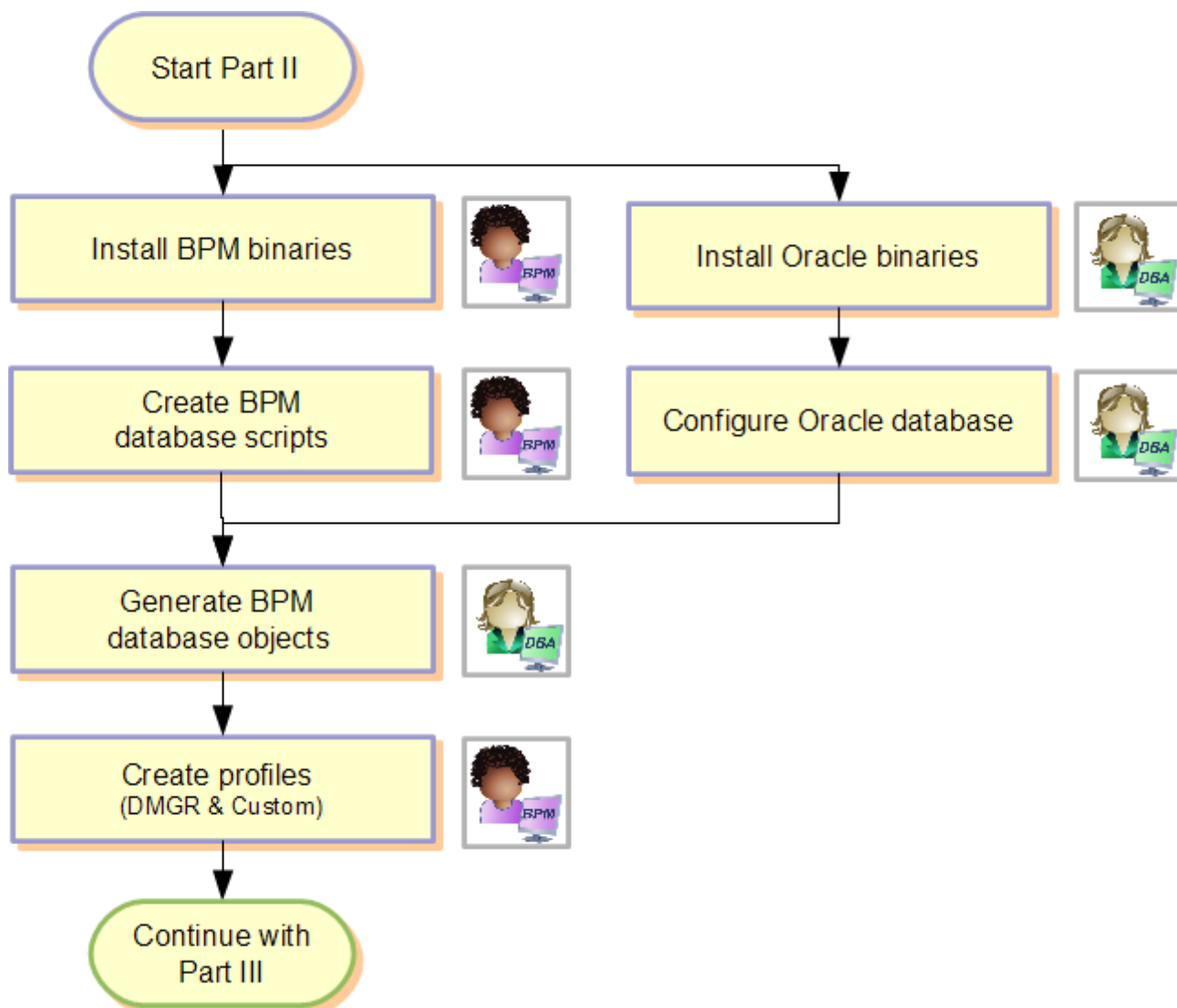
For the installation of the products and fixpacks the files have been copied to a local directory on each machine.
Hint: This could also be a shared directory.

3.4.2 Oracle 11g Release 2 (11.2.0.2.0)

Get the Oracle database installation media for example:

- a DVD containing the 64-bit version of the Oracle 11g R2

Part II: Combined BPM Administrator and Database Administrator (DBA) tasks



Chapter 4 Install the BPM binaries



Involved systems:

Deployment manager: fmtc4052.boeblingen.de.ibm.com
Custom node 1: fmtc4054.boeblingen.de.ibm.com
Custom node 2: fmtc4055.boeblingen.de.ibm.com

Extract the BPM binaries to **/BPMtmp**:

```
cd /BPMtmp/  
tar -xvf /<BPM_PS_BINARIES>/bpmAll.dvd.7500.linux.ia32.amd64.DISK1.tar.gz;  
tar -xvf /<BPM_PS_BINARIES>/bpmPS.dvd.7500.linux.ia32.amd64.DISK2.tar.gz ;  
tar -xvf /<BPM_PS_BINARIES>/bpmAll.dvd.7500.linux.ia32.amd64.DISK3.tar.gz
```

In order to install BPM silently a response file is required.

Navigate to **/BPMtmp/responsefiles/BPM**:

```
cd /BPMtmp/responsefiles/BPM
```

Create a backup copy of the response file

```
cp template_response.xml template_responseBACKUP.xml
```

1. As user **root** open **template_response.xml** in a text editor, find the **server** section and comment out the **32bit repository**.

Before change (original):

```
<server>  
  <!-- ## IBM Installation Repository Location ##-->  
  <repository location='../..//IM/' temporary='true'/>  
  <!-- ## IBM Business Process Manager Advanced - Process Server, WebSphere  
    Application Server ND, DB2 Express, WebSphere Application Server  
    Feature Pack for XML, and WebSphere Application Server Feature  
    Pack for SCA ##-->  
  <repository location="../..//repository/repos_32bit/" />  
  <!-- Remove this repository if installing on a 64 bit system -->  
  <repository location="../..//repository/repos_64bit/" />  
  <!-- Remove this repository if installing on a 32 bit system -->  
  <!-- ## WebSphere Application Server Live Update Repository ##-->  
  <!-- repository  
    location="http://public.dhe.ibm.com/software/websphere/repositories/" /-->  
</server>
```

After change:

```
<server>
  <!-- ## IBM Installation Repository Location ##-->
  <repository location='../..'/IM/' temporary='true' />
  <!-- ## IBM Business Process Manager Advanced - Process Server, WebSphere
        Application Server ND, DB2 Express, WebSphere Application Server
        Feature Pack for XML, and WebSphere Application Server Feature
        Pack for SCA ##-->
  <!-- <repository location="../../repository/repos_32bit/" /> -->
  <!-- Remove this repository if installing on a 64 bit system -->
  <repository location="../../repository/repos_64bit/" />
  <!-- Remove this repository if installing on a 32 bit system -->
  <!-- ## WebSphere Application Server Live Update Repository ##-->
  <!-- repository
location="http://public.dhe.ibm.com/software/websphere/repositories/" /-->
</server>
```

2. Find the **profile kind** section. Replace **`${INSTALL_LOCATION_IM}`** by **`/opt/IBM`** in order to specify where the IBM Installation Manager is going to be installed.

Before change (original):

```
<profile kind='self' installLocation='${INSTALL_LOCATION_IM}' id='IBM In
stallation Manager'>
  <data key='eclipseLocation' value='${INSTALL_LOCATION_IM}' />
</profile>
```

After change:

```
<profile kind='self' installLocation='/opt/IBM' id='IBM In
stallation Manager'>
  <data key='eclipseLocation' value='/opt/IBM' />
</profile>
```

3. Find the **profile installLocation** section. Replace **`${INSTALL_LOCATION}`** by **`/bpm75`** in order to specify where BPM is going to be installed. Since the 64bit version is going to be installed set **`user.select.64bit.image, com.ibm.websphere.ND.v70`** to **`true`**.

Before change (original):

```
<profile installLocation='${INSTALL_LOCATION}' id='IBM Business Process
Manager Advanced - Process Server'>
  <data key='eclipseLocation' value='${INSTALL_LOCATION}' />
  <data key="cic.selector.nl" value="en" />
  <data key='user.import.profile' value='false' />
  <data key='user.select.64bit.image, com.ibm.websphere.ND.v70'
value='false' />
  <!-- #####
  <data key='user.bpm.admin.username' value='admin' />
  <data key='user.bpm.admin.password' value='admin' />
  #####-->
</profile>
```

After change:

```
<profile installLocation='/bpm75' id='IBM Business Process Manager
Advanced - Process Server'>
  <data key='eclipseLocation' value='/bpm75' />
  <data key="cic.selector.nl" value="en" />
  <data key='user.import.profile' value='false' />
  <data key='user.select.64bit.image, com.ibm.websphere.ND.v70'
value='true' />
  <!-- #####
  <data key='user.bpm.admin.username' value='admin' />
  <data key='user.bpm.admin.password' value='admin' />
  #####-->
</profile>
```

3. Find the second install section. Replace `${FEATURE_LIST}` by `wps.client.feature`, `wps.server.feature` and `wps.samples.feature`). Since the environment is going to be created with a Oracle database there is no need to install DB2 Express, therefore comment out the `DB2 Express offering`.

Before change (original):

```
<install>
  <offering profile="IBM Business Process Manager Advanced - Process Ser
ver" id="com.ibm.websphere.ND.v70" features='core.feature,samples,im
port.productProviders.feature,import.configLauncher.feature,consoleLan
guagesSupport.feature,runtimeLanguagesSupport.feature' />
  <offering profile="IBM Business Process Manager Advanced - Process Ser
ver" id="com.ibm.websphere.XML.v10" />
  <offering profile="IBM Business Process Manager Advanced - Process Ser
ver" id="com.ibm.websphere.SCA.v10" />
  <offering profile="IBM Business Process Manager Advanced - Process Ser
ver" id="com.ibm.ws.WBPMPS" features='${FEATURE_LIST}' />
  <offering profile="IBM Business Process Manager Advanced - Process Server"
id="com.ibm.ws.DB2EXP97.linuxia32" />
</install>
```

After change:

```
<install>
  <offering profile="IBM Business Process Manager Advanced - Process Ser
ver" id="com.ibm.websphere.ND.v70" features='core.feature,samples,im
port.productProviders.feature,import.configLauncher.feature,consoleLan
guagesSupport.feature,runtimeLanguagesSupport.feature' />
  <offering profile="IBM Business Process Manager Advanced - Process Ser
ver" id="com.ibm.websphere.XML.v10" />
  <offering profile="IBM Business Process Manager Advanced - Process Ser
ver" id="com.ibm.websphere.SCA.v10" />
  <offering profile="IBM Business Process Manager Advanced - Process Ser
ver" id="com.ibm.ws.WBPMPS"
features='wps.client.feature,wps.server.feature,wps.samples.feature' />
  <!--<offering profile="IBM Business Process Manager Advanced - Process
Server" id="com.ibm.ws.DB2EXP97.linuxia32" />-->
</install>
```

Save and close `template_response.xml`.

4. To start the installation run following command:

```
/BPMtmp/IM/installc -acceptLicense input
/BPMtmp/responsefiles/BPM/template_response.xml -log silent_install.log
```

Wait until the command and thus the installation completes (this may take a few minutes).

4.1 Verify BPM binary installation

Verify the success of the binary installation by examining the BPM log files. If the last line of the file contains the word **INSTCONFSUCCESS** BPM was installed successfully.

The log file is located here:

```
/bpm75/logs/install/installconfig.log
```

On each machine make a BPM version info check. To check the BPM version specify the following command on each machine:

```
/bpm75/bin/versionInfo.sh
```

This results in the following report. Check if the version numbers are compliant on each machine:

```
-----  
IBM WebSphere Application Server Product Installation Status Report  
-----
```

```
Report at date and time May 30, 2011 5:57:28 PM GMT+01:00
```

```
Installation  
-----
```

```
Product Directory      /bpm75  
Version Directory     /bpm75/properties/version  
DTD Directory         /bpm75/properties/version/dtd  
Log Directory         /bpm75/logs  
Backup Directory     /bpm75/properties/version/nif/backup  
TMP Directory        /tmp
```

```
Product List  
-----
```

```
XML                   installed  
SCA                   installed  
BPMPS                 installed  
ND                   installed
```

```
Installed Product  
-----
```

```
Name                 XML Feature Pack  
Version              1.0.0.9  
ID                   XML  
Build Level          cf091117.04  
Build Date           4/29/11  
Architecture         AMD (64 bit)
```

```
Installed Product
```

```
-----
Name                SCA Feature Pack
Version             1.0.1.11
ID                 SCA
Build Level         cf111118.05
Build Date          5/6/11
Architecture        AMD (64 bit)
```

Installed Product

```
-----
Name                IBM Business Process Manager Advanced V7.5 -
Process Server
Version             7.5.0.0
ID                 BPMPS
Build Level         o1120.12
Build Date          5/18/11
Architecture        AMD (64 bit)
```

Installed Product

```
-----
Name                IBM WebSphere Application Server - ND
Version             7.0.0.17
ID                 ND
Build Level         cf171115.15
Build Date          4/16/11
Architecture        AMD (64 bit)
```

End Installation Status Report

Note: Verify that the 64bit software has been installed (Architecture AMD (64bit))

Chapter 5 Create the BPM database scripts



Involved systems:

Deployment manager: fmtc4052.boeblingen.de.ibm.com

After the BPM Process Server binaries have been installed the database scripts which are required by the database administrator to create the database objects (users, tablespaces, tables) have to be generated. Scripts are needed for the following BPM components:

- Business Process Choreographer (BPC) including the Reporting function
- Performance Data Warehouse
- Process Server
- Business Space
- Common BPM functionality
- Service Integration Bus (SIB) Messaging Engines

In order to create the required scripts a utility provided by Business Process Manager called Database Design Generator is going to be used. Currently the Database Design Generator does not generate scripts for all database objects that are required. Those scripts that won't be generated by the Database Design Generator have to be created additionally according to following table:

User (=Schema)	Scripts generated by Database Design Generator		
	Create user	Create tablespaces	Create tables
BPC4052C01	yes	yes	yes
PDW4052C01	no*	no*	yes
PSS4052C01	no*	no*	yes
BSP4052C01	yes	yes	yes
COM4052C01	yes	no*	yes
Messaging - BPCMSG4052C01 - PDWMSG4052C01 - PSSMSG4052C01 - CEIMSG4052C01 - SCASYSMSG4052C01 - SCAAPPMSG4052C01	yes	no*	yes

* have to be created additionally.

At the moment it is possible to define only one common tablespace directory for the predefined tablespaces that are required by Business Process Choreographer (incl. Reporting function) and BusinessSpace. In order to distribute the tablespaces accross the recommended file systems (as defined in the planning section) the generated scripts will have to be altered once they have been generated.

5.1 Create Scripts for BPC

Navigate to **/bpm75/util/dbUtils**:

```
cd /bpm75/util/dbUtils
```

At this point no scripts or properties files exist:

```
ls -l
```

```
-rwxr-xr-x 1 root root 1308 Jun  1 16:02 DbDesignGenerator.sh
drwxr-xr-x 2 root root 4096 Jun  1 16:04 profileHelpers
```

1. As user **root** start the Database Design Generator:

```
./DbDesignGenerator.sh
```

```
[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu;
'?' for help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment
Environment
(2)Create a database design for a single component
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]
```

2. Enter **2** to create a database design for a single component, then hit enter:

```
Please enter the number for the design option :2
```

```
(1)bpc
(2)bpcreporting
(3)bpm_performancedw
(4)bpm_processserver
(5)bspace
(6)cei
(7)commondb
(8)sca
(9)sibme
```

3. Enter **1** to create a database design for the Business Process Choreographer, then hit enter:

```
Please enter the number for the component :1
```

```
[info] Please pick one of the following [database type(s)] :  
  
(1) DB2-distributed  
(2) DB2-zOS  
(3) Oracle  
(4) SQL Server
```

4. Enter **3** to select Oracle, then hit enter:

```
Please enter the number for the database type :3
```

```
[info] Please enter the values for the properties in the database objects  
section.
```

```
[info] Please pick one of the following [scenario(s)] :
```

```
(1) Configuration  
(2) Migration  
(3) Removal  
(4) WorkItemMigration
```

5. Leave the default (**Configuraton**) and hit enter:

```
Please enter the number for the scenario [default=Configuration]
```

6. Enter the Database name (**ORA11DB**), then hit enter:

```
Database name (SID) [default=BPEDB] :ORA11DB
```

7. Enter the Database schema/user name (**BPC4052C01**), then hit enter:

```
Database schema name / user (leave empty to use implicit schema) [default=]  
:BPC4052C01
```

8. Enter the password for user **BPC4052C01**, then hit enter:

```
Password for database schema user [default=] :<BPC4052C01_password>
```

9. Select to use tablespaces (default) and hit enter:

```
Use tablespaces (true/false)?[default=true] :
```

10. Enter **/opt/oracle/oradata/ORA11DB** as tablespace directory, then hit enter:

```
Tablespace directory (only needed when using tablespaces)[default=]  
:/opt/oracle/oradata/ORA11DB
```

Note: **/opt/oracle/oradata/ORA11DB** is used as placeholder and will be replaced by the intended tablespace directories once the scripts have been generated.

11. Enter **BPC4052C01_AUDITLOG** for audit log items, then hit enter:

```
Tablespace for audit log items (leave default when not using tablespaces)  
[default=AUDITLOG] :BPC4052C01_AUDITLOG
```

12. Enter **BPC4052C01_INDEXTS** for the indexes of all tables, then hit enter:

```
Tablespace for indexes for all tables (leave default when not using  
tablespaces)[default=INDEXTS] :BPC4052C01_INDEXTS
```

13. Enter **BPC4052C01_INSTANCE** for instance items, then hit enter:

```
Tablespace for instance items (leave default when not using tablespaces)  
[default=INSTANCE] :BPC4052C01_INSTANCE
```

14. Enter **BPC4052C01_LOBTS** for the large objects of all tables, then hit enter:

```
Tablespace for large objects for all tables (leave default when not using  
tablespaces)[default=LOBTS] :BPC4052C01_LOBTS
```

15. Enter **BPC4052C01_SCHEDTS** for scheduler items, then hit enter:

```
Tablespace for scheduler items (leave default when not using tablespaces)  
[default=SCHEDTS] :BPC4052C01_SCHEDTS
```

16. Enter **BPC4052C01_STAFFQRY** for staff query items, then hit enter:

```
Tablespace for staff query items (leave default when not using  
tablespaces)[default=STAFFQRY] :BPC4052C01_STAFFQRY
```

17. Enter **BPC4052C01_TEMPLATE** for template items, then hit enter:

```
Tablespace for template items (leave default when not using tablespaces)
[default=TEMPLATE] :BPC4052C01_TEMPLATE
```

18. Enter **BPC4052C01_WORKITEM** for work item tables and indexes, then hit enter:

```
Tablespace for work item tables and indexes (leave default when not using
tablespaces) [default=WORKITEM] :BPC4052C01_WORKITEM
```

```
[info] You have completed database objects section properties needed for
database scripts generation.
```

19. Leave the default (empty) on the next prompt and hit enter:

```
To skip data source properties, enter 's'; or enter anything else to
continue :
```

```
[info] Please pick one of the following [database provider(s)] :
```

```
(1)Oracle JDBC Driver (XA)
```

20. Leave the default (**Oracle JDBC Driver (XA)**) as database provider, then hit enter:

```
Please enter the number for the database provider [default=Oracle JDBC
Driver (XA)] :
```

```
[info] Please enter the values for the properties in the data source
properties section.
```

21. Enter **false** since the database tables are going to be created manually using the created scripts, then hit enter:

```
Automatically create the database tables when the database is accessed for
the first time (true/false)?[default=true] :false
```

```
[info] Please pick one of the following [Oracle driver type(s)] :
```

```
(1)oci
(2)thin
```

22. Leave the default (**thin**) as Oracle driver type, then hit enter:

```
Please enter the number for the Oracle driver type [default=thin] :
```

23. Enter the Database server host (**fmtc6152.boeblingen.de.ibm.com**) and hit enter:

```
Database server host[default=] :fmtc6152.boeblingen.de.ibm.com
```

24. Enter the Database server port (**1521**), then hit enter:

```
Database server port[default=1521] :
```

25. Leave the Data source username default (**BPC4052C01**) and hit enter:

```
Data source user name[default=BPC4052C01] :
```

26. Leave the default Data source password (this is the same password that has already been specified for database schema user **BPC4052C01**) and hit enter:

```
Data source password[default=*****] :
```

27. Leave the default Oracle JDBC driver path and hit enter:

```
Oracle JDBC driver path[default=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle] :
```

28. Leave the default for the output directory in order to create the scripts in the current directory, then hit enter:

```
Please enter the output directory [default=/bpm75/util/dbUtils] :
```

29. Enter **BPC_Oracle_BPC4052C01.properties** as output filename, then hit enter:

```
In order to achieve the desired tablespace distribution that has been defined in chapter XXXPlease enter the output filename [default=BPC_Oracle.properties] : BPC_Oracle_BPC4052C01.properties
```

```
[info] The database design has been generated in/bpm75/util/dbUtils/BPC_Oracle_BPC4052C01.properties
```

30. Leave the default to generate the database scripts and hit enter:

```
generate database scripts? (y/n) [default=y] :
```

31. Enter **Oracle-BPC-BPC4052C01** as output directory, then hit enter:

```
Please enter the output directory for BPC [default=Oracle-BPC] :  
Oracle-BPC-BPC4052C01
```

```
[info] The script(s) have been generated in /bpm75/util/dbUtils/Oracle-  
BPC-BPC4052C01  
[info] thanks, quitting now ...
```

At this point a properties file (**BPC_Oracle_BPC4052C01.properties**) and a folder which contains the corresponding database scripts (**Oracle-BPC-BPC4052C01**) have been created:

```
ls -l
```

```
... BPC_Oracle_BPC4052C01.properties  
... dbDesignGenerator.log  
... DbDesignGenerator.sh  
... Oracle-BPC-BPC4052C01  
... profileHelpers
```

In order to achieve the desired tablespace distribution that has been defined in the planning section the script that is going to be used to create the Business Process Choreographer tablespaces has to be altered. Navigate to **Oracle-BPC-BPC4052C01**, then open **createTablespace.sql** in a text editor:

```
CREATE TABLESPACE BPC4052C01_AUDITLOG  
  DATAFILE '/opt/oracle/oradata/ORA11DB/BPC4052C01_AUDITLOG.dbf' SIZE 100M  
  AUTOEXTEND ON NEXT 20M MAXSIZE UNLIMITED LOGGING;  
CREATE TABLESPACE BPC4052C01_INSTANCE  
  DATAFILE '/opt/oracle/oradata/ORA11DB/BPC4052C01_INSTANCE.dbf' SIZE 500M  
  AUTOEXTEND ON NEXT 100M MAXSIZE UNLIMITED LOGGING;  
CREATE TABLESPACE BPC4052C01_STAFFQRY  
  DATAFILE '/opt/oracle/oradata/ORA11DB/BPC4052C01_STAFFQRY.dbf' SIZE 10M  
  AUTOEXTEND ON NEXT 2M MAXSIZE UNLIMITED LOGGING;  
CREATE TABLESPACE BPC4052C01_TEMPLATE  
  DATAFILE '/opt/oracle/oradata/ORA11DB/BPC4052C01_TEMPLATE.dbf' SIZE 100M  
  AUTOEXTEND ON NEXT 20M MAXSIZE UNLIMITED LOGGING;  
CREATE TABLESPACE BPC4052C01_WORKITEM  
  DATAFILE '/opt/oracle/oradata/ORA11DB/BPC4052C01_WORKITEM.dbf' SIZE 50M  
  AUTOEXTEND ON NEXT 10M MAXSIZE UNLIMITED LOGGING;  
CREATE TABLESPACE BPC4052C01_LOBTS  
  DATAFILE '/opt/oracle/oradata/ORA11DB/BPC4052C01_LOBTS.dbf' SIZE 200M  
  AUTOEXTEND ON NEXT 40M MAXSIZE UNLIMITED LOGGING;
```

```

CREATE TABLESPACE BPC4052C01_INDEXTS
  DATAFILE '/opt/oracle/oradata/ORA11DB/BPC4052C01_INDEXTS.dbf' SIZE 250M
AUTOEXTEND ON NEXT 50M MAXSIZE UNLIMITED LOGGING;
-- start import scheduler DDL: createTablespaceOracle.ddl
CREATE TABLESPACE BPC4052C01_SCHEDTS DATAFILE
'/opt/oracle/oradata/ORA11DB/BPC4052C01_SCHEDTS.dbf' SIZE 5M AUTOEXTEND ON
NEXT 1M MAXSIZE UNLIMITED;
-- end import scheduler DDL: createTablespaceOracle.ddl

```

The default tablespace datafile path (**/opt/oracle/oradata/ORA11DB**) has been inserted. Now alter **createTablespace.sql** according to what has been defined in the planning section (tablespace datafile location and datafile size). The result should look like this:

```

CREATE TABLESPACE BPC4052C01_AUDITLOG
  DATAFILE '/disk9/BPC4052C01_AUDITLOG.dbf' SIZE 50M AUTOEXTEND ON NEXT
20M MAXSIZE UNLIMITED LOGGING;
CREATE TABLESPACE BPC4052C01_INSTANCE
  DATAFILE '/disk3/BPC4052C01_INSTANCE.dbf' SIZE 500M AUTOEXTEND ON NEXT
100M MAXSIZE UNLIMITED LOGGING;
CREATE TABLESPACE BPC4052C01_STAFFQRY
  DATAFILE '/disk4/BPC4052C01_STAFFQRY.dbf' SIZE 10M AUTOEXTEND ON NEXT 2M
MAXSIZE UNLIMITED LOGGING;
CREATE TABLESPACE BPC4052C01_TEMPLATE
  DATAFILE '/disk8/BPC4052C01_TEMPLATE.dbf' SIZE 100M AUTOEXTEND ON NEXT
20M MAXSIZE UNLIMITED LOGGING;
CREATE TABLESPACE BPC4052C01_WORKITEM
  DATAFILE '/disk3/BPC4052C01_WORKITEM.dbf' SIZE 50M AUTOEXTEND ON NEXT
10M MAXSIZE UNLIMITED LOGGING;
CREATE TABLESPACE BPC4052C01_LOBTS
  DATAFILE '/disk9/BPC4052C01_LOBTS.dbf' SIZE 50M AUTOEXTEND ON NEXT 40M
MAXSIZE UNLIMITED LOGGING;
CREATE TABLESPACE BPC4052C01_INDEXTS
  DATAFILE '/disk8/BPC4052C01_INDEXTS.dbf' SIZE 250M AUTOEXTEND ON NEXT
50M MAXSIZE UNLIMITED LOGGING;
-- start import scheduler DDL: createTablespaceOracle.ddl
CREATE TABLESPACE BPC4052C01_SCHEDTS DATAFILE
'/disk9/BPC4052C01_SCHEDTS.dbf' SIZE 5M AUTOEXTEND ON NEXT 1M MAXSIZE
UNLIMITED;
-- end import scheduler DDL: createTablespaceOracle.ddl

```

After you have finished editing the file save and close **createTablespace.sql**.

5.2 Create Scripts for BPC Reporting function

1. As user **root** start the Database Design Generator again:

```
./DbDesignGenerator.sh
```

```
[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu;
'?' for help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment
Environment
(2)Create a database design for a single component
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]
```

2. Enter **2** to create a database design for a single component, then hit enter:

```
Please enter the number for the design option :2
```

```
(1)bpc
(2)bpcreporting
(3)bpm_performancedw
(4)bpm_processserver
(5)bspace
(6)cei
(7)commondb
(8)sca
(9)sibme
```

3. Enter **2** to create a database design for the Business Process Choreographer Reporting function, then hit enter:

```
Please enter the number for the component :2
```

```
[info] Please pick one of the following [database type(s)] :

(1)DB2-distributed
(2)DB2-zOS
(3)Oracle
(4)SQL Server
```

4. Enter **3** to select Oracle, then hit enter:

```
Please enter the number for the database type :3
```

```
[info] Please enter the values for the properties in the database objects section.
```

```
[info] Please pick one of the following [scenario(s)] :
```

```
(1) Configuration  
(2) Removal
```

5. Leave the default (**Configuration**) and hit enter:

```
Please enter the number for the scenario [default=Configuration]
```

6. Enter the Database name (**ORA11DB**), then hit enter:

```
Database name (SID) [default=BPEDB] :ORA11DB
```

7. Enter the Database schema/user name (**BPC4052C01**), then hit enter:

```
Database schema name / user (leave empty to use implicit schema) [default=]  
:BPC4052C01
```

8. Enter the password for user **BPC4052C01**, then hit enter:

```
Password for database schema user [default=] :<BPC4052C01_password>
```

9. Select to use tablespaces (default) and hit enter:

```
Use tablespaces (true/false)? [default=true] :
```

10. Enter **/opt/oracle/oradata/ORA11DB** as tablespace directory, then hit enter:

```
Tablespace directory (only needed when using tablespaces) [default=]  
:/opt/oracle/oradata/ORA11DB
```

Note: **/opt/oracle/oradata/ORA11DB** is used as placeholder and will be replaced by the intended tablespace directories once the scripts have been generated.

11. Enter **BPC4052C01_OBSVRIDX** for Reporting function indexes, then hit enter:

```
Tablespace for Reporting function indexes (leave default when not using  
tablespaces)[default=OBSVRIDX] :BPC4052C01_OBSVRIDX
```

12. Enter **BPC4052C01_OBSVRLOB** for Reporting function large objects, then hit enter:

```
Tablespace for Reporting function large objects (leave default when not  
using tablespaces)[default=OBSVRLOB] :BPC4052C01_OBSVRLOB
```

13. Enter **BPC4052C01_OBSVRTS** for Reporting function tables, then hit enter:

```
Tablespace for Reporting function tables (leave default when not using  
tablespaces)[default=OBSVRTS] :BPC4052C01_OBSVRTS
```

```
[info] You have completed database objects section properties needed for  
database scripts generation.
```

14. Leave the default (empty) on the next prompt and hit enter:

```
To skip data source properties, enter 's'; or enter anything else to  
continue :
```

```
[info] Please pick one of the following [database provider(s)] :
```

```
(1)Oracle JDBC Driver (XA)
```

15. Leave the default (**Oracle JDBC Driver (XA)**) as database provider, then hit enter:

```
Please enter the number for the database provider [default=Oracle JDBC  
Driver (XA)] :
```

```
[info] Please enter the values for the properties in the data source  
properties section.
```

16. Enter **false** since the database tables are going to be created manually using the created scripts, then hit enter:

```
Automatically create the database tables when the database is accessed for  
the first time (true/false)?[default=true] :false
```

```
[info] Please pick one of the following [Oracle driver type(s)] :
```

```
(1)oci  
(2)thin
```

17. Leave the default (**thin**) as Oracle driver type, then hit enter:

```
Please enter the number for the Oracle driver type [default=thin] :
```

18. Enter the Database server host (**fmtc6152.boeblingen.de.ibm.com**) and hit enter:

```
Database server host[default=] :fmtc6152.boeblingen.de.ibm.com
```

19. Enter the Database server port (**1521**), then hit enter

```
Database server port[default=1521] :
```

20. Leave the Data source username default (**BPC4052C01**) and hit enter:

```
Data source user name[default=BPC4052C01] :
```

21. Leave the default Data source password (this is the same password that has already been specified for database schema user **BPC4052C01**) and hit enter:

```
Data source password[default=*****] :
```

22. Leave the default Oracle JDBC driver path and hit enter:

```
Oracle JDBC driver path[default=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle] :
```

23. Leave the default for the output directory in order to create the scripts in the current directory, then hit enter:

```
Please enter the output directory [default=/bpm75/util/dbUtils] :
```

24. Enter **BPCReporting_Oracle_BPC4052C01.properties** as output filename, then hit enter:

```
Please enter the output filename[default=BPCReporting_Oracle.
Properties] :BPCReporting_Oracle_BPC4052C01.properties
```

```
[info] The database design has been generated
in/bpm75/util/dbUtils/BPCReporting_Oracle_BPC4052C01.properties
```

Leave the default to generate the database scripts and hit enter:

```
generate database scripts? (y/n) [default=y] :
```

Enter **Oracle-BPCReporting-BPC4052C01** as output directory, then hit enter:

```
Please enter the output directory for BPC [default=Oracle-  
BPCReporting] :Oracle-BPCReporting-BPC4052C01
```

```
[info] The script(s) have been generated in /bpm75/util/dbUtils/Oracle-  
BPCReporting-BPC4052C01  
[info] thanks, quitting now ...
```

Verify the existence of the newly created files:

```
ls -l
```

```
... BPC_Oracle_BPC4052C01.properties  
... BPCReporting_Oracle_BPC4052C01.properties  
... dbDesignGenerator.log  
... DbDesignGenerator.sh  
... Oracle-BPC-BPC4052C01  
... Oracle-BPCReporting-BPC4052C01  
... profileHelpers
```

In order to achieve the desired tablespace distribution that has been defined in the planning section the script that is going to be used to create the Business Process Choreographer Reporting function tablespaces has to be altered. Navigate to **Oracle-BPCReporting-BPC4052C01**, then open **createTablespace_Observer.sql** in a text editor:

```
CREATE TABLESPACE BPC4052C01_OBSVRTS  
  DATAFILE '/opt/oracle/oradata/ORAl1DB/BPC4052C01_OBSVRTS.dbf' SIZE 100M  
  AUTOEXTEND ON NEXT 20M MAXSIZE UNLIMITED LOGGING;  
CREATE TABLESPACE BPC4052C01_OBSVRLOB  
  DATAFILE '/opt/oracle/oradata/ORAl1DB/BPC4052C01_OBSVRLOB.dbf' SIZE 200M  
  AUTOEXTEND ON NEXT 40M MAXSIZE UNLIMITED LOGGING;  
CREATE TABLESPACE BPC4052C01_OBSVRIDX  
  DATAFILE '/opt/oracle/oradata/ORAl1DB/BPC4052C01_OBSVRIDX.dbf' SIZE 250M  
  AUTOEXTEND ON NEXT 50M MAXSIZE UNLIMITED LOGGING;
```

The default tablespace datafile path (**/opt/oracle/oradata/ORA11DB**) has been inserted. Now alter **createTablespace_Observer.sql** according to what has been defined in the planning section (tablespace datafile location and datafile size). The result should look like this:

```
CREATE TABLESPACE BPC4052C01_OBSVRTS
  DATAFILE '/disk7/BPC4052C01_OBSVRTS.dbf' SIZE 100M AUTOEXTEND ON NEXT
  20M MAXSIZE UNLIMITED LOGGING;
CREATE TABLESPACE BPC4052C01_OBSVRLOB
  DATAFILE '/disk7/BPC4052C01_OBSVRLOB.dbf' SIZE 200M AUTOEXTEND ON NEXT
  40M MAXSIZE UNLIMITED LOGGING;
CREATE TABLESPACE BPC4052C01_OBSVRIDX
  DATAFILE '/disk6/BPC4052C01_OBSVRIDX.dbf' SIZE 250M AUTOEXTEND ON NEXT
  50M MAXSIZE UNLIMITED LOGGING;
```

After you have finished editing the file save and close **createTablespace_Observer.sql**.

5.3 Create Scripts for Performance Data Warehouse

1. As user **root** start the Database Design Generator again:

```
./DbDesignGenerator.sh
```

```
[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu;
'?' for help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment
Environment
(2)Create a database design for a single component
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]
```

2. Enter **2** to create a database design for a single component, then hit enter:

```
Please enter the number for the design option :4
```

```
(1)bpc
(2)bpcreporting
(3)bpm_performancedw
(4)bpm_processserver
(5)bspace
(6)cei
(7)commondb
(8)sca
(9)sibme
```

3. Enter **3** to create a database design for the Performance Data Warehouse, then hit enter:

```
Please enter the number for the component :3
```

```
[info] Please pick one of the following [database type(s)] :

(1)DB2-distributed
(2)DB2-zOS
(3)Oracle
(4)SQL Server
```

4. Enter **3** to select Oracle, then hit enter:

```
Please enter the number for the database type :3
```

```
[info] Please enter the values for the properties in the database objects section.
```

5. Enter the Database name (**ORA11DB**), then hit enter:

```
Database name(SID) [default=PDWDB] :ORA11DB
```

6. Enter the Database user name (**PDW4052C01**), then hit enter:

```
Database User name[default=] :PDW4052C01
```

```
[info] You have completed database objects section properties needed for database scripts generation.
```

7. Leave the default (empty) on the next prompt and hit enter:

```
To skip data source properties, enter 's'; or enter anything else to continue :
```

```
[info] Please pick one of the following [database provider(s)] :
```

```
(1)Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)
```

8. Leave the default (**Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)**) as database provider, then hit enter:

```
Please enter the number for the database provider [default=Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)] :
```

```
[info] Please enter the values for the properties in the data source properties section.
```

9. Enter the Database server host (**fmtc6152.boeblingen.de.ibm.com**) and hit enter:

```
Database server host[default=] :fmtc6152.boeblingen.de.ibm.com
```

10. Enter the Database server port (**1521**), then hit enter

```
Database server port[default=1521] :
```

11. Enter **false** since the database tables are going to be created manually using the created scripts, then hit enter:

```
Create the database tables during configuration (true/false)?  
[default=true] :false
```

12. Leave the Data source username default (**PDW4052C01**) and hit enter:

```
Data source user name[default=PDW4052C01] :
```

13. Enter the password for user **PDW4052C01**, then hit enter:

```
Data source password[default=] :<PDW4052C01_password>
```

14. Leave the default Oracle JDBC driver path and hit enter:

```
Oracle JDBC driver path[default=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle] :
```

15. Leave the default for the output directory in order to create the scripts in the current directory, then hit enter:

```
Please enter the output directory [default=/bpm75/util/dbUtils] :
```

16. Enter **BPM_PerformanceDW_Oracle_PDW4052C01.properties** as output filename, then hit enter:

```
Please enter the output  
filename[default=BPM_PerformanceDW_Oracle.properties]  
:BPM_PerformanceDW_Oracle_PDW4052C01.properties
```

```
[info] The database design has been generated  
in/bpm75/util/dbUtils/BPM_PerformanceDW_Oracle_PDW4052C01.properties
```

17. Leave the default to generate the database scripts and hit enter:

```
generate database scripts? (y/n) [default=y] :
```

18. Enter **Oracle-BPM_PerformanceDW-PDW4052C01** as output directory, then hit enter:

```
Please enter the output directory for BPM_PerformanceDW
[default=Oracle-BPM_PerformanceDW] :
Oracle-BPM_PerformanceDW-PDW4052C01
```

```
[info] The script(s) have been generated in /bpm75/util/dbUtils/Oracle-
BPM_PerformanceDW-PDW4052C01
[info] thanks, quitting now ...
```

Verify the existence of the newly created files:

```
ls -l
```

```
... BPC_Oracle_BPC4052C01.properties
... BPCReporting_Oracle_BPC4052C01.properties
... BPM_PerformanceDW_Oracle_PDW4052C01.properties
... dbDesignGenerator.log
... DbDesignGenerator.sh
... Oracle-BPC-BPC4052C01
... Oracle-BPCReporting-BPC4052C01
... Oracle-BPM_PerformanceDW-PDW4052C01
... profileHelpers
```

Currently the database design generator only creates a script for the the Performance Data Warehouse tables, not for the required user and tablespace. Therefore a script that does both (creating the tablespace as well as the user) needs to be created. Navigate to **Oracle-BPM_PerformanceDW-PDW4052C01**, create a new file and name it **createTablespaceAndUser_PerformanceDW.sql**. Insert following into the newly created file (make sure that the tablespace datafile location, the tablespace datafile size as well as the schema roles and privileges correspond to what has been defined in the planning section. Also make sure that you replace <PDW4052C01_password> with the intended password):

```
CREATE TABLESPACE PDW4052C01_UDT DATAFILE '/disk6/PDW4052C01_UDT.dbf'
SIZE 100M AUTOEXTEND ON NEXT 20M MAXSIZE UNLIMITED LOGGING;
CREATE USER PDW4052C01 IDENTIFIED BY <PDW4052C01_password> DEFAULT
TABLESPACE PDW4052C01_UDT;
GRANT CONNECT, RESOURCE TO PDW4052C01;
GRANT EXECUTE ON DBMS_LOCK TO PDW4052C01;
```

After you have finished editing the file save and close **createTablespaceAndUser_PerformanceDW.sql**.

Open **createTable_PerformanceDW.sql** in a text editor. At the very end of the file add command **QUIT;**. **createTable_PerformanceDW.sql** should then look like this:

```
...
DECLARE
v_table_count NUMBER;
  BEGIN
    SELECT COUNT(*) INTO v_table_count FROM LSW_SYSTEM_SCHEMA WHERE
PROPNAME = 'DatabaseSchemaVersion' ;
    IF (v_table_count = 0) THEN
      INSERT INTO LSW_SYSTEM_SCHEMA ("PROPNAME",
"PROPVALUE")
VALUES ('DatabaseSchemaVersion',
'7.5.0') ;
END IF ;
END ;

/
QUIT;
```

After you have finished editing the file save and close **createTable_PerformanceDW.sql**.

5.4 Create Scripts for Process Server

1. As user **root** start the Database Design Generator again:

```
./DbDesignGenerator.sh
```

```
[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu;
'?' for help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment
Environment
(2)Create a database design for a single component
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]
```

2. Enter **2** to create a database design for a single component, then hit enter:

```
Please enter the number for the design option :4
```

```
(1)bpc
(2)bpcreporting
(3)bpm_performancedw
(4)bpm_processserver
(5)bspace
(6)cei
(7)commondb
(8)sca
(9)sibme
```

3. Enter **4** to create a database design for the Process Server, then hit enter:

```
Please enter the number for the component :4
```

```
[info] Please pick one of the following [database type(s)] :

(1)DB2-distributed
(2)DB2-zOS
(3)Oracle
(4)SQL Server
```

4. Enter **3** to select Oracle, then hit enter:

```
Please enter the number for the database type :3
```

```
[info] Please enter the values for the properties in the database objects section.
```

5. Enter the Database name (**ORA11DB**), then hit enter:

```
Database name(SID) [default=BPMDB] :ORA11DB
```

6. Enter the Database user name (**PSS4052C01**), then hit enter:

```
Database User name[default=] :PSS4052C01
```

```
[info] Please pick one of the following [Is this database for a Process Center?(s)] :
```

```
(1) false  
(2) true
```

7. Leave the default (**false**), then hit enter:

```
Please enter the number for the Is this database for a Process Center? [default=false] :
```

8. Enter the BPM administrator user name and hit enter:

```
The user ID you use for administrative security[default=] : admin
```

9. Enter the BPM administrator password and hit enter:

```
The password for the name specified with the adminUserName parameter[default=] : <admin_password>
```

```
[info] You have completed database objects section properties needed for database scripts generation.
```

10. Leave the default (empty) on the next prompt and hit enter:

```
To skip data source properties, enter 's'; or enter anything else to continue :
```

```
[info] Please pick one of the following [database provider(s)] :
```

```
(1) Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)
```

11. Leave the default (**Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)**) as database provider, then hit enter:

```
Please enter the number for the database provider [default=Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)] :
```

```
[info] Please enter the values for the properties in the data source properties section.
```

12. Enter the Database server host (**fmtc6152.boeblingen.de.ibm.com**) and hit enter:

```
Database server host[default=] :fmtc6152.boeblingen.de.ibm.com
```

13. Enter the Database server port (**1521**), then hit enter

```
Database server port[default=1521] :
```

14. Enter false since the database tables are going to be created manually using the created scripts, then hit enter:

```
Create the database tables during configuration (true/false)? [default=true] :false
```

15. Leave the Data source username default (**PSS4052C01**) and hit enter:

```
Data source user name[default=PSS4052C01] :
```

16. Enter the password for user **PSS4052C01**, then hit enter:

```
Data source password[default=] :<PSS4052C01_password>
```

17. Leave the default Oracle JDBC driver path and hit enter:

```
Oracle JDBC driver path[default=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle] :
```

18. Leave the default for the output directory in order to create the scripts in the current directory, then hit enter:

```
Please enter the output directory [default=/bpm75/util/dbUtils] :
```

19. Enter **BPM_ProcessServer_Oracle_PSS4052C01.properties** as output filename, then hit enter:

```
Please enter the output
filename[default=BPM_ProcessServer_Oracle.properties]
:BPM_ProcessServer_Oracle_PSS4052C01.properties
```

```
[info] The database design has been generated
in/bpm75/util/dbUtils/BPM_ProcessServer_Oracle_PSS4052C01.properties
```

20. Leave the default to generate the database scripts and hit enter:

```
generate database scripts? (y/n) [default=y] :
```

21. Enter **Oracle-BPM_ProcessServer-PSS4052C01** as output directory, then hit enter:

```
Please enter the output directory for BPM_ProcessServer
[default=Oracle-BPM_ProcessServer] :
Oracle-BPM_ProcessServer-PSS4052C01
```

```
[info] The script(s) have been generated in /bpm75/util/dbUtils/Oracle-
BPM_ProcessServer-PSS4052C01
[info] thanks, quitting now ...
```

Verify the existence of the newly created files:

```
ls -l
```

```
... BPC_Oracle_BPC4052C01.properties
... BPCReporting_Oracle_BPC4052C01.properties
... BPM_PerformanceDW_Oracle_PDW4052C01.properties
... BPM_ProcessServer_Oracle_PSS4052C01.properties
... dbDesignGenerator.log
... DbDesignGenerator.sh
... Oracle-BPC-BPC4052C01
... Oracle-BPCReporting-BPC4052C01
... Oracle-BPM_PerformanceDW-PDW4052C01
... Oracle-BPM_ProcessServer-PSS4052C01
... profileHelpers
```

Currently the database design generator only creates a script for the Process Server tables, not for the required user and tablespace. Therefore a script that does both (creating the tablespace as well as the user) needs to be created. Navigate to **Oracle-BPM_ProcessServer-PSS4052C01**, create a new file and name it **createTablespaceAndUser_ProcessServer.sql**. Insert following into the newly created file (make sure that the tablespace datafile location, the tablespace datafile size as well as the schema roles and privileges correspond to what has been defined in the planning section. Also make sure that you replace <PSS4052C01_password> with the intended password):

```
CREATE TABLESPACE PSS4052C01_UDT DATAFILE '/disk4/PSS4052C01_UDT.dbf'
SIZE 100M AUTOEXTEND ON NEXT 20M MAXSIZE UNLIMITED LOGGING;
CREATE USER PSS4052C01 IDENTIFIED BY <PSS4052C01_password> DEFAULT
TABLESPACE PSS4052C01_UDT;
GRANT CONNECT, RESOURCE TO PSS4052C01;
```

After you have finished editing the file save and close **createTablespaceAndUser_ProcessServer.sql**.

Open **createTable_ProcessServer.sql** in a text editor. At the very end of the file add command **QUIT**; **createTable_ProcessServer.sql** should then look like this:

```
...
DECLARE
v_table_count NUMBER;
BEGIN
SELECT COUNT(*) INTO v_table_count FROM LSW_USR_GRP_MEM_XREF WHERE
USER_ID = 9 AND GROUP_ID = 16 ;
IF (v_table_count = 0) THEN
INSERT INTO LSW_USR_GRP_MEM_XREF("USER_ID",
"GROUP_ID")
VALUES (9,
16) ;
END IF ;
END ;

/
QUIT;
```

After you have finished editing the file save and close **createTable_ProcessServer.sql**.

5.5 Create Scripts for Business Space

1. As user **root** start the Database Design Generator again:

```
./DbDesignGenerator.sh
```

```
[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu;
'?' for help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment
Environment
(2)Create a database design for a single component
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]
```

2. Enter **2** to create a database design for a single component, then hit enter:

```
Please enter the number for the design option :4
```

```
(1)bpc
(2)bpcreporting
(3)bpm_performancedw
(4)bpm_processserver
(5)bspace
(6)cei
(7)commondb
(8)sca
(9)sibme
```

3. Enter **5** to create a database design for Business Space, then hit enter:

```
Please enter the number for the component :5
```

```
[info] Please pick one of the following [database type(s)] :

(1)DB2-distributed
(2)DB2-iSeries
(3)DB2-zOS
(4)Derby-embedded
(5)Derby-networkServer
(6)Oracle
(7)SQL Server
```

4. Enter **6** to select Oracle, then hit enter:

```
Please enter the number for the database type :6
```

```
[info] Please enter the values for the properties in the database objects section.
```

5. Enter the Database name (**ORA11DB**), then hit enter:

```
Database name (SID) [default=BSPACE] :ORA11DB
```

6. Enter the Database schema (**BSP4052C01**), then hit enter:

```
Database schema [default=IBMBUSSP] :BSP4052C01
```

7. Enter the password for user **BSP4052C01**, then hit enter:

```
Password for database schema user [default=] :<BSP4052C01_password>
```

8. Enter **BSP4052C01** as prefix for tablespace names, then hit enter:

```
Prefix for tablespace names (0-4 characters) [default=BSP] :BSP4052C01_
```

9. Leave the default (empty) on the next prompt and hit enter:

```
System user name (this is required ONLY for creating the database as a part of standalone profile creation.) [default=] :
```

10. Leave the default (empty) on the next prompt and hit enter:

```
System password (this is required ONLY for creating the database as a part of standalone profile creation.) [default=] :
```

11. Enter **/opt/oracle/oradata/ORA11DB** as tablespace directory, then hit enter:

```
Directory or file name prefix for tablespace files [default=BSP] :/opt/oracle/oradata/ORA11DB
```

```
[info] You have completed database objects section properties needed for database scripts generation.
```

Note: **/opt/oracle/oradata/ORA11DB** is used as placeholder and will be replaced by the intended tablespace directories once the scripts have been generated.

12. Leave the default (empty) on the next prompt and hit enter:

```
To skip data source properties, enter 's'; or enter anything else to
continue :
```

```
[info] Please pick one of the following [database provider(s)] :
(1)Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)
```

13. Leave the default (**Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)**) as database provider, then hit enter:

```
Please enter the number for the database provider [default=Oracle JDBC
Driver # XA data source # Oracle JDBC Driver (XA)] :
```

```
[info] Please enter the values for the properties in the data source
properties section.
```

14. Enter the Database server host (**fmtc6152.boeblingen.de.ibm.com**) and hit enter:

```
Database server host[default=] :fmtc6152.boeblingen.de.ibm.com
```

15. Enter the Database server port (**1521**), then hit enter

```
Database server port[default=1521] :
```

```
[info] Please pick one of the following [Oracle driver type(s)] :
(1)oci8
(2)thin
```

16. Leave the default (**thin**) as Oracle driver type, then hit enter:

```
Please enter the number for the Oracle driver type [default=thin] :
```

17. Leave the Data source username default (**BSP4052C01**) and hit enter:

```
Data source user name[default=BSP4052C01] :
```

18. Leave the default Data source password (this is the same password that has already been specified for database schema user **BSP4052C01**) and hit enter:

```
Data source password[default=*****] :
```

19. Leave the default Oracle JDBC driver path and hit enter:

```
Oracle JDBC driver path[default=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle] :
```

20. Leave the default for the output directory in order to create the scripts in the current directory, then hit enter:

```
Please enter the output directory [default=/bpm75/util/dbUtils] :
```

21. Enter **BSpace_Oracle_BSP4052C01.properties** as output filename, then hit enter:

```
Please enter the output filename[default=BSpace_Oracle.properties] :  
BSpace_Oracle_BSP4052C01.properties
```

```
[info] The database design has been generated  
in/bpm75/util/dbUtils/BSpace_Oracle_BSP4052C01.properties
```

22. Leave the default to generate the database scripts and hit enter:

```
generate database scripts? (y/n) [default=y] :
```

23. Enter **Oracle-BSpace-BSP4052C01** as output directory, then hit enter:

```
Please enter the output directory for BSpace [default=Oracle-BSpace]  
: Oracle-BSpace-BSP4052C01
```

```
[info] The script(s) have been generated in /bpm75/util/dbUtils/Oracle-  
BSpace-BSP4052C01  
[info] thanks, quitting now ...
```

Verify the existence of the newly created files:

```
ls -l
```

```
... BPC_Oracle_BPC4052C01.properties  
... BPCReporting_Oracle_BPC4052C01.properties  
... BPM_PerformanceDW_Oracle_PDW4052C01.properties  
... BPM_ProcessServer_Oracle_PSS4052C01.properties  
... BSpace_Oracle_BSP4052C01.properties  
... dbDesignGenerator.log  
... DbDesignGenerator.sh  
... Oracle-BPC-BPC4052C01  
... Oracle-BPCReporting-BPC4052C01  
... Oracle-BPM_PerformanceDW-PDW4052C01  
... Oracle-BPM_ProcessServer-PSS4052C01  
... Oracle-BSpace-BSP4052C01  
... profileHelpers
```

In order to achieve the desired tablespace distribution that has been defined in the planning section the script that is going to be used to create the BusinessSpace tablespaces has to be altered. Navigate to **Oracle-BSpace-BSP4052C01**, then open **createTablespace_BusinessSpace.sql** in a text editor:

```
...
CREATE TABLESPACE "BSP4052C01_REGTABSSPACE"
  DATAFILE '/opt/oracle/oradata/ORA11DBREGTABSSPACE' SIZE 100M REUSE
  AUTOEXTEND ON NEXT 20M
  EXTENT MANAGEMENT LOCAL
  SEGMENT SPACE MANAGEMENT AUTO
  ONLINE
  PERMANENT
;
-----
-- Create tablespaces --
-----

CREATE TABLESPACE BSP4052C01_BSPACE
  DATAFILE '/opt/oracle/oradata/ORA11DBBS.dbf' SIZE 300M AUTOEXTEND ON
NEXT 100M MAXSIZE UNLIMITED LOGGING;
```

The default tablespace datafile path (**/opt/oracle/oradata/ORA11DB..**) has been inserted. Now alter **createTablespace_BusinessSpace.sql** according to what has been defined in the planning section (tablespace datafile location and datafile size, also make sure to change the datafile name accordingly). The result should look like this:

```
...
CREATE TABLESPACE "BSP4052C01_REGTABSSPACE"
  DATAFILE '/disk7/BSP4052C01_REGTABSSPACE.dbf' SIZE 100M REUSE
  AUTOEXTEND ON NEXT 20M
  EXTENT MANAGEMENT LOCAL
  SEGMENT SPACE MANAGEMENT AUTO
  ONLINE
  PERMANENT
;
-----
-- Create tablespaces --
-----

CREATE TABLESPACE BSP4052C01_BSPACE
  DATAFILE '/disk8/BSP4052C01_BSPACE.dbf' SIZE 100M AUTOEXTEND ON NEXT
100M MAXSIZE UNLIMITED LOGGING;
```

After you have finished editing the file save and close **createTablespace_BusinessSpace.sql**.

Open **createTable_BusinessSpace.sql** in a text editor. At the very end of the file add command **QUIT;**. **createTable_BusinessSpace.sql** should then look like this:

```
...
-----
-- Create tables for business space--
-----

        CREATE TABLE BSP4052C01.BSP_USER_DATA_T (
                USER_DN                VARCHAR2(1024) NOT NULL ,
                EXTENSION                BLOB ,
                PRIMARY KEY ( USER_DN )
        ) TABLESPACE BSP4052C01_BSPACE
        LOGGING;

QUIT;
```

After you have finished editing the file save and close **createTable_BusinessSpace.sql**.

5.6 Create Scripts for the common BPM functionality

1. As user **root** start the Database Design Generator again:

```
./DbDesignGenerator.sh
```

```
[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu;
'?' for help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment
Environment
(2)Create a database design for a single component
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]
```

2. Enter **2** to create a database design for a single component, then hit enter:

```
Please enter the number for the design option :2
```

```
(1)bpc
(2)bpcreporting
(3)bpm_performancedw
(4)bpm_processserver
(5)bspace
(6)cei
(7)commondb
(8)sca
(9)sibme
```

3. Enter **7** to create a database design for the common BPM functionality, then hit enter:

```
Please enter the number for the component :7
```

```
[info] Please pick one of the following [database type(s)] :

(1)DB2-distributed
(2)DB2-zOS
(3)Oracle
(4)SQL Server
```

4. Enter **3** to select Oracle, then hit enter:

```
Please enter the number for the database type :3
```

```
[info] Please enter the values for the properties in the database objects section.
```

5. Enter the Database name (**ORA11DB**), then hit enter:

```
Database name(SID) [default=CMNDB] :ORA11DB
```

6. Enter the Database User name (**COM4052C01**), then hit enter:

```
Database User name[default=] :COM4052C01
```

7. Enter the Database schema (**COM4052C01**), then hit enter:

```
Database schema[default=] :COM4052C01
```

8. Leave the default (empty) on the next prompt and hit enter:

```
System user name(this is required ONLY for creating the database as a part of standalone profile creation.) [default=] :
```

9. Leave the default (empty) on the next prompt and hit enter:

```
System password(this is required ONLY for creating the database as a part of standalone profile creation.) [default=] :
```

10. Leave the default (empty) on the next prompt and hit enter:

```
Database Location(this is required ONLY for creating the database as a part of standalone profile creation.) [default=] :
```

```
[info] You have completed database objects section properties needed for database scripts generation.
```

11. Leave the default (empty) on the next prompt and hit enter:

```
To skip data source properties, enter 's'; or enter anything else to continue :
```

```
[info] Please pick one of the following [database provider(s)] :  
(1)Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)
```

12. Leave the default (**Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)**) as database provider, then hit enter:

```
Please enter the number for the database provider [default=Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)] :
```

```
[info] Please enter the values for the properties in the data source properties section.
```

13. Enter the Database server host (**fmtc6152.boeblingen.de.ibm.com**), then hit enter:

```
Database server host[default=] :fmtc6152.boeblingen.de.ibm.com
```

14. Enter the Database server port (**1521**), then hit enter

```
Database server port[default=1521] :
```

```
[info] Please pick one of the following [Oracle driver type(s)] :
```

```
(1)oci8  
(2)thin
```

15. Leave the default (**thin**) as Oracle driver type, then hit enter:

```
Please enter the number for the Oracle driver type [default=thin] :
```

16. Leave the Data source username default (**COM4052C01**) and hit enter:

```
Data source user name[default=COM4052C01] :
```

17. Enter the password for **COM4052C01**, then hit Enter

```
Data source password[default=] :<COM4052C01_password>
```

18. Leave the default Oracle JDBC driver path and hit enter:

```
Oracle JDBC driver path[default=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle] :
```

19. Leave the default for the output directory in order to create the scripts in the current directory, then hit enter:

```
Please enter the output directory [default=/bpm75/util/dbUtils] :
```

20. Enter **CommonDB_Oracle_COM4052C01.properties** as output filename, then hit enter:

```
Please enter the output filename [default=CommonDB_Oracle.properties] :  
CommonDB_Oracle_COM4052C01.properties
```

```
[info] The database design has been generated  
in/bpm75/util/dbUtils/CommonDB_Oracle_COM4052C01.properties
```

21. Leave the default to generate the database scripts and hit enter:

```
generate database scripts? (y/n) [default=y] :
```

22. Enter **Oracle-CommonDB-COM4052C01** as output directory, then hit enter:

```
Please enter the output directory for CommonDB [default=Oracle-  
CommonDB] : Oracle-CommonDB-COM4052C01
```

```
[info] The script(s) have been generated in /bpm75/util/dbUtils/Oracle-  
CommonDB-COM4052C01  
[info] thanks, quitting now ...
```

Verify the existence of the newly created files:

```
ls -l
```

```
... BPC_Oracle_BPC4052C01.properties  
... BPCReporting_Oracle_BPC4052C01.properties  
... BPM_PerformanceDW_Oracle_PDW4052C01.properties  
... BPM_ProcessServer_Oracle_PSS4052C01.properties  
... Bspace_Oracle_BSP4052C01.properties  
... CommonDB_Oracle_COM4052C01.properties  
... dbDesignGenerator.log  
... DbDesignGenerator.sh  
... Oracle-BPC-BPC4052C01  
... Oracle-BPCReporting-BPC4052C01  
... Oracle-BPM_PerformanceDW-PDW4052C01  
... Oracle-BPM_ProcessServer-PSS4052C01  
... Oracle-BSpace-BSP4052C01  
... Oracle-CommonDB-COM4052C01  
... profileHelpers
```

Currently the database design generator only creates scripts for the user and tables required by the common BPM functionality, not for the recommended tablespace. In order to create a dedicated tablespace one of the generated scripts has to be altered. Navigate to **Oracle-CommonDB-COM4052C01** and open **createSchema_CommonDB.sql** in a text editor:

```
CREATE USER COM4052C01 IDENTIFIED BY &dbCommonPassword;
grant connect, resource, unlimited tablespace to COM4052C01;
grant create view to COM4052C01;
grant javauserpriv to COM4052C01;
```

After the file has been changed it should look like this (make sure that tablespace datafile location and datafile size correspond to what has been defined in the planning section, also replace `&dbCommonPassword` (`COM4052C01_password`) with the intended password):

```
CREATE TABLESPACE COM4052C01_UDT DATAFILE '/disk8/COM4052C01_UDT.dbf' SIZE
100M AUTOEXTEND ON NEXT 20M MAXSIZE UNLIMITED LOGGING;
CREATE USER COM4052C01 IDENTIFIED BY <COM4052C01_password> DEFAULT
TABLESPACE COM4052C01_UDT;
grant connect, resource, unlimited tablespace to COM4052C01;
grant create view to COM4052C01;
grant javauserpriv to COM4052C01;
```

After you have finished editing the file save and close **createSchema_CommonDB.sql**.

Now open **configCommonDB.sh** in a text editor. Comment out all commands except:

```
ls | egrep "(^create|^insert)Table" | sed 's/^\@/' >> files.sql
echo quit >> files.sql
```

Before (original):

```
INIT_DIR=`pwd`

CURRENT_DIR=`dirname $0`
if [ "$CURRENT_DIR" = "." ] ; then
    CURRENT_DIR=`pwd`
fi

cd $CURRENT_DIR

echo "Please enter password or press enter to skip (password will be
stored as cleartext in SQL file(s)): "
read PASSWORD

TMP=`temp.sql`
CREATE SCHEMA='createSchema_CommonDB.sql'
```

```

if [ "$PASSWORD" != "" ] ; then
    sed "$ s/&dbCommonPassword/$PASSWORD/" $CREATE_SCHEMA > $TMP && \
    mv $TMP $CREATE_SCHEMA && rm $TMP
    ls | egrep "createSchema_CommonDB.sql" | sed 's/^/\@/' >> files.sql
fi

ls | egrep "(^create|^insert)Table" | sed 's/^/\@/' >> files.sql
echo quit >> files.sql

sqlplus COM4052C01@ORA11DB @files.sql

rm -f files.sql

cd $INIT_DIR

```

After:

```

#INIT_DIR=`pwd`

#CURRENT_DIR=`dirname $0`
#if [ "$CURRENT_DIR" = "." ] ; then
#    CURRENT_DIR=`pwd`
#fi

#cd $CURRENT_DIR

#echo "Please enter password or press enter to skip (password will be
#stored as cleartext in SQL file(s)):"
#read PASSWORD

#TMP=`temp.sql`
#CREATE_SCHEMA='createSchema_CommonDB.sql'

#if [ "$PASSWORD" != "" ] ; then
#    sed "$ s/&dbCommonPassword/$PASSWORD/" $CREATE_SCHEMA > $TMP && \
#    mv $TMP $CREATE_SCHEMA && rm $TMP
#    ls | egrep "createSchema_CommonDB.sql" | sed 's/^/\@/' >> files.sql
#fi

ls | egrep "(^create|^insert)Table" | sed 's/^/\@/' >> files.sql
echo quit >> files.sql

#sqlplus COM4052C01@ORA11DB @files.sql

#rm -f files.sql

#cd $INIT_DIR

```

After you have finished editing the file save and close **configCommonDB.sh**.

Now run **configCommonDB.sh**:

```
./configCommonDB.sh
```

Once the command has finished investigate the content of **Oracle-CommonDB-COM4052C01**. A file called **files.sql** should now have been created:

```
ls -l
```

```
...
... esbserver_upgradeSchema610_Recovery.sql
... esbserver_upgradeSchema612_lockmanager.sql
... esbserver_upgradeSchema612_Recovery.sql
... esbserver_upgradeSchema620_lockmanager.sql
... files.sql
... insertTable_CommonDB.sql
... resetTables_DirectDeploy.sql
... upgradeSchema602_CommonDB.sql
... upgradeSchema602_customization.sql
...
```

5.7 Create Scripts for BPC Messaging

1. As user **root** start the Database Design Generator again:

```
./DbDesignGenerator.sh
```

```
[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu;
'?' for help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment
Environment
(2)Create a database design for a single component
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]
```

2. Enter **2** to create a database design for a single component, then hit enter:

```
Please enter the number for the design option :2
```

```
(1)bpc
(2)bpcreporting
(3)bpm_performancedw
(4)bpm_processserver
(5)bspace
(6)cei
(7)commondb
(8)sca
(9)sibme
```

3. Enter **9** to create a database design for SIB messaging, then hit enter:

```
Please enter the number for the component :9
```

```
[info] Please pick one of the following [database type(s)] :

(1)DB2-distributed
(2)DB2-zOS
(3)Oracle
(4)SQL Server
```

4. Enter **3** to select Oracle, then hit enter:

```
Please enter the number for the database type :3
```

```
[info] Please enter the values for the properties in the database objects section.
```

5. Enter the Database User name (**BPCMSG4052C01**), then hit enter:

```
Database User name[default=IBMUUSER] :BPCMSG4052C01
```

6. Enter the Schema name (**BPCMSG4052C01**), then hit enter:

```
Schema name[default=IBMWSSIB] :BPCMSG4052C01
```

```
[info] You have completed database objects section properties needed for database scripts generation.
```

7. Leave the default (empty) on the next prompt and hit enter:

```
To skip data source properties, enter 's'; or enter anything else to continue :
```

```
[info] Please pick one of the following [database provider(s)] :  
(1)Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)
```

8. Leave the default (**Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)**) as database provider, then hit enter:

```
Please enter the number for the database provider [default=Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)] :
```

```
[info] Please enter the values for the properties in the data source properties section.
```

9. Enter the Database name (**ORA11DB**), then hit enter:

```
Database name[default=] :ORA11DB
```

10. Enter the Database server host (**fmtc6152.boeblingen.de.ibm.com**), then hit enter:

```
Database server host[default=] :fmtc6152.boeblingen.de.ibm.com
```

11. Enter the Database server port (**1521**), then hit enter

```
Database server port[default=1521] :
```

```
[info] Please pick one of the following [Oracle driver type(s)] :
```

```
(1)oci8  
(2)thin
```

12. Leave the default (**thin**) as Oracle driver type, then hit enter:

```
Please enter the number for the Oracle driver type [default=thin] :
```

```
[info] Please pick one of the following [createTables(s)] :
```

```
(1>false  
(2>true
```

13. Enter **1 (=false)**, then hit enter:

```
Please enter the number for the createTables [default=true] :1
```

14. Leave the Data source username default (**BPCMSG4052C01**) and hit enter:

```
Data source user name[default=BPCMSG4052C01] :
```

15. Enter the password for **BPCMSG4052C01**, then hit Enter

```
Data source password[default=] :<BPCMSG4052C01_password>
```

16. Leave the default Oracle JDBC driver path and hit enter:

```
Oracle JDBC driver path[default=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle] :
```

17. Leave the default for the output directory in order to create the scripts in the current directory, then hit enter:

```
Please enter the output directory [default=/bpm75/util/dbUtils] :
```

18. Enter **SibME_Oracle_BPCMSG4052C01.properties** as output filename, then hit enter:

```
Please enter the output filename [default=SibME_Oracle.properties] :  
SibME_Oracle_BPCMSG4052C01.properties
```

```
[info] The database design has been generated  
in/bpm75/util/dbUtils/SibME_Oracle_BPCMSG4052C01.properties
```

19. Leave the default to generate the database scripts and hit enter:

```
generate database scripts? (y/n) [default=y] :
```

20. Enter **Oracle-SibME-BPCMSG4052C01** as output directory, then hit enter:

```
Please enter the output directory for SibME [default=Oracle-SibME] :  
Oracle-SibME-BPCMSG4052C01
```

```
[info] The script(s) have been generated in /bpm75/util/dbUtils/Oracle-  
SibME-BPCMSG4052C01  
[info] thanks, quitting now ...
```

Verify the existence of the newly created files:

```
ls -l
```

```
... BPC_Oracle_BPC4052C01.properties  
... BPCReporting_Oracle_BPC4052C01.properties  
... BPM_PerformanceDW_Oracle_PDW4052C01.properties  
... BPM_ProcessServer_Oracle_PSS4052C01.properties  
... Bspace_Oracle_BSP4052C01.properties  
... CommonDB_Oracle_COM4052C01.properties  
... SibME_Oracle_BPCMSG4052C01.properties  
... dbDesignGenerator.log  
... DbDesignGenerator.sh  
... Oracle-BPC-BPC4052C01  
... Oracle-BPCReporting-BPC4052C01  
... Oracle-BPM_PerformanceDW-PDW4052C01  
... Oracle-BPM_ProcessServer-PSS4052C01  
... Oracle-BSpace-BSP4052C01  
... Oracle-CommonDB-COM4052C01  
... Oracle-SibME-BPCMSG4052C01  
... profileHelpers
```

Currently the database design generator only creates a script for the user and tables required by Business Process Choreographer SIB Messaging, not for the recommended tablespace. In order to create a dedicated tablespace the generated script has to be altered. Navigate to **Oracle-SibME-BPCMSG4052C01**, then open **Oracle-SibME.sql** in a text editor:

```
CREATE USER BPCMSG4052C01 IDENTIFIED EXTERNALLY DEFAULT TABLESPACE USERS
QUOTA UNLIMITED ON USERS ACCOUNT LOCK;

CREATE TABLE BPCMSG4052C01.SIBOWNER (
  ME_UUID VARCHAR(16),
  INC_UUID VARCHAR(16),
  VERSION INTEGER,
  MIGRATION_VERSION INTEGER
);
...
```

Add a command to create a dedicated tablespace and change the way the user is created (make sure that the tablespace datafile location, the datafile size as well as the schema roles correspond to what has been defined in the planning section. Also make sure that you replace <BPCMSG4052C01_password> with the intended password). The file should look like this:

```
CREATE TABLESPACE BPCMSG4052C01_UDT DATAFILE '/disk5/BPCMSG4052C01_UDT
.dbf' SIZE 100M AUTOEXTEND ON NEXT 20M MAXSIZE UNLIMITED LOGGING;
CREATE USER BPCMSG4052C01 IDENTIFIED BY <BPCMSG4052C01_password> DEFAULT
TABLESPACE BPCMSG4052C01_UDT;
GRANT CONNECT, RESOURCE TO BPCMSG4052C01;

CREATE TABLE BPCMSG4052C01.SIBOWNER (
  ME_UUID VARCHAR(16),
  INC_UUID VARCHAR(16),
  VERSION INTEGER,
  MIGRATION_VERSION INTEGER
);
...
```

Scroll down towards the end of the file, there are 9 **GRANT** commands:

```
...
CREATE TABLE BPCMSG4052C01.SIBKEYS (
  ID VARCHAR2(50) NOT NULL,
  LAST_KEY NUMBER(19) NOT NULL,
  PRIMARY KEY(ID)
);
GRANT SELECT,INSERT,UPDATE ON BPCMSG4052C01.SIBOWNER TO BPCMSG4052C01;
GRANT SELECT,INSERT,UPDATE ON BPCMSG4052C01.SIBOWNER0 TO BPCMSG4052C01;
GRANT SELECT,INSERT ON BPCMSG4052C01.SIBCLASSMAP TO BPCMSG4052C01;
GRANT SELECT,INSERT ON BPCMSG4052C01.SIBLISTING TO BPCMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON BPCMSG4052C01.SIB000 TO
BPCMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON BPCMSG4052C01.SIB001 TO
BPCMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON BPCMSG4052C01.SIB002 TO
BPCMSG4052C01;
GRANT SELECT,INSERT,UPDATE,DELETE ON BPCMSG4052C01.SIBXACTS TO
BPCMSG4052C01;
GRANT SELECT,INSERT,UPDATE ON BPCMSG4052C01.SIBKEYS TO BPCMSG4052C01;
```

Remove all of them and add command **QUIT;** at the very end of the file:

```
...
CREATE TABLE BPCMSG4052C01.SIBKEYS (
  ID VARCHAR2(50) NOT NULL,
  LAST_KEY NUMBER(19) NOT NULL,
  PRIMARY KEY(ID)
);
QUIT;
```

After you have finished editing the file save and close **Oracle-SibME.sql**.

5.8 Create Scripts for Performance Data Warehouse Messaging

1. As user **root** start the Database Design Generator again:

```
./DbDesignGenerator.sh
```

```
[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu;
'?' for help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment
Environment
(2)Create a database design for a single component
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]
```

2. Enter **2** to create a database design for a single component, then hit enter:

```
Please enter the number for the design option :2
```

```
(1)bpc
(2)bpcreporting
(3)bpm_performancedw
(4)bpm_processserver
(5)bspace
(6)cei
(7)commondb
(8)sca
(9)sibme
```

3. Enter **9** to create a database design for SIB messaging, then hit enter:

```
Please enter the number for the component :9
```

```
[info] Please pick one of the following [database type(s)] :

(1)DB2-distributed
(2)DB2-zOS
(3)Oracle
(4)SQL Server
```

4. Enter **3** to select Oracle, then hit enter:

```
Please enter the number for the database type :3
```

```
[info] Please enter the values for the properties in the database objects section.
```

5. Enter the Database User name (**PDWMSG4052C01**), then hit enter:

```
Database User name[default=IBMUUSER] :PDWMSG4052C01
```

6. Enter the Schema name (**PDWMSG4052C01**), then hit enter:

```
Schema name[default=IBMWSSIB] :PDWMSG4052C01
```

```
[info] You have completed database objects section properties needed for database scripts generation.
```

7. Leave the default (empty) on the next prompt and hit enter:

```
To skip data source properties, enter 's'; or enter anything else to continue :
```

```
[info] Please pick one of the following [database provider(s)] :  
(1)Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)
```

8. Leave the default (**Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)**) as database provider, then hit enter:

```
Please enter the number for the database provider [default=Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)] :
```

```
[info] Please enter the values for the properties in the data source properties section.
```

9. Enter the Database name (**ORA11DB**), then hit enter:

```
Database name[default=] :ORA11DB
```

10. Enter the Database server host (**fmtc6152.boeblingen.de.ibm.com**), then hit enter:

```
Database server host[default=] :fmtc6152.boeblingen.de.ibm.com
```

11. Enter the Database server port (**1521**), then hit enter

```
Database server port[default=1521] :
```

```
[info] Please pick one of the following [Oracle driver type(s)] :
```

```
(1)oci8  
(2)thin
```

12. Leave the default (**thin**) as Oracle driver type, then hit enter:

```
Please enter the number for the Oracle driver type [default=thin] :
```

```
[info] Please pick one of the following [createTables(s)] :
```

```
(1>false  
(2>true
```

13. Enter **1 (=false)**, then hit enter:

```
Please enter the number for the createTables [default=true] :1
```

14. Leave the Data source username default (**PDWMSG4052C01**) and hit enter:

```
Data source user name[default=PDWMSG4052C01] :
```

15. Enter the password for **PDWMSG4052C01**, then hit Enter

```
Data source password[default=] :<PDWMSG4052C01_password>
```

16. Leave the default Oracle JDBC driver path and hit enter:

```
Oracle JDBC driver path[default=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle] :
```

17. Leave the default for the output directory in order to create the scripts in the current directory, then hit enter:

```
Please enter the output directory [default=/bpm75/util/dbUtils] :
```

18. Enter **SibME_Oracle_PDWMMSG4052C01.properties** as output filename, then hit enter:

```
Please enter the output filename [default=SibME_Oracle.properties] :  
SibME_Oracle_PDWMMSG4052C01.properties
```

```
[info] The database design has been generated  
in/bpm75/util/dbUtils/SibME_Oracle_PDWMMSG4052C01.properties
```

19. Leave the default to generate the database scripts and hit enter:

```
generate database scripts? (y/n) [default=y] :
```

20. Enter **Oracle-SibME-PDWMMSG4052C01** as output directory, then hit enter:

```
Please enter the output directory for SibME [default=Oracle-SibME] :  
Oracle-SibME-PDWMMSG4052C01
```

```
[info] The script(s) have been generated in /bpm75/util/dbUtils/Oracle-  
SibME-PDWMMSG4052C01  
[info] thanks, quitting now ...
```

Verify the existence of the newly created files:

```
ls -l
```

```
... BPC_Oracle_BPC4052C01.properties  
... BPCReporting_Oracle_BPC4052C01.properties  
... BPM_PerformanceDW_Oracle_PDW4052C01.properties  
... BPM_ProcessServer_Oracle_PSS4052C01.properties  
... Bspace_Oracle_BSP4052C01.properties  
... CommonDB_Oracle_COM4052C01.properties  
... SibME_Oracle_BPCMSG4052C01.properties  
... SibME_Oracle_PDWMMSG4052C01.properties  
... dbDesignGenerator.log  
... DbDesignGenerator.sh  
... Oracle-BPC-BPC4052C01  
... Oracle-BPCReporting-BPC4052C01  
... Oracle-BPM_PerformanceDW-PDW4052C01  
... Oracle-BPM_ProcessServer-PSS4052C01  
... Oracle-BSpace-BSP4052C01  
... Oracle-CommonDB-COM4052C01  
... Oracle-SibME-BPCMSG4052C01  
... Oracle-SibME-PDWMMSG4052C01  
... profileHelpers
```

Currently the database design generator only creates a script for the user and tables required by Performance Data Warehouse SIB Messaging, not for the recommended tablespace. In order to create a dedicated tablespace the generated script has to be altered. Navigate to **Oracle-SibME-PDWMSG4052C01**, then open **Oracle-SibME.sql** in a text editor:

```
CREATE USER PDWMSG4052C01 IDENTIFIED EXTERNALLY DEFAULT TABLESPACE USERS
QUOTA UNLIMITED ON USERS ACCOUNT LOCK;

CREATE TABLE PDWMSG4052C01.SIBOWNER (
  ME_UUID VARCHAR(16),
  INC_UUID VARCHAR(16),
  VERSION INTEGER,
  MIGRATION_VERSION INTEGER
);
...
```

Add a command to create a dedicated tablespace and change the way the user is created (make sure that the tablespace datafile location, the datafile size as well as the schema roles correspond to what has been defined in the planning section. Also make sure that you replace <PDWMSG4052C01_password> with the intended password). The file should look like this:

```
CREATE TABLESPACE PDWMSG4052C01_UDT DATAFILE '/disk6/PDWMSG4052C01_UDT
.dbf' SIZE 100M AUTOEXTEND ON NEXT 20M MAXSIZE UNLIMITED LOGGING;
CREATE USER PDWMSG4052C01 IDENTIFIED BY <PDWMSG4052C01_password> DEFAULT
TABLESPACE PDWMSG4052C01_UDT;
GRANT CONNECT, RESOURCE TO PDWMSG4052C01;

CREATE TABLE PDWMSG4052C01.SIBOWNER (
  ME_UUID VARCHAR(16),
  INC_UUID VARCHAR(16),
  VERSION INTEGER,
  MIGRATION_VERSION INTEGER
);
...
```

Scroll down towards the end of the file, there are 9 **GRANT** commands:

```
...
CREATE TABLE PDWMSG4052C01.SIBKEYS (
  ID VARCHAR2(50) NOT NULL,
  LAST_KEY NUMBER(19) NOT NULL,
  PRIMARY KEY(ID)
);
GRANT SELECT,INSERT,UPDATE ON PDWMSG4052C01.SIBOWNER TO PDWMSG4052C01;
GRANT SELECT,INSERT,UPDATE ON PDWMSG4052C01.SIBOWNER0 TO PDWMSG4052C01;
GRANT SELECT,INSERT ON PDWMSG4052C01.SIBCLASSMAP TO PDWMSG4052C01;
GRANT SELECT,INSERT ON PDWMSG4052C01.SIBLISTING TO PDWMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON PDWMSG4052C01.SIB000 TO
PDWMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON PDWMSG4052C01.SIB001 TO
PDWMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON PDWMSG4052C01.SIB002 TO
PDWMSG4052C01;
GRANT SELECT,INSERT,UPDATE,DELETE ON PDWMSG4052C01.SIBXACTS TO
PDWMSG4052C01;
GRANT SELECT,INSERT,UPDATE ON PDWMSG4052C01.SIBKEYS TO PDWMSG4052C01;
```

Remove all of them and add command **QUIT;** at the very end of the file:

```
...
CREATE TABLE PDWMSG4052C01.SIBKEYS (
  ID VARCHAR2(50) NOT NULL,
  LAST_KEY NUMBER(19) NOT NULL,
  PRIMARY KEY(ID)
);
QUIT;
```

After you have finished editing the file save and close **Oracle-SibME.sql**.

5.9 Create Scripts for Process Server Messaging

1. As user **root** start the Database Design Generator again:

```
./DbDesignGenerator.sh
```

```
[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu;
'?' for help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment
Environment
(2)Create a database design for a single component
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]
```

2. Enter **2** to create a database design for a single component, then hit enter:

```
Please enter the number for the design option :2
```

```
(1)bpc
(2)bpcreporting
(3)bpm_performancedw
(4)bpm_processserver
(5)bspace
(6)cei
(7)commondb
(8)sca
(9)sibme
```

3. Enter **9** to create a database design for SIB messaging, then hit enter:

```
Please enter the number for the component :9
```

```
[info] Please pick one of the following [database type(s)] :

(1)DB2-distributed
(2)DB2-zOS
(3)Oracle
(4)SQL Server
```

4. Enter **3** to select Oracle, then hit enter:

```
Please enter the number for the database type :3
```

```
[info] Please enter the values for the properties in the database objects section.
```

5. Enter the Database User name (**PSSMSG4052C01**), then hit enter:

```
Database User name[default=IBMUUSER] :PSSMSG4052C01
```

6. Enter the Schema name (**PSSMSG4052C01**), then hit enter:

```
Schema name[default=IBMWSSIB] :PSSMSG4052C01
```

```
[info] You have completed database objects section properties needed for database scripts generation.
```

7. Leave the default (empty) on the next prompt and hit enter:

```
To skip data source properties, enter 's'; or enter anything else to continue :
```

```
[info] Please pick one of the following [database provider(s)] :  
(1)Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)
```

8. Leave the default (**Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)**) as database provider, then hit enter:

```
Please enter the number for the database provider [default=Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)] :
```

```
[info] Please enter the values for the properties in the data source properties section.
```

9. Enter the Database name (**ORA11DB**), then hit enter:

```
Database name[default=] :ORA11DB
```

10. Enter the Database server host (**fmtc6152.boeblingen.de.ibm.com**), then hit enter:

```
Database server host[default=] :fmtc6152.boeblingen.de.ibm.com
```

11. Enter the Database server port (**1521**), then hit enter

```
Database server port[default=1521] :
```

```
[info] Please pick one of the following [Oracle driver type(s)] :
```

```
(1)oci8  
(2)thin
```

12. Leave the default (**thin**) as Oracle driver type, then hit enter:

```
Please enter the number for the Oracle driver type [default=thin] :
```

```
[info] Please pick one of the following [createTables(s)] :
```

```
(1>false  
(2>true
```

13. Enter **1 (=false)**, then hit enter:

```
Please enter the number for the createTables [default=true] :1
```

14. Leave the Data source username default (**PSSMSG4052C01**) and hit enter:

```
Data source user name[default=PSSMSG4052C01] :
```

15. Enter the password for **PSSMSG4052C01**, then hit Enter

```
Data source password[default=] :<PSSMSG4052C01_password>
```

16. Leave the default Oracle JDBC driver path and hit enter:

```
Oracle JDBC driver path[default=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle] :
```

17. Leave the default for the output directory in order to create the scripts in the current directory, then hit enter:

```
Please enter the output directory [default=/bpm75/util/dbUtils] :
```

18. Enter **SibME_Oracle_PSSMSG4052C01.properties** as output filename, then hit enter:

```
Please enter the output filename [default=SibME_Oracle.properties] :  
SibME_Oracle_PSSMSG4052C01.properties
```

```
[info] The database design has been generated  
in/bpm75/util/dbUtils/SibME_Oracle_PSSMSG4052C01.properties
```

19. Leave the default to generate the database scripts and hit enter:

```
generate database scripts? (y/n) [default=y] :
```

20. Enter **Oracle-SibME-PSSMSG4052C01** as output directory, then hit enter:

```
Please enter the output directory for SibME [default=Oracle-SibME] :  
Oracle-SibME-PSSMSG4052C01
```

```
[info] The script(s) have been generated in /bpm75/util/dbUtils/Oracle-  
SibME-PSSMSG4052C01  
[info] thanks, quitting now ...
```

Verify the existence of the newly created files:

```
ls -l
```

```
... BPC_Oracle_BPC4052C01.properties  
... BPCReporting_Oracle_BPC4052C01.properties  
... BPM_PerformanceDW_Oracle_PDW4052C01.properties  
... BPM_ProcessServer_Oracle_PSS4052C01.properties  
... Bspace_Oracle_BSP4052C01.properties  
... CommonDB_Oracle_COM4052C01.properties  
... SibME_Oracle_BPCMSG4052C01.properties  
... SibME_Oracle_PDWMMSG4052C01.properties  
... SibME_Oracle_PSSMSG4052C01.properties  
... dbDesignGenerator.log  
... DbDesignGenerator.sh  
... Oracle-BPC-BPC4052C01  
... Oracle-BPCReporting-BPC4052C01  
... Oracle-BPM_PerformanceDW-PDW4052C01  
... Oracle-BPM_ProcessServer-PSS4052C01  
... Oracle-BSpace-BSP4052C01  
... Oracle-CommonDB-COM4052C01  
... Oracle-SibME-BPCMSG4052C01  
... Oracle-SibME-PDWMMSG4052C01  
... Oracle-SibME-PSSMSG4052C01  
... profileHelpers
```

Currently the database design generator only creates a script for the user and tables required by Process Server SIB Messaging, not for the recommended tablespace. In order to create a dedicated tablespace the generated script has to be altered. Navigate to **Oracle-SibME-PSSMSG4052C01**, then open **Oracle-SibME.sql** in a text editor:

```
CREATE USER PSSMSG4052C01 IDENTIFIED EXTERNALLY DEFAULT TABLESPACE USERS
QUOTA UNLIMITED ON USERS ACCOUNT LOCK;

CREATE TABLE PSSMSG4052C01.SIBOWNER (
  ME_UUID VARCHAR(16),
  INC_UUID VARCHAR(16),
  VERSION INTEGER,
  MIGRATION_VERSION INTEGER
);
...
```

Add a command to create a dedicated tablespace and change the way the user is created (make sure that the tablespace datafile location, the datafile size as well as the schema roles correspond to what has been defined in the planning section. Also make sure that you replace <PSSMSG4052C01_password> with the intended password). The file should look like this:

```
CREATE TABLESPACE PSSMSG4052C01_UDT DATAFILE '/disk5/PSSMSG4052C01_UDT
.dbf' SIZE 100M AUTOEXTEND ON NEXT 20M MAXSIZE UNLIMITED LOGGING;
CREATE USER PSSMSG4052C01 IDENTIFIED BY <PSSMSG4052C01_password> DEFAULT
TABLESPACE PSSMSG4052C01_UDT;
GRANT CONNECT, RESOURCE TO PSSMSG4052C01;

CREATE TABLE PSSMSG4052C01.SIBOWNER (
  ME_UUID VARCHAR(16),
  INC_UUID VARCHAR(16),
  VERSION INTEGER,
  MIGRATION_VERSION INTEGER
);
...
```

Scroll down towards the end of the file, there are 9 **GRANT** commands:

```
...
CREATE TABLE PSSMSG4052C01.SIBKEYS (
  ID VARCHAR2(50) NOT NULL,
  LAST_KEY NUMBER(19) NOT NULL,
  PRIMARY KEY(ID)
);
GRANT SELECT,INSERT,UPDATE ON PSSMSG4052C01.SIBOWNER TO PSSMSG4052C01;
GRANT SELECT,INSERT,UPDATE ON PSSMSG4052C01.SIBOWNER0 TO PSSMSG4052C01;
GRANT SELECT,INSERT ON PSSMSG4052C01.SIBCLASSMAP TO PSSMSG4052C01;
GRANT SELECT,INSERT ON PSSMSG4052C01.SIBLISTING TO PSSMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON PSSMSG4052C01.SIB000 TO
PSSMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON PSSMSG4052C01.SIB001 TO
PSSMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON PSSMSG4052C01.SIB002 TO
PSSMSG4052C01;
GRANT SELECT,INSERT,UPDATE,DELETE ON PSSMSG4052C01.SIBXACTS TO
PSSMSG4052C01;
GRANT SELECT,INSERT,UPDATE ON PSSMSG4052C01.SIBKEYS TO PSSMSG4052C01;
```

Remove all of them and add command **QUIT;** at the very end of the file:

```
...
CREATE TABLE PSSMSG4052C01.SIBKEYS (
  ID VARCHAR2(50) NOT NULL,
  LAST_KEY NUMBER(19) NOT NULL,
  PRIMARY KEY(ID)
);
QUIT;
```

After you have finished editing the file save and close **Oracle-SibME.sql**.

5.10 Create Scripts for Common Event Infrastructure Messaging

1. As user **root** start the Database Design Generator again:

```
./DbDesignGenerator.sh
```

```
[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu;
'?' for help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment
Environment
(2)Create a database design for a single component
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]
```

2. Enter **2** to create a database design for a single component, then hit enter:

```
Please enter the number for the design option :2
```

```
(1)bpc
(2)bpcreporting
(3)bpm_performancedw
(4)bpm_processserver
(5)bspace
(6)cei
(7)commondb
(8)sca
(9)sibme
```

3. Enter **9** to create a database design for SIB messaging, then hit enter:

```
Please enter the number for the component :9
```

```
[info] Please pick one of the following [database type(s)] :

(1)DB2-distributed
(2)DB2-zOS
(3)Oracle
(4)SQL Server
```

4. Enter **3** to select Oracle, then hit enter:

```
Please enter the number for the database type :3
```

```
[info] Please enter the values for the properties in the database objects section.
```

5. Enter the Database User name (**CEIMSG4052C01**), then hit enter:

```
Database User name[default=IBMUUSER] :CEIMSG4052C01
```

6. Enter the Schema name (**CEIMSG4052C01**), then hit enter:

```
Schema name[default=IBMWSSIB] :CEIMSG4052C01
```

```
[info] You have completed database objects section properties needed for database scripts generation.
```

7. Leave the default (empty) on the next prompt and hit enter:

```
To skip data source properties, enter 's'; or enter anything else to continue :
```

```
[info] Please pick one of the following [database provider(s)] :  
(1)Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)
```

8. Leave the default (**Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)**) as database provider, then hit enter:

```
Please enter the number for the database provider [default=Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)] :
```

```
[info] Please enter the values for the properties in the data source properties section.
```

9. Enter the Database name (**ORA11DB**), then hit enter:

```
Database name[default=] :ORA11DB
```

10. Enter the Database server host (**fmtc6152.boeblingen.de.ibm.com**), then hit enter:

```
Database server host[default=] :fmtc6152.boeblingen.de.ibm.com
```

11. Enter the Database server port (**1521**), then hit enter

```
Database server port[default=1521] :
```

```
[info] Please pick one of the following [Oracle driver type(s)] :
```

```
(1)oci8  
(2)thin
```

12. Leave the default (**thin**) as Oracle driver type, then hit enter:

```
Please enter the number for the Oracle driver type [default=thin] :
```

```
[info] Please pick one of the following [createTables(s)] :
```

```
(1>false  
(2>true
```

13. Enter **1 (=false)**, then hit enter:

```
Please enter the number for the createTables [default=true] :1
```

14. Leave the Data source username default (**CEIMSG4052C01**) and hit enter:

```
Data source user name[default=CEIMSG4052C01] :
```

15. Enter the password for **CEIMSG4052C01**, then hit Enter

```
Data source password[default=] :<CEIMSG4052C01_password>
```

16. Leave the default Oracle JDBC driver path and hit enter:

```
Oracle JDBC driver path[default=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle] :
```

17. Leave the default for the output directory in order to create the scripts in the current directory, then hit enter:

```
Please enter the output directory [default=/bpm75/util/dbUtils] :
```

18. Enter **SibME_Oracle_CEIMSG4052C01.properties** as output filename, then hit enter:

```
Please enter the output filename [default=SibME_Oracle.properties] :  
SibME_Oracle_CEIMSG4052C01.properties
```

```
[info] The database design has been generated  
in/bpm75/util/dbUtils/SibME_Oracle_CEIMSG4052C01.properties
```

19. Leave the default to generate the database scripts and hit enter:

```
generate database scripts? (y/n) [default=y] :
```

20. Enter **Oracle-SibME-CEIMSG4052C01** as output directory, then hit enter:

```
Please enter the output directory for SibME [default=Oracle-SibME] :  
Oracle-SibME-CEIMSG4052C01
```

```
[info] The script(s) have been generated in /bpm75/util/dbUtils/Oracle-  
SibME-CEIMSG4052C01  
[info] thanks, quitting now ...
```

Verify the existence of the newly created files:

```
ls -l
```

```
... BPC_Oracle_BPC4052C01.properties  
... BPCReporting_Oracle_BPC4052C01.properties  
... BPM_PerformanceDW_Oracle_PDW4052C01.properties  
... BPM_ProcessServer_Oracle_PSS4052C01.properties  
... Bspace_Oracle_BSP4052C01.properties  
... CommonDB_Oracle_COM4052C01.properties  
... SibME_Oracle_BPCMSG4052C01.properties  
... SibME_Oracle_PDWMSG4052C01.properties  
... SibME_Oracle_PSSMSG4052C01.properties  
... SibME_Oracle_CEIMSG4052C01.properties  
... dbDesignGenerator.log  
... DbDesignGenerator.sh  
... Oracle-BPC-BPC4052C01  
... Oracle-BPCReporting-BPC4052C01  
... Oracle-BPM_PerformanceDW-PDW4052C01  
... Oracle-BPM_ProcessServer-PSS4052C01  
... Oracle-BSpace-BSP4052C01  
... Oracle-CommonDB-COM4052C01  
... Oracle-SibME-BPCMSG4052C01  
... Oracle-SibME-PDWMSG4052C01  
... Oracle-SibME-PSSMSG4052C01  
... Oracle-SibME-CEIMSG4052C01  
... profileHelpers
```

Currently the database design generator only creates a script for the user and tables required by Common Event Infrastructure SIB Messaging, not for the recommended tablespace. In order to create a dedicated tablespace the generated script has to be altered. Navigate to **Oracle-SibME-CEIMSG4052C01**, then open **Oracle-SibME.sql** in a text editor:

```
CREATE USER CEIMSG4052C01 IDENTIFIED EXTERNALLY DEFAULT TABLESPACE USERS
QUOTA UNLIMITED ON USERS ACCOUNT LOCK;

CREATE TABLE CEIMSG4052C01.SIBOWNER (
  ME_UUID VARCHAR(16),
  INC_UUID VARCHAR(16),
  VERSION INTEGER,
  MIGRATION_VERSION INTEGER
);
...
```

Add a command to create a dedicated tablespace and change the way the user is created (make sure that the tablespace datafile location, the datafile size as well as the schema roles correspond to what has been defined in the planning section. Also make sure that you replace <CEIMSG4052C01_password> with the intended password). The file should look like this:

```
CREATE TABLESPACE CEIMSG4052C01_UDT DATAFILE '/disk9/CEIMSG4052C01_UDT
.dbf' SIZE 50M AUTOEXTEND ON NEXT 20M MAXSIZE UNLIMITED LOGGING;
CREATE USER CEIMSG4052C01 IDENTIFIED BY <CEIMSG4052C01_password> DEFAULT
TABLESPACE CEIMSG4052C01_UDT;
GRANT CONNECT, RESOURCE TO CEIMSG4052C01;

CREATE TABLE CEIMSG4052C01.SIBOWNER (
  ME_UUID VARCHAR(16),
  INC_UUID VARCHAR(16),
  VERSION INTEGER,
  MIGRATION_VERSION INTEGER
);
...
```

Scroll down towards the end of the file, there are 9 **GRANT** commands:

```
...
CREATE TABLE CEIMSG4052C01.SIBKEYS (
  ID VARCHAR2(50) NOT NULL,
  LAST_KEY NUMBER(19) NOT NULL,
  PRIMARY KEY(ID)
);
GRANT SELECT,INSERT,UPDATE ON CEIMSG4052C01.SIBOWNER TO CEIMSG4052C01;
GRANT SELECT,INSERT,UPDATE ON CEIMSG4052C01.SIBOWNER0 TO CEIMSG4052C01;
GRANT SELECT,INSERT ON CEIMSG4052C01.SIBCLASSMAP TO CEIMSG4052C01;
GRANT SELECT,INSERT ON CEIMSG4052C01.SIBLISTING TO CEIMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON CEIMSG4052C01.SIB000 TO
CEIMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON CEIMSG4052C01.SIB001 TO
CEIMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON CEIMSG4052C01.SIB002 TO
CEIMSG4052C01;
GRANT SELECT,INSERT,UPDATE,DELETE ON CEIMSG4052C01.SIBXACTS TO
CEIMSG4052C01;
GRANT SELECT,INSERT,UPDATE ON CEIMSG4052C01.SIBKEYS TO CEIMSG4052C01;
```

Remove all of them and add command **QUIT;** at the very end of the file:

```
...
CREATE TABLE CEIMSG4052C01.SIBKEYS (
  ID VARCHAR2(50) NOT NULL,
  LAST_KEY NUMBER(19) NOT NULL,
  PRIMARY KEY(ID)
);
QUIT;
```

After you have finished editing the file save and close **Oracle-SibME.sql**.

5.11 Create Scripts for SCA System Messaging

1. As user `root` start the Database Design Generator again:

```
./DbDesignGenerator.sh
```

```
[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu;
'?' for help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment
Environment
(2)Create a database design for a single component
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]
```

2. Enter `2` to create a database design for a single component, then hit enter:

```
Please enter the number for the design option :2
```

```
(1)bpc
(2)bpcreporting
(3)bpm_performancedw
(4)bpm_processserver
(5)bspace
(6)cei
(7)commondb
(8)sca
(9)sibme
```

3. Enter `9` to create a database design for SIB messaging, then hit enter:

```
Please enter the number for the component :9
```

```
[info] Please pick one of the following [database type(s)] :

(1)DB2-distributed
(2)DB2-zOS
(3)Oracle
(4)SQL Server
```

4. Enter **3** to select Oracle, then hit enter:

```
Please enter the number for the database type :3
```

```
[info] Please enter the values for the properties in the database objects section.
```

5. Enter the Database User name (**SCASYMSG4052C01**), then hit enter:

```
Database User name[default=IBMUUSER] :SCASYMSG4052C01
```

6. Enter the Schema name (**SCASYMSG4052C01**), then hit enter:

```
Schema name[default=IBMWSSIB] :SCASYMSG4052C01
```

```
[info] You have completed database objects section properties needed for database scripts generation.
```

7. Leave the default (empty) on the next prompt and hit enter:

```
To skip data source properties, enter 's'; or enter anything else to continue :
```

```
[info] Please pick one of the following [database provider(s)] :  
(1)Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)
```

8. Leave the default (**Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)**) as database provider, then hit enter:

```
Please enter the number for the database provider [default=Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)] :
```

```
[info] Please enter the values for the properties in the data source properties section.
```

9. Enter the Database name (**ORA11DB**), then hit enter:

```
Database name[default=] :ORA11DB
```

10. Enter the Database server host (**fmtc6152.boeblingen.de.ibm.com**), then hit enter:

```
Database server host[default=] :fmtc6152.boeblingen.de.ibm.com
```

11. Enter the Database server port (**1521**), then hit enter

```
Database server port[default=1521] :
```

```
[info] Please pick one of the following [Oracle driver type(s)] :
```

```
(1)oci8  
(2)thin
```

12. Leave the default (**thin**) as Oracle driver type, then hit enter:

```
Please enter the number for the Oracle driver type [default=thin] :
```

```
[info] Please pick one of the following [createTables(s)] :
```

```
(1>false  
(2>true
```

12. Enter **1 (=false)**, then hit enter:

```
Please enter the number for the createTables [default=true] :1
```

14. Leave the Data source username default (**SCASYSMSG4052C01**) and hit enter:

```
Data source user name[default=SCASYSMSG4052C01] :
```

15. Enter the password for **SCASYSMSG4052C01**, then hit Enter

```
Data source password[default=] :<SCASYSMSG4052C01_password>
```

16. Leave the default Oracle JDBC driver path and hit enter:

```
Oracle JDBC driver path[default=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle] :
```

17. Leave the default for the output directory in order to create the scripts in the current directory, then hit enter:

```
Please enter the output directory [default=/bpm75/util/dbUtils] :
```

18. Enter **SibME_Oracle_SCASYSMSG4052C01.properties** as output filename, then hit enter:

```
Please enter the output filename [default=SibME_Oracle.properties] :  
SibME_Oracle_SCASYSMSG4052C01.properties
```

```
[info] The database design has been generated  
in/bpm75/util/dbUtils/SibME_Oracle_CEIMSG4052C01.properties
```

19. Leave the default to generate the database scripts and hit enter:

```
generate database scripts? (y/n) [default=y] :
```

20. Enter **Oracle-SibME-SCASYSMSG4052C01** as output directory, then hit enter:

```
Please enter the output directory for SibME [default=Oracle-SibME] :  
Oracle-SibME-SCASYSMSG4052C01
```

```
[info] The script(s) have been generated in /bpm75/util/dbUtils/Oracle-  
SibME-SCASYSMSG4052C01  
[info] thanks, quitting now ...
```

Verify the existence of the newly created files:

```
ls -l
```

```
... BPC_Oracle_BPC4052C01.properties  
... BPCReporting_Oracle_BPC4052C01.properties  
... BPM_PerformanceDW_Oracle_PDW4052C01.properties  
... BPM_ProcessServer_Oracle_PSS4052C01.properties  
... Bspace_Oracle_BSP4052C01.properties  
... CommonDB_Oracle_COM4052C01.properties  
... SibME_Oracle_BPCMSG4052C01.properties  
... SibME_Oracle_PDWMSG4052C01.properties  
... SibME_Oracle_PSSMSG4052C01.properties  
... SibME_Oracle_CEIMSG4052C01.properties  
... SibME_Oracle_SCASYSMSG4052C01.properties  
... dbDesignGenerator.log  
... DbDesignGenerator.sh  
... Oracle-BPC-BPC4052C01  
... Oracle-BPCReporting-BPC4052C01  
... Oracle-BPM_PerformanceDW-PDW4052C01  
... Oracle-BPM_ProcessServer-PSS4052C01  
... Oracle-BSpace-BSP4052C01  
... Oracle-CommonDB-COM4052C01  
... Oracle-SibME-BPCMSG4052C01  
... Oracle-SibME-PDWMSG4052C01  
... Oracle-SibME-PSSMSG4052C01  
... Oracle-SibME-CEIMSG4052C01  
... Oracle-SibME-SCASYSMSG4052C01  
... profileHelpers
```

Currently the database design generator only creates a script for the user and tables required by SCA System SIB Messaging, not for the recommended tablespace. In order to create a dedicated tablespace the generated script has to be altered. Navigate to **Oracle-SibME-SCASYSMSG4052C01**, then open **Oracle-SibME.sql** in a text editor:

```
CREATE USER SCASYSMSG4052C01 IDENTIFIED EXTERNALLY DEFAULT TABLESPACE
USERS QUOTA UNLIMITED ON USERS ACCOUNT LOCK;

CREATE TABLE SCASYSMSG4052C01.SIBOWNER (
  ME_UUID VARCHAR(16),
  INC_UUID VARCHAR(16),
  VERSION INTEGER,
  MIGRATION_VERSION INTEGER
);
...
```

Add a command to create a dedicated tablespace and change the way the user is created (make sure that the tablespace datafile location, the datafile size as well as the schema roles correspond to what has been defined in the planning section. Also make sure that you replace <SCASYSMSG4052C01_password> with the intended password). The file should look like this:

```
CREATE TABLESPACE SCASYSMSG4052C01_UDT DATAFILE
'/disk5/SCASYSMSG4052C01_UDT.dbf' SIZE 100M AUTOEXTEND ON NEXT 20M MAXSIZE
UNLIMITED LOGGING;
CREATE USER SCASYSMSG4052C01 IDENTIFIED BY <SCASYSMSG4052C01_password>
DEFAULT TABLESPACE SCASYSMSG4052C01_UDT;
GRANT CONNECT, RESOURCE TO SCASYSMSG4052C01;

CREATE TABLE SCASYSMSG4052C01.SIBOWNER (
  ME_UUID VARCHAR(16),
  INC_UUID VARCHAR(16),
  VERSION INTEGER,
  MIGRATION_VERSION INTEGER
);
...
```

Scroll down towards the end of the file, there are 9 **GRANT** commands:

```
...
CREATE TABLE SCASYSMSG4052C01.SIBKEYS (
  ID VARCHAR2(50) NOT NULL,
  LAST_KEY NUMBER(19) NOT NULL,
  PRIMARY KEY(ID)
);
GRANT SELECT,INSERT,UPDATE ON SCASYSMSG4052C01.SIBOWNER TO
SCASYSMSG4052C01;
GRANT SELECT,INSERT,UPDATE ON SCASYSMSG4052C01.SIBOWNER0 TO
SCASYSMSG4052C01;
GRANT SELECT,INSERT ON SCASYSMSG4052C01.SIBCLASSMAP TO SCASYSMSG4052C01;
GRANT SELECT,INSERT ON SCASYSMSG4052C01.SIBLISTING TO SCASYSMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON SCASYSMSG4052C01.SIB000 TO
SCASYSMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON SCASYSMSG4052C01.SIB001 TO
SCASYSMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON SCASYSMSG4052C01.SIB002 TO
SCASYSMSG4052C01;
GRANT SELECT,INSERT,UPDATE,DELETE ON SCASYSMSG4052C01.SIBXACTS TO
SCASYSMSG4052C01;
GRANT SELECT,INSERT,UPDATE ON SCASYSMSG4052C01.SIBKEYS TO
SCASYSMSG4052C01;
```

Remove all of them and add command **QUIT;** at the very end of the file:

```
...
CREATE TABLE SCASYSMSG4052C01.SIBKEYS (
  ID VARCHAR2(50) NOT NULL,
  LAST_KEY NUMBER(19) NOT NULL,
  PRIMARY KEY(ID)
);
QUIT;
```

After you have finished editing the file save and close **Oracle-SibME.sql**.

5.12 Create Scripts for SCA Application Messaging

1. As user **root** start the Database Design Generator again:

```
./DbDesignGenerator.sh
```

```
[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu;
'?' for help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment
Environment
(2)Create a database design for a single component
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]
```

2. Enter **2** to create a database design for a single component, then hit enter:

```
Please enter the number for the design option :2
```

```
(1)bpc
(2)bpcreporting
(3)bpm_performancedw
(4)bpm_processserver
(5)bspace
(6)cei
(7)commondb
(8)sca
(9)sibme
```

3. Enter **9** to create a database design for SIB messaging, then hit enter:

```
Please enter the number for the component :9
```

```
[info] Please pick one of the following [database type(s)] :

(1)DB2-distributed
(2)DB2-zOS
(3)Oracle
(4)SQL Server
```

4. Enter **3** to select Oracle, then hit enter:

```
Please enter the number for the database type :3
```

```
[info] Please enter the values for the properties in the database objects section.
```

5. Enter the Database User name (**SCAAPMSG4052C01**), then hit enter:

```
Database User name[default=IBMUUSER] :SCAAPMSG4052C01
```

6. Enter the Schema name (**SCAAPMSG4052C01**), then hit enter:

```
Schema name[default=IBMWSSIB] :SCAAPMSG4052C01
```

```
[info] You have completed database objects section properties needed for database scripts generation.
```

7. Leave the default (empty) on the next prompt and hit enter:

```
To skip data source properties, enter 's'; or enter anything else to continue :
```

```
[info] Please pick one of the following [database provider(s)] :  
(1)Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)
```

8. Leave the default (**Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)**) as database provider, then hit enter:

```
Please enter the number for the database provider [default=Oracle JDBC Driver # XA data source # Oracle JDBC Driver (XA)] :
```

```
[info] Please enter the values for the properties in the data source properties section.
```

9. Enter the Database name (**ORA11DB**), then hit enter:

```
Database name[default=] :ORA11DB
```

10. Enter the Database server host (**fmtc6152.boeblingen.de.ibm.com**), then hit enter:

```
Database server host[default=] :fmtc6152.boeblingen.de.ibm.com
```

11. Enter the Database server port (**1521**), then hit enter

```
Database server port[default=1521] :
```

```
[info] Please pick one of the following [Oracle driver type(s)] :
```

```
(1)oci8  
(2)thin
```

12. Leave the default (**thin**) as Oracle driver type, then hit enter:

```
Please enter the number for the Oracle driver type [default=thin] :
```

```
[info] Please pick one of the following [createTables(s)] :
```

```
(1>false  
(2>true
```

13. Enter **1 (=false)**, then hit enter:

```
Please enter the number for the createTables [default=true] :1
```

14. Leave the Data source username default (**SCAAPMSG4052C01**) and hit enter:

```
Data source user name[default=SCAAPMSG4052C01] :
```

15. Enter the password for **SCAAPMSG4052C01**, then hit Enter

```
Data source password[default=] :<SCAAPMSG4052C01_password>
```

16. Leave the default Oracle JDBC driver path and hit enter:

```
Oracle JDBC driver path[default=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle] :
```

17. Leave the default for the output directory in order to create the scripts in the current directory, then hit enter:

```
Please enter the output directory [default=/bpm75/util/dbUtils] :
```

18. Enter **SibME_Oracle_SCAAPPMSG4052C01.properties** as output filename, then hit enter:

```
Please enter the output filename [default=SibME_Oracle.properties] :  
SibME_Oracle_SCAAPPMSG4052C01.properties
```

```
[info] The database design has been generated  
in/bpm75/util/dbUtils/SibME_Oracle_SCAAPPMSG4052C01.properties
```

19. Leave the default to generate the database scripts and hit enter:

```
generate database scripts? (y/n) [default=y] :
```

20. Enter **Oracle-SibME-SCAAPPMSG4052C01** as output directory, then hit enter:

```
Please enter the output directory for SibME [default=Oracle-SibME] :  
Oracle-SibME-SCAAPPMSG4052C01
```

```
[info] The script(s) have been generated in /bpm75/util/dbUtils/Oracle-  
SibME-SCAAPPMSG4052C01  
[info] thanks, quitting now ...
```

Verify the existence of the newly created files:

```
ls -l
```

```
... BPC_Oracle_BPC4052C01.properties  
... BPCReporting_Oracle_BPC4052C01.properties  
... BPM_PerformanceDW_Oracle_PDW4052C01.properties  
... BPM_ProcessServer_Oracle_PSS4052C01.properties  
... Bspace_Oracle_BSP4052C01.properties  
... CommonDB_Oracle_COM4052C01.properties  
... SibME_Oracle_BPCMSG4052C01.properties  
... SibME_Oracle_PDWMSG4052C01.properties  
... SibME_Oracle_PSSMSG4052C01.properties  
... SibME_Oracle_CEIMSG4052C01.properties  
... SibME_Oracle_SCASYSMSG4052C01.properties  
... SibME_Oracle_SCAAPPMSG4052C01.properties  
... dbDesignGenerator.log  
... DbDesignGenerator.sh  
... Oracle-BPC-BPC4052C01  
... Oracle-BPCReporting-BPC4052C01  
... Oracle-BPM_PerformanceDW-PDW4052C01  
... Oracle-BPM_ProcessServer-PSS4052C01  
... Oracle-BSpace-BSP4052C01  
... Oracle-CommonDB-COM4052C01  
... Oracle-SibME-BPCMSG4052C01  
... Oracle-SibME-PDWMSG4052C01  
... Oracle-SibME-PSSMSG4052C01  
... Oracle-SibME-CEIMSG4052C01  
... Oracle-SibME-SCASYSMSG4052C01  
... Oracle-SibME-SCAAPPMSG4052C01  
... profileHelpers
```

Currently the database design generator only creates a script for the user and tables required by SCA Application SIB Messaging, not for the recommended tablespace. In order to create a dedicated tablespace the generated script has to be altered. Navigate to **Oracle-SibME-SCAAPPMSG4052C01**, then open **Oracle-SibME.sql** in a text editor:

```
CREATE USER SCAAPPMSG4052C01 IDENTIFIED EXTERNALLY DEFAULT TABLESPACE
USERS QUOTA UNLIMITED ON USERS ACCOUNT LOCK;

CREATE TABLE SCAAPPMSG4052C01.SIBOWNER (
  ME_UUID VARCHAR(16),
  INC_UUID VARCHAR(16),
  VERSION INTEGER,
  MIGRATION_VERSION INTEGER
);
...
```

Add a command to create a dedicated tablespace and change the way the user is created (make sure that the tablespace datafile location, the datafile size as well as the schema roles correspond to what has been defined in the planning section. Also make sure that you replace <SCAAPPMSG4052C01_password> with the intended password). The file should look like this:

```
CREATE TABLESPACE SCAAPPMSG4052C01_UDT DATAFILE
'/disk9/SCAAPPMSG4052C01_UDT.dbf' SIZE 50M AUTOEXTEND ON NEXT 20M MAXSIZE
UNLIMITED LOGGING;
CREATE USER SCAAPPMSG4052C01 IDENTIFIED BY <SCAAPPMSG4052C01_password>
DEFAULT TABLESPACE SCAAPPMSG4052C01_UDT;
GRANT CONNECT, RESOURCE TO SCAAPPMSG4052C01;

CREATE TABLE SCAAPPMSG4052C01.SIBOWNER (
  ME_UUID VARCHAR(16),
  INC_UUID VARCHAR(16),
  VERSION INTEGER,
  MIGRATION_VERSION INTEGER
);
...
```

Scroll down towards the end of the file, there are 9 **GRANT** commands:

```
...
CREATE TABLE SCAAPPMSG4052C01.SIBKEYS (
  ID VARCHAR2(50) NOT NULL,
  LAST_KEY NUMBER(19) NOT NULL,
  PRIMARY KEY(ID)
);
GRANT SELECT,INSERT,UPDATE ON SCAAPPMSG4052C01.SIBOWNER TO
SCAAPPMSG4052C01;
GRANT SELECT,INSERT,UPDATE ON SCAAPPMSG4052C01.SIBOWNERO TO
SCAAPPMSG4052C01;
GRANT SELECT,INSERT ON SCAAPPMSG4052C01.SIBCLASSMAP TO SCAAPPMSG4052C01;
GRANT SELECT,INSERT ON SCAAPPMSG4052C01.SIBLISTING TO SCAAPPMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON SCAAPPMSG4052C01.SIB000 TO
SCAAPPMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON SCAAPPMSG4052C01.SIB001 TO
SCAAPPMSG4052C01;
GRANT SELECT,INSERT,DELETE,UPDATE ON SCAAPPMSG4052C01.SIB002 TO
SCAAPPMSG4052C01;
GRANT SELECT,INSERT,UPDATE,DELETE ON SCAAPPMSG4052C01.SIBXACTS TO
SCAAPPMSG4052C01;
GRANT SELECT,INSERT,UPDATE ON SCAAPPMSG4052C01.SIBKEYS TO
SCAAPPMSG4052C01;
```

Remove all of them and add command **QUIT;** at the very end of the file:

```
...
CREATE TABLE SCAAPPMSG4052C01.SIBKEYS (
  ID VARCHAR2(50) NOT NULL,
  LAST_KEY NUMBER(19) NOT NULL,
  PRIMARY KEY(ID)
);
QUIT;
```

After you have finished editing the file save and close **Oracle-SibME.sql**.

5.13 Create Scripts for XA recovery

In order to assure proper XA recovery handling a dedicated XA recovery user with corresponding privileges is required. Within [/bpm75/util/dbUtils](#) create a folder and name it **Oracle-XA_Recovery-XAREC4052C01**. Run:

```
mkdir Oracle-XA_Recovery-XAREC4052C01
```

Navigate to **Oracle-XA_Recovery-XAREC4052C01**, create a new file and name it **createUser_XA_Recovery.sql**. Insert following into the newly created file (Make sure that you replace <XAREC4052C01_password> with the intended password):

```
CREATE USER XAREC4052C01 IDENTIFIED BY <XAREC4052C01_password>;
GRANT CONNECT TO XAREC4052C01;
GRANT FORCE ANY TRANSACTION TO XAREC4052C01;
GRANT SELECT ON DBA_PENDING_TRANSACTIONS TO XAREC4052C01;
GRANT SELECT ON PENDING_TRANS$ TO XAREC4052C01;
GRANT SELECT ON DBA_2PC_PENDING TO XAREC4052C01;
GRANT EXECUTE ON DBMS_XA TO XAREC4052C01;
```

After you have finished editing the file save and close **createUser_XA_Recovery.sql**.

5.14 Providing the Scripts for execution

Congratulations, you now have created all database files that are needed by the database administrator in order to create the database objects required by BPM. In order to provide the files to the DBA for execution the whole **dbUtils** folder is going to be packed and copied over to the database host. Run:

```
tar cfvz /bpm75/util/dbUtils/dbUtils.tar.gz /bpm75/util/dbUtils/  
...  
/bpm75/util/dbUtils/Oracle-SibME-PDWMSG4052C01/Oracle-SibME.sql  
/bpm75/util/dbUtils/SibME_Oracle_PDWMSG4052C01.properties  
/bpm75/util/dbUtils/Oracle-SibME-SCAAPPMSG4052C01/  
/bpm75/util/dbUtils/Oracle-SibME-SCAAPPMSG4052C01/Oracle-SibME.sql  
[root@fmtc4052 dbUtils]#
```

In order to proceed copy **dbUtils.tar.gz** to the machine hosting the database (**fmtc6152.boeblingen.de.ibm.com**). Run:

```
cd /bpm75/util/dbUtils  
scp dbUtils.tar.gz oracle@fmtc6152.boeblingen.de.ibm.com:/home/oracle
```

Enter the password of the host and hit enter, **dbUtils.tar.gz** will now be copied to the database machine.

```
oracle@fmtc6152.boeblingen.de.ibm.com's password: <password>
```

```
dbUtils.tar.gz 100% 171KB 170.7KB/s 00:00
```

Chapter 6 Install the Oracle binaries



Involved systems:

Database machine: fmtc6152.boeblingen.de.ibm.com

This chapter covers the Oracle binary installation and its prerequisites on an Red Hat Enterprise Linux Version 5 system.

6.1 Oracle installation prerequisites

All information in the following sections were gathered from the **Oracle® Database Installation Guide 11g Release 2 (11.2) for Linux** Part Number **E16763-09**:

http://download.oracle.com/docs/cd/E11882_01/install.112/e16763/toc.htm

Before Oracle can be installed on a Linux operating system all requirements must be met and all preparation tasks must be finished successfully.

6.1.1 Oracle operating system requirements

This section describes the operating system requirements for Oracle 11g. These requirements will be checked during the Oracle installation process and marked as failed or succeeded. If a prerequisite check fails go back to this chapter. Continuing the installation with a failed prerequisite can lead to an unrecoverable installation failure.

6.1.1.1 Required Linux packages for Oracle

An Oracle 11g installation requires several Linux software packages (RPMs) to be installed on the RHEL5. Most of these packages have been installed automatically during the actual Linux installation. However, to avoid potential problems at a later point in time, it is recommended to check that the RPMs listed below are installed. Note that these packages must be at least at the level of the listed version.

RPMs required for Oracle 11g on a RHEL5 64-bit system - note that on a 64bit system, several software packages are required in both, 32-bit and 64-bit versions:

```
binutils-2.17.50.0.6
compat-libstdc++-33-3.2.3
compat-libstdc++-33-3.2.3 (32 bit)
elfutils-libelf-0.125
elfutils-libelf-devel-0.125
gcc-4.1.2
gcc-c++-4.1.2
glibc-2.5-24
glibc-2.5-24 (32 bit)
glibc-common-2.5
glibc-devel-2.5
glibc-devel-2.5 (32 bit)
glibc-headers-2.5
ksh-20060214
libaio-0.3.106
libaio-0.3.106 (32 bit)
libaio-devel-0.3.106
libaio-devel-0.3.106 (32 bit)
libgcc-4.1.2
libgcc-4.1.2 (32 bit)
libstdc++-4.1.2
libstdc++-4.1.2 (32 bit)
libstdc++-devel 4.1.2
make-3.81
numactl-devel-0.9.8.x86_64
sysstat-7.0.2
```

Note: The listed packages without additional (32 bit) mark are 64 bit versions.

RPMs required for Oracle 11g on a RHEL5 32-bit system:

```
binutils-2.17.50.0.6
compat-libstdc++-33-3.2.3
elfutils-libelf-0.125
elfutils-libelf-devel-0.125
elfutils-libelf-devel-static-0.125
gcc-4.1.2
gcc-c++-4.1.2
glibc-2.5-24
glibc-common-2.5
glibc-devel-2.5
glibc-headers-2.5
kernel-headers-2.6.18
ksh-20060214
libaio-0.3.106
libaio-devel-0.3.106
libgcc-4.1.2
libgomp-4.1.2
libstdc++-4.1.2
libstdc++-devel-4.1.2
make-3.81
numactl-devel-0.9.8.i386
sysstat-7.0.2
```

To verify that the required software packages are installed, enter the following command as user **root**:

```
rpm -qa |grep <package_name>
```

For example:

```
rpm -qa |grep binutils
```

To install the required software packages , enter the following command as user **root**:

```
rpm -ivh <package_name_version>
```

For example:

```
rpm -ivh binutils-2.17.50.0.6
```

6.1.1.2 Linux kernel requirements

Oracle 11g requires a Linux kernel version of at least 2.6.18.

To verify the installed Linux kernel version on your Oracle DB host machine execute the following command as user `root`:

```
uname -r
```

```
2.6.18-238.5.1.el5
```

6.1.1.3 Linux kernel parameters

The Linux kernel parameters listed below show the values required for the Oracle 11g database. It is recommended to tune these parameters for production environments.

For further information on tuning please refer to: **Oracle® Database Performance Tuning Guide 11g Release 2 (11.2)** Part Number **E16638-05**:

http://download.oracle.com/docs/cd/E11882_01/server.112/e16638/toc.htm

The following parameters and values are required as a minimum for the Oracle 11g installation:

Kernel parameter		Value	Description
kernel.shmmax		32-bit Linux: 1 byte less than 4 GB which is 4294967295 64-bit Linux: half the size of physical memory	shmmax is the maximum size of one shared memory segment.
kernel.shmmni		4096	shmmni is the maximum number of shared memory segments
kernel.shmall		2097152	shmall specifies the maximum number of shared memory pages
kernel.sem	semmsl	250	semmsl is the maximum number of semaphores per semaphore set
	semmns	32000	semmns is the the total number of semaphores
	semopm	100	semopm is the maximum number of semaphore operations that can be performed per semop(2) system call.
	semmni	128	semmni is the maximum number of semaphore sets in the entire Linux system
fs.file-max		6815744	file-max is the maximum of file handles that the Linux kernel will allocate
fs.aio-max-nr		1048576	io-max-nr limits concurrent outstanding requests and should be set to avoid I/O subsystem failures
net.ipv4.ip_local_port_range		9000 65500	ip_local_port_range defines the local port range used by TCP und UDP traffic to choose the local port
net.core.rmem_default		262144	rmem_default is the receive socket buffer's default size
net.core.rmem_max		4194304	rmem_max is the receive socket buffer's maximum size
net.core.wmem_default		262144	wmem_default is the send socket buffer's default size
net.core.wmem_max		1048576	wmem_max is the send socket buffer's maximum size

Important: If the current system values are higher than the ones listed above, it is recommended to leave them as they are.

This is not valid for the SHMMAX parameter which needs to be calculated.

To check the values issue the following command as user `root`:

```
/sbin/sysctl -a | grep <kernel_parameter>
```

For example:

```
/sbin/sysctl -a | grep kernel.shmmax
```

```
kernel.shmmax = 4294967295
```

To change the values, edit `/etc/sysctl.conf` as user `root` and modify this file as shown below:

```
# -----  
# Linux kernel parameter for Oracle 11g  
# -----  
kernel.shmmax = <add value here>  
kernel.shmmni = 4096  
kernel.shmall = 2097152  
kernel.sem = 250 32000 100 128  
fs.file-max = 6815744  
fs.aio-max-nr = 1048576  
net.ipv4.ip_local_port_range = 9000 65500  
net.core.rmem_default = 262144  
net.core.rmem_max = 4194304  
net.core.wmem_default = 262144  
net.core.wmem_max = 1048576
```

After completing the changes, activate them either by issuing the following command as user `root`:

```
/sbin/sysctl -p
```

or reboot the system.

6.1.1.4 Memory requirements

Oracle 11g requires a minimum of 1GB RAM memory.

6.1.1.5 Disk space requirements

The following are the disk space requirements for installing Oracle Database 11g Release 2.

6.1.1.5.1 Disk requirements in the /tmp directory

In the /tmp directory 1 GB of free disk space is required.

To determine the amount of disk space available in the /tmp directory, enter the following command:

```
df -k /tmp
```

If there is less than 1 GB of free disk space available in the /tmp directory, then complete one of the following steps:

- Delete unnecessary files from the /tmp directory to meet the disk space requirement.
- Set the TMP and TMPDIR environment variables when setting the oracle user's environment (described in Linux operating system user for Oracle).
- Extend the file system that contains the /tmp directory. If necessary, contact the system administrator for information about extending file systems.

6.1.1.5.2 Disk space requirements on the system

To determine the amount of free disk space on the system, enter the following command:

```
df -k
```

The following table describes the disk space requirements for software files for each installation type:

Installation Type	Requirement for Software Files (GB)
Enterprise Edition	4.35
Standard Edition	3.73

Installation Type	Requirement for Data Files (GB)
Enterprise Edition	1.68
Standard Edition	1.48

Additional disk space, either on a file system or in an Automatic Storage Management disk group, is required for the flash recovery area if you choose to configure automated backups.

6.1.1.6 Swap Space requirements

Oracle 11g requires the following swap space size:

RAM size	Swap space size
1GB – 2GB RAM	1.5 x the RAM size
2GB – 16GB RAM	1 x the RAM size
More than 16GB RAM	16 GB

To display the size of the configured swap space execute the following command as user `root`:

```
grep SwapTotal /proc/meminfo
```

```
SwapTotal:      8385920 kB
```

6.1.2 The Linux operating system user for Oracle

The Oracle 11g installation is usually performed using a Linux operating system user. This user needs certain environment variable settings to make sure that the Oracle database is set up and functions correctly. This section describes how to create such a user for Oracle, and how to configure this user's environment.

6.1.2.1 Creating the Linux operating system user for Oracle

The following local operating system groups and users are required to install an Oracle database:

- Oracle Inventory group (`oinstall`)
- Operating System database administrator group (`dba`)
- Oracle software owner/user (`oracle`)

Note: The group and user names are recommendations from the Oracle Installation Guide for Linux.

To determine if these groups and users already exist, and if necessary, to create them, follow the steps below.

To determine if the group `oinstall` exists, enter the following command as user `root`:

```
grep oinstall /etc/group
```

If the output of this command contains the group name `oinstall`, then the group already exists.

To determine if the group `dba` exists, enter the following command as user `root`:

```
grep dba /etc/group
```

If the output from this command contains the group name `dba`, then the group already exists.

If you need to create these groups, enter the following commands as user `root`:

```
groupadd oinstall  
groupadd dba
```

To determine if the user `oracle` exists and belongs to the correct groups, enter the following command as user `root`:

```
id oracle
```

If the user `oracle` exists, this command will display information about the groups to which the user belongs. The output should be similar to the following:

```
uid=440(oracle) gid=200(oinstall) groups=201(dba),202(oper)
```

This indicates that `oinstall` is the primary group and `dba` is a secondary group. Some hints and tips if you need to adapt your settings are described in the following.

If the `oracle` user exists, but its primary group is not `oinstall` or it is not a member of the group `dba`, enter the following command as user `root`:

```
usermod -g oinstall -G dba oracle
```

If the user `oracle` does not exist, enter the following command as user `root` to create it:

```
useradd -g oinstall -G dba oracle
```

This command creates the `oracle` user and specifies `oinstall` as the primary group and `dba` as the secondary group.

Enter the following command to set the password of the `oracle` user:

```
passwd oracle
```

6.1.2.2 Modifying the profile of user oracle

After creating the operating system user `oracle`, the user's profile needs to be changed. Log in as user `oracle` and change or add the following entries in `/home/oracle/.bash_profile`:

```
export ORACLE_BASE=/opt/oracle
export ORACLE_HOME=$ORACLE_BASE/product/11.2.0
export ORACLE_PATH=$ORACLE_BASE/common/oracle/sql:.$ORACLE_HOME/rdbms/admin
export ORACLE_SID=ORA11DB

export PATH=.:${PATH}:$HOME/bin:$ORACLE_HOME/bin
export PATH=${PATH}:/usr/bin:/bin:/usr/bin/X11:/usr/local/bin
export PATH=${PATH}:$ORACLE_BASE/common/oracle/bin
export ORACLE_TERM=xterm
export TNS_ADMIN=$ORACLE_HOME/network/admin
export ORA_NLS10=$ORACLE_HOME/nls/data
export LD_LIBRARY_PATH=$ORACLE_HOME/lib
export LD_LIBRARY_PATH=${LD_LIBRARY_PATH}:$ORACLE_HOME/oracm/lib
export LD_LIBRARY_PATH=${LD_LIBRARY_PATH}:/lib:/usr/lib:/usr/local/lib
export CLASSPATH=$ORACLE_HOME/JRE
export CLASSPATH=${CLASSPATH}:$ORACLE_HOME/jlib
export CLASSPATH=${CLASSPATH}:$ORACLE_HOME/rdbms/jlib
export CLASSPATH=${CLASSPATH}:$ORACLE_HOME/network/jlib
export THREADS_FLAG=native
export TEMP=/tmp
export TMPDIR=/tmp
```

The environment variables **ORACLE_BASE** and **ORACLE_HOME** can be adapted in order to match a different Oracle installation directory.

Note: In this document the defaults are used for the environment variables **ORACLE_BASE** and **ORACLE_HOME**. If other values are used the screens shown in Installing the Oracle binaries will reflect those values instead of the defaults.

The environment variable **ORACLE_SID** defines the Oracle System ID for the particular database on the system. Set this system variable to match the value that will be used later in the database creation process.

6.1.3 Creating the directories for Oracle

The Oracle user needs a base directory for the software binaries and the database files. The user must have read and write access to this directory. Create this directory to match the path defined in the previous chapter in the system variable **ORACLE_BASE** (e.g. /opt/oracle).

To create the Oracle base directory execute the following commands as user `root`:

```
mkdir -p /opt/oracle
chown -R oracle:oinstall /opt/oracle
chmod -R 775 /opt/oracle
```

6.2 Installing the Oracle binaries

This chapter describes the Oracle 11g binary installation on a Red Hat Enterprise Linux 5 (RHEL5) operating system. It will be performed in silent mode using an response file. General information about how to install Oracle using a response file can be found in the **Oracle® Database Installation Guide 11g Release 2 (11.2) for Linux** Part Number E16763-09.

http://download.oracle.com/docs/cd/E11882_01/install.112/e16763/toc.htm

Before installing , make sure that the binaries for Oracle 11g have been unzipped in `/tmp/db11202` directory or the Software CD/DVD is mounted in the system. In this example the unzipped variant will be used. Please refer to the Linux man-page how to mount the CD/DVD and how to access the file on it.

Note: Make sure that you use Oracle 32-bit binaries on a 32-bit Linux system, and Oracle 64-bit binaries on a 64-bit system.

The following are the general steps to install and configure Oracle products using Oracle Universal Installer in silent mode:

1. Create the oraInst.loc file
2. Prepare a response file
3. Run Oracle Universal Installer in silent mode
4. Run Net Configuration Assistant in silent mode
5. Run Database Configuration Assistant

These steps are described in the following sections.

Note: The steps in the following sections are executed as user `oracle`.

6.2.1 Create the `oraInst.loc` file

This file specifies the location of the Oracle Inventory directory where Oracle Universal Installer creates the inventory of Oracle products installed on the system.

Note: If Oracle software has been installed previously on the system, the `oraInst.loc` file might already exist. If the file does exist, you do not need to create a new one.

To create the `oraInst.loc` file, follow these steps:

Switch user to `root`:

```
su - root
```

Change directory to `/etc`:

```
cd /etc
```

Use a text editor to create the `oraInst.loc` file, containing the following lines:

```
vi oraInst.loc
```

```
inventory_loc=/opt/oracle/oraInventory  
inst_group=oinstall
```

Enter the following commands to set the appropriate owner, group, and permissions on the `oraInst.loc` file:

```
chown oracle:oinstall oraInst.loc  
chmod 664 oraInst.loc
```

6.2.2 Prepare a response file

Oracle provides response file templates for each product and installation type, and for each configuration tool. In this example the response files are located in `/tmp/db11202/database/response` and it will use the `db_install.rsp` for the silent installation.

To modify the `db_install.rsp` response file open it in a text editor:

```
vi /tmp/db11202/database/response/db_install.rsp
```

Remember that sensitive information, such as passwords, can be specified at the command line rather than within the response file. ["How Response Files Work?"](#) explains this method. **See Also:** [Oracle Universal Installer and OPatch User's Guide](#) for detailed information on creating response files

Note: Oracle Universal Installer or configuration assistant fails if the response file is not configured correctly. Refer to ["Silent-Mode Response File Error Handling"](#) section for more information about troubleshooting a failed silent-mode installation.

Change the variables in the `db_install.rsp` response file to the following values:

```
oracle.install.responseFileVersion=/oracle/install/rspfmt_dbinstall_response_schema_v11_2_0
oracle.install.option=INSTALL_DB_SWONLY
ORACLE_HOSTNAME=fmtc6152.boeblingen.de.ibm.com
UNIX_GROUP_NAME=oinstall
INVENTORY_LOCATION=/opt/oracle/oraInventory
SELECTED_LANGUAGES=en
ORACLE_HOME=/opt/oracle/product/11.2.0
ORACLE_BASE=/opt/oracle
oracle.install.db.InstalledEdition=EE
oracle.install.db.EEOptionsSelection=true
oracle.install.db.optionalComponents=
oracle.install.db.DBA_GROUP=dba
oracle.install.db.OPER_GROUP=oinstall
oracle.install.db.CLUSTER_NODES=
oracle.install.db.isRACOneInstall=false
oracle.install.db.racOneServiceName=
oracle.install.db.config.starterdb.type=GENERAL_PURPOSE
oracle.install.db.config.starterdb.globalDBName=
```

```
oracle.install.db.config.starterdb.SID=
oracle.install.db.config.starterdb.characterSet=
oracle.install.db.config.starterdb.memoryLimit=
oracle.install.db.config.starterdb.memoryOption=false
oracle.install.db.config.starterdb.installExampleSchemas=false
oracle.install.db.config.starterdb.enableSecuritySettings=true
oracle.install.db.config.starterdb.password.ALL=
oracle.install.db.config.starterdb.password.SYS=
oracle.install.db.config.starterdb.password.SYSTEM=
oracle.install.db.config.starterdb.password.SYSMAN=
oracle.install.db.config.starterdb.password.DBSNMP=
oracle.install.db.config.starterdb.control=DB_CONTROL
oracle.install.db.config.starterdb.gridcontrol.gridControlServiceURL=
oracle.install.db.config.starterdb.automatedBackup.enable=false
oracle.install.db.config.starterdb.automatedBackup.osuid=
oracle.install.db.config.starterdb.automatedBackup.ospwd=
oracle.install.db.config.starterdb.storageType=
oracle.install.db.config.starterdb.fileSystemStorage.dataLocation=
oracle.install.db.config.starterdb.fileSystemStorage.recoveryLocation=
oracle.install.db.config.asm.diskGroup=
oracle.install.db.config.asm.ASMSNMPPassword=
MYORACLESUPPORT_USERNAME=
MYORACLESUPPORT_PASSWORD=
SECURITY_UPDATES_VIA_MYORACLESUPPORT=false
DECLINE_SECURITY_UPDATES=true
PROXY_HOST=
PROXY_PORT=
PROXY_USER=
PROXY_PWD=
COLLECTOR_SUPPORTHUB_URL=
oracle.installer.autoupdates.option=SKIP_UPDATES
oracle.installer.autoupdates.downloadUpdatesLoc=
AUTOUPDATES_MYORACLESUPPORT_USERNAME=
AUTOUPDATES_MYORACLESUPPORT_PASSWORD=
```

6.2.3 Run Oracle Universal Installer in silent mode

The Oracle Universal Installer provides several options. For help information on the full set of these options, run the runInstaller command with the -help option:

```
/tmp/db11202/database/runInstaller -help
```

To start Oracle Universal Installer in silent mode, enter the following command:

```
/tmp/db11202/database/runInstaller -silent -noconfig -responseFile  
/tmp/db11202/database/response/db_install.rsp
```

Note: Do not specify a relative path to the response file. Otherwise the Oracle Universal Installer will fail.

Wait until the installation is finished.

If any errors occur, refer to **Oracle® Database Installation Guide 11g Release 2 (11.2) for Linux** Part Number E16763-09 for troubleshooting:

```
http://download.oracle.com/docs/cd/E11882\_01/install.112/e16763/toc.htm
```

Log in as the `root` user and run the `root.sh` script:

```
su - root  
password:  
/opt/oracle/product/11.2.0/root.sh
```

Chapter 7 Configure the Oracle database



Involved systems:

Database machine: fmtc6152.boeblingen.de.ibm.com

7.1 Run Net Configuration Assistant in silent mode

To configure and start an Oracle Net listener on the system run Net Configuration Assistant in silent mode. Oracle provides a response file template named `netca.rsp` in the response directory `/tmp/db11202/database/response`.

To run Net Configuration Assistant using a response file:

1. Open the response file in a text editor:

```
vi /tmp/db11202/database/response/netca.rsp
```

Change the variables in the `netca.rsp` response file to the following values:

```
SHOW_GUI=false
```

2. Log in as the Oracle software owner user (in this case `oracle`).

3. Run the network configuration assistant using the `netca.rsp` response file:

```
/opt/oracle/product/11.2.0/bin/netca -silent -responsefile  
/tmp/db11202/database/response/netca.rsp
```

Wait until the installation is finished.

If any errors occur, refer to **Oracle® Database Installation Guide 11g Release 2 (11.2) for Linux** Part Number E16763-09 for troubleshooting:

```
http://download.oracle.com/docs/cd/E11882\_01/install1.112/e16763/toc.htm
```

7.1.1 Verifying the created listener

To verify the created listener log in with a separate session as user `oracle` and execute the following command:

```
lsnrctl status
```

The output will be like:

```
LSNRCTL for Linux: Version 11.2.0.2.0 - Production on 11-MAY-2011 10:13:50
Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=IPC)(KEY=EXTPROC1521)))
STATUS of the LISTENER
-----
Alias                LISTENER
Version              TNSLSNR for Linux: Version 11.2.0.2.0 -
Production
Start Date           11-MAY-2011 10:12:36
Uptime               0 days 0 hr. 1 min. 14 sec
Trace Level          off
Security              ON: Local OS Authentication
SNMP                 OFF
Listener Parameter File
/opt/oracle/product/11.2.0/network/admin/listener.ora
Listener Log File
/opt/oracle/diag/tnslsnr/fmtc6152/listener/alert/log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=EXTPROC1521)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)
(HOST=fmtc6152.boeblingen.de.ibm.com)(PORT=1521)))
The listener supports no services
The command completed successfully
```

7.2 Run Database Configuration Assistant

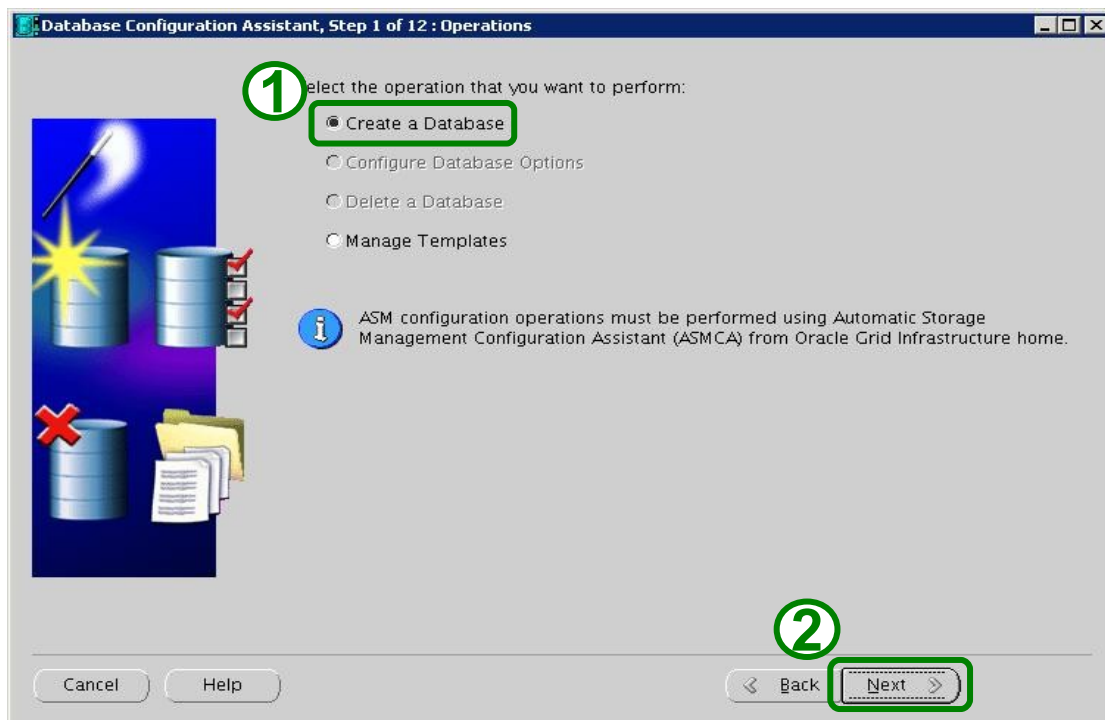
Start the database configuration assistant by executing the `/opt/oracle/product/11.2.0/bin/dbca` command as user `oracle` to create the BPM database.

Note: When X11 content is forwarded to a Windows system using an outdated X-Windows terminal emulators (or *X Server*), the Oracle installation wizard may be displayed incorrectly. It is highly recommended to use one of the latest X Servers, for example the open source.Xming 6.9.0.23

For more information about Xming refer to:

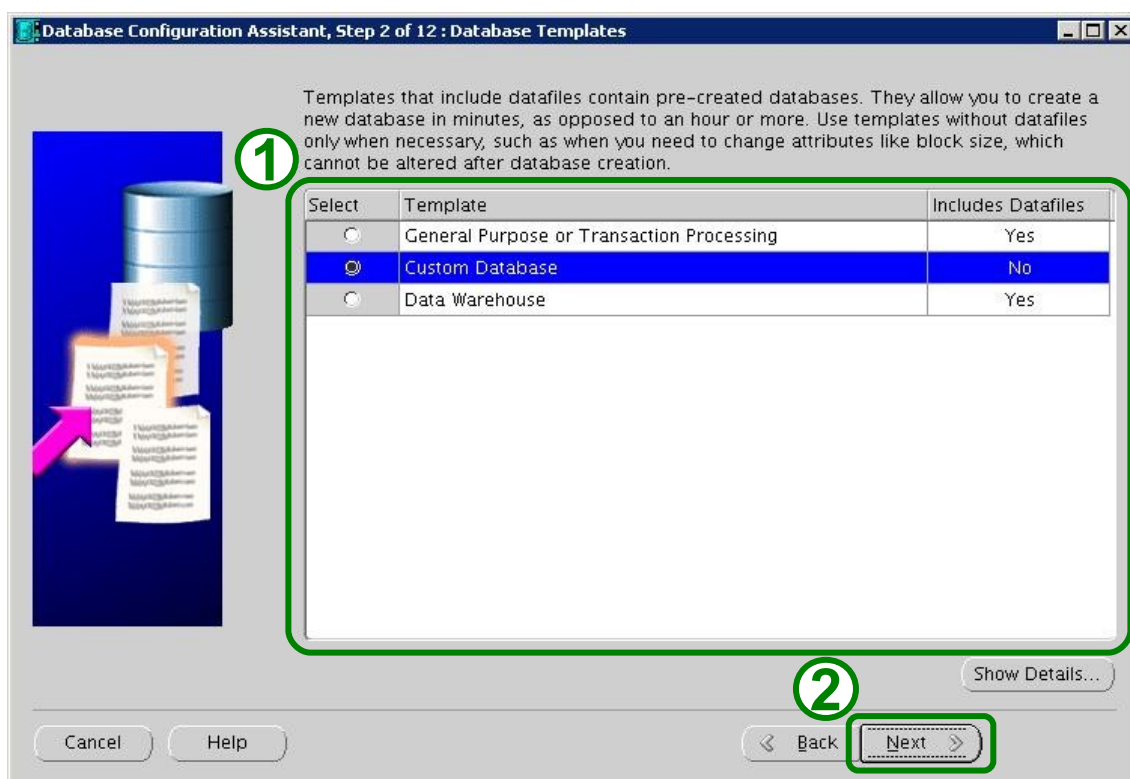
<http://sourceforge.net/projects/xming.>

The "Operations" panel is displayed:



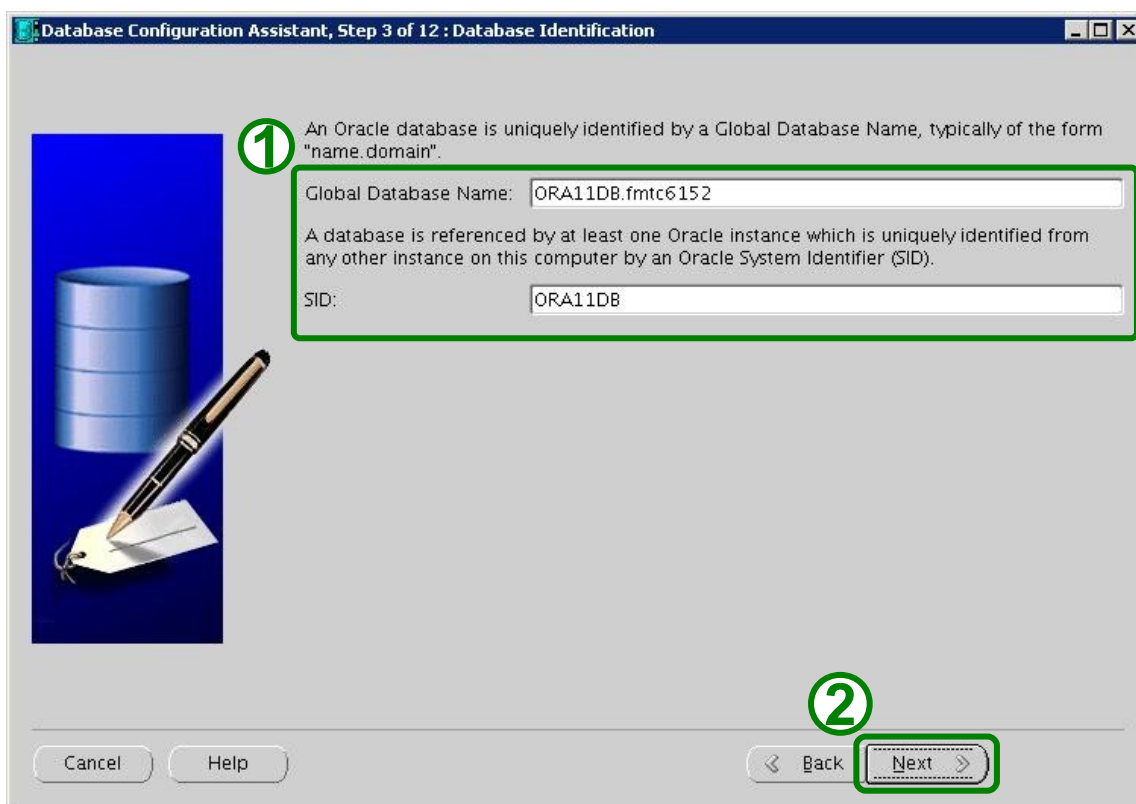
1. Select "Create a Database"
2. Press **Next** button.

The "Database Templates" panel is displayed:



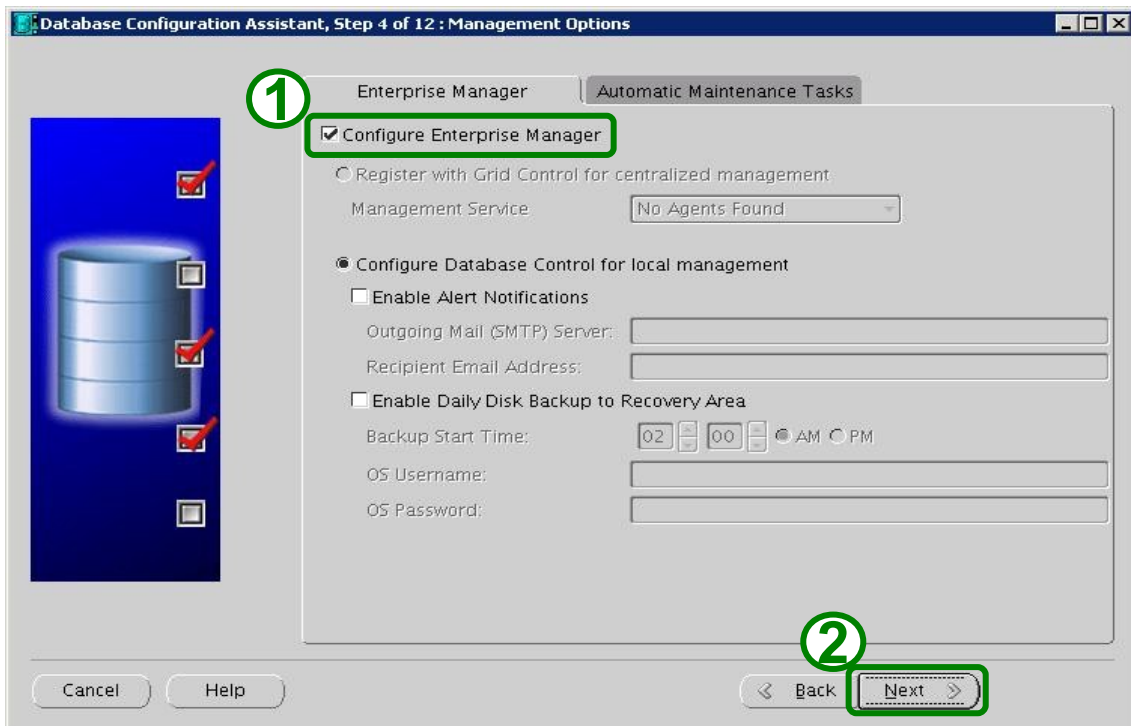
1. By default there are three database templates. Select "Custom Database".
2. Press **Next** button.

The "Database Identification" panel is displayed:



1. Specify the "Global Database Name and the System ID (SID).
The "Global Database Name" usually consists of the SID followed by the database domain.
The hostname of the database will be used as the database domain.
2. Press **Next** button.

The "Management Options" panel is displayed:



1. Select "Configure Enterprise Manager" to add the Oracle Enterprise Repository to the database.

It is recommended to choose this option unless Oracle Grid Control which is the Oracle Enterprise Infrastructure for managing multiple databases is used. This will make database monitoring and tuning in the future much more easier and comfortable.

2. Press **Next** button.

The "Database Credentials" panel is displayed:

Database Configuration Assistant, Step 5 of 12: Database Credentials

For security reasons, you must specify passwords for the following user accounts in the new database.

Use Different Administrative Passwords

User Name	Password	Confirm Password
SYS		
SYSTEM		
DBSNMP		
SYSMAN		

Use the Same Administrative Password for All Accounts

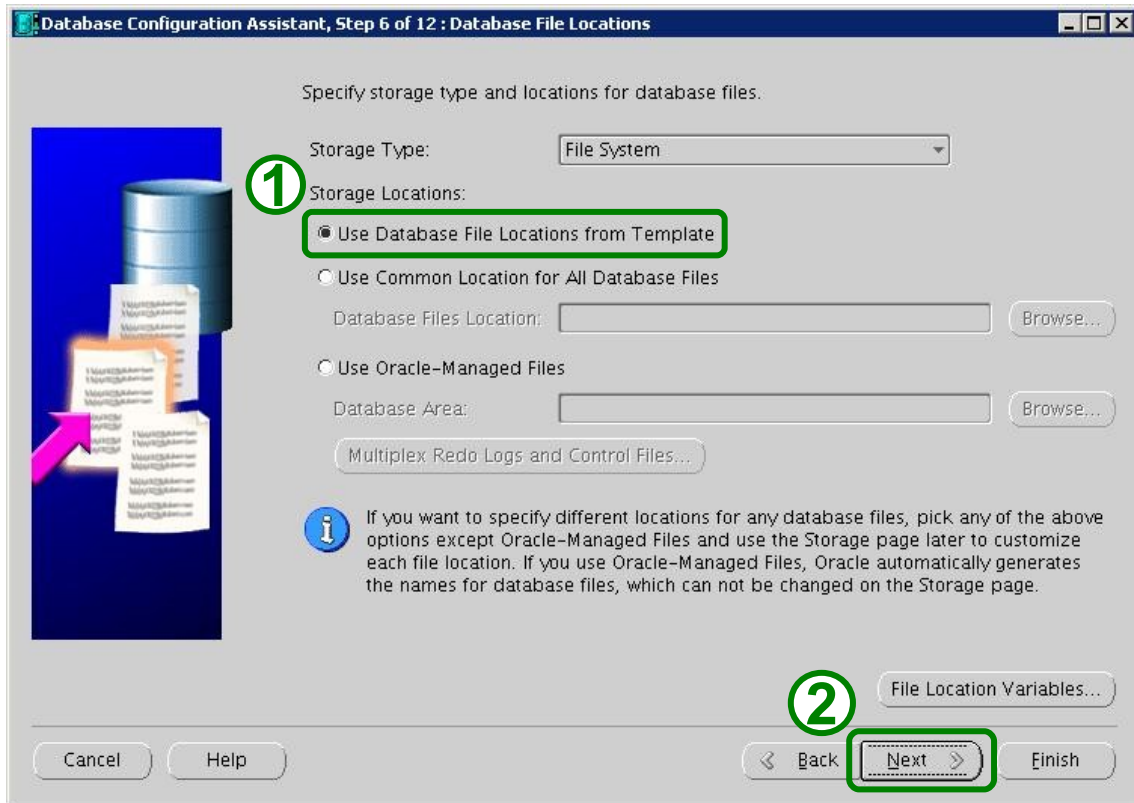
Password: *****

Confirm Password: *****

Cancel Help Back Next

1. Select "Use the Same Administrative Password for All Accounts" and type in a preferred password.
2. Press **Next** button.

The "Database File Locations" panel is displayed:



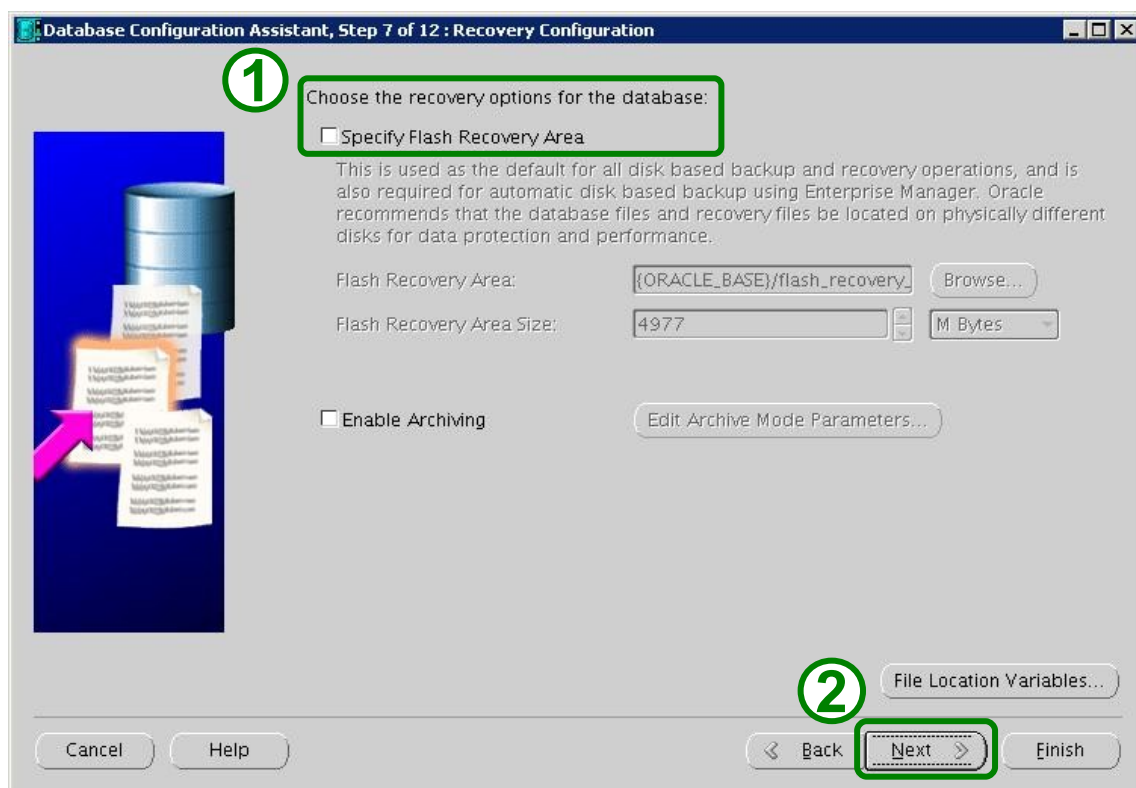
"**Database File Locations from Template**" gives the most control over the location where the database files will be created.

Choosing "**Common Location for All Database Files**", will create all database files in the same directory.

The mechanism of "**Oracle-Managed Files**" means, that Oracle is creating all database files in the database area. The database area is a simple directory. All database files will be created in that directory. In contrast to the "**Common Location**" Oracle assigns the name of the database files. This could be an advantage if a database file is often added to a tablespace. Simply the tablespace and the size have to be specified. Selecting "**Multiplex redo logs and Control Files**" stores a copy of all redo log files and a control file in the Flash Recovery Area. This area was introduced with Oracle 10g.

1. Select "Use Database File Locations from Template".
2. Press **Next** button.

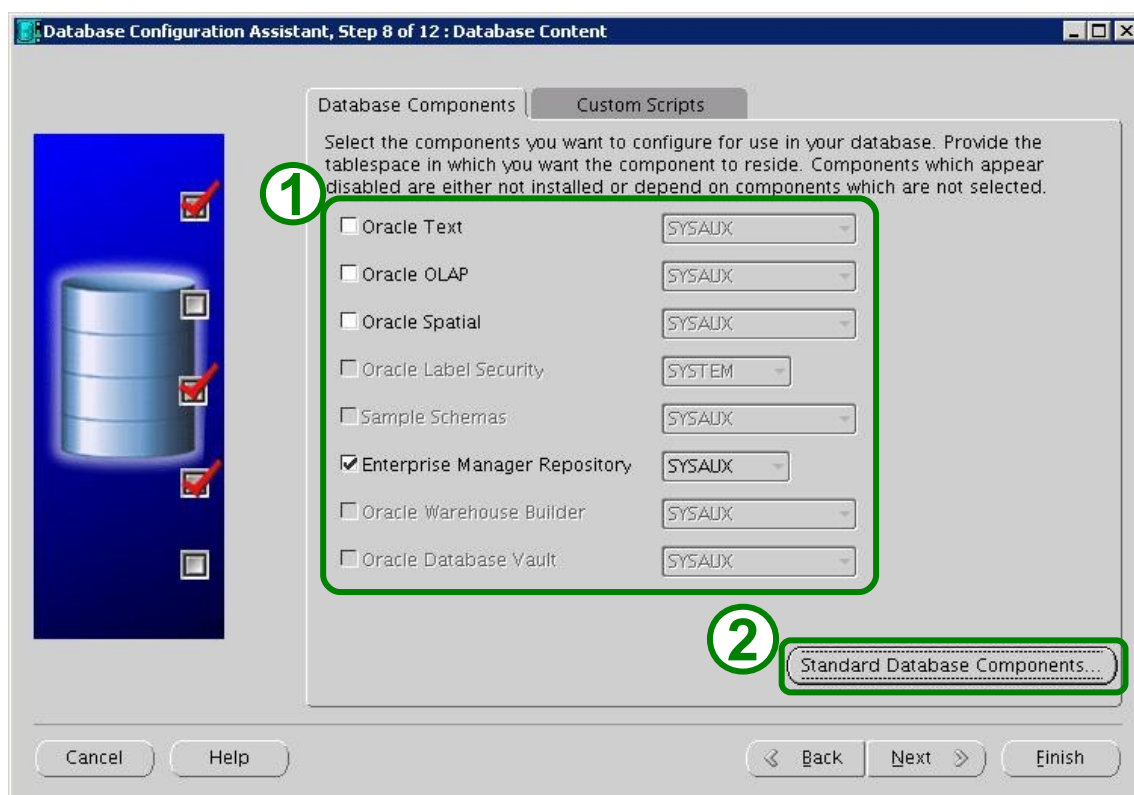
The "Recovery Configuration" panel is displayed:



Flash Recovery Area is not needed if archiving is disabled and/or redo logs and control files are not multiplexed.

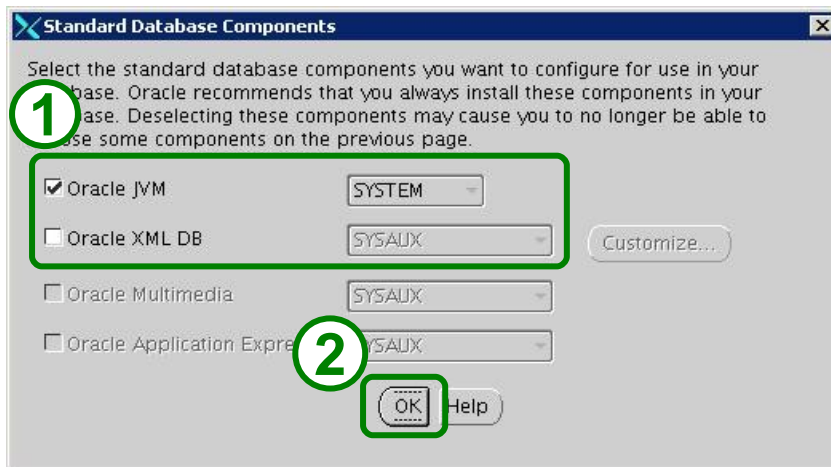
1. Deselect "Specify Flash Recovery Area"
2. Press **Next** button.

The "Database Content" panel is displayed:



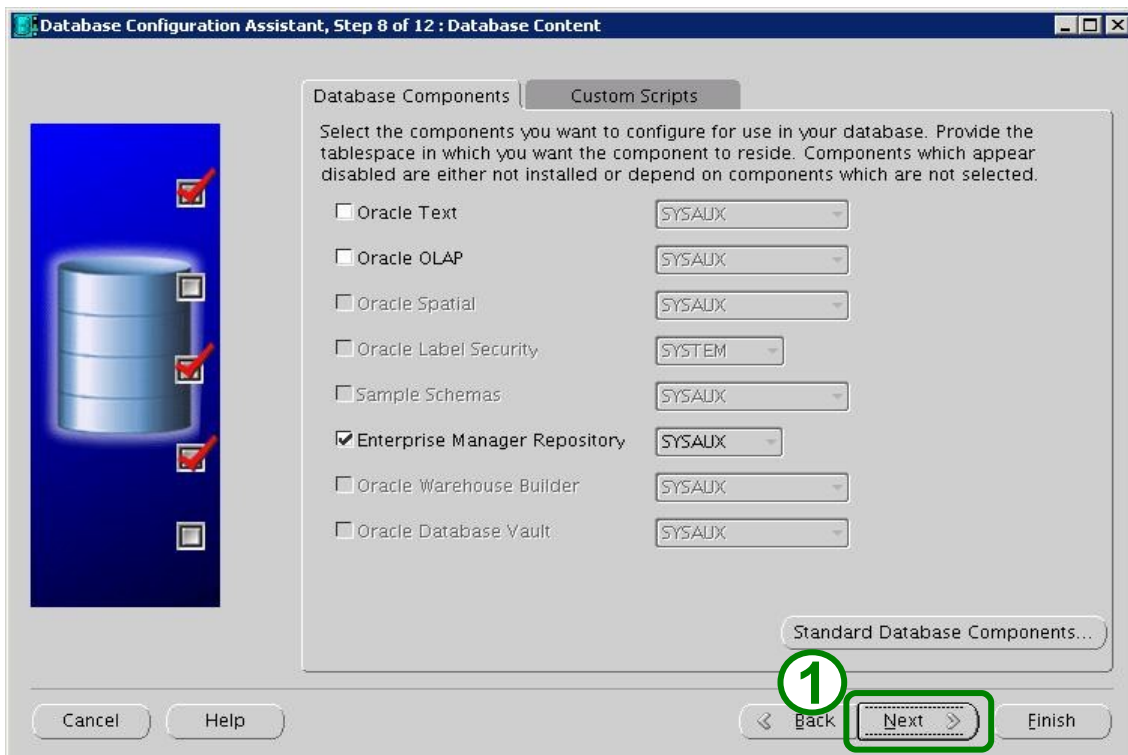
1. Deselect all database components except "Enterprise Manager Repository"
2. Press **Standard Database Components** button.

The "Standard Database Components" panel pops up:



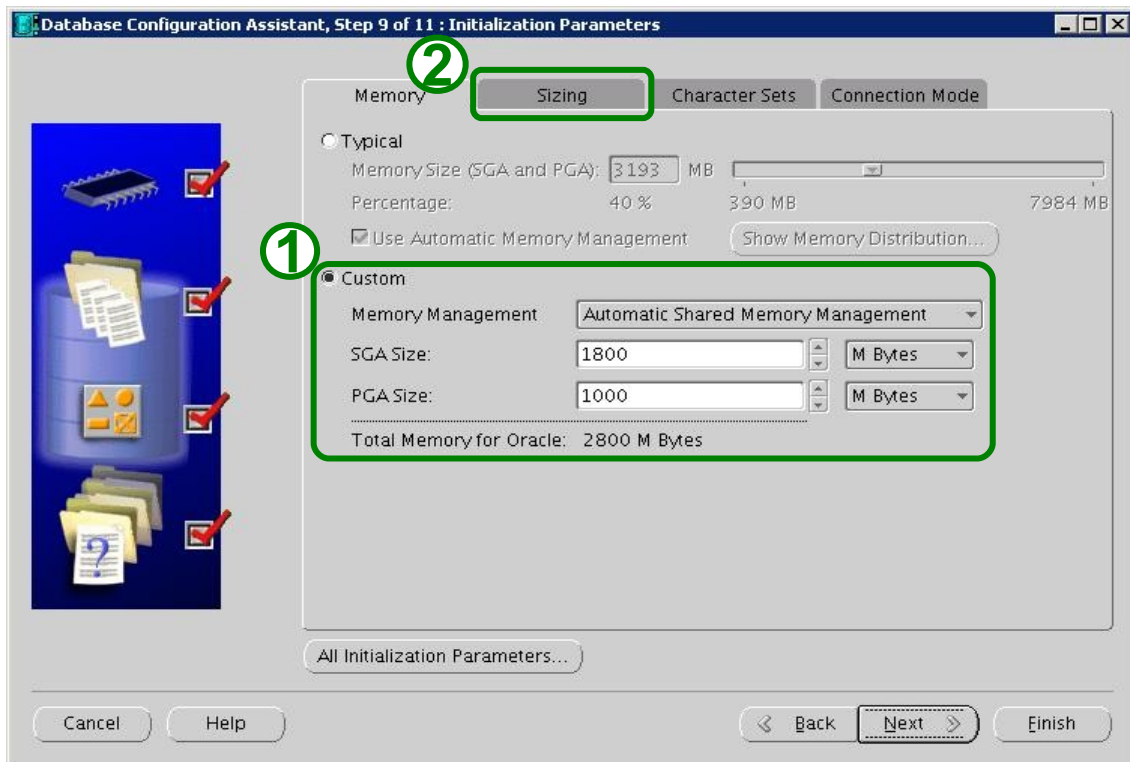
1. Deselect all standard database components except of "Oracle JVM".
2. Press **OK** button.

The "Standard Database Components" is closed and the "Database Content" panel gets the focus back:



1. Press **Next** button.

The "Initialization Parameters" panel with open "Memory" tab is displayed:



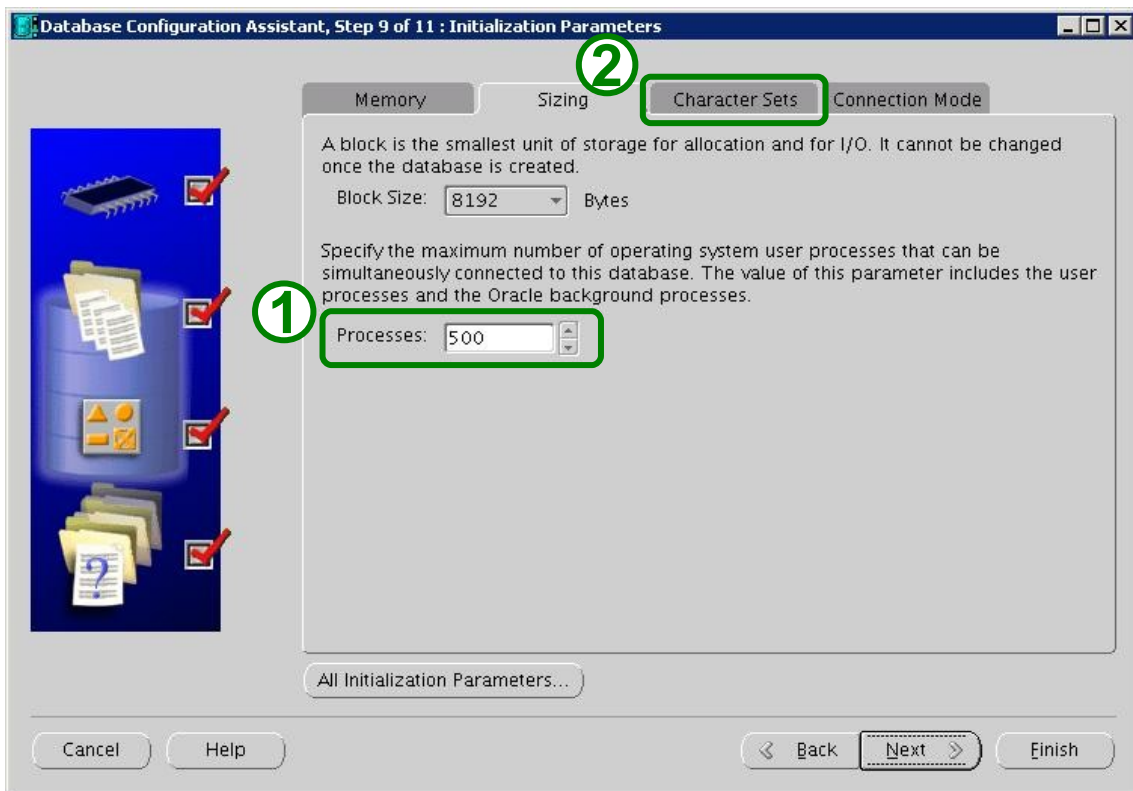
"Typical" defines one memory size for both the System Global Area (SGA) and the Program Global Area (PGA) in one value and splits it automatically into SGA and PGA.

"Custom" defines the SGA and PGA memory size separately. The SGA size can not be set higher than defined in the kernel parameter kernel.shmmax.

1. Select "Custom" and type in the chosen SGA and PGA memory size.
2. Select **Sizing** tab.

Note: When choosing the SGA and PGA size make sure, that the database host has enough memory and will not start swapping. Swapping will cause an extreme slow down of the database.

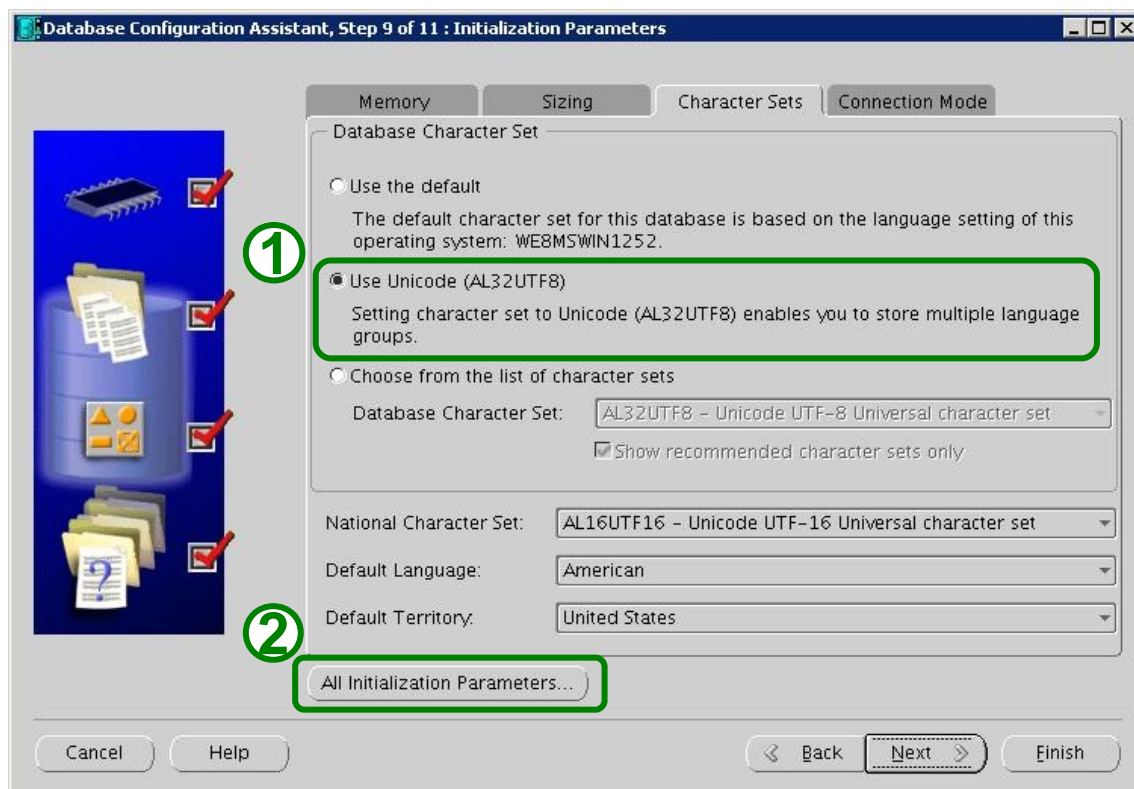
The "Initialization Parameters" panel with open "Sizing" tab is displayed:



On the "Sizing" tab increase the number of processes. This parameter limits the number of parallel database connections if "Dedicated Server" is used as connection mode. It depends on the BPEL application and the number of process instances that are running in parallel.

1. Change the processes from 150 to 500 as a first initial tuning action.
2. Select **Character Sets** tab.

The "Initialization Parameters" panel with open "Character Sets" tab is displayed:



BPM Process Server needs an UTF8 database as a data store.

1. Select "Use Unicode (AL32UTF8)"
2. Press **All Initialization Parameters** button.

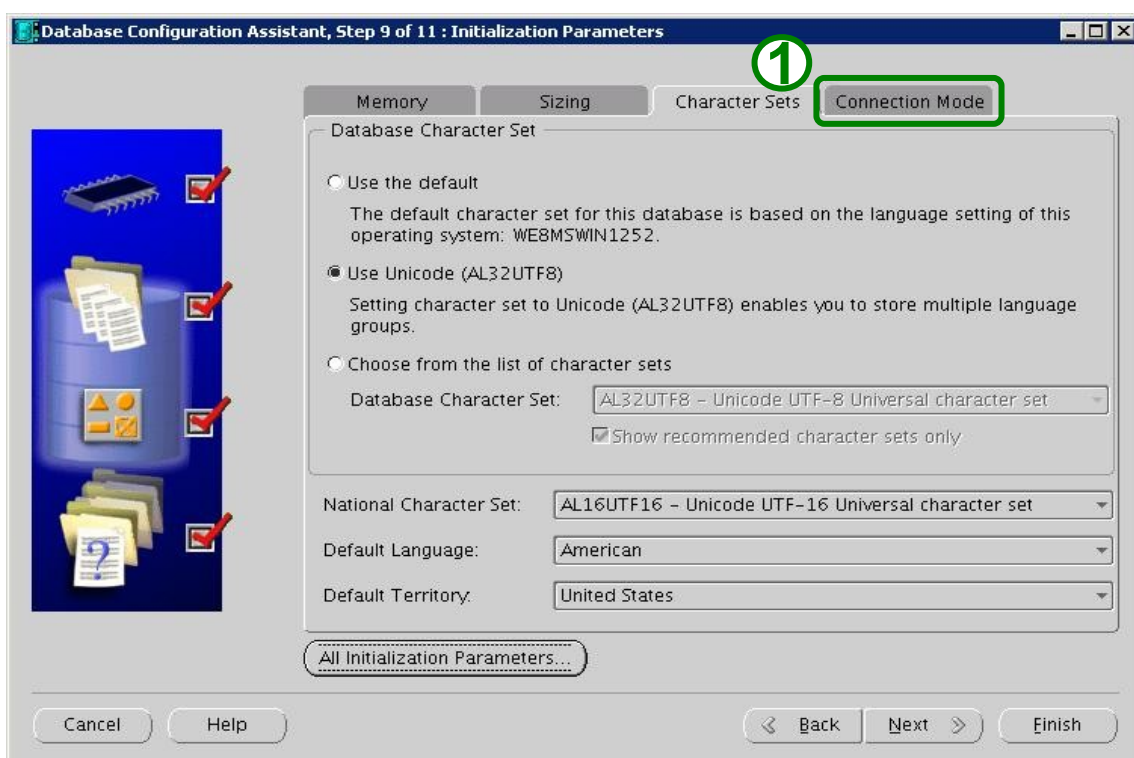
The "All Initialization Parameters" panel pops up:

Name	Value	Override D...	Basic	Category
nls_time_format				NLS
nls_time_tz_format				NLS
nls_timestamp_for...				NLS
nls_timestamp_tz_f...				NLS
object_cache_max...	10			Objects and LOBs
object_cache_opti...	102400			Objects and LOBs
olap_page_pool_size	0			Miscellaneous
open_cursors	1000	✓	✓	Cursors and Library
open_links	4			Distributed, Replicat
open_links_per_inst...	4			Distributed, Replicat
optimizer_capture_...	FALSE			Miscellaneous
optimizer_dynamic...	2			Miscellaneous
optimizer_features...	11.2.0.1			Optimizer
optimizer_index_ca...	0			Optimizer
optimizer_index_co...	100			Optimizer
optimizer_mode	ALL_ROWS			Optimizer
optimizer_secure_v...	TRUE			Miscellaneous
optimizer_use_invis...	FALSE			Miscellaneous
optimizer_use_pen...	FALSE			Miscellaneous
optimizer_use_sql...	TRUE			Miscellaneous
os_authent_prefix	ops\$			Security and Auditing
os_roles	FALSE			Security and Auditing
parallel_adaptive_...	TRUE			Parallel Executions
parallel_degree_limit	CPU			Miscellaneous
parallel_degree_po...	MANUAL			Miscellaneous

1. Press **Show Advanced Parameters** button.
2. Change the parameters as shown in the table on the following page.
3. Press **Close** button.

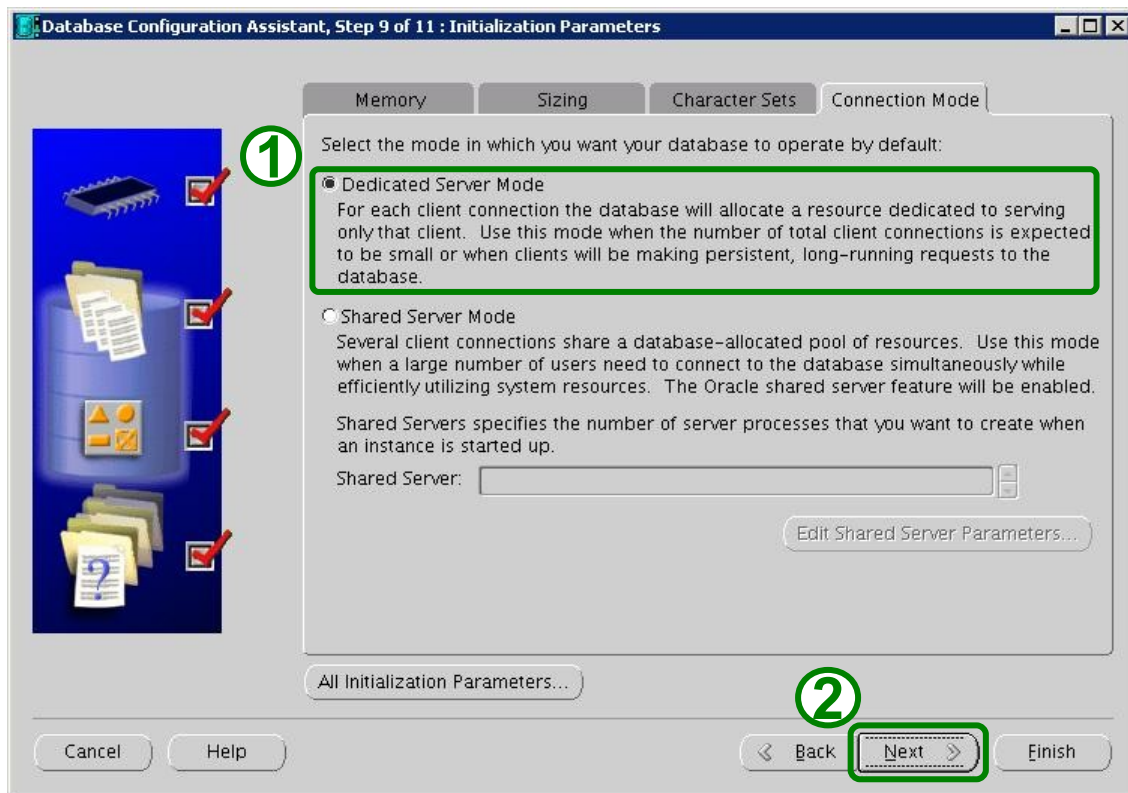
Parameter	default	new value	Remark
OPEN_CURSORS	300	1000	Specifies the maximum number of open cursors (context areas) a session can have at once, and constrains the PL/SQL cursor cache size which PL/SQL uses to avoid reparsing statements re-executed by a user. Set this value high enough to prevent the applications from running out of open cursors.
SESSION_CACHED_CURSORS	50	1000	Specifies the number of session cursors to cache. When the same SQL statement is parses several times, it's session cursor is moved into the session cursor cache.
FAST_START_MTRR_TARGET		900	This parameter specifies the mean time in seconds that the database should be able to recover if a crash occurs. Possible values are from 0 to 3600.

The "All Initialization Parameters" is closed and the "Initialization Parameters" panel gets the focus back:



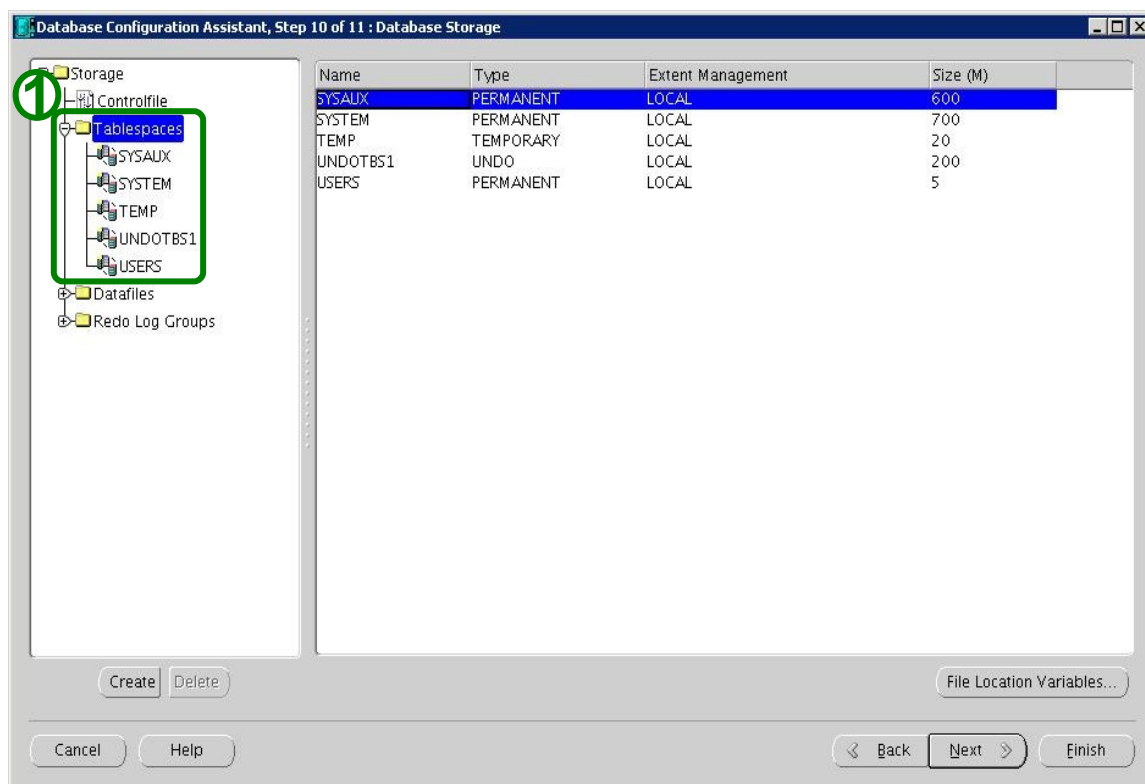
1. Select **Connection Mode** tab.

The "Initialization Parameters" panel with open "Connection Mode" tab is displayed:



1. Verify that "Dedicated Server Mode" is selected.
2. Press **Next** button.

The "Database Storage" panel is displayed:



The default size of the database files of the tablespaces is too small!
Increase the sizes to the following values:

SYSAUX	600 MB
SYSTEM	700 MB
TEMP	200 MB
UNDOTBS1	1500 MB
USERS	150 MB

1. Select the tablespace TEMP.

Database Configuration Assistant, Step 10 of 11: Database Storage

Storage

- Controlfile
- Tablespaces
 - SYSAUX
 - SYSTEM
 - TEMP
 - UNDOTBS1
 - USERS
- Datafiles
- Redo Log Groups

General Storage

Name: TEMP

Use bigfile tablespace

Tempfiles

File Name	File Directory	Size	
temp01.dbf	{ORACLE_BASE}/oradata/{DB_UNIQUE_NAME}/	20	MB

①

②

Status

Online Read Only

Offline Normal

Type

Permanent

Temporary

Set as Default Temporary Tablespace

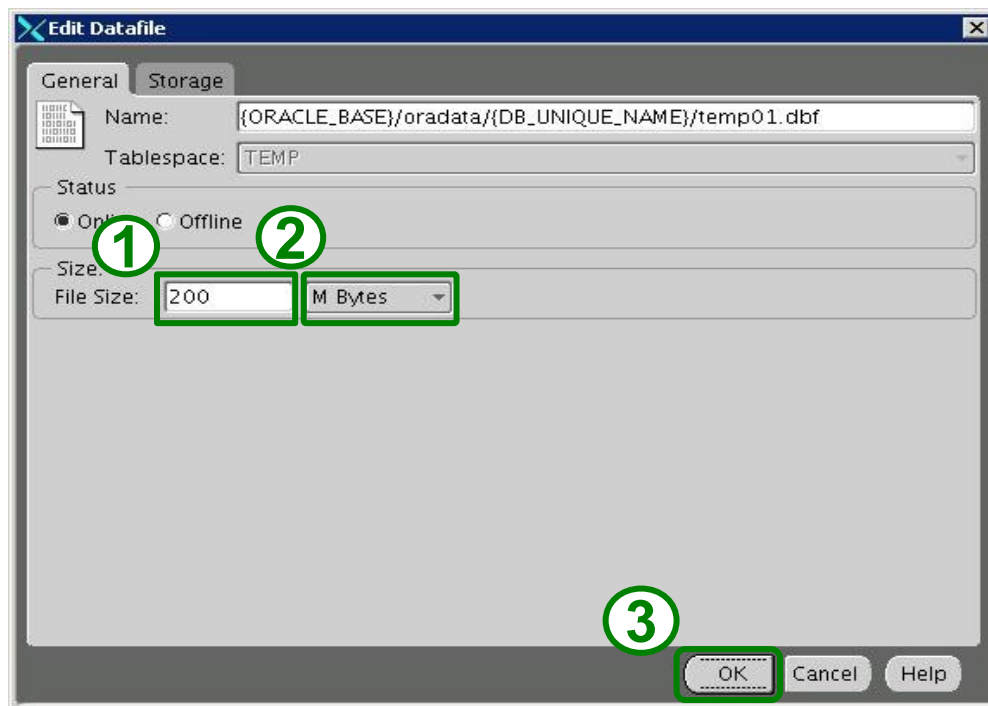
Undo

Create Delete File Location Variables...

Cancel Help < Back Next > Finish

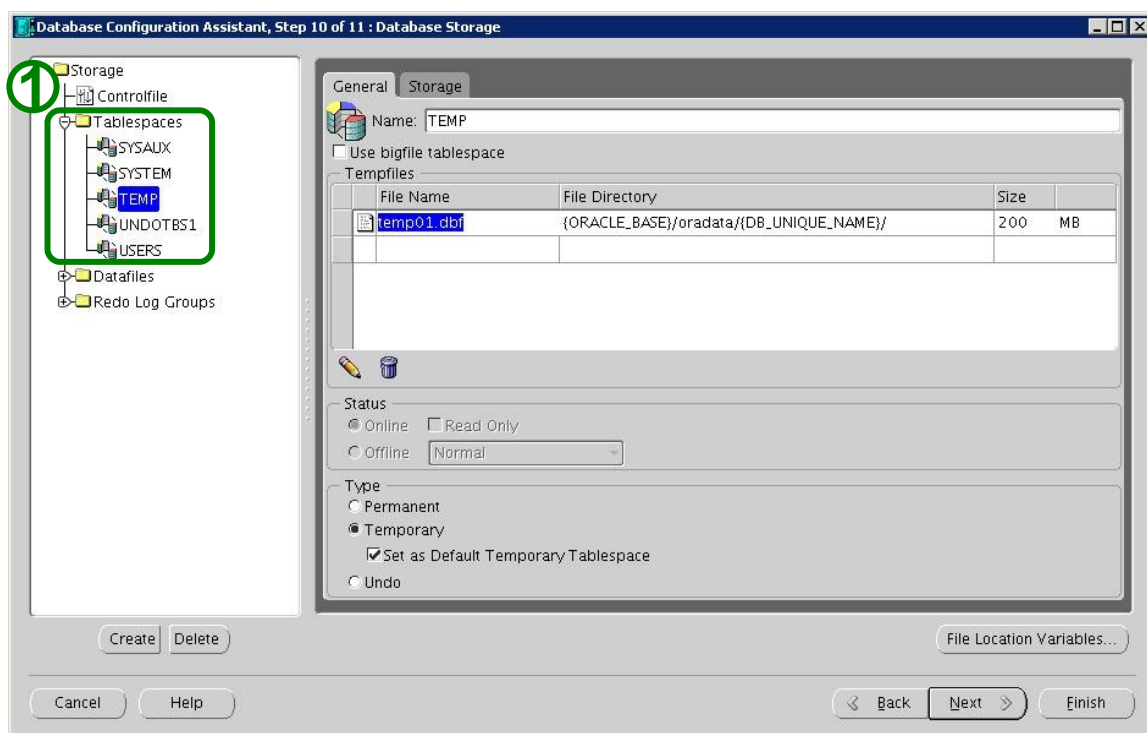
1. Select the datafile.
2. Press Pencil icon to edit the datafile.

The "Edit Datafile" panel pops up:



1. Change the file size to the value 200.
2. Make sure that "M Bytes" is selected.
3. Press **OK** button to confirm and save the changes.

The "Edit Datafile" is closed and the "Database Storage" panel gets the focus back:



1. Repeat the last two steps for the UNDOTBS1 and USERS table spaces to increase the size.

Database Configuration Assistant, Step 10 of 11 : Database Storage

Group	Size (K)
1	51200
2	51200
3	51200

Specify size and location of the redo log files. The optimal size depends on the database load. To increase the performance of the database increase the size at least to **1500 MByte**. All redo log files should have the same size.

1. Select first Redo Log Group.

Database Configuration Assistant, Step 10 of 11 : Database Storage

Storage

- Controlfile
- Tablespaces
 - SYSAUX
 - SYSTEM
 - TEMP
 - UNDOTBS1
 - USERS
- Datafiles
- Redo Log Groups
 - 1
 - 2
 - 3

General

Group: 1

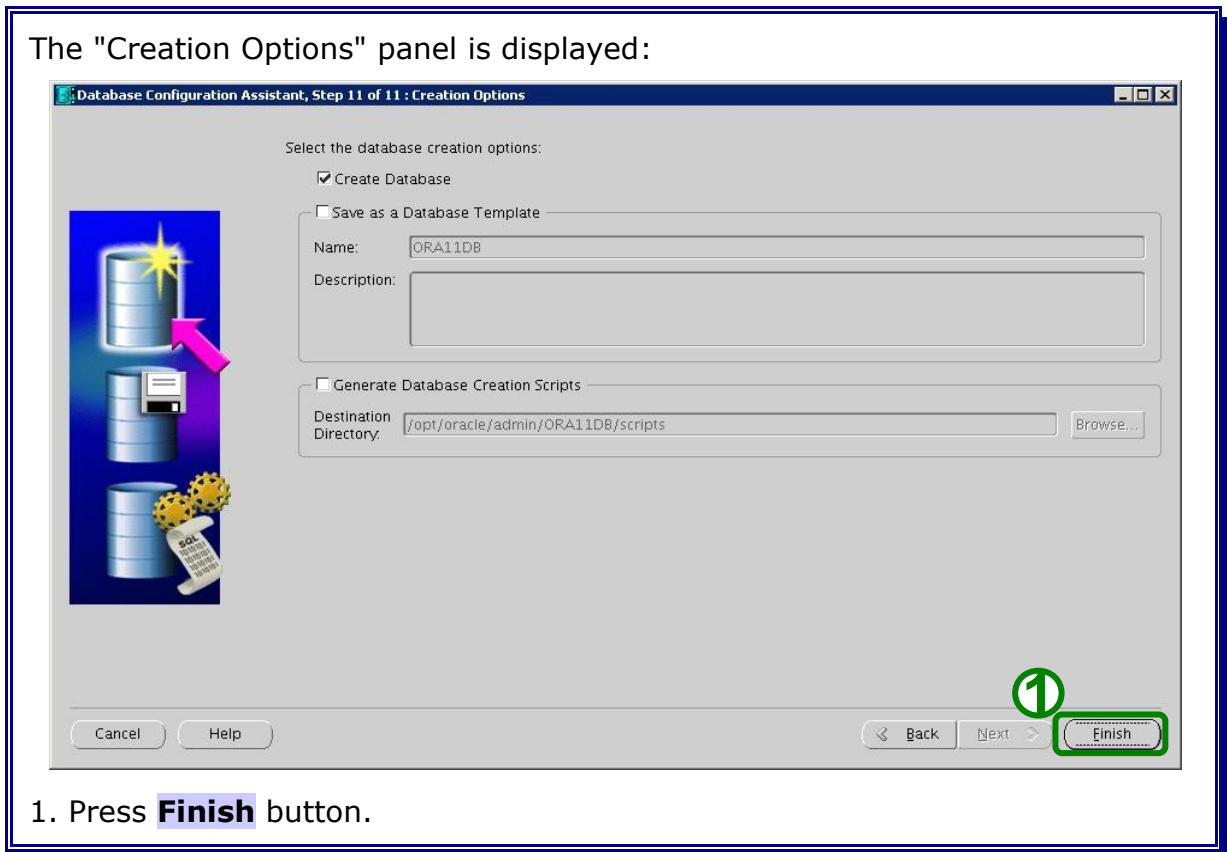
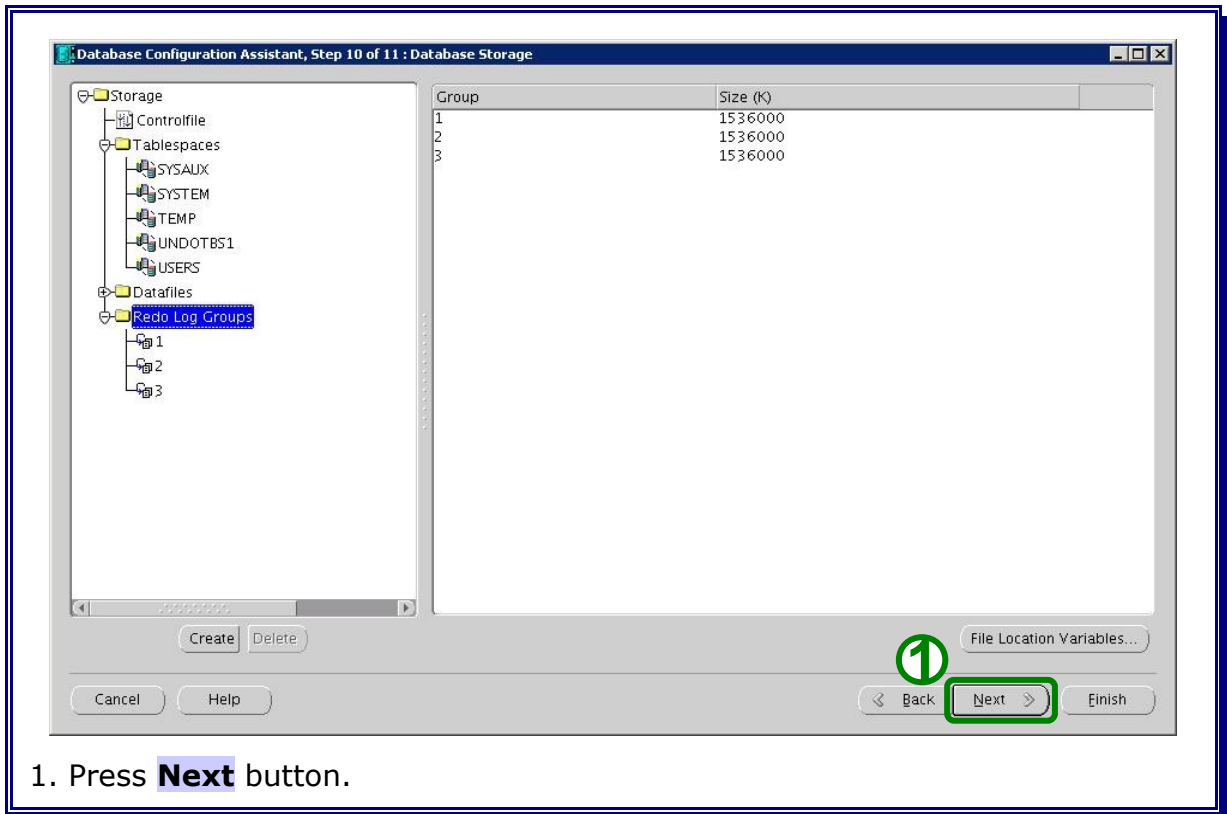
File Size: 1500 M Bytes

Redo Log Members:

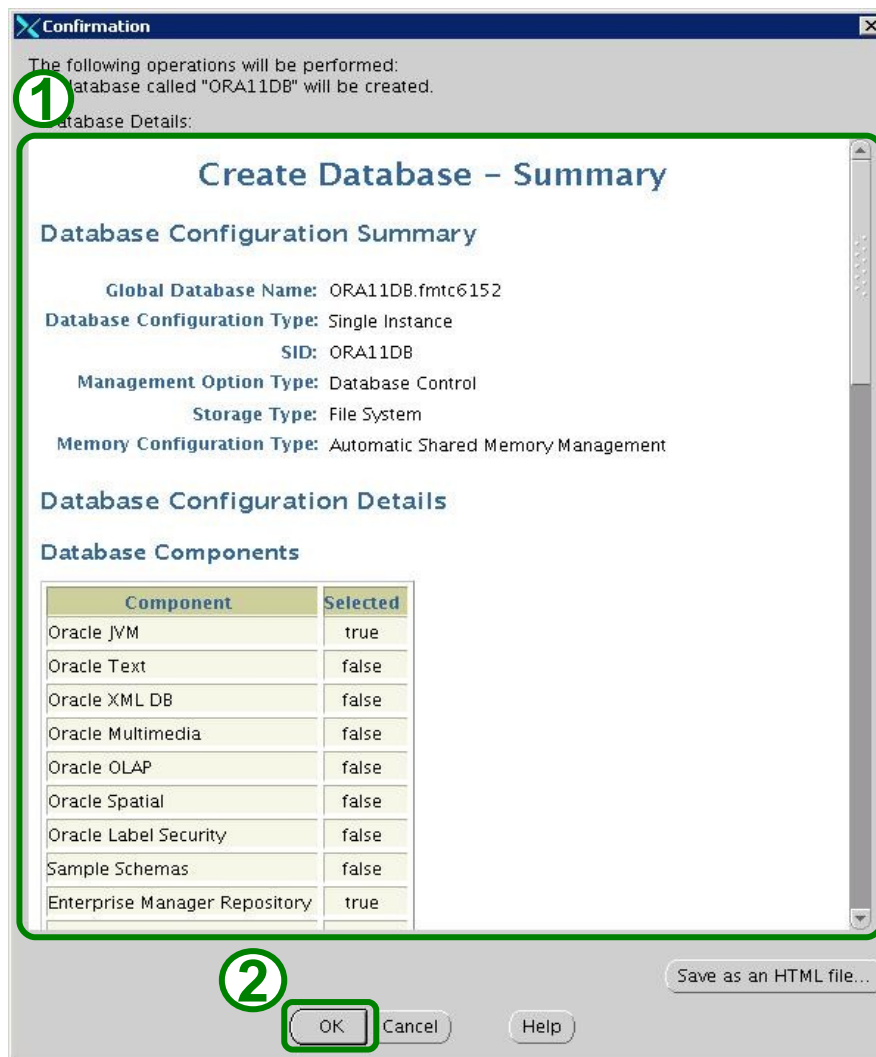
File Name	File Directory
redo01.log	{ORACLE_BASE}/oradata/{DB_UNIQUE_NAME}/

Buttons: Create, Delete, File Location Variables..., Cancel, Help, Back, Next, Finish

1. Insert value 1500 into File Size field.
2. Make sure that "M Bytes" is selected.
3. Select the two other Redo Log Groups one after the other and repeat the steps 1 and 2.

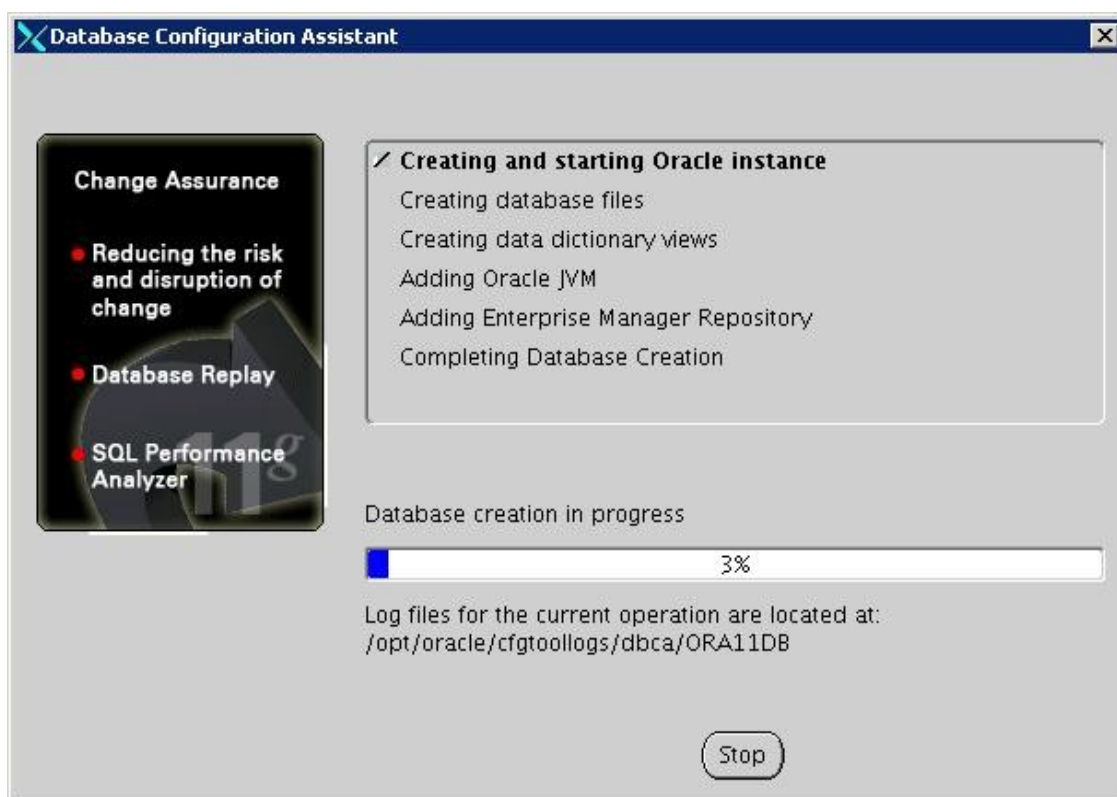


The "Confirmation" panel pops up:

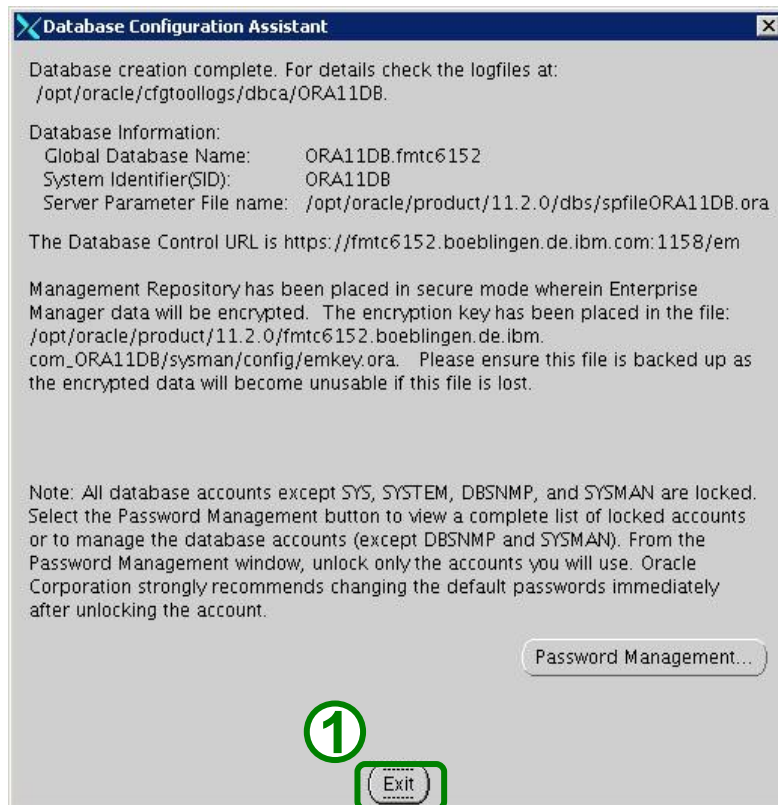


1. Verify the Oracle database configuration.
2. Press **OK** button.

The "Database Configuration Assistant" starts:



Wait until the database creation is finished.



1. Press **Exit** button.

7.3 Database listener configuration

Login as user `oracle`.

Goto the directory `/opt/oracle/product/11.2.0/network/admin` and verify the settings in the file `listener.ora`:

```
# listener.ora Network Configuration File:
/opt/oracle/product/11.2.0/network/admin/listener.ora
# Generated by Oracle configuration tools.

LISTENER =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = IPC) (KEY = EXTPROC1521))
      (ADDRESS = (PROTOCOL = TCP) (HOST = fmtc6152.boeblingen.de.ibm.com)
    (PORT = 1521))
    )
  )

ADR_BASE_LISTENER = /opt/oracle
```

The Oracle listener will discover the database instance ORA11DB automatically after a time period of about 1 minute.

The file `tnsnames.ora` located in the same directory has also to be checked. Verify the following lines in the `tnsnames.ora` file:

```
# tnsnames.ora Network Configuration File:
/opt/oracle/product/11.2.0/network/admin/tnsnames.ora
# Generated by Oracle configuration tools.

ORA11DB =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = fmtc6152.boeblingen.de.ibm.com)
    (PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = ORA11DB.fmtc6152)
    )
  )
```

Restart the listener if the files are changed.

Note: The commands to start and stop the listener are listed in the Oracle Appendix in this document.

7.4 Configuring database initialization parameters

During the creation of the database the right initialization parameters were already set.

Note: Skip this chapter if a new database was created during the Oracle installation process.

Modify the initialization parameters of an existing database to match the “new value” size in the table below:

<i>Parameter</i>	<i>default</i>	<i>new value</i>	Remark
OPEN_CURSORS	300	1000	Specifies the maximum number of open cursors (context areas) a session can have at once, and constrains the PL/SQL cursor cache size which PL/SQL uses to avoid reparsing statements re-executed by a user. Set this value high enough to prevent the applications from running out of open cursors.
SESSION_CACHED_CURSORS	50	1000	Specifies the number of session cursors to cache. When the same SQL statement is parses several times, it's session cursor is moved into the session cursor cache.
FAST_START_MTTR_TARGET		900	This parameter specifies the mean time in seconds that the database should be able to recover if a crash occurs. Possible values are from 0 to 3600.
PROCESSES	150	500	This parameter limits the number of parallel database connections if you are using “Dedicated Server” as connection mode. It depends on the BPEL application and the number of process instances that are running in parallel.

To change the parameters connect to the database ORA11DB as SYSDBA and use the ALTER SYSTEM command. The following script can be used to change the database initialization parameters.

Create a file `setOraInitParameter.sql` with an editor and paste in the lines from below.

```
REM
*****
REM File:  setOraInitParameter.sql
REM Date:  2011-05-16
REM
REM Desc:  Set the initial Oracle database parameters.
REM
REM Usage:Execute the sql script as user oracle on the database host.
REM
*****

ALTER SYSTEM SET OPEN_CURSORS=1000 SCOPE = spfile;
ALTER SYSTEM SET SESSION_CACHED_CURSORS=1000 SCOPE = spfile;
ALTER SYSTEM SET FAST_START_MTTR_TARGET=900 SCOPE = spfile;
ALTER SYSTEM SET PROCESSES=500 SCOPE = spfile;

REM Commit work
COMMIT;
EXIT
```

Execute the `setOraInitParameter.sql` by typing the following command as user `oracle`:

```
sqlplus sys/<yourPassword>@ORA11DB AS SYSDBA @setOraInitParameter.sql
```

Stop and restart the database after changing the initialization parameters.

Note: How to start and stop the database please refer to the Appendix chapter.

Chapter 8 Generate the BPM database objects



Involved systems:

Database machine: fmtc6152.boeblingen.de.ibm.com

This chapter describes the necessary steps to generate the BPM database objects for the BPM Process Server based on previously created scripts. The corresponding creation details including the necessary steps to transfer the scrips to the database machine have been described in the chapter 'Create the BPM database scripts'.

Now those scripts will be executed.

As user **oracle** extract the **dbUtils.tar.gz**. Run:

```
cd /home/oracle
tar -xvf dbUtils.tar.gz
```

```
...
bpm75/util/dbUtils/Oracle-SibME-PDWMSG4052C01/
bpm75/util/dbUtils/Oracle-SibME-PDWMSG4052C01/Oracle-SibME.sql
bpm75/util/dbUtils/SibME_Oracle_PDWMSG4052C01.properties
bpm75/util/dbUtils/Oracle-SibME-SCAAPPMSG4052C01/
bpm75/util/dbUtils/Oracle-SibME-SCAAPPMSG4052C01/Oracle-SibME.sql
[oracle@fmtc6152 ~]#
```

8.1 Generate database objects for BPC

Navigate to **/home/oracle/bpm75/util/dbUtils/Oracle-BPC-BPC4052C01**:

```
cd /home/oracle/bpm75/util/dbUtils/Oracle-BPC-BPC4052C01
```

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA @createTablespace.sql
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:07:51 2011
Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options

Tablespace created.
Tablespace created.
Tablespace created.
Tablespace created.
Tablespace created.
Tablespace created.
Tablespace created.
Tablespace created.

Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
[oracle@fmtc6152 Oracle-BPC-BPC4052C01]$
```

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA @createSchemaUser.sql
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:10:57 2011
Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options

User created.
Grant succeeded.
Grant succeeded.
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-BPC-BPC4052C01]$
```

Now create the Business Process Choreographer tables. In order to verify whether the creation of the tables has been successful the output of sqlplus will be dumped into a text file.

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA @createSchema.sql >  
createSchemaDump.txt
```

Once the command finishes open **createSchemaDump.txt** in a text editor and make sure that all commands have been executed successfully:

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:27:53 2011  
  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
  
Table created.  
Table altered.  
Table created.  
Table altered.  
Index created.  
...  
Table created.  
Table created.  
Index created.  
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options
```

In case all commands have been executed successfully, run following as user **oracle**:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:46:55 2011  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-BPC-BPC4052C01]$
```

8.2 Generate database objects for BPC Reporting function

Navigate to **/home/oracle/bpm75/util/dbUtils/Oracle-BPCReporting-BPC4052C01**:

```
cd /home/oracle/bpm75/util/dbUtils/Oracle-BPCReporting-BPC4052C01
```

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA  
@createTablespace_Observer.sql
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:50:51 2011  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
  
Tablespace created.  
Tablespace created.  
Tablespace created.  
  
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-BPCReporting-BPC4052C01]$
```

Now create the Business Process Choreographer Reporting function tables. In order to verify whether the creation of the tables has been successful the output of sqlplus will be dumped into a text file.

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA @createSchema_Observer.sql >
createSchema_ObserverDump.txt
```

Once the command finishes open **createSchema_ObserverDump.txt** in a text editor and make sure that all commands have been executed successfully:

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:54:54 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options

Table created.
Table altered.
Table created.
Table altered.
...
1 row created.
1 row created.
1 row created.
Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

In case all commands have been executed successfully, run following as user **oracle**:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:46:55 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-BPCReporting-BPC4052C01]$
```

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA  
@createFunctionsJava_Observer.sql
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:59:15 2011  
  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
  
Function created.  
Function created.
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-BPCReporting-BPC4052C01]$
```

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
@createFunctionsSql_Observer.sql
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 19:00:54 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options

Function created.
Function created.
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
[oracle@fmtc6152 Oracle-BPCReporting-BPC4052C01]$
```

8.3 Generate database objects for Performance Data Warehouse

Navigate to **/home/oracle/bpm75/util/dbUtils/Oracle-BPM_PerformanceDW-PDW4052C01**:

```
cd /home/oracle/bpm75/util/dbUtils/Oracle-BPM_PerformanceDW-PDW4052C01
```

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
@createTablespaceAndUser_PerformanceDW.sql
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 19:04:07 2011
Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options

Tablespace created.
User created.
Grant succeeded.
Grant succeeded.
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
[oracle@fmtc6152 Oracle-BPM_PerformanceDW-PDW4052C01]$
```

Now create the Performance Data Warehouse tables. In order to verify whether the creation of the tables has been successful the output of sqlplus will be dumped into a text file.

As user **oracle** run:

```
sqlplus PDW4052C01/<PDW4052C01_password>@ORA11DB
@createTable_PerformanceDW.sql > createTable_PerformanceDWDump.txt
```

Note: Run this command as user **PDW4052C01** and NOT as user **SYSDBA**

Once the command finishes open **createTable_PerformanceDWDump.txt** in a text editor and make sure that all commands have been executed successfully:

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 19:18:27 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options

PL/SQL procedure successfully completed.
PL/SQL procedure successfully completed.
PL/SQL procedure successfully completed.
...
PL/SQL procedure successfully completed.
PL/SQL procedure successfully completed.
Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

In case all commands have been executed successfully, run following as user **oracle**:

```
sqlplus PDW4052C01/<PDW4052C01_password>@ORA11DB
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:46:55 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-BPM_PerformanceDW-PDW4052C01]$
```

8.4 Generate database objects for Process Server

Navigate to **/home/oracle/bpm75/util/dbUtils/Oracle-BPM_ProessServer-PSS4052C01**:

```
cd /home/oracle/bpm75/util/dbUtils/Oracle-BPM_ProcessServer-PSS4052C01
```

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
@createTablespaceAndUser_ProcessServer.sql
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Wed Jun 15 09:19:58 2011
Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options

Tablespace created.
User created.
Grant succeeded.
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
[oracle@fmtc6152 Oracle-BPM_ProcessServer-PSS4052C01]$
```

Now create the Process Server tables. In order to verify whether the creation of the tables has been successful the output of sqlplus will be dumped into a text file.

As user **oracle** run:

```
sqlplus PSS4052C01/<PSS4052C01_password>@ORA11DB
@createTable_ProcessServer.sql > createTable_ProcessServerDump.txt
```

Note: Run this command as user **PSS4052C01** and NOT as user **SYSDBA**

Once the command finishes open **createTable_ProcessServerDump.txt** in a text editor and make sure that all commands have been executed successfully:

```
SQL*Plus: Release 11.2.0.2.0 Production on Wed Jun 15 09:33:21 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options

PL/SQL procedure successfully completed.
PL/SQL procedure successfully completed.
PL/SQL procedure successfully completed.
PL/SQL procedure successfully completed.
...
PL/SQL procedure successfully completed.

Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

In case all commands have been executed successfully, run following as user **oracle**:

```
sqlplus PSS4052C01/<PSS4052C01_password>@ORA11DB
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:46:55 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-BPM_ProcessServer-PSS4052C01]$
```

As user **oracle** run:

```
sqlplus PSS4052C01/<PSS4052C01_password>@ORA11DB  
@createProcedure_ProcessServer.sql
```

Note: Run this command as user **PSS4052C01** and NOT as user **SYSDBA**

```
SQL*Plus: Release 11.2.0.2.0 Production on Wed Jun 15 10:03:57 2011  
  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
  
Function created.  
Procedure created.  
Procedure created.  
Procedure created.  
Procedure created.
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-BPM_ProcessServer-PSS4052C01]$
```

8.5 Generate database objects for Business Space

Navigate to **/home/oracle/bpm75/util/dbUtils/Oracle-BSpace- BSP4052C01**:

```
cd /home/oracle/bpm75/util/dbUtils/Oracle-BSpace-BSP4052C01
```

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA  
@createTablespace_BusinessSpace.sql
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Wed Jun 15 10:09:30 2011  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production With the Partitioning, OLAP, Data Mining and Real Application  
Testing options  
  
Tablespace created.  
Tablespace created.
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-BSpace-BSP4052C01]$
```

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
@createSchema_BusinessSpace.sql
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Wed Jun 15 10:12:49 2011
Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production With the Partitioning, OLAP, Data Mining and Real Application
Testing options

User created.
Grant succeeded.
Grant succeeded.
User altered.
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
[oracle@fmtc6152 Oracle-BSpace-BSP4052C01]$
```

Now create the BusinessSpace tables. In order to verify whether the creation of the tables has been successful the output of sqlplus will be dumped into a text file.

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
@createTable_BusinessSpace.sql > createTable_BusinessSpaceDump.sql
```

Once the command finishes open **createTable_BusinessSpaceDump.txt** in a text editor and make sure that all commands have been executed successfully:

```
SQL*Plus: Release 11.2.0.2.0 Production on Wed Jun 15 10:32:46 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production With the Partitioning, OLAP, Data Mining and Real Application
Testing options

Session altered.
Table created.
Table created.
Index created.
...
1 row created.
Table created.
Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

In case all commands have been executed successfully, run following as user **oracle**:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:46:55 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-BSpace-BSP4052C01]$
```

8.6 Generate database objects for the common BPM functionality

Navigate to **/home/oracle/bpm75/util/dbUtils/Oracle-CommonDB-COM4052C01**:

```
cd /home/oracle/bpm75/util/dbUtils/Oracle-CommonDB-COM4052C01
```

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA @createSchema_CommonDB.sql
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Wed Jun 15 10:46:01 2011  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production With the Partitioning, OLAP, Data Mining and Real Application  
Testing options  
  
Tablespace created.  
User created.  
Grant succeeded.  
Grant succeeded.  
Grant succeeded.
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-CommonDB-COM4052C01]$
```

Now create the tables for the common BPM functionality. In order to verify whether the creation of the tables has been successful the output of sqlplus will be dumped into a text file.

As user **oracle** run:

```
sqlplus COM4052C01/<COM4052C01_password>@ORA11DB @files.sql >
filesDump.txt
```

Note: Run this command as user **COM4052C01** and NOT as user **SYSDBA**

Once the command finishes open **filesDump.txt** in a text editor and make sure that all commands have been executed successfully:

```
SQL*Plus: Release 11.2.0.2.0 Production on Wed Jun 15 12:44:18 2011
Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production With the Partitioning, OLAP, Data Mining and Real Application
Testing options

Table created.
Index created.
Index created.
Table created.
...
1 row created.
1 row created.

Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

In case all commands have been executed successfully, run following as user **oracle**:

```
sqlplus COM4052C01/<COM4052C01_password>@ORA11DB
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:46:55 2011
Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-CommonDB-COM4052C01]$
```

8.7 Generate database objects for BPC Messaging

Navigate to **/home/oracle/bpm75/util/dbUtils/Oracle-SibME-BPCMSG4052C01**:

```
cd /home/oracle/bpm75/util/dbUtils/Oracle-SibME-BPCMSG4052C01
```

Now create the tablespace, user and tables for Business Process Choreographer SIB Messaging. In order to verify whether the creation of the objects has been successful the output of sqlplus will be dumped into a text file.

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA @Oracle-SibME.sql > Oracle-SibMEDump.txt
```

Once the command finishes open **Oracle-SibMEDump.txt** in a text editor and make sure that all commands have been executed successfully:

```
SQL*Plus: Release 11.2.0.2.0 Production on Fri Jun 17 09:08:42 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production With the Partitioning, OLAP, Data Mining and Real Application
Testing options

Tablespace created.
User created.
Grant succeeded.
Table created.
...
Index created.
Table created.

Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

In case all commands have been executed successfully, run following as user **oracle**:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:46:55 2011  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-SibME-BPCMSG4052C01]$
```

8.8 Generate database objects for Performance Data Warehouse Messaging

Navigate to **/home/oracle/bpm75/util/dbUtils/Oracle-SibME-PDWMSG4052C01**:

```
cd /home/oracle/bpm75/util/dbUtils/Oracle-SibME-PDWMSG4052C01
```

Now create the tablespace, user and tables for Performance Data Warehouse SIB Messaging. In order to verify whether the creation of the objects has been successful the output of sqlplus will be dumped into a text file.

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA @Oracle-SibME.sql > Oracle-SibMEDump.txt
```

Once the command finishes open **Oracle-SibMEDump.txt** in a text editor and make sure that all commands have been executed successfully:

```
SQL*Plus: Release 11.2.0.2.0 Production on Fri Jun 17 09:08:42 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production With the Partitioning, OLAP, Data Mining and Real Application
Testing options

Tablespace created.
User created.
Grant succeeded.
Table created.
...
Index created.
Table created.

Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

In case all commands have been executed successfully, run following as user **oracle**:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:46:55 2011  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-SibME-PDWMSG4052C01]$
```

8.9 Generate database objects for Process Server Messaging

Navigate to **/home/oracle/bpm75/util/dbUtils/Oracle-SibME-PSSMSG4052C01**:

```
cd /home/oracle/bpm75/util/dbUtils/Oracle-SibME-PSSMSG4052C01
```

Now create the tablespace, user and tables for Process Server SIB Messaging. In order to verify whether the creation of the objects has been successful the output of sqlplus will be dumped into a text file.

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA @Oracle-SibME.sql > Oracle-SibMEDump.txt
```

Once the command finishes open **Oracle-SibMEDump.txt** in a text editor and make sure that all commands have been executed successfully:

```
SQL*Plus: Release 11.2.0.2.0 Production on Fri Jun 17 09:08:42 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production With the Partitioning, OLAP, Data Mining and Real Application
Testing options

Tablespace created.
User created.
Grant succeeded.
Table created.
...
Index created.
Table created.
Table created.
Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

In case all commands have been executed successfully, run following as user **oracle**:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:46:55 2011  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-SibME-PSSMSG4052C01]$
```

8.10 Generate database objects for Common Event Infrastructure Messaging

Navigate to **/home/oracle/bpm75/util/dbUtils/Oracle-SibME-CEIMSG4052C01**:

```
cd /home/oracle/bpm75/util/dbUtils/Oracle-SibME-CEIMSG4052C01
```

Now create the tablespace, user and tables for Common Event Infrastructure SIB Messaging. In order to verify whether the creation of the objects has been successful the output of sqlplus will be dumped into a text file.

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA @Oracle-SibME.sql > Oracle-SibMEDump.txt
```

Once the command finishes open **Oracle-SibMEDump.txt** in a text editor and make sure that all commands have been executed successfully:

```
SQL*Plus: Release 11.2.0.2.0 Production on Fri Jun 17 09:08:42 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production With the Partitioning, OLAP, Data Mining and Real Application
Testing options

Tablespace created.
User created.
Grant succeeded.
Table created.
...
Index created.
Table created.

Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

In case all commands have been executed successfully, run following as user **oracle**:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:46:55 2011  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-SibME-CEIMSG4052C01]$
```

8.11 Generate database objects for SCA System Messaging

Navigate to **/home/oracle/bpm75/util/dbUtils/Oracle-SibME-SCASYSMSG4052C01**:

```
cd /home/oracle/bpm75/util/dbUtils/Oracle-SibME-SCASYSMSG4052C01
```

Now create the tablespace, user and tables for SCA System SIB Messaging. In order to verify whether the creation of the objects has been successful the output of sqlplus will be dumped into a text file.

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA @Oracle-SibME.sql > Oracle-SibMEDump.txt
```

Once the command finishes open **Oracle-SibMEDump.txt** in a text editor and make sure that all commands have been executed successfully:

```
SQL*Plus: Release 11.2.0.2.0 Production on Fri Jun 17 09:08:42 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production With the Partitioning, OLAP, Data Mining and Real Application
Testing options

Tablespace created.
User created.
Grant succeeded.
Table created.
...
Index created.
Table created.

Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

In case all commands have been executed successfully, run following as user **oracle**:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:46:55 2011  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-SibME-SCASYSMSG4052C01]$
```

8.12 Generate database objects for SCA Application Messaging

Navigate to **/home/oracle/bpm75/util/dbUtils/Oracle-SibME-SCAAPPMSG4052C01**:

```
cd /home/oracle/bpm75/util/dbUtils/Oracle-SibME-SCAAPPMSG4052C01
```

Now create the tablespace, user and tables for SCA Application SIB Messaging. In order to verify whether the creation of the objects has been successful the output of sqlplus will be dumped into a text file.

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA @Oracle-SibME.sql > Oracle-SibMEDump.txt
```

Once the command finishes open **Oracle-SibMEDump.txt** in a text editor and make sure that all commands have been executed successfully:

```
SQL*Plus: Release 11.2.0.2.0 Production on Fri Jun 17 09:08:42 2011

Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production With the Partitioning, OLAP, Data Mining and Real Application
Testing options

Tablespace created.
User created.
Grant succeeded.
Table created.
...
Index created.
Table created.

Disconnected from Oracle Database 11g Enterprise Edition Release
11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

In case all commands have been executed successfully, run following as user **oracle**:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Tue Jun 14 18:46:55 2011  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-SibME-SCAAPPMSG4052C01]$
```

8.13 Generate database objects for XA recovery

Navigate to **/home/oracle/bpm75/util/dbUtils/Oracle-XA_Recovery-XAREC4052C01**:

```
cd /home/oracle/bpm75/util/dbUtils/Oracle-XA_Recovery-XAREC4052C01
```

As user **oracle** run:

```
sqlplus sys/<sys_password>@ORA11DB AS SYSDBA @createUser_XA_Recovery.sql
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Fri Jun 17 17:24:30 2011  
Copyright (c) 1991, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production With the Partitioning, OLAP, Data Mining and Real Application  
Testing options  
  
User created.  
Grant succeeded.  
Grant succeeded.  
Grant succeeded.  
Grant succeeded.  
Grant succeeded.  
Grant succeeded.
```

Enter **commit**; then hit enter:

```
SQL> commit;
```

```
Commit complete.
```

Enter **exit**, then hit enter:

```
SQL> exit
```

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.2.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options  
[oracle@fmtc6152 Oracle-XA_Recovery-XAREC4052C01]$
```

Congratulations, now you have created all database objects that are required by BPM.

Chapter 9 Create the profiles



Involved systems:

Deployment manager: fmtc4052.boeblingen.de.ibm.com
Custom node 1: fmtc4054.boeblingen.de.ibm.com
Custom node 2: fmtc4055.boeblingen.de.ibm.com

This chapter shows how to create and federate the profiles required for this setup. On a high level following steps are required:

- Create the Deployment Manager profile
- Create the Custom profiles
- Start the Deployment Manager
- Federate the Custom nodes

9.1 Copy the Oracle driver to the BPM machines

Before the profiles are going to be created it has to be ensured that the BPM installations (on **fmtc4052.boeblingen.de.ibm.com**, **fmtc4054.boeblingen.de.ibm.com** and **fmtc4055.boeblingen.de.ibm.com**) use the oracle driver (`ojdbc6.jar`) that corresponds to the oracle installation. In order to do so copy **ojdbc6.jar** from the oracle installation to each BPM installation.

Location of **ojdbc6.jar** within the oracle installation:

`/opt/oracle/product/11.2.0/jdbc/lib`

Location of **ojdbc6.jar** within the BPM installation:

`/bpm75/jdbcdriivers/Oracle`

1. Within each BPM installation make a backup of the existing **ojdbc6.jar**.

```
cd /bpm75/jdbcdriivers/Oracle
mv ojdbc6.jar ojdbc6.BACKUP
```

2. Copy **ojdbc6.jar** from **`/opt/oracle/product/11.2.0/jdbc/lib`** on the oracle host (fmtc6152.boeblingen.de.ibm.com) to **`/bpm75/jdbcdriivers/Oracle`** on each BPM host (on **fmtc4052.boeblingen.de.ibm.com**, **fmtc4054.boeblingen.de.ibm.com** and **fmtc4055.boeblingen.de.ibm.com**). The content of **`/bpm75/jdbcdriivers/Oracle`** should then look like this:

```
ls -l
... ojdbc6.BACKUP
... ojdbc6.jar
```

9.2 Create the Deployment Manager profile

The first step in building up a BPM Process Server cell or cluster is creating a deployment manager profile. The deployment manager is used to manage the environment. In order to create the deployment manager profile silently a corresponding response file is required. Before that a working directory has to be created. As user **root** run:

```
mkdir /profileRespFiles
```

Navigate to **profileRespFiles**. Create a file **fmtc4052BPM_PS_DMGR.response**. Copy following content into **fmtc4052BPM_PS_DMGR.response** (Make sure that you replace the parameters with what has been defined in the planning section):

```
create
profileName=Dmgr01
profilePath=/bpm75/profiles/Dmgr01
templatePath=/bpm75/profileTemplates/BPM/dmgr.procsvr.adv
serverType=DEPLOYMENT_MANAGER
cellName=fmtc4052Cell01
nodeName=fmtc4052CellManager01
hostName=fmtc4052.boeblingen.de.ibm.com
enableService=false
enableAdminSecurity=true
adminUserName=admin
adminPassword=<admin_password>
dbType=Oracle
dbHostName=fmtc6152.boeblingen.de.ibm.com
dbServerPort=1521
dbName=ORA11DB
dbCommonUserId=COM4052C01
dbCommonPassword=<COM4052C01_password>
dbDesignEnabled=false
dbDelayConfig=true
dbDriverType=ORACLE_THIN
dbJDBCClasspath=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle
dbCreateNew=false
```

After you have copied the content save and close **fmtc4052BPM_PS_DMGR.response**.

9.2.1 Port considerations

The response file described above does not specify any custom port values, so following default port values are going to be used (in case this is the first deployment manager profile to be created on the machine):

```
IPC_CONNECTOR_ADDRESS=9632
CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS=9403
WC_adminhost=9060
DataPowerMgr_inbound_secure=5555
DCS_UNICAST_ADDRESS=9352
BOOTSTRAP_ADDRESS=9809
SAS_SSL_SERVERAUTH_LISTENER_ADDRESS=9401
CELL_DISCOVERY_ADDRESS=7277
SOAP_CONNECTOR_ADDRESS=8879
ORB_LISTENER_ADDRESS=9100
CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS=9402
WC_adminhost_secure=9043
```

If custom port values are supposed to be used those port values have to be defined in a dedicated file (eg. portdef.props). This file has then to be referenced from within the response file. For instance **portdef.props** could contain:

```
IPC_CONNECTOR_ADDRESS=<custom_port>
CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS=<custom_port>
WC_adminhost=<custom_port>
DataPowerMgr_inbound_secure=<custom_port>
DCS_UNICAST_ADDRESS=<custom_port>
BOOTSTRAP_ADDRESS=<custom_port>
SAS_SSL_SERVERAUTH_LISTENER_ADDRESS=<custom_port>
CELL_DISCOVERY_ADDRESS=<custom_port>
SOAP_CONNECTOR_ADDRESS=<custom_port>
ORB_LISTENER_ADDRESS=<custom_port>
CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS=<custom_port>
WC_adminhost_secure=<custom_port>
```

and would be referenced in **fmtc4052BPM_PS_DMGR.response** as follows:

```
...
dbDriverType=ORACLE_THIN
dbJDBCClasspath=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle
dbCreateNew=false
portsFile=/profileRespFiles/portdef.props
```

9.2.2 Security considerations

The response file described above does not specify the usage of any custom (and thus already existing!) security certificates (default personal certificate, root signing certificate). In this case a new default personal certificate (default expiration period: 1 year) and a root signing certificate (default expiration period: 15 years) will be created by default.

If dedicated certificates are supposed to be used (default personal certificate and/or root signing certificate) those certificates have to be referenced from within **fmtc4052BPM_PS_DMGR.response** as follows:

```
...
dbDriverType=ORACLE_THIN
dbJDBCClasspath=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle
dbCreateNew=false
importPersonalCertKS <keystore_path>
importPersonalCertKSPassword <keystore_password>
importPersonalCertKSType <keystore_type>
importPersonalCertKSAlias <keystore_alias>
importSigningCertKS <keystore_path>
importSigningCertKSPassword <keystore_password>
importSigningCertKSType <keystore_type>
importSigningCertKSAlias <keystore_alias>
```

Note: When one of the parameters that begin with **-importPersonal** is specified all of the them have to be specified.

Note: When one of the parameters that begin with **-importSigning** is specified all of the them have to be specified.

For further information regarding profile creation parameters have a look at the info center:

http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp?topic=/com.ibm.wbpm.ref.doc/topics/rins_manageprofiles_parms.html

Once **fmtc4052BPM_PS_DMGR.response** corresponds to your environment and requirements run the following command as user **root** to create the deployment manager profile:

```
/bpm75/bin/manageprofiles.sh -response /profileRespFiles/  
fmtc4052BPM_PS_DMGR.response
```

```
INSTCONFSUCCESS: Success: Profile Dmgr01 now exists. Please consult  
/bpm75/profiles/Dmgr01/logs/AboutThisProfile.txt for more information  
about this profile.
```

9.2.3 Verification

1. List the deployment manager profile that has been created with the following command:

```
/bpm75/bin/manageprofiles.sh -listProfiles
```

```
[Dmgr01]
```

2. Navigate to **/bpm75/logs/manageprofiles** and check file **Dmgr01_create.log** to contain return code **"INSTCONFSUCCESS"**:

```
<message>Returning with return code: INSTCONFSUCCESS</message>
```

9.3 Create the Custom profiles

The next step in the setup of a clustered environment is to create the custom profiles on the those machines which are supposed to host the servers (=cluster members) that will be created later on. Like the deployment manager profile the custom profiles are going to be created silently.

In order to create the custom profile silently corresponding response files are required. Before that a working directory has to be created. As user **root** run:

```
mkdir /profileRespFiles
```

Navigate to **profileRespFiles** on **fmtc4054.boeblingen.de.ibm.com** and create a file **fmtc4054BPM_PS_Custom.response**. Copy following content into **fmtc4054BPM_PS_Custom.response** (Make sure that you replace the parameters with what has been defined in the planning section):

```
create
profileName=Custom01
profilePath=/bpm75/profiles/Custom01
templatePath=/bpm75/profileTemplates/BPM/managed.procsvr.adv
cellName=fmtc4054Cell01
nodeName=fmtc4054Node01
hostName=fmtc4054.boeblingen.de.ibm.com
dbType=Oracle
dbJDBCClasspath=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle
```

After you have copied the content save and close **fmtc4054BPM_PS_Custom.response**.

Navigate to **profileRespFiles** on **fmtc4055.boeblingen.de.ibm.com** and create a file **fmtc4055BPM_PS_Custom.response**. Copy following content into **fmtc4055BPM_PS_Custom.response** (Make sure that you replace the parameters with what has been defined in the planning section):

```
create
profileName=Custom01
profilePath=/bpm75/profiles/Custom01
templatePath=/bpm75/profileTemplates/BPM/managed.procsvr.adv
cellName=fmtc4055Cell01
nodeName=fmtc4055Node01
hostName=fmtc4055.boeblingen.de.ibm.com
dbType=Oracle
dbJDBCClasspath=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle
```

After you have copied the content save and close **fmtc4055BPM_PS_Custom.response**

9.3.1 Security considerations

The response file described above does not specify the usage of any custom (and thus already existing!) security certificates (default personal certificate, root signing certificate). In this case a new default personal certificate (default expiration period: 1 year) and a root signing certificate (default expiration period: 15 years) will be created by default.

If dedicated certificates are supposed to be used (default personal certificate and/or root signing certificate) those certificates have to be referenced from within **fmtc4054BPM_PS_Custom.response** and **fmtc4055BPM_PS_Custom.response** as follows:

```
...
hostName=fmtc4055.boeblingen.de.ibm.com
dbType=Oracle
dbJDBCClasspath=${WAS_INSTALL_ROOT}/jdbcdrivers/Oracle
importPersonalCertKS <keystore_path>
importPersonalCertKSPassword <keystore_password>
importPersonalCertKSType <keystore_type>
importPersonalCertKSAlias <keystore_alias>
importSigningCertKS <keystore_path>
importSigningCertKSPassword <keystore_password>
importSigningCertKSType <keystore_type>
importSigningCertKSAlias <keystore_alias>
```

For further information regarding profile creation parameters have a look at the info center:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp?topic=/com.ibm.wbpm.ref.doc/topics/rins\_manageprofiles\_parms.html
```

Once **fmtc4054BPM_PS_Custom.response** and **fmtc4055BPM_PS_Custom.response** correspond to your environment and requirements run following command as user **root** to create the custom profiles:

On **fmtc4054.boeblingen.de.ibm.com**:

```
/bpm75/bin/manageprofiles.sh -response /profileRespFiles/  
fmtc4054BPM_PS_Custom.response
```

```
INSTCONFSUCCESS: Success: Profile Custom01 now exists. Please consult  
/bpm75/profiles/Custom01/logs/AboutThisProfile.txt for more information  
about this profile.
```

On **fmtc4055.boeblingen.de.ibm.com**:

```
/bpm75/bin/manageprofiles.sh -response /profileRespFiles/  
fmtc4055BPM_PS_Custom.response
```

```
INSTCONFSUCCESS: Success: Profile Custom01 now exists. Please consult  
/bpm75/profiles/Custom01/logs/AboutThisProfile.txt for more information  
about this profile.
```

9.3.2 Verification

1. List the custom profiles that have been created with following command (on **fmtc4054.boeblingen.de.ibm.com** and **fmtc4055.boeblingen.de.ibm.com**):

```
/bpm75/bin/manageprofiles.sh -listProfiles
```

```
[Custom01]
```

2. On both machines navigate to **/bpm75/logs/manageprofiles** and check file **Custom01_create.log** to contain return code **"INSTCONFSUCCESS"**:

```
<message>Returning with return code: INSTCONFSUCCESS</message>
```

9.4 Start the Deployment Manager

Note: At this point all the BPM database objects (chapter “Generate the BPM database objects”) have to exist.

In order to continue with the configuration of the environment the deployment manager needs to be started. Run following command on **fmtc4052.boeblingen.de.ibm.com** as user **root**:

```
/bpm75/profiles/Dmgr01/bin/startManager.sh
```

```
ADMU0116I: Tool information is being logged in file
           /bpm75/profiles/Dmgr01/logs/dmgr/startServer.log
ADMU0128I: Starting tool with the Dmgr01 profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server dmgr open for e-business; process id is 15074
```

Once the deployment manager is started verify the corresponding logs under **/bpm75/profiles/Dmgr01/logs/dmgr**.

9.5 Federate the Custom nodes

The generic command to federate a custom node is as follows:

```
/<custom_profile>/bin/addNode.sh <host_deployment_manager>  
<SOAP_connector_port_deployment_manager> -username  
<username_deployment_manager> -password <password_deployment_manager>
```

If the default ports have been used during deployment manager profile creation the SOAP connector port is **8879**. To be sure check the ports within the **serverindex.xml** file within the deployment manager profile (**/bpm75/profiles/Dmgr01/config/cells/fmtc4052Cell01/nodes/fmtc4052CellManager01/serverindex.xml**).

Make sure that the deployment manager is started, then federate both custom nodes as user **root** using the BPM administrator credentials:

On **fmtc4054.boeblingen.de.ibm.com**:

```
/bpm75/profiles/Custom01/bin/addNode.sh fmtc4052.boeblingen.de.ibm.com  
8879 -username admin -password <admin_password>
```

```
ADMU0116I: Tool information is being logged in file  
/bpm75/profiles/Custom01/logs/addNode.log  
ADMU0128I: Starting tool with the Custom01 profile  
CWPKI0308I: Adding signer alias "CN=fmtc4052.boeblingen.de.ibm.c" to local  
keystore "ClientDefaultTrustStore" with the following SHA dige  
st:  
D7:7C:DC:A3:E3:E0:8D:76:0C:7B:C8:9E:E6:B1:A6:35:90:5B:D6:51  
CWPKI0308I: Adding signer alias "datapower" to local keystore  
"ClientDefaultTrustStore" with the following SHA digest:  
A9:BA:A4:B5:BC:26:2F:5D:2A:80:93:CA:BA:F4:31:05:F2:54:14:17  
ADMU0001I: Begin federation of node fmtc4054Node01 with Deployment Manager  
at fmtc4052.boeblingen.de.ibm.com:8879.  
ADMU0009I: Successfully connected to Deployment Manager Server:  
fmtc4052.boeblingen.de.ibm.com:8879  
ADMU0507I: No servers found in configuration under:  
/bpm75/profiles/Custom01/config/cells/fmtc4054Node01Cell/nodes/  
fmtc4054Node01/servers  
ADMU2010I: Stopping all server processes for node fmtc4054Node01  
ADMU0024I: Deleting the old backup directory.  
ADMU0015I: Backing up the original cell repository.  
ADMU0012I: Creating Node Agent configuration for node: fmtc4054Node01  
ADMU0014I: Adding node fmtc4054Node01 configuration to cell:  
fmtc4052Cell01  
ADMU0016I: Synchronizing configuration between node and cell.  
ADMU0018I: Launching Node Agent process for node: fmtc4054Node01  
ADMU0020I: Reading configuration for Node Agent process: nodeagent  
ADMU0022I: Node Agent launched. Waiting for initialization status.  
ADMU0030I: Node Agent initialization completed successfully. Process id  
is: 12566  
  
ADMU0300I: The node fmtc4054Node01 was successfully added to the fmtc4052  
Cell01 cell.
```

```

ADMU0306I: Note:
ADMU0302I: Any cell-level documents from the standalone fmtc4052Cell01
configuration have not been migrated to the new cell.
ADMU0307I: You might want to:
ADMU0303I: Update the configuration on the fmtc4052Cell01 Deployment Mana
ger with values from the old cell-level documents.

ADMU0306I: Note:
ADMU0304I: Because -includeapps was not specified, applications installed
on the standalone node were not installed on the new cell.
ADMU0307I: You might want to:
ADMU0305I: Install applications onto the fmtc4052Cell01 cell using wsadmin
$AdminApp or the Administrative Console.

ADMU0003I: Node fmtc4054Node01 has been successfully federated.

```

On **fmtc4055.boeblingen.de.ibm.com**:

```

/bpm75/profiles/Custom01/bin/addNode.sh fmtc4052.boeblingen.de.ibm.com
8879 -username admin -password <admin_password>
ADMU0116I: Tool information is being logged in file

```

```

/bpm75/profiles/Custom01/logs/addNode.log
ADMU0128I: Starting tool with the Custom01 profile
CWPKI0308I: Adding signer alias "CN=fmtc4052.boeblingen.de.ibm.c" to local
keystore "ClientDefaultTrustStore" with the following SHA dige
st:
D7:7C:DC:A3:E3:E0:8D:76:0C:7B:C8:9E:E6:B1:A6:35:90:5B:D6:51
CWPKI0308I: Adding signer alias "datapower" to local keystore
"ClientDefaultTrustStore" with the following SHA digest:
A9:BA:A4:B5:BC:26:2F:5D:2A:80:93:CA:BA:F4:31:05:F2:54:14:17
ADMU0001I: Begin federation of node fmtc4055Node01 with Deployment Manager
at fmtc4052.boeblingen.de.ibm.com:8879.
ADMU0009I: Successfully connected to Deployment Manager Server:
fmtc4052.boeblingen.de.ibm.com:8879
ADMU0507I: No servers found in configuration under:
/bpm75/profiles/Custom01/config/cells/fmtc4055Node01Cell/nodes/
fmtc4055Node01/servers
ADMU2010I: Stopping all server processes for node fmtc4055Node01
ADMU0024I: Deleting the old backup directory.
ADMU0015I: Backing up the original cell repository.
ADMU0012I: Creating Node Agent configuration for node: fmtc4055Node01
ADMU0014I: Adding node fmtc4055Node01 configuration to cell:
fmtc4052Cell01
ADMU0016I: Synchronizing configuration between node and cell.
ADMU0018I: Launching Node Agent process for node: fmtc4055Node01
ADMU0020I: Reading configuration for Node Agent process: nodeagent
ADMU0022I: Node Agent launched. Waiting for initialization status.
ADMU0030I: Node Agent initialization completed successfully. Process id
is: 31916

ADMU0300I: The node fmtc4055Node01 was successfully added to the fmtc4052
Cell01 cell.

ADMU0306I: Note:

```

```
ADMU0302I: Any cell-level documents from the standalone fmtc4052Cell01
           configuration have not been migrated to the new cell.
ADMU0307I: You might want to:
ADMU0303I: Update the configuration on the fmtc4052Cell01 Deployment Mana
           ger with values from the old cell-level documents.

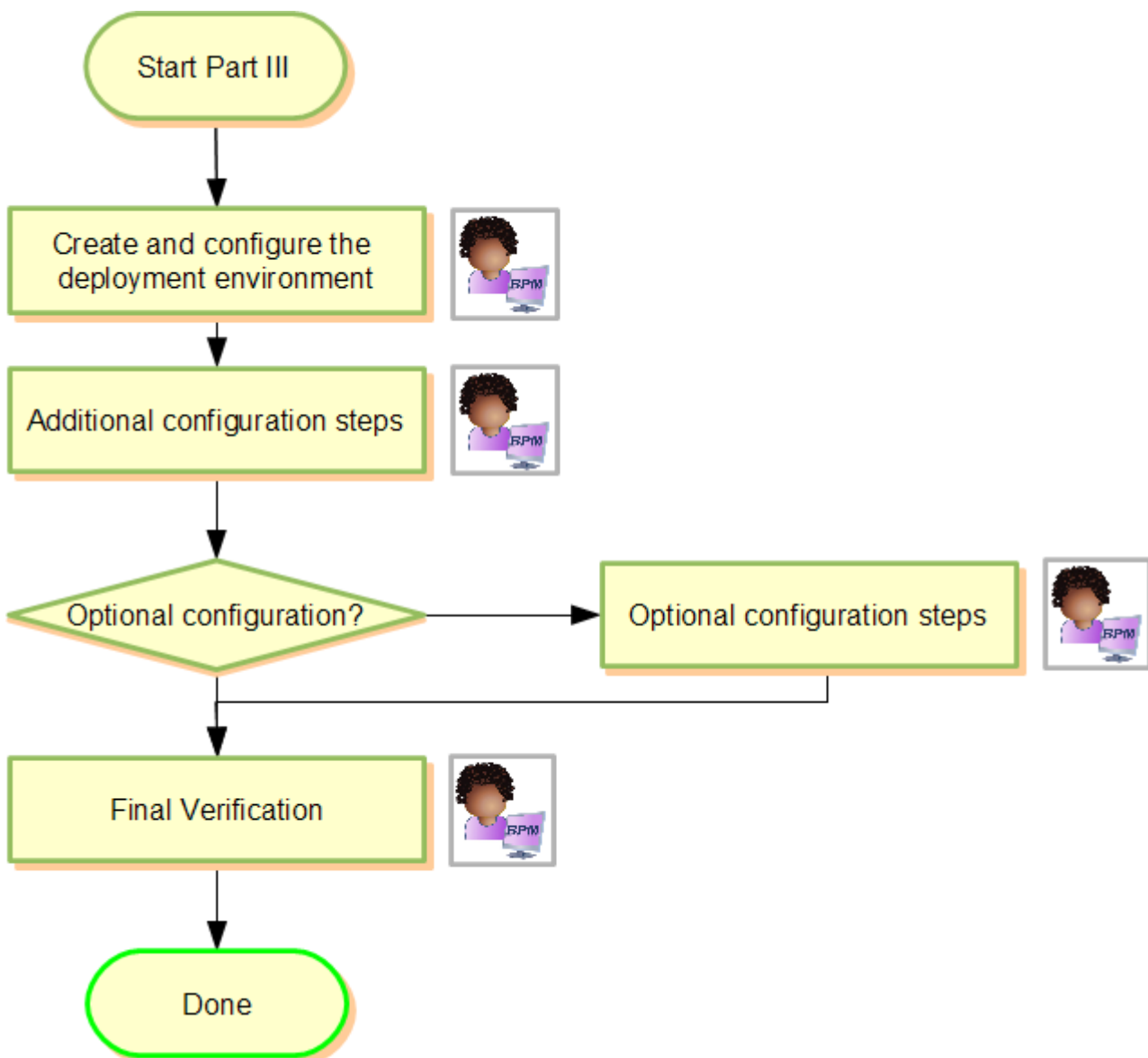
ADMU0306I: Note:
ADMU0304I: Because -includeapps was not specified, applications installed
           on the standalone node were not installed on the new cell.
ADMU0307I: You might want to:
ADMU0305I: Install applications onto the fmtc4052Cell01 cell using wsadmin
           $AdminApp or the Administrative Console.

ADMU0003I: Node fmtc4055Node01 has been successfully federated.
```

Unlike the deployment manager profile creation, the creation of a BPM PS custom profile does not create a startable server. The servers are created later on when the clusters are created.

On both machines (**fmtc4054.boeblingen.de.ibm.com** and **fmtc4055.boeblingen.de.ibm.com**) check the nodeagent logs (**[/bpm75/profiles/Custom01/logs/nodeagent](#)**). Check that they do not contain any errors. Further check the **addNode.log** and make sure that it does not contain any errors (**[/bpm75/profiles/Custom01/logs/](#)**).

Part III: BPM Administrator (BPM Admin) tasks



Chapter 10 Create and configure the deployment environment



Involved systems:

Deployment manager: `fmtc4052.boeblingen.de.ibm.com`

The creation of a deployment environment (DE) was simplified with the integration of standard topology configuration options into the admin console. The DE panel flow within admin console provides a very convenient and consistent way to setup a BPM Cluster topology with all needed members and related functions (DB connections/content, Messaging, Business Process Choreographer, etc..).

Manual configuration of a deployment environment is not recommended, except a dedicated setup is required which cannot be covered by the available DE topology options in the admin console.

Another powerful options is a DE export/import function. This allows for example to reuse an already configred DE for repetitive configuration either manually using the admin console or leveraging wsadmin command to create the DE silently/automated.

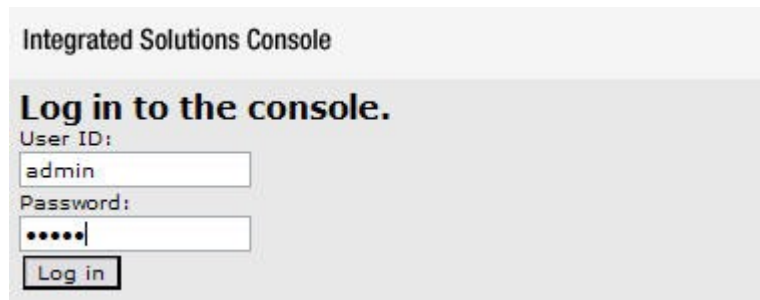
10.1 Create the deployment environment

Logon to BPM Deployment Manager Admin Console using the credentials the system has been set up with:

<http://fmtc4052.boeblingen.de.ibm.com:9060/ibm/console>

Note: In IBM Business Process Manager V7.5 security is enabled by default.

The "Login" page is displayed:



Integrated Solutions Console

Log in to the console.

User ID:
admin

Password:
.....

Log in

1. Type in the "user ID" in this case "admin" and the specified password.
2. Click **Log In**.

In the admin console, navigate to:

Servers
-> **Deployment Environments**

The Deployment Environments are displayed:



Deployment Environments

Deployment Environments

Select deployment environments to manage. You can manage deployment environments that are created with patterns or custom deployment environments.

Start **1** New... Remove Import... Export...

Select	Status	Deployment Environment Name	Features	Pattern	Description
None					
Total 0					

1. Click **New**.

The "Create new deployment environment" page is displayed:

Create new deployment environment

Create a deployment environment that is based on a pattern or
Enter the deployment environment name and select the path to
steps", the wizard displays only those pages that do not have a
At the end of the wizard, you can generate the deployment env
deployment environment definition. To generate the environme

Create Deployment Environment

1 Create a deployment environment based on a pattern
 Create a deployment environment based on an imported
File path

2 * Deployment environment name

Fast path: Show only needed steps

3 Detailed: Show all steps

4

1. Select "Create a deployment environment based on a pattern".
2. Specify the Deployment environment name "BPMPS".
3. Select "Detailed: Show all steps".
4. Click **Next**.

The "Create new deployment environment" page is displayed:

Create new deployment environment

Select the feature for the deployment environment.

Select	Features	Description
<input checked="" type="radio"/>	BMAPS	BPM Advanced Process Server
<input type="radio"/>	WESB	WebSphere Enterprise Service Bus

Pre **2** Next Cancel

1. Select "BMAPS".
2. Click **Next**.

The "Create new deployment environment" page is displayed:

Create new deployment environment

Deployment environment patterns are rules-based configurations of the most commonly used an environment configuration. Deployment environment patterns represent well-known, tested patterns ensures reliable deployment environment functionality. You can create custom deploy supplied by the patterns.

Select a pattern that provides the topological characteristics of the deployment environment:

Select	Deployment Environment Patterns	Description
<input type="radio"/>	Single Cluster	The single cluster pattern is the simplest pattern. It defin messaging infrastructure and supporting applications.
<input type="radio"/>	Remote Messaging	The remote messaging pattern defines one cluster for a; infrastructure. The supporting applications are configured
<input checked="" type="radio"/>	Remote Messaging, Remote Support, and Web	The remote messaging, remote support, and Web patter cluster for the messaging infrastructure; one remote clus Space and REST services related Web applications.
<input type="radio"/>	Remote Messaging and Remote Support	The remote messaging and remote support pattern defin the messaging infrastructure, and one remote cluster for

Pre **2** Next Cancel

1. Select "Remote Messaging and Remote Support, and Web".
2. Click **Next**.

The "Create new deployment environment" page is displayed:

Create new deployment environment

→ **Step 1: Select Nodes**

[Step 2: Clusters](#)

[Step 3: System REST Service Endpoints](#)

[Step 4: Import database configuration](#)

[Step 5: Database](#)

[Step 6: Security](#)

[Step 7: Process Server](#)

[Step 8: Business Process Choreographer](#)

[Step 9: Web Application Context Roots](#)

[Step 10: Summary](#)

Select Nodes

i Select the nodes to use for the deployment environment. The *Remote Mess* deployment environment *BPM75* requires at least **1 node**. For high-availability a nodes. For scalability, select more than two nodes.

Select	Node	Version
<input checked="" type="checkbox"/>	fmtc4054Node01	BPMPMS 7.5.0.0, BPMA 7.5.0.0, BPMAPS 7.5.0.0, WPS 7.5.0.0
<input checked="" type="checkbox"/>	fmtc4055Node01	BPMPMS 7.5.0.0, BPMA 7.5.0.0, BPMAPS 7.5.0.0, WPS 7.5.0.0
Number of required nodes		1
Number of selected nodes		2

2

1. Select the two nodes `fmtc4054Node01` and `fmtc4055Node01`.
2. Click **Next**.

The "Create new deployment environment" page is displayed:

Create new deployment environment

Step 1: Select Nodes

→ **Step 2:** Clusters

Step 2.1: Application Deployment Target

Step 2.2: Messaging Infrastructure

Step 2.3: Supporting Infrastructure

Step 2.4: Web Applications

Step 3: System REST Service Endpoints

Step 4: Import database configuration

Step 5: Database

Step 6: Security

Step 7: Process Server

Step 8: Business Process Choreographer

Step 9: Web Application Context Roots

Step 10: Summary

Cluster Members

Map the clusters to the listed nodes by indicating the number of cluster members to configure.

Cluster	Version	Application Deployment Target	Messaging Infrastructure	Supporting Infrastructure	Web Applications
fmtc4054Node01	BPMP 7.5.0.0, BPMA 7.5.0.0, BPMA 7.5.0.0, WPS 7.5.0.0	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
fmtc4055Node01	BPMP 7.5.0.0, BPMA 7.5.0.0, BPMA 7.5.0.0, WPS 7.5.0.0	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>

Previous **Next** Cancel

1. Leave the default (according to the planning section: one member per cluster and node).
2. Click **Next**.

The "Create new deployment environment" page is displayed:

Create new deployment environment

[Step 1: Select Nodes](#)

[Step 2: Clusters](#)

→ [Step 2.1: Application Deployment Target](#)

[Step 2.2: Messaging Infrastructure](#)

[Step 2.3: Supporting Infrastructure](#)

[Step 2.4: Web Applications](#)

[Step 3: System REST Service Endpoints](#)

[Step 4: Import database configuration](#)

[Step 5: Database](#)

[Step 6: Security](#)

[Step 7: Process Server](#)

[Step 8: Business Process Choreographer](#)

[Step 9: Web Application Context Roots](#)

[Step 10: Summary](#)

Cluster Naming

Customize the name of a cluster and cluster member.

Cluster

Cluster

Application Deployment Target

* Cluster Name

BPMP5.AppTarget

Cluster Members

Node Name	Cluster Member Name
fmtc4054Node01	BPMP5.AppTarget.fmtc4054Nc
fmtc4055Node01	BPMP5.AppTarget.fmtc4055Nc

Pre **Next** Cancel

1. Leave the default name for the Application Cluster and the Application Cluster Members (matches names defined in planning section).
2. Click **Next**.

The "Create new deployment environment" page is displayed:

Create new deployment environment

[Step 1: Select Nodes](#)

[Step 2: Clusters](#)

[Step 2.1: Application Deployment Target](#)

→ [Step 2.2: Messaging Infrastructure](#) **1**

[Step 2.3: Supporting Infrastructure](#)

[Step 2.4: Web Applications](#)

[Step 3: System REST Service Endpoints](#)

[Step 4: Import database configuration](#)

[Step 5: Database](#)

[Step 6: Security](#)

[Step 7: Process Server](#)

[Step 8: Business Process Choreographer](#)

[Step 9: Web Application Context Roots](#)

[Step 10: Summary](#)

Cluster Naming

Customize the name of a cluster and cluster member.

Cluster

Cluster

Messaging Infrastructure

* Cluster Name

BPMP.S.Messaging

Cluster Members

Node Name	Cluster Member Name
fmtc4054Node01	BPMP.S.Messaging.fmtc4054N
fmtc4055Node01	BPMP.S.Messaging.fmtc4055N

Prev **2** Next Cancel

1. Leave the default name for the Messaging Cluster and the Messaging Cluster Members (matches names defined in planning section).
2. Click **Next**.

The "Create new deployment environment" page is displayed:

Create new deployment environment

[Step 1: Select Nodes](#)

[Step 2: Clusters](#)

[Step 2.1: Application Deployment Target](#)

[Step 2.2: Messaging Infrastructure](#)

→ [Step 2.3: Supporting Infrastructure](#) **1**

[Step 2.4: Web Applications](#)

[Step 3: System REST Service Endpoints](#)

[Step 4: Import database configuration](#)

[Step 5: Database](#)

[Step 6: Security](#)

[Step 7: Process Server](#)

[Step 8: Business Process Choreographer](#)

[Step 9: Web Application Context Roots](#)

[Step 10: Summary](#)

Cluster Naming

Customize the name of a cluster and cluster member.

Cluster

Cluster
Supporting Infrastructure

* Cluster Name
BPMP.S.Support

Cluster Members

Node Name	Cluster Member Name
fmtc4054Node01	BPMP.S.Support.fmtc4054Node
fmtc4055Node01	BPMP.S.Support.fmtc4055Node

Prev **2** Next Cancel

1. Leave the default name for the Support Cluster and the Support Cluster Members (matches names defined in planning section).
2. Click **Next**.

The "Create new deployment environment" page is displayed:

Create new deployment environment

[Step 1: Select Nodes](#)

[Step 2: Clusters](#)

[Step 2.1: Application Deployment Target](#)

[Step 2.2: Messaging Infrastructure](#)

[Step 2.3: Supporting Infrastructure](#)

1 [Step 2.4: Web Applications](#)

[Step 3: System REST Service Endpoints](#)

[Step 4: Import database configuration](#)

[Step 5: Database](#)

[Step 6: Security](#)

[Step 7: Process Server](#)

[Step 8: Business Process Choreographer](#)

[Step 9: Web Application Context Roots](#)

[Step 10: Summary](#)

Cluster Naming

Customize the name of a cluster and cluster member.

Cluster

Cluster

Web Applications

* Cluster Name

BPMP.S.WebApp

Cluster Members

Node Name	Cluster Member Name
fmtc4054Node01	BPMP.S.WebApp.fmtc4054Nod
fmtc4055Node01	BPMP.S.WebApp.fmtc4055Nod

Prev **2** Next Cancel

1. Leave the default name for the Web Application Cluster and the Web Application Cluster Members (matches names defined in planning section).
2. Click **Next**.

The "Create new deployment environment" page is displayed:

Create new deployment environment

[Step 1: Select Nodes](#)
[Step 2: Clusters](#)
→ [Step 3: System REST Service Endpoints](#)
[Step 4: Import database configuration](#)
[Step 5: Database](#)
[Step 6: Security](#)
[Step 7: Process Server](#)
[Step 8: Business Process Choreographer](#)
[Step 9: Web Application Context Roots](#)
[Step 10: Summary](#)

System REST Service Endpoints

Use this page to configure service endpoints for Representatio want widgets to be available in Business Space, you must confi For each REST service endpoint, specify the host or virtual host cluster. If you leave the host and port fields empty, the values HTTP port. For a load-balanced environment, you must later ct port of your environment.

REST services

Protocol:

Host name or virtual host in a load-balanced environment:

Port:

Context root:

Prev **1** Next Cancel

Don't configure the REST Endpoints for now, this will be done later.

1. Click **Next**.

Note: Keeping the defaults of "System REST Service Endpoints" panel leads to a default configuration of REST Service Endpoints with a fix endpoint configuration to one member of the Application Cluster (arbitrary selection of first server returned on member query during config). This procedure allows to have a working access to REST API after successful Deployment Environment creation. A reconfiguration of these deafaults is done later to utilize the HTTP server and Plugin for request distribution onto cluster members. Next to proper HTTP server and Plugin configuration, the mapping of webmodules has to be extended to include the webserver node.

Note: Keep in mind that the REST default configuration does not allow high availability, failover, nor load distribution. The configured cluster member represents a single point of failure. If it is stopped/down, the REST service cannot be reached. To achieve this, a reconfiguration to the centralized access point is required (HTTP server, IP-sprayer, Load Balancer, etc.) If this centralized access point is already available when configuring the Deployment Environment, the credentials can be directly entered into the "REST Service Endpoint" panel.

The "Create new deployment environment" page is displayed:

Create new deployment environment

[Step 1: Select Nodes](#)

[Step 2: Clusters](#)

[Step 3: System REST Service Endpoints](#)

→ [Step 4: Import database configuration](#)

[Step 5: Database](#)

[Step 6: Security](#)

[Step 7: Process Server](#)

[Step 8: Business Process Choreographer](#)

[Step 9: Web Application Context Roots](#)

[Step 10: Summary](#)

Import database configuration

If you defined a database design document, enter the deployment environment. The database design document deployment environment features. If you do not have database parameters on the following page.

Import database configuration file for features:

1

1. Click **Next**.

The "Create new deployment environment" page is displayed:

The screenshot shows a web interface for creating a new deployment environment. On the left, there is a navigation pane with steps: Step 5: Database (selected), Step 6: Security, Step 7: Process Server, Step 8: Business Process Choreographer, Step 9: Web Application Context Roots, and Step 10: Summary. The main area contains a table with the following columns: Select, Name, Database Name, Schema, Create Tables, User Name, Password, Server, and Provider. A green box highlights the first row of the table, and a circled '1' is placed next to the 'Select' checkbox. At the bottom, there are 'Pre', 'Next', and 'Cancel' buttons, with a circled '2' next to the 'Next' button.

Select	Name	Database Name	Schema	Create Tables	User Name	Password	Server	Provider
<input checked="" type="checkbox"/>	Business Process Choreographer data source	ORA11DB	BPC4052C0	<input type="checkbox"/>	BPC4052C01	*****	fmtc6152.bc	Oracle
<input type="checkbox"/>	Business Process Choreographer Messaging Engine data source	ORA11DB	BPCMSG405	<input type="checkbox"/>	BPCMSG405	*****	fmtc6152.bc	Oracle
<input type="checkbox"/>	Business Process Choreographer reporting function data source	ORA11DB	BPC4052C0	<input type="checkbox"/>	BPC4052C0	*****	fmtc6152.bc	Oracle
<input type="checkbox"/>	Business Space data source	ORA11DB	BSP4052C0	<input type="checkbox"/>	BSP4052C0	*****	fmtc6152.bc	Oracle
<input type="checkbox"/>	CEI Messaging Engine data source	ORA11DB	CEIMSG405	<input type="checkbox"/>	CEIMSG405	*****	fmtc6152.bc	Oracle
<input type="checkbox"/>	Performance Data Warehouse data source	ORA11DB		<input type="checkbox"/>		*****	fmtc6152.bc	Oracle
<input type="checkbox"/>	Performance Data Warehouse Messaging Engine data source	ORA11DB	PDWMSG405	<input type="checkbox"/>	PDWMSG405	*****	fmtc6152.bc	Oracle
<input type="checkbox"/>	Process Server data source	ORA11DB		<input type="checkbox"/>		*****	fmtc6152.bc	Oracle
<input type="checkbox"/>	Process Server Messaging Engine data source	ORA11DB	PSEMSG405	<input type="checkbox"/>	PSEMSG405	*****	fmtc6152.bc	Oracle
<input type="checkbox"/>	SCA System Bus Messaging Engine data source	ORA11DB	SCASYSMSG	<input type="checkbox"/>	SCASYSMSG	*****	fmtc6152.bc	Oracle
<input type="checkbox"/>	SCA Application Bus Messaging Engine data source	ORA11DB	SCAAPMSG	<input type="checkbox"/>	SCAAPMSG	*****	fmtc6152.bc	Oracle

Pre **Next** Cancel

1. Fill in the database configuration information according to the definitions of the planning section. Ensure that all values match exactly, because this configuration info refers to an existing database configuration. Failing to ensure matching values leads to unwanted debugging and fixing actions.
2. Click **Next**.

The following table repeats the content of the previous screen shot for better reading only.

Data Source Name	Database Name	Schema	Create Tables	User Name	Password	Server
Business Process Choreographer data source	ORA11DB	BPC4052C01	No (unchecked)*	BPC4052C01	<BPC4052C01_password>	fmtc6152.boebling en.de.ibm.com
Business Process Choreographer Messaging Engine data source	ORA11DB	BPCMSG4052C01	No (unchecked)*	BPCMSG4052C01	<BPCMSG4052C01_password>	fmtc6152.boebling en.de.ibm.com
Business Process Choreographer reporting function data source	ORA11DB	BPC4052C01	No (unchecked)*	BPC4052C01	<BPC4052C01_password>	fmtc6152.boebling en.de.ibm.com
Business Space data source	ORA11DB	BSP4052C01	No (unchecked)*	BSP4052C01	<BSP4052C01_password>	fmtc6152.boebling en.de.ibm.com
CEI Messaging Engine data source	ORA11DB	CEIMSG4052C01	No (unchecked)*	CEIMSG4052C01	<CEIMSG4052C01_password>	fmtc6152.boebling en.de.ibm.com
Performance Data Warehouse data source	ORA11DB	-	No (unchecked)*	PDW4052C01	<PDW4052C01_password>	fmtc6152.boebling en.de.ibm.com
Performance Data Warehouse Messaging Engine data source	ORA11DB	PDWMSG4052C01	No (unchecked)*	PDWMSG4052C01	<PDWMSG4052C01_password>	fmtc6152.boebling en.de.ibm.com
Process Server data source	ORA11DB	-	No (unchecked)*	PSS4052C01	<PSS4052C01_password>	fmtc6152.boebling en.de.ibm.com
Process Server Messaging Engine data source	ORA11DB	PSSMSG4052C01	No (unchecked)*	PSSMSG4052C01	<PSSMSG4052C01_password>	fmtc6152.boebling en.de.ibm.com
SCA System Bus Messaging Engine data source	ORA11DB	SCASYSMSG4052C01	No (unchecked)*	SCASYSMSG4052C01	<password>	fmtc6152.boebling en.de.ibm.com
SCA Application Bus Messaging Engine data source	ORA11DB	SCAAPMSG4052C01	No (unchecked)*	SCAAPMSG4052C01	<SCAAPMSG4052C01_password>	fmtc6152.boebling en.de.ibm.com

* tables have already been created by the database administrator in chapter "Create Database Objects".

The "Create new deployment environment" page is displayed:

The screenshot shows the "Create new deployment environment" page. On the left, a sidebar lists steps from 1 to 10. Step 6, "Security", is highlighted with a green circle containing the number 1. The main area is titled "Security" and contains the instruction: "Edit the user names and passwords for the authentication aliases that are needed by this deployment environment." Below this is a table with four columns: "Name", "User name", "Password", and "Confirm Passw". The table contains three rows of authentication aliases, each with a default "admin" user name and a masked password. A green box highlights the entire table. At the bottom of the page, there are "Previous", "Next", and "Cancel" buttons. The "Next" button is highlighted with a green circle containing the number 2.

Name	User name	Password	Confirm Passw
CEI JMS authentication alias	admin	*****	*****
SCA authentication alias	admin	*****	*****
Business Process Choreographer JMS authentication alias	admin	*****	*****

1. Leave the default User name and Password for CEI JMS authentication, SCA and Business Process Choreographer JMS authentication alias (matches user name/password defined in planning section).
2. Click **Next**.

The "Create new deployment environment" page is displayed:

For offline mode don't configure a remote process center.

1. Enable "Use server offline"
2. Click **Next**.

Note: For exclusive and controlled application deployment actions the planned production environment does not have an online connection to a Process Center. Application deployment is managed via commandline scripts by the BPM administrator. In case the production environment is aimed to be configured in online mode, the most convenient way is to specify the Process Center connection details in this panel. Another option is to configure the online Process Center connection manually. Independent of the chosen way it is not required to have a Process Center up and running during online mode configuration.

"Customizing the settings used by Process Server to connect to Process Center":

http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/topic/com.ibm.wbpm.imuc.ebpm.doc/topics/tconnect_to_pctr.html

The "Create new deployment environment" page is displayed:

Create new deployment environment

[Step 1: Select Nodes](#)
[Step 2: Clusters](#)
[Step 3: System REST Service Endpoints](#)
[Step 4: Import database configuration](#)
[Step 5: Database](#)
[Step 6: Security](#)
[Step 7: Process Server](#)
→ [Step 8: Business Process Choreographer](#)
[Step 9: Web Application Context Roots](#)
[Step 10: Summary](#)

Business Process Choreographer

The business process choreographer components need to have the following parameters:

▼ **Security**

Role	Use Default	Users	Groups	Description
Administrator	<input type="checkbox"/>	admin		User names, groups, and human task privileges.
Monitor	<input type="checkbox"/>	admin		User names, groups, and human task properties of all components.

Authentication	Users	Password	Confirm Password
JMS API Authentication	admin
Escalation User Authentication	admin
Administration job user authentication	admin

▼ **Human Task Manager Mail Session**

Enable e-mail service

Mail transport host

Mail transport user

Mail transport password

Confirm mail transport password

Business Process Choreographer Explorer URL

Prev **3** Next Cancel

1. Enter the password for JMS API, Escalation User and Administration job user authentication (according to the planning section).
2. Disable "Enable e-mail service"
3. Click **Next**.

The "Create new deployment environment" page is displayed:

Create new deployment environment

[Step 1: Select Nodes](#)
[Step 2: Clusters](#)
[Step 3: System REST Service Endpoints](#)
[Step 4: Import database configuration](#)
[Step 5: Database](#)
[Step 6: Security](#)
[Step 7: Process Server](#)
[Step 8: Business Process Choreographer](#)
→ [Step 9: Web Application Context Roots](#)
[Step 10: Summary](#)

Web Application Context Roots

Modify the context roots for Web applications.

Context Root

Business Process Choreographer Explorer context root: /bpc

Business Process Rules Manager context root: /br

Business Space context root: /BusinessSpace

Pre **2** Next Cancel

1. Leave the default Context Root values.
2. Click **Next**.

The "Create new deployment environment" page is displayed:

Property
Environment name
Environment type
Process center connection URL

Business Process Choreographer

Parameter
Business Process Choreographer Explorer context root
Create a mail session to send e-mails
Mail session host
Business Process Choreographer Explorer URL
User for Administrator role
Group for Administrator role
User for Monitor role
Group for Monitor role












Business Process Rules Manager

Parameter
Business Process Rules Manager context root

Previous **1** Finish and Generate Environment Cancel

1. Click **Finish and Generate Environment** after having verified the Summary information.

The "Configuration Status" page is displayed:

	2011-06-20 15:17:12	CWLDB9013I: Configuring component WBI_BPCEventC
	2011-06-20 15:17:12	CWLDB9022I: Creating authentication alias OBSVRDB
	2011-06-20 15:17:12	CWLDB9022I: Creating authentication alias OBSVRDB
	2011-06-20 15:17:14	CWLDB9021I: Datasource BPCRFDDataSource is config
	2011-06-20 15:17:17	CWLDB9013I: Configuring component WBI_BPCEexplor
	2011-06-20 15:17:26	CWLDB9013I: Configuring component WBI_RECOVER'
	2011-06-20 15:17:26	CWLDB9013I: Configuring component WBI_BRM on de
	2011-06-20 15:17:27	CWLDB9013I: Configuring component WBI_Federated
	2011-06-20 15:17:27	CWLDB9013I: Configuring component WBI_BSPACE o
	2011-06-20 15:17:27	CWLDB9051W: Deployment environment BPMPS is suc
	2011-06-20 15:17:27	The configuration has ended.

1

1. Click **Save Changes** upon successful creation of the Deployment Environment.
2. Restart the cell.

10.2 Configure deployment environment

NOTE: In case of a failing verification steps of this chapter, take the correcting action described and restart the entire cell to catch-up changes.

10.2.1 Bootstrap Process Server

To complete database configuration for IBM Business Process Manager V7.5, a manual step is currently required to load the repository (BPMDB database). On execution of the command line script, cell information is gathered from a profile and used for the connection and propagation to the database.

Run the following command line on DMGR:

```
/bpm75/profiles/Dmgr01/bin/bootstrapProcessServerData.sh -profilePath  
/bpm75/profiles/Dmgr01 -dbType ORACLE -dbJDBCClasspath  
/bpm75/jdbcdriver/Oracle -nodeName fmtc4054Node01 -serverName  
BPMP5.AppTarget.fmtc4054Node01.0
```

```
...  
[Activating .... ] Jul 14, 2011 11:17:42 AM  
com.lombardisoftware.core.cache.LocalCache initializeSettingsFile  
[Activating .... ] INFO: CWLLG2155I: Cache settings read have been from  
file file:/bpm75/BPM/Lombardi/process-  
server/twinit/lib/basic_resources.jar!/LombardiTeamWorksCache.xml.  
[delete] Deleting:  
/bpm75/profiles/Dmgr01/config/cells/fmtc4052Cell101/nodes/fmtc4054Node01/se  
rvers/BPMP5.AppTarget.fmtc4054Node01.0/process-  
server/config/100Bootstrap.xml  
[delete] Deleting:  
/bpm75/profiles/Dmgr01/config/cells/fmtc4052Cell101/nodes/fmtc4054Node01/se  
rvers/BPMP5.AppTarget.fmtc4054Node01.0/process-  
server/TeamWorksConfiguration.running.xml  
  
BUILD SUCCESSFUL  
Total time: 2 minutes 27 seconds
```

The bootstrapping of data completed. Check the output for errors.

Note: Though bootstrap action being a profile command, it is not required to be run on the custom nodes, as the database is the configuration target.

10.2.2 Configure bus security

IBM Business Process Manager V7.5 introduces two additional buses leveraged by Process Server and Performance Data Warehouse. As a limitation of the current release the deployment environment configuration establishes these two buses **without** security. The manual steps required to enable security for the two new buses are covered by the following technote:

Technote: Securing the messaging engines underlying the IBM Process Server and Performance Data Warehouse for IBM Business Process Manager

<http://www.ibm.com/support/docview.wss?uid=swg21499518>

10.2.3 Verify data sources

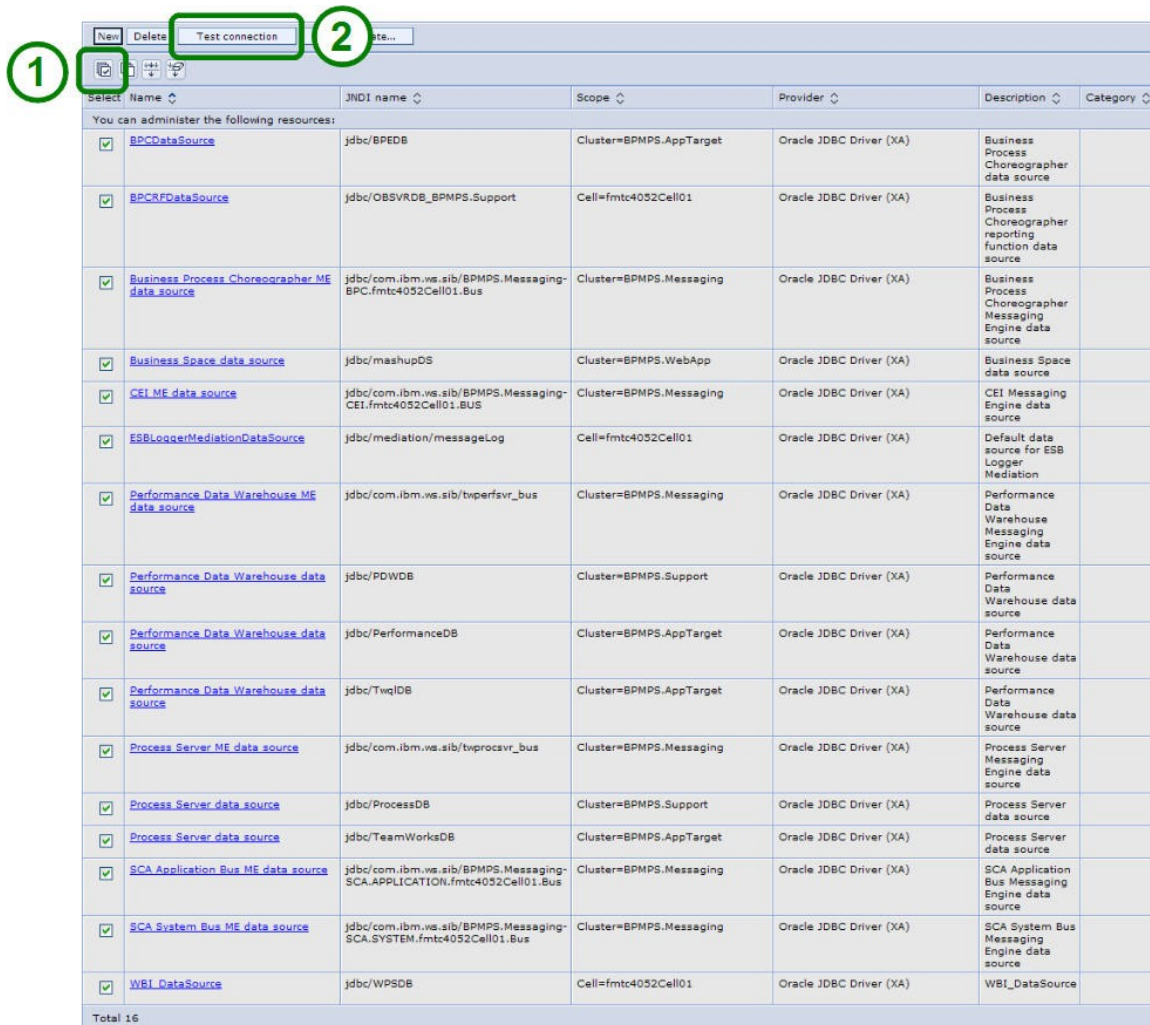
Datasource provide the gateway to between WebSphere and database system. A key verification step is a connection test of each configured datasource.

In the admin console, navigate to

Resources
-> **JDBC**
-> **Data sources**

Verify data sources functionality:

1. Select all datasources
2. Click **Test connection**



Select	Name	JNDI name	Scope	Provider	Description	Category
<input checked="" type="checkbox"/>	BPCCDataSource	jdbc/BPEDB	Cluster=BPMPs.AppTarget	Oracle JDBC Driver (XA)	Business Process Choreographer data source	
<input checked="" type="checkbox"/>	BPCCRFDataSource	jdbc/OBSVRDB_BPMPs.Support	Cell=fmtc4052Cell01	Oracle JDBC Driver (XA)	Business Process Choreographer reporting function data source	
<input checked="" type="checkbox"/>	Business Process Choreographer ME data source	jdbc/com.ibm.ws.sib/BPMPs.Messaging-BPC.fmtc4052Cell01.Bus	Cluster=BPMPs.Messaging	Oracle JDBC Driver (XA)	Business Process Choreographer Messaging Engine data source	
<input checked="" type="checkbox"/>	Business Space data source	jdbc/mashupDS	Cluster=BPMPs.WebApp	Oracle JDBC Driver (XA)	Business Space data source	
<input checked="" type="checkbox"/>	CEI ME data source	jdbc/com.ibm.ws.sib/BPMPs.Messaging-CEI.fmtc4052Cell01.BUS	Cluster=BPMPs.Messaging	Oracle JDBC Driver (XA)	CEI Messaging Engine data source	
<input checked="" type="checkbox"/>	ESBLoggerMediationDataSource	jdbc/mediation/messageLog	Cell=fmtc4052Cell01	Oracle JDBC Driver (XA)	Default data source for ESB Logger Mediation	
<input checked="" type="checkbox"/>	Performance Data Warehouse ME data source	jdbc/com.ibm.ws.sib/twperfsrv_bus	Cluster=BPMPs.Messaging	Oracle JDBC Driver (XA)	Performance Data Warehouse Messaging Engine data source	
<input checked="" type="checkbox"/>	Performance Data Warehouse data source	jdbc/PDOWDB	Cluster=BPMPs.Support	Oracle JDBC Driver (XA)	Performance Data Warehouse data source	
<input checked="" type="checkbox"/>	Performance Data Warehouse data source	jdbc/PerformanceDB	Cluster=BPMPs.AppTarget	Oracle JDBC Driver (XA)	Performance Data Warehouse data source	
<input checked="" type="checkbox"/>	Performance Data Warehouse data source	jdbc/TwqIDB	Cluster=BPMPs.AppTarget	Oracle JDBC Driver (XA)	Performance Data Warehouse data source	
<input checked="" type="checkbox"/>	Process Server ME data source	jdbc/com.ibm.ws.sib/twprocvr_bus	Cluster=BPMPs.Messaging	Oracle JDBC Driver (XA)	Process Server Messaging Engine data source	
<input checked="" type="checkbox"/>	Process Server data source	jdbc/ProcessDB	Cluster=BPMPs.Support	Oracle JDBC Driver (XA)	Process Server data source	
<input checked="" type="checkbox"/>	Process Server data source	jdbc/TeamWorksDB	Cluster=BPMPs.AppTarget	Oracle JDBC Driver (XA)	Process Server data source	
<input checked="" type="checkbox"/>	SCA Application Bus ME data source	jdbc/com.ibm.ws.sib/BPMPs.Messaging-SCA.APPLICATION.fmtc4052Cell01.Bus	Cluster=BPMPs.Messaging	Oracle JDBC Driver (XA)	SCA Application Bus Messaging Engine data source	
<input checked="" type="checkbox"/>	SCA System Bus ME data source	jdbc/com.ibm.ws.sib/BPMPs.Messaging-SCA.SYSTEM.fmtc4052Cell01.Bus	Cluster=BPMPs.Messaging	Oracle JDBC Driver (XA)	SCA System Bus Messaging Engine data source	
<input checked="" type="checkbox"/>	WBI DataSource	jdbc/WPSDB	Cell=fmtc4052Cell01	Oracle JDBC Driver (XA)	WBI DataSource	

Total 16

3. The test result is displayed at the top of the page. Success messages for each datasource are mandatory:

```
Messages
[+] The test connection operation for data source BPCDataSource on server nodeagent at node fmtc4054Node01 was successful.
[+] The test connection operation for data source BPCDataSource on server nodeagent at node fmtc4055Node01 was successful.
[+] The test connection operation for data source BPCRFDataSource on server dmgr at node fmtc4052CellManager01 was successful.
[+] The test connection operation for data source Business Process Choreographer ME data source on server nodeagent at node fmtc4054Node01 was successful.
[+] The test connection operation for data source Business Process Choreographer ME data source on server nodeagent at node fmtc4055Node01 was successful.
[+] The test connection operation for data source Business Space data source on server nodeagent at node fmtc4054Node01 was successful.
[+] The test connection operation for data source Business Space data source on server nodeagent at node fmtc4055Node01 was successful.
[+] The test connection operation for data source CEI ME data source on server nodeagent at node fmtc4054Node01 was successful.
[+] The test connection operation for data source CFI ME data source on server nodeagent at node fmtc4055Node01 was successful.
```

In case of errors, analyse the datasource configuration based on the error message. Common errors are incorrect credentials for database connection string, userid, password.

10.3 Verify host aliases

Proper host alias configuration comprising hostname and port values are key for accessing web applications provided by the IBM Business Process Manager cell. In case of consistent step execution, the port values of the planning section are available after deployment environment creation. To get an idea on the actual configured port values, check the credentials of the related cluster member.

Note: Port values may vary for other deployment environments.

First we check the host aliases for the Support cluster members. To check it navigate to:

```
Servers
-> Server Types
  -> WebSphere application servers
    -> BPMPS.AppTarget.fmtc4054Node01.0
      -> Communications
        -> Ports
```

The "Ports" page is displayed:

Communications

Ports

Port Name	Port
BOOTSTRAP_ADDRESS	2810
SOAP_CONNECTOR_ADDRESS	8881
SAS_SSL_SERVERAUTH_LISTENER_ADDRESS	9401
CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS	9403
CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS	9402
WC_adminhost	9060
WC_defaulthost	9080
DCS_UNICAST_ADDRESS	9354
WC_adminhost_secure	9043
WC_defaulthost_secure	9443
SIP_DEFAULTHOST	5060
SIP_DEFAULTHOST_SECURE	5061
SIB_ENDPOINT_ADDRESS	7276
SIB_ENDPOINT_SECURE_ADDRESS	7286
SIB_MQ_ENDPOINT_ADDRESS	5558
SIB_MQ_ENDPOINT_SECURE_ADDRESS	5578
ORB_LISTENER_ADDRESS	9100
IPC_CONNECTOR_ADDRESS	9634

1. Take note of the port values of "WC_defaulthost" and "WC_defaulthost_secure"
2. An entry in the host alias list needs to reflect each of them.

Repeat the previous step to get the actual port values of all configured servers of the cell.

In the admin console navigate to:

```
Environment
-> Virtual hosts
  -> default host
    -> Host aliases
```

Verify that all cluster members are reflected by at least one port value in the Host alias section, either by a full qualified hostname or by the wild card "*":

Select	Host Name	Port
<input type="checkbox"/>	*	9080
<input type="checkbox"/>	*	80
<input type="checkbox"/>	*	9443
<input type="checkbox"/>	*	5060
<input type="checkbox"/>	*	5061
<input type="checkbox"/>	*	443
<input type="checkbox"/>	*	9083
<input type="checkbox"/>	*	9446
<input type="checkbox"/>	fmtc4054.boeblingen.de.ibm.com	9080
<input type="checkbox"/>	fmtc4054.boeblingen.de.ibm.com	80
<input type="checkbox"/>	fmtc4054.boeblingen.de.ibm.com	9443
<input type="checkbox"/>	fmtc4054.boeblingen.de.ibm.com	5060
<input type="checkbox"/>	fmtc4054.boeblingen.de.ibm.com	5061
<input type="checkbox"/>	fmtc4054.boeblingen.de.ibm.com	443
<input type="checkbox"/>	fmtc4055.boeblingen.de.ibm.com	9080
<input type="checkbox"/>	fmtc4055.boeblingen.de.ibm.com	80
<input type="checkbox"/>	fmtc4055.boeblingen.de.ibm.com	9443
<input type="checkbox"/>	fmtc4055.boeblingen.de.ibm.com	5060
<input type="checkbox"/>	fmtc4055.boeblingen.de.ibm.com	5061
<input type="checkbox"/>	fmtc4055.boeblingen.de.ibm.com	443

Total 20

Note: In case it is required to add an host alias , click "New", specify hostname and port, then click "OK". Save and synchronize the configuration.

Chapter 11 Additional configuration steps



Involved systems:

Deployment manager: fmtc4052.boeblingen.de.ibm.com

11.1 Map the BPM XA recovery authentication aliases

In order to ensure proper XA transaction handling in case of an error a dedicated oracle XA recovery user (XAREC4052C01) with specific XA privileges has to be mapped to the BPM XA recovery authentication aliases that is defined for each data source.

In the admin console navigate to:

```
Security
-> Global Security
-> Java Authentication and Authorization Service
-> J2C authentication data
```

The "JAAS - J2C authentication data" panel is displayed:



Select	Alias	User ID
<input type="checkbox"/>	BPCDB_BPMP.S.AppTarget Auth Alias	BPC4052C01
<input checked="" type="checkbox"/>	BPCDB_BPMP.S.AppTarget Auth Alias XAR	BPC4052C01

1. Select "BPCDB_BPMP.S.AppTarget_Auth_Alias_XAR".

The "JAAS – J2C authentication data" panel is displayed:

Global security

Global security > JAAS - J2C authentication data > BPCDB_BF

Specifies a list of user identities and passwords for Java(TM) 2

General Properties

* Alias
BPCDB_BPMPMS.AppTarget_Auth_Alias_XAR

1 * User ID
XAREC4052C01

2 * Password

Description
Business Process Choreograp

3 OK Reset Cancel

1. Replace User ID "BPC4052C01" by "XAREC4052C01".
2. Enter the password for XAREC4052C01 (<XAREC4052C01_password>).
3. Click **OK** and **Save** the change.

Repeat this step for the remaining BPM XA recovery authentication aliases:

BPM XA recovery authentication alias	Oracle XA recovery user ID	Oracle XA recovery password
BPCME_00_Auth_Alias_XAR	XAREC4052C01	<XAREC4052C01_password>
BSPACE_Auth_Alias_XAR	XAREC4052C01	<XAREC4052C01_password>
CEIME_BPMPMS.Messaging_Auth_Alias_XAR	XAREC4052C01	<XAREC4052C01_password>
OBSVRDB_BPMPMS.Support_Auth_Alias_XAR	XAREC4052C01	<XAREC4052C01_password>
PERFDWME_Auth_Alias_XAR	XAREC4052C01	<XAREC4052C01_password>
PROCSVRME_Auth_Alias_XAR	XAREC4052C01	<XAREC4052C01_password>
SCAAPPME00_Auth_Alias_XAR	XAREC4052C01	<XAREC4052C01_password>
SCASYSME00_Auth_Alias_XAR	XAREC4052C01	<XAREC4052C01_password>
WPSDB_Auth_Alias_XAR	XAREC4052C01	<XAREC4052C01_password>
performancedblogon_XAR	XAREC4052C01	<XAREC4052C01_password>
processdblogon_XAR	XAREC4052C01	<XAREC4052C01_password>

Save the changes once all XA recovery authentication aliases have been mapped to the Oracle XA recovery user.

11.2 Share transaction and recovery logs

To enable proper failover handling, transaction and recovery log of each cluster member needs to be shared. Sharing means that the log files can be commonly accessed by each node/cluster member. From the multiple technologies available today to establish a shared filestore among systems, choose whatever fits your needs best. The shared filestore technique leveraged for this setup is NFS.

Navigate to:

```
Servers
-> Clusters
-> WebSphere application server clusters
```

The "WebSphere application server clusters" panel is displayed:

Select	Name
<input checked="" type="checkbox"/>	BPMP.S.AppTarget
<input type="checkbox"/>	BPMP.S.Messaging
<input type="checkbox"/>	BPMP.S.Support
<input type="checkbox"/>	BPMP.S.WebApp

Total 4

1. Select "BPMP.S.AppTarget".

The "WebSphere application server clusters" panel is displayed:

WebSphere application server clusters

WebSphere application server clusters > BPMP5.AppTarget

Use this page to change the configuration settings for a cluster. A :
a member of the cluster fails, requests are routed to other membe

Runtime Configuration Local Topology

General Properties

* Cluster name
BPMP5.AppTarget

Bounding node group name
DefaultNodeGroup

Prefer local

Enable failover of transaction log recovery

1. Check "Enable failover of transaction log recovery".
2. Click **OK** and **Save** the change.

Repeat this configuration step for the remaining clusters:

- BPMP5.Messaging
- BPMP5.Support
- BPMP5.WebApp

Create tranlog and recoverylog directories according to the planning section underneath the defined mount point as user **root**:

```
cd /BPMdata
mkdir SharedLogs
cd SharedLogs
mkdir tranlogs
mkdir recoverylogs

cd tranlogs
mkdir BPMPS.AppTarget.fmtc4054Node01.0
mkdir BPMPS.AppTarget.fmtc4055Node01.0
mkdir BPMPS.Messaging.fmtc4054Node01.0
mkdir BPMPS.Messaging.fmtc4055Node01.0
mkdir BPMPS.Support.fmtc4054Node01.0
mkdir BPMPS.Support.fmtc4055Node01.0
mkdir BPMPS.WebApp.fmtc4054Node01.0
mkdir BPMPS.WebApp.fmtc4055Node01.0

cd ../recoverylogs
mkdir BPMPS.AppTarget.fmtc4054Node01.0
mkdir BPMPS.AppTarget.fmtc4055Node01.0
```

Configure each cluster member to its newly created shared transaction log folder.

Navigate to:

```
Servers
-> Server Types
-> WebSphere application servers
-> BPMPS.AppTarget.fmtc4054Node01.0
-> Container Settings
-> Container Services
-> Transaction Service
```

The Transaction service settings are displayed:

General Properties

1

* Total transaction lifetime timeout
 seconds

* Async response timeout
 seconds

* Client inactivity timeout
 seconds

* Maximum transaction timeout
 seconds

Heuristic retry limit
 retries

Heuristic retry wait
 seconds

Enable logging for heuristic reporting

Heuristic completion direction

Accept heuristic hazard

2 Enable file locking

Enable transaction coordination authorization

Default WS-Transaction specification level

External WS-Transaction HTTP(S) URL prefix

Select prefix

Specify custom prefix

3

1. Enter tranlog directory
/BPMdata/SharedLogs/tranlogs/BPMPS.AppTarget.fmtc4054Node01.0.
2. Uncheck "Enable file locking".
3. Click **OK** and **Save** the change.

Note: If Network File System Version 3 is used for storing transaction recovery logs and automated peer recovery is used then file locking must be disabled:

http://publib.boulder.ibm.com/infocenter/wasinfo/v7r0/index.jsp?topic=/com.ibm.websphere.nd.doc/info/ae/ae/tjta_disable_lock.html

Repeat this configuration step for the remaining cluster members to configure their tranlogs according to the planning section:

- BPMPS.AppTarget.fmtc4055Node01.0
- BPMPS.Messaging.fmtc4054Node01.0
- BPMPS.Messaging.fmtc4055Node01.0
- BPMPS.Support.fmtc4054Node01.0
- BPMPS.Support.fmtc4055Node01.0
- BPMPS.WebApp.fmtc4054Node01.0
- BPMPS.WebApp.fmtc4055Node01.0

Configure each AppTarget member to its newly created shared recovery log folder.

Navigate to:

```
Servers
-> Server Types
-> WebSphere application servers
-> BPMPS.AppTarget.fmtc4054Node01.0
-> Container Settings
-> Container Services
-> Compensation Service
```

The Compensation service settings are displayed:

1

Enable service at server startup

Recovery log directory
/BPMdata/SharedLogs/recover

Recovery log file size
5 MB

Compensation handler retry limit
-1 retries

Compensation handler retry interval
30 seconds

Apply **OK** Reset Cancel

2

1. Enter recovery log directory
/BPMdata/SharedLogs/recoverylogs/BPMPS.AppTarget.fmtc4054Node01.0
2. Click **OK** and **Save** the change.

Repeat the previous step for the remaining application cluster member (BPMPS.AppTarget.fmtc4055Node01.0) to configure the recovery log according to the planning section.

11.3 Configure Messaging startup policy

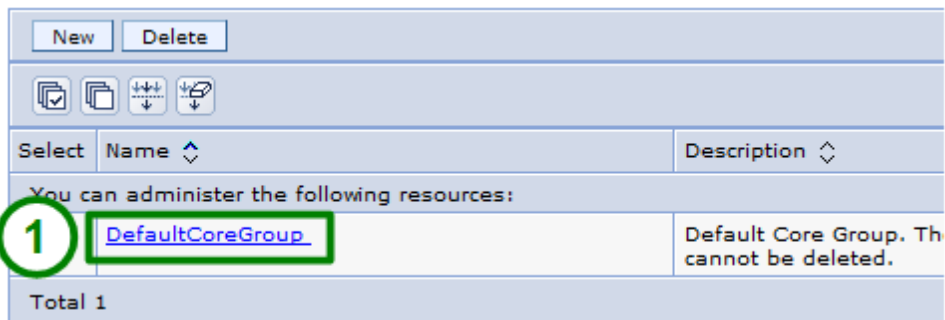
For workload distribution reasons the active and passive message engines can be distributed across the two messaging cluster members. In order to do so the SIBus policy of the messaging engines will be configured as follows:

Messaging Engine	Cluster member	
	BPMP5.Messaging.fmtc4054Node01.0	BPMP5.Messaging.fmtc4055Node01.0
BPC ME	ACTIVE (Started)	PASSIVE (Joined)
CEI ME	PASSIVE (Joined)	ACTIVE (Started)
PerFDW ME	ACTIVE (Started)	PASSIVE (Joined)
ProcServ ME	PASSIVE (Joined)	ACTIVE (Started)
SCA.APP ME	ACTIVE (Started)	PASSIVE (Joined)
SCA.SYS ME	PASSIVE (Joined)	ACTIVE (Started)

In the admin console navigate to:

```
Servers
  -> Core Groups
    -> Core group settings
```

The Core Groups panel is displayed:



1. Select "DefaultCoreGroup".

The Default Core Group panel is displayed:

Core Groups

[Core Groups](#) > **DefaultCoreGroup**

Use this page to specify the settings for a core group.

Runtime Configuration

General Properties

* Name
DefaultCoreGroup

Description
Default Core Group. The default core group cannot be deleted.

Additional Properties

- Core group servers
- Discovery and failure detection
- 1** Policies
- Preferred coordinator servers
- Custom properties

1. Select "Policies".

The Policies panel is displayed:

Core Groups

[Core Groups](#) > [DefaultCoreGroup](#) > [Policies](#)

Use this page to view and manage the policies associated with a core group. Core members are activated or deactivated.

⊕ Preferences

1

Select	Name	Description
<input type="checkbox"/>	Clustered TM Policy	TM One-Of-N Policy
<input type="checkbox"/>	Default SIBus Policy	SIBus One-Of-N Policy
<input type="checkbox"/>	Default Sip Quorum Policy	SIP All-active-policy with quorum disabled by default

Total 3

1. Click **New**.

The Policies panel is displayed:

Core Groups

[Core Groups](#) > [DefaultCoreGroup](#) > [Policies](#) > [New](#)

Specifies the type of policy that you are creating.

Configuration

General Properties

Policies

1

2

1. Select "One of N policy".
2. Click **Next**.

The Policies panel is displayed:

Core Groups

[Core Groups](#) > [DefaultCoreGroup](#) > [Policies](#) > [New](#) >

Use this page to define a One of N policy. This type c

Configuration

General Properties

* Name
BPC ME Policy

* Policy type
One of N policy

Description

* Is alive timer
120 seconds

Failback

Preferred servers only

Quorum

1. Enter "BPC ME Policy".
2. Specify 120 seconds for the is alive timer
3. Check "Failback".
4. Check "Preferred servers only".
5. Click **OK** and **Save** the change.

The Policies panel is displayed:

Core Groups

[Core Groups](#) > [DefaultCoreGroup](#) > **Policies**

Use this page to view and manage the policies. Members are activated or deactivated.

⊕ Preferences

New Delete

⊞ ⊞ ⊕ ⊕

Select Name ⌵

You can administer the following resources:

<input checked="" type="checkbox"/>	BPC ME Policy
<input type="checkbox"/>	Clustered TM Policy
<input type="checkbox"/>	Default SIBus Policy
<input type="checkbox"/>	Default Sip Quorum Policy


Total 4

1. Select the newly created "BPC ME Policy".

The BPC ME Policy panel is displayed:

Core Groups

Messages

 The policy must have at least one match criteria defined.

[Core Groups](#) > [DefaultCoreGroup](#) > [Policies](#) > **BPC ME Policy**

Use this page to define a One of N policy. This type of policy keeps one group member active at all times

Configuration

General Properties

* Name

* Policy type

Description

* Is alive timer
 seconds

Failback

Preferred servers only

Quorum

Additional Properties

1 [Match criteria](#)

[Preferred servers](#)

[Custom properties](#)

1. Select "Match criteria".

The Match criteria panel is displayed:

Core Groups

[Core Groups](#) > [DefaultCoreGroup](#) > [Policies](#) > [BPC ME Policy](#) > **Match criteria**

Use this page to define the match criteria for the policy. Match criteria consist of a name and a string value.

⊕ Preferences

1 **New** Delete

☑ ☐ ⬆⬇⬆⬇ ⬆⬇⬆⬇

Select	Name	Value
None		
Total 0		

1. Click **New**

The Match criteria panel is displayed:

Core Groups

[Core Groups](#) > [DefaultCoreGroup](#) > [Policies](#) > [BPC ME Policy](#) > [Match criteria](#) > **New**

Use this page to specify a name-value pair that is used as part of the match criteria for the name of the high availability group associated with the policy.

Configuration

General Properties

* Name
IBM_hc

* Value
BPMPS.Messaging

Description

Apply OK Reset Cancel

1. Enter "IBM_hc".
2. Enter "BPMPS.Messaging".
3. Click **OK** and **Save** the change.

The Match criteria panel is displayed:

1

New Delete

Select Name Value

You can administer the following resources:

Select	Name	Value
<input type="checkbox"/>	IBM_hc	BPMPS.Messaging

Total 1

1. Click **New**

The Match criteria panel is displayed:

Core Groups

[Core Groups](#) > [DefaultCoreGroup](#) > [Policies](#) > [BPC ME Policy](#) > [Match criteria](#) > **New**

Use this page to specify a name-value pair that is used as part of the match criteria for the name of the high availability group associated with the policy.

Configuration

General Properties

* Name
WSAF_SIB_BUS

* Value
BPC.fmtc4052Cell01.Bus

Description

Apply OK Reset Cancel

1. Enter "WSAF_SIB_BUS".
2. Enter "BPC.fmtc4052Cell01.Bus".
3. Click **OK** and **Save** the change.

The Match criteria panel is displayed:

1 **New** Delete

Select	Name	Value
You can administer the following resources:		
<input type="checkbox"/>	IBM hc	BPMP5.Messaging
<input type="checkbox"/>	WSAF SIB BUS	BPC.fmtc4052Cell01.Bus
Total 2		

1. Click **New**

The Match criteria panel is displayed:

Core Groups

[Core Groups](#) > [DefaultCoreGroup](#) > [Policies](#) > [BPC ME Policy](#) > [Match criteria](#) > [New](#)

Use this page to specify a name-value pair that is used as part of the match criteria f name of the high availability group associated with the policy.

Configuration

General Properties

* Name
WSAF_SIB_MESSAGING_ENGINE

* Value
BPMPS.Messaging.000-BPC.fmtc4052Cell01.Bus





Description



Apply OK Reset Cancel

1. Enter "WSAF_SIB_MESSAGING_ENGINE".
2. Enter "BPMPS.Messaging.000-BPC.fmtc4052Cell01.Bus".
3. Click **OK** and **Save** the change.

The Match criteria panel is displayed:

1 **New** Delete

Select	Name 	Value 
You can administer the following resources:		
<input type="checkbox"/>	IBM_hc	BPMP.S.Messaging
<input type="checkbox"/>	WSAF_SIB_BUS	BPC.fmtc4052Cell01.Bus
<input type="checkbox"/>	WSAF_SIB_MESSAGING_ENGINE	BPMP.S.Messaging.000-BPC.fmtc4052Cell01.Bus
Total 3		

1. Click **New**

The Match criteria panel is displayed:

Core Groups

[Core Groups](#) > [DefaultCoreGroup](#) > [Policies](#) > [BPC ME Policy](#) > [Match criteria](#) > **New**

Use this page to specify a name-value pair that is used as part of the match criteria f name of the high availability group associated with the policy.

Configuration

General Properties

* Name
type

* Value
WSAF_SIB

Description

Apply OK Reset Cancel

1. Enter "type".
2. Enter "WSAF_SIB".
3. Click **OK** and **Save** the change.

The Match criteria panel is displayed:





Core Groups 1

[Core Groups](#) > [DefaultCoreGroup](#) > [Policies](#) > **BPC ME Policy** > Match criteria

Use this page to define the match criteria for the policy. Match criteria consist of name-value pairs of data, in string value.

⊞ Preferences

New Delete

Select	Name	Value
You can administer the following resources:		
<input type="checkbox"/>	IBM_hc	BPMP.S.Messaging
<input type="checkbox"/>	WSAF_SIB_BUS	BPC.fmtc4052Cell01.Bus
<input type="checkbox"/>	WSAF_SIB_MESSAGING_ENGINE	BPMP.S.Messaging.000-BPC.fmtc4052Cell01.Bus
<input type="checkbox"/>	type	WSAF_SIB

Total 4

1. Select "BPC ME Policy".

The BPC ME Policy panel is displayed:

Core Groups

[Core Groups](#) > [DefaultCoreGroup](#) > [Policies](#) > **BPC ME Policy**

Use this page to define a One of N policy. This type of policy keeps one group member active at all time

Configuration

General Properties

* Name
BPC ME Policy

* Policy type
One of N policy

Description

* Is alive timer
120 seconds

Failback

Preferred servers only

Quorum

Additional Properties

1 Match criteria
 Preferred servers
 Custom properties

1. Select "Preferred servers".

The Preferred servers panel is displayed:

Core Groups

[Core Groups](#) > [DefaultCoreGroup](#) > [Policies](#) > [BPC ME Policy](#) > [Preferred servers](#)

Use this page to define an ordered list of preferred servers for the policy. When activating core group members, the policy gives preference to the servers list. Click Move up or Move down to adjust the order of the servers in this list.

Configuration

General Properties

Core group servers

- fmtc4052CellManager01/dmgr
- fmtc4054Node01/nodeagent
- fmtc4055Node01/nodeagent
- fmtc4054Node01/BPMPS.AppTarget.fmtc4054Node01.0
- fmtc4055Node01/BPMPS.AppTarget.fmtc4055Node01.0
- fmtc4054Node01/BPMPS.Support.fmtc4054Node01.0
- fmtc4055Node01/BPMPS.Support.fmtc4055Node01.0
- fmtc4054Node01/BPMPS.WebApp.fmtc4054Node01.0
- fmtc4055Node01/BPMPS.WebApp.fmtc4055Node01.0

Preferred servers

- fmtc4054Node01/BPMPS.Messaging.fmtc4054Node01.0
- fmtc4055Node01/BPMPS.Messaging.fmtc4055Node01.0

Move up ^ Move down v

Add >> Remove <<

OK Cancel

1. Move both messaging engine cluster members (fmtc4054Node01/BPMPS.Messaging.fmtc4054Node01.0, fmtc4055Node01/BPMPS.Messaging.fmtc4055Node01.0) from Core group servers list to the Preferred servers list.
2. Click **OK** and **Save** the change.

Note: Make sure that the fmtc4054 server is the FIRST entry in the preferred servers list.

The Policies panel should now look like this:

Core Groups

[Core Groups](#) > [DefaultCoreGroup](#) > **Policies**

Use this page to view and manage the policies associated with a core group. Coordinators use these policies to determine on which servers the core group members are activated or deactivated.

Preferences

Select	Name	Description	Policy type	Match criteria
You can administer the following resources:				
<input type="checkbox"/>	BPC ME Policy		One of N policy	IBM_hc=BPMP.S.Messaging, WSAF_SIB_BUS=BPC.fmtc4052Cell01.Bus, WSAF_SIB_MESSAGING_ENGINE=BPMP.S.Messaging.000-BPC.fmtc4052Cell01.Bus, type=WSAF_SIB
<input type="checkbox"/>	Clustered TM Policy	TM One-Of-N Policy	One of N policy	type=WAS_TRANSACTION
<input type="checkbox"/>	Default SIBus Policy	SIBus One-Of-N Policy	One of N policy	type=WSAF_SIB
<input type="checkbox"/>	Default Sip Quorum Policy	SIP All-active-policy with quorum disabled by default	All active policy	type=SIP_QUORUM
Total 4				

Create five more policies according to following table, one policy for each messaging engine:

Messaging Engine	Policy			
	Name	Match Criteria		Preferred Servers (order is important!)
		Name	Value	
CEI ME	CEI ME Policy	IBM_hc	BPMP.S.Messaging	fmtc4055Node01/BPMP.S.Messaging.fmtc4055Node01.0, fmtc4054Node01/BPMP.S.Messaging.fmtc4054Node01.0
		WSAF_SIB_BUS	CEI.fmtc4052Cell01.BUS	
		WSAF_SIB_MESSAGING_ENGINE	BPMP.S.Messaging.000-CEI.fmtc4052Cell01.BUS	
		type	WSAF_SIB	
PerfDW ME	PerfDW ME Policy	IBM_hc	BPMP.S.Messaging	fmtc4054Node01/BPMP.S.Messaging.fmtc4054Node01.0, fmtc4055Node01/BPMP.S.Messaging.fmtc4055Node01.0
		WSAF_SIB_BUS	PERFDW.fmtc4052Cell01.Bus	
		WSAF_SIB_MESSAGING_ENGINE	BPMP.S.Messaging.000-PERFDW.fmtc4052Cell01.Bus	
		type	WSAF_SIB	
ProcServ ME	ProcServ ME Policy	IBM_hc	BPMP.S.Messaging	fmtc4055Node01/BPMP.S.Messaging.fmtc4055Node01.0, fmtc4054Node01/BPMP.S.Messaging.fmtc4054Node01.0
		WSAF_SIB_BUS	PROCSVR.fmtc4052Cell01.Bus	
		WSAF_SIB_MESSAGING_ENGINE	BPMP.S.Messaging.000-PROCSVR.fmtc4052Cell01.Bus	
		type	WSAF_SIB	
SCA.APP ME	SCA.APP ME Policy	IBM_hc	BPMP.S.Messaging	fmtc4054Node01/BPMP.S.Messaging.fmtc4054Node01.0, fmtc4055Node01/BPMP.S.Messaging.fmtc4055Node01.0
		WSAF_SIB_BUS	SCA.APPLICATION.fmtc4052Cell01.Bus	
		WSAF_SIB_MESSAGING_ENGINE	BPMP.S.Messaging.000-SCA.APPLICATION.fmtc4052Cell01.Bus	
		type	WSAF_SIB	
SCA.SYS ME	SCA.SYS ME Policy	IBM_hc	BPMP.S.Messaging	fmtc4055Node01/BPMP.S.Messaging.fmtc4055Node01.0, fmtc4054Node01/BPMP.S.Messaging.fmtc4054Node01.0
		WSAF_SIB_BUS	SCA.SYSTEM.fmtc4052Cell01.Bus	
		WSAF_SIB_MESSAGING_ENGINE	BPMP.S.Messaging.000-SCA.SYSTEM.fmtc4052Cell01.Bus	
		Type	WSAF_SIB	

Once all policies have been created the Policies panel should now look like this:

Core Groups

[Core Groups](#) > [DefaultCoreGroup](#) > Policies

Use this page to view and manage the policies associated with a core group. Coordinators use these policies to determine on which servers the core group members are activated or deactivated.

Preferences

New Delete

Select Name Description Policy type Match criteria

You can administer the following resources:

Select	Name	Description	Policy type	Match criteria
<input type="checkbox"/>	BPC ME Policy		One of N policy	IBM_hc=BPMPMS.Messaging, WSAF_SIB_BUS=BPC.fmtc4052Cell01.Bus, WSAF_SIB_MESSAGING_ENGINE=BPMPMS.Messaging.000-BPC.fmtc4052Cell01.Bus, type=WSAF_SIB
<input type="checkbox"/>	CEI ME Policy		One of N policy	IBM_hc=BPMPMS.Messaging, WSAF_SIB_BUS=CEI.fmtc4052Cell01.BUS, WSAF_SIB_MESSAGING_ENGINE=BPMPMS.Messaging.000-CEI.fmtc4052Cell01.BUS, type=WSAF_SIB
<input type="checkbox"/>	Clustered TM Policy	TM One-Of-N Policy	One of N policy	type=WAS_TRANSACTIONS
<input type="checkbox"/>	Default SIBus Policy	SIBus One-Of-N Policy	One of N policy	type=WSAF_SIB
<input type="checkbox"/>	Default Sip Quorum Policy	SIP All-active-policy with quorum disabled by default	All active policy	type=SIP_QUORUM
<input type="checkbox"/>	PerfDW ME Policy		One of N policy	IBM_hc=BPMPMS.Messaging, WSAF_SIB_BUS=PERFDW.fmtc4052Cell01.Bus, WSAF_SIB_MESSAGING_ENGINE=BPMPMS.Messaging.000-PERFDW.fmtc4052Cell01.Bus, type=WSAF_SIB
<input type="checkbox"/>	ProcSrv ME Policy		One of N policy	IBM_hc=BPMPMS.Messaging, WSAF_SIB_BUS=PROCSVR.fmtc4052Cell01.Bus, WSAF_SIB_MESSAGING_ENGINE=BPMPMS.Messaging.000-PROCSVR.fmtc4052Cell01.Bus, type=WSAF_SIB
<input type="checkbox"/>	SCA.APP ME Policy		One of N policy	IBM_hc=BPMPMS.Messaging, WSAF_SIB_BUS=SCA.APPLICATION.fmtc4052Cell01.Bus, WSAF_SIB_MESSAGING_ENGINE=BPMPMS.Messaging.000-SCA.APPLICATION.fmtc4052Cell01.Bus, type=WSAF_SIB
<input type="checkbox"/>	SCA.SYS ME Policy		One of N policy	IBM_hc=BPMPMS.Messaging, WSAF_SIB_BUS=SCA.SYSTEM.fmtc4052Cell01.Bus, WSAF_SIB_MESSAGING_ENGINE=BPMPMS.Messaging.000-SCA.SYSTEM.fmtc4052Cell01.Bus, type=WSAF_SIB

Total 9

11.4 Verification

To verify the configuration applied so far, stop the node agents and the deployment manager and start them again.

Please refer to the Appendix "Start/stop the deployment manager and the node agents" on how to start and stop the node agents and the deployment manager.

The following verification chapters start the different clusters in the sequence of their dependency. Later on the cluster start can be done in the right sequence by just starting the deployment environment.

11.4.1 Verify messaging cluster

In the admin console navigate to:

```
Servers
-> Clusters
-> WebSphere application server clusters
```

Start the messaging cluster:

The screenshot shows the 'WebSphere application server clusters' page. At the top, there are buttons for 'New', 'Delete', 'Start', 'Stop', 'Ripplestart', and 'ImmediateStop'. The 'Start' button is circled in green with the number 2. Below the buttons is a table with columns 'Select', 'Name', and 'Status'. The table lists four resources: 'BPMP.S.AppTarget', 'BPMP.S.Messaging', 'BPMP.S.Support', and 'BPMP.S.WebApp'. The 'BPMP.S.Messaging' row is highlighted with a green circle (1) around the 'Select' checkbox, and the entire row is enclosed in a green box. The 'Status' column for 'BPMP.S.Messaging' shows a dark green icon, indicating it is started. The other resources have red 'X' icons, indicating they are not started. At the bottom of the table, it says 'Total 4'.

1. Select "BPMP.S.Messaging".
2. Click **Start**.
3. Wait until the Status is dark green (Started).

Check log file **SystemOut.log** for **BPMP5.Messaging** in directory:

on fmtc5045:

```
/bpm75/profiles/Custom01/logs/BPMP5.Messaging.fmtc4054Node01.0
```

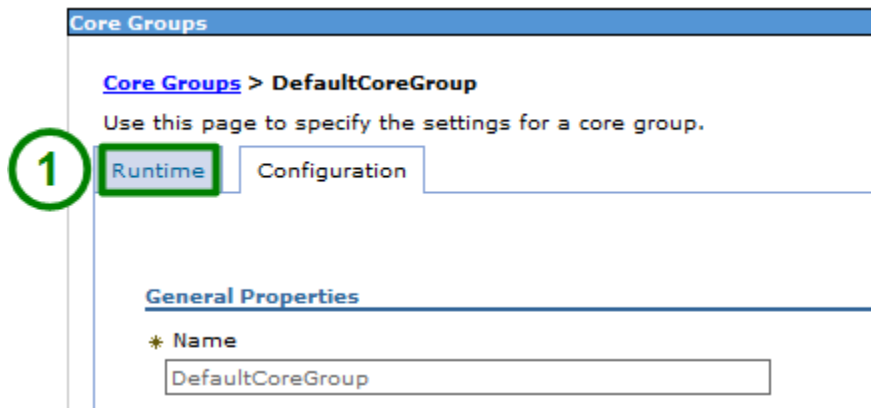
on fmtc5055:

```
/bpm75/profiles/Custom01/logs/BPMP5.Messaging.fmtc4055Node01.0
```

In order to verify whether the messaging engines have been started properly according to the defined policy navigate to:

```
Servers  
-> Core Groups  
  -> Core group settings  
    -> DefaultCoreGroup
```

The Default Core Group panel is displayed:



1. Select the "Runtime" tab.

The Match criteria panel is displayed:

Core Groups

[Core Groups](#) > DefaultCoreGroup

Use this page to specify the settings for a core group.

Runtime **Configuration**

Group name properties

* Group name properties

*

Number of matches

23 Calculate groups

1 Show groups Show servers

1. Click **Show groups**

The High availability groups panel is displayed:

1	IBM_hc=BPMPs.Messaging.WSAF_SIB_BUS=BPC.fmtc4052Cell01.Bus,WSAF_SIB_MESSAGING_ENGINE=BPMPs.Messaging.000-BPC.fmtc4052Cell01.Bus,type=WSAF_SIB	Not enabled	BPC ME Policy	✔
	IBM_hc=BPMPs.Messaging.WSAF_SIB_BUS=CEI.fmtc4052Cell01.Bus,WSAF_SIB_MESSAGING_ENGINE=BPMPs.Messaging.000-CEI.fmtc4052Cell01.Bus,type=WSAF_SIB	Not enabled	CEI ME Policy	✔
	IBM_hc=BPMPs.Messaging.WSAF_SIB_BUS=PERFDW.fmtc4052Cell01.Bus,WSAF_SIB_MESSAGING_ENGINE=BPMPs.Messaging.000-PERFDW.fmtc4052Cell01.Bus,type=WSAF_SIB	Not enabled	PerFDW ME Policy	✔
	IBM_hc=BPMPs.Messaging.WSAF_SIB_BUS=PROCSVR.fmtc4052Cell01.Bus,WSAF_SIB_MESSAGING_ENGINE=BPMPs.Messaging.000-PROCSVR.fmtc4052Cell01.Bus,type=WSAF_SIB	Not enabled	ProcSrv ME Policy	✔
	IBM_hc=BPMPs.Messaging.WSAF_SIB_BUS=SCA.APPLICATION.fmtc4052Cell01.Bus,WSAF_SIB_MESSAGING_ENGINE=BPMPs.Messaging.000-SCA.APPLICATION.fmtc4052Cell01.Bus,type=WSAF_SIB	Not enabled	SCA.APP ME Policy	✔
	IBM_hc=BPMPs.Messaging.WSAF_SIB_BUS=SCA.SYSTEM.fmtc4052Cell01.Bus,WSAF_SIB_MESSAGING_ENGINE=BPMPs.Messaging.000-SCA.SYSTEM.fmtc4052Cell01.Bus,type=WSAF_SIB	Not enabled	SCA.SYS ME Policy	✔

1. Select the high availability group that represents the BPC messaging engine (applied policy: BPC ME policy)

The High availability groups panel is displayed:

Core Groups ?


Core Groups > DefaultCoreGroup > High availability groups > High availability group

Use this page to manage the state of members of a high availability group. The page lists the current members of the high availability group. Note: only high availability groups governed by a 'No operation' policy can have its members activated and deactivated.

⊞ Preferences

Enable Disable Activate Deactivate

☑ ☰ ⬆️ ⬇️ ⬆️ ⬇️

Select	Name	Node	Version	Status
You can administer the following resources:				
<input type="checkbox"/>	BPMPs.Messaging.fmtc4054Node01.0	fmtc4054Node01	7.0.0.17	1 
<input type="checkbox"/>	BPMPs.Messaging.fmtc4055Node01.0	fmtc4055Node01	7.0.0.17	
Total 2				

1. The green icon indicates that the BPC messaging engine has been started on the messaging engine cluster member BPMPs.Messaging.fmtc4054Node01.0 which has been defined within the BPC ME Policy.

Repeat this verification for the remaining high availability groups respectively messaging engines.

11.4.2 Verify the support cluster

Note: Make sure the messaging cluster is already started before executing this step.

In the admin console navigate to

```
Servers
-> Clusters
-> WebSphere application server clusters
```

Start the support cluster:

The screenshot shows the 'WebSphere application server clusters' page. At the top, there are buttons for 'New', 'Delete', 'Start', 'Stop', 'Ripplestart', and 'ImmediateStop'. The 'Start' button is circled in green with a '2'. Below the buttons is a table with columns 'Select', 'Name', and 'Status'. The table contains four rows: 'BPMP.S.AppTarget', 'BPMP.S.Messaging', 'BPMP.S.Support', and 'BPMP.S.WebApp'. The 'BPMP.S.Support' row is selected with a checkbox, circled in green with a '1', and highlighted with a green box. The status of 'BPMP.S.Support' is a dark green arrow pointing right.

Select	Name	Status
<input type="checkbox"/>	BPMP.S.AppTarget	✖
<input type="checkbox"/>	BPMP.S.Messaging	➔
<input checked="" type="checkbox"/>	BPMP.S.Support	➔
<input type="checkbox"/>	BPMP.S.WebApp	✖

Total 4

1. Select Select "BPMP.S.Support".
2. Click **Start**.
3. Wait until the Status is dark green (Started).

Check the log file **SystemOut.log** for the support cluster members in directory for errors:

on fmtc4054:

```
/bpm75/profiles/Custom01/logs/BPMPS.Support.fmtc4054Node01.0
```

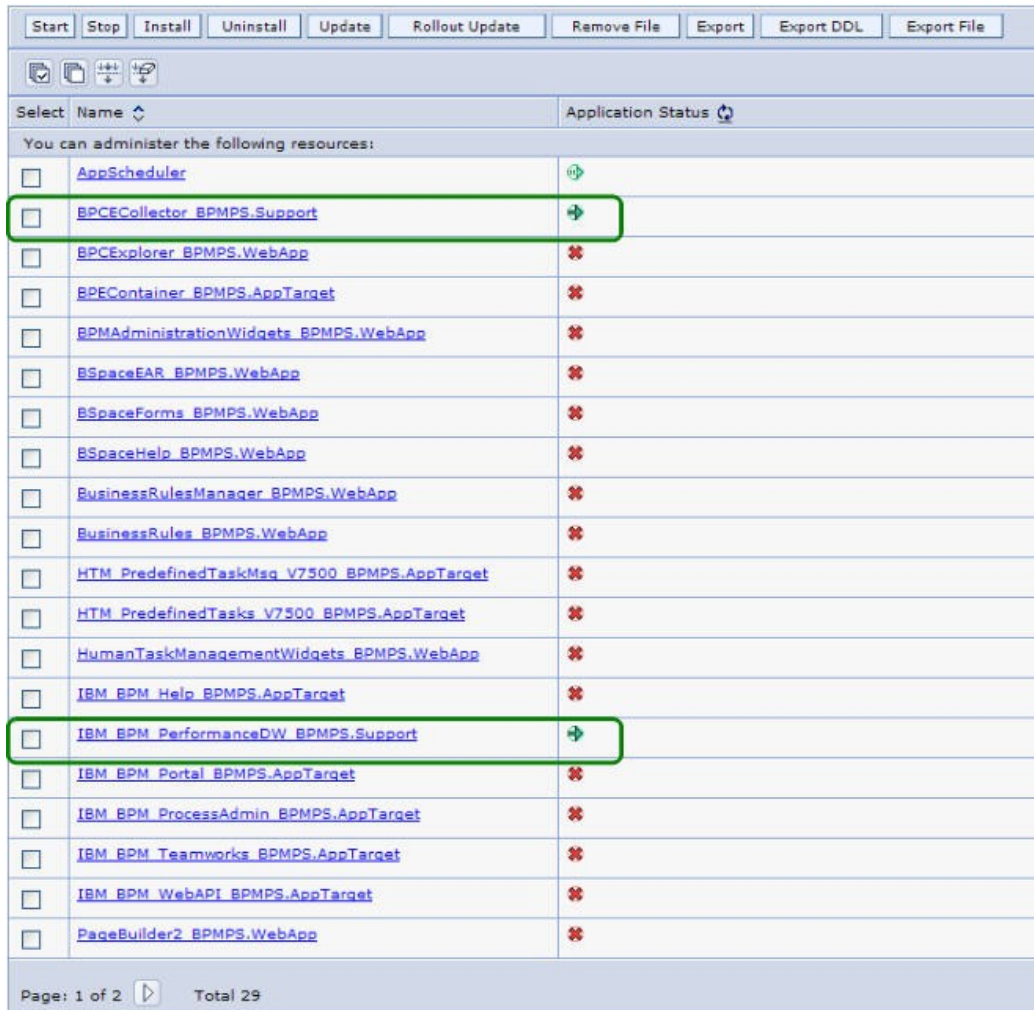
on fmtc4055:

```
/bpm75/profiles/Custom01/logs/BPMPS.Support.fmtc4055Node01.0
```

Now check that all applications on the support cluster have been started successfully.
To do that navigate to:

Applications
-> Application Types
-> WebSphere enterprise applications

Verify that the following applications are started:



Select	Name	Application Status
<input type="checkbox"/>	AppScheduler	🟢
<input type="checkbox"/>	BPCECollector_BPMPs.Support	🟢
<input type="checkbox"/>	BPCEExplorer_BPMPs.WebApp	❌
<input type="checkbox"/>	BPEContainer_BPMPs.AppTarget	❌
<input type="checkbox"/>	BPMAAdministrationWidgets_BPMPs.WebApp	❌
<input type="checkbox"/>	BSpaceEAR_BPMPs.WebApp	❌
<input type="checkbox"/>	BSpaceForms_BPMPs.WebApp	❌
<input type="checkbox"/>	BSpaceHelp_BPMPs.WebApp	❌
<input type="checkbox"/>	BusinessRulesManager_BPMPs.WebApp	❌
<input type="checkbox"/>	BusinessRules_BPMPs.WebApp	❌
<input type="checkbox"/>	HTM_PredefinedTaskMsg_V7500_BPMPs.AppTarget	❌
<input type="checkbox"/>	HTM_PredefinedTasks_V7500_BPMPs.AppTarget	❌
<input type="checkbox"/>	HumanTaskManagementWidgets_BPMPs.WebApp	❌
<input type="checkbox"/>	IBM_BPM_Help_BPMPs.AppTarget	❌
<input type="checkbox"/>	IBM_BPM_PerformanceDW_BPMPs.Support	🟢
<input type="checkbox"/>	IBM_BPM_Portal_BPMPs.AppTarget	❌
<input type="checkbox"/>	IBM_BPM_ProcessAdmin_BPMPs.AppTarget	❌
<input type="checkbox"/>	IBM_BPM_Teamworks_BPMPs.AppTarget	❌
<input type="checkbox"/>	IBM_BPM_WebAPI_BPMPs.AppTarget	❌
<input type="checkbox"/>	PageBuilder2_BPMPs.WebApp	❌

Page: 1 of 2 Total 29

1. Verify that all applications ending with ".Support" are started successful.

11.4.3 Verify the application target (BPEL) cluster

Note: Make sure the messaging and support cluster are already started before executing this step.

In the admin console, navigate to:

```
Servers
-> Clusters
-> WebSphere application server clusters
```

Start the application target cluster:

WebSphere application server clusters

Use this page to change the configuration settings for a cluster. A server cluster consists of a group of application servers. If one of the member servers fails, requests will be routed to other members of the cluster. Learn more about this task in a [guided activity](#). A guided activity provides a list of task steps and more general information about the topic.

⊞ Preferences

New Delete **Start** Stop Ripplestart ImmediateStop

⊞ ⊞ ⊞ ⊞ ⊞ **2**

Select Name Status

You can administer the following resources:

Select	Name	Status
<input checked="" type="checkbox"/> 1	BPMPS.AppTarget	✖
<input type="checkbox"/>	BPMPS.Messaging	➔
<input type="checkbox"/>	BPMPS.Support	➔
<input type="checkbox"/>	BPMPS.WebApp	✖

Total 4

1. Select "BPMPS.AppTarget".
2. Click **Start**.
3. Wait until the Status is dark green (Started).

Check the log file **SystemOut.log** for the application target cluster members in directory for errors:

on fmtc4054:

```
/bpm75/profiles/Custom01/logs/BPMPS.AppTarget.fmtc4054Node01.0
```

on fmtc4055:

```
/bpm75/profiles/Custom01/logs/BPMPS.AppTarget.fmtc4055Node01.0
```

Now check that all applications on the application target cluster have been started successfully. To do that navigate to:

```
Applications  
-> Application Types  
-> WebSphere enterprise applications
```

Verify that the following applications are started:

Select	Name	Application Status
You can administer the following resources:		
<input type="checkbox"/>	AppScheduler	→
<input type="checkbox"/>	BPCECollector_BPMPs.Support	→
<input type="checkbox"/>	BPCEExplorer_BPMPs.WebApp	✖
<input type="checkbox"/>	BPEContainer_BPMPs.AppTarget	→
<input type="checkbox"/>	BPMAdministrationWidgets_BPMPs.WebApp	✖
<input type="checkbox"/>	BSpaceEAR_BPMPs.WebApp	✖
<input type="checkbox"/>	BSpaceForms_BPMPs.WebApp	✖
<input type="checkbox"/>	BSpaceHelp_BPMPs.WebApp	✖
<input type="checkbox"/>	BusinessRulesManager_BPMPs.WebApp	✖
<input type="checkbox"/>	BusinessRules_BPMPs.WebApp	✖
<input type="checkbox"/>	HTM_PredefinedTaskMsg_V7500_BPMPs.AppTarget	→
<input type="checkbox"/>	HTM_PredefinedTasks_V7500_BPMPs.AppTarget	→
<input type="checkbox"/>	HumanTaskManagementWidgets_BPMPs.WebApp	✖
<input type="checkbox"/>	IBM BPM Help_BPMPs.AppTarget	→
<input type="checkbox"/>	IBM BPM PerformanceDW_BPMPs.Support	→
<input type="checkbox"/>	IBM BPM Portal_BPMPs.AppTarget	→
<input type="checkbox"/>	IBM BPM ProcessAdmin_BPMPs.AppTarget	→
<input type="checkbox"/>	IBM BPM Teamworks_BPMPs.AppTarget	→
<input type="checkbox"/>	IBM BPM WebAPI_BPMPs.AppTarget	→
<input type="checkbox"/>	PageBuilder2_BPMPs.WebApp	✖

Page: 1 of 2 Total 29

1. Verify that all applications ending with “.AppTarget” are now successfully started.

Verify that the following applications are started:

<input type="checkbox"/>	REST Services Gateway	✖
<input type="checkbox"/>	REST Services Gateway Dmgr	➔
<input type="checkbox"/>	RemoteAL61	➔
<input type="checkbox"/>	TaskContainer_BPMP5.AppTarget	➔
<input type="checkbox"/>	mm.was_BPMP5.WebApp	✖
<input type="checkbox"/>	persistentLkMqr	➔
<input type="checkbox"/>	sca.sib.mediation	➔
<input type="checkbox"/>	webWidget_BPMP5.WebApp	✖
<input type="checkbox"/>	wpsFEMqr 7.5.0	➔

Page: 2 of 2 Total 29

1. Verify that all applications ending with “.AppTarget” are now successfully started:Verify the Web application cluster

11.4.4 Verify the web application cluster

Note: Make sure the three other clusters are already started before executing this step.

In the admin console, navigate to:

```
Servers
-> Clusters
-> WebSphere application server clusters
```

Start the Web application cluster:

The screenshot shows the 'WebSphere application server clusters' page in the admin console. At the top, there are buttons for 'New', 'Delete', 'Start', 'Stop', 'Ripplestart', and 'ImmediateStop'. The 'Start' button is circled in green with a '2'. Below the buttons is a table with columns for 'Select', 'Name', and 'Status'. The table lists four resources: 'BPMP.S.AppTarget', 'BPMP.S.Messaging', 'BPMP.S.Support', and 'BPMP.S.WebApp'. The 'BPMP.S.WebApp' row is selected, indicated by a checked checkbox and a green circle with a '1' next to it. The status for 'BPMP.S.WebApp' is shown as a red 'X'. The total number of resources is 4.

1. Select "BPMP.S.WebApp".
2. Click **Start**.
3. Wait until the Status is dark green (Started).

Check the log file **SystemOut.log** for the application target cluster members in directory for errors:

on fmtc4054:

```
/bpm75/profiles/Custom01/logs/BPMP.S.WebApp.fmtc4054Node01.0
```

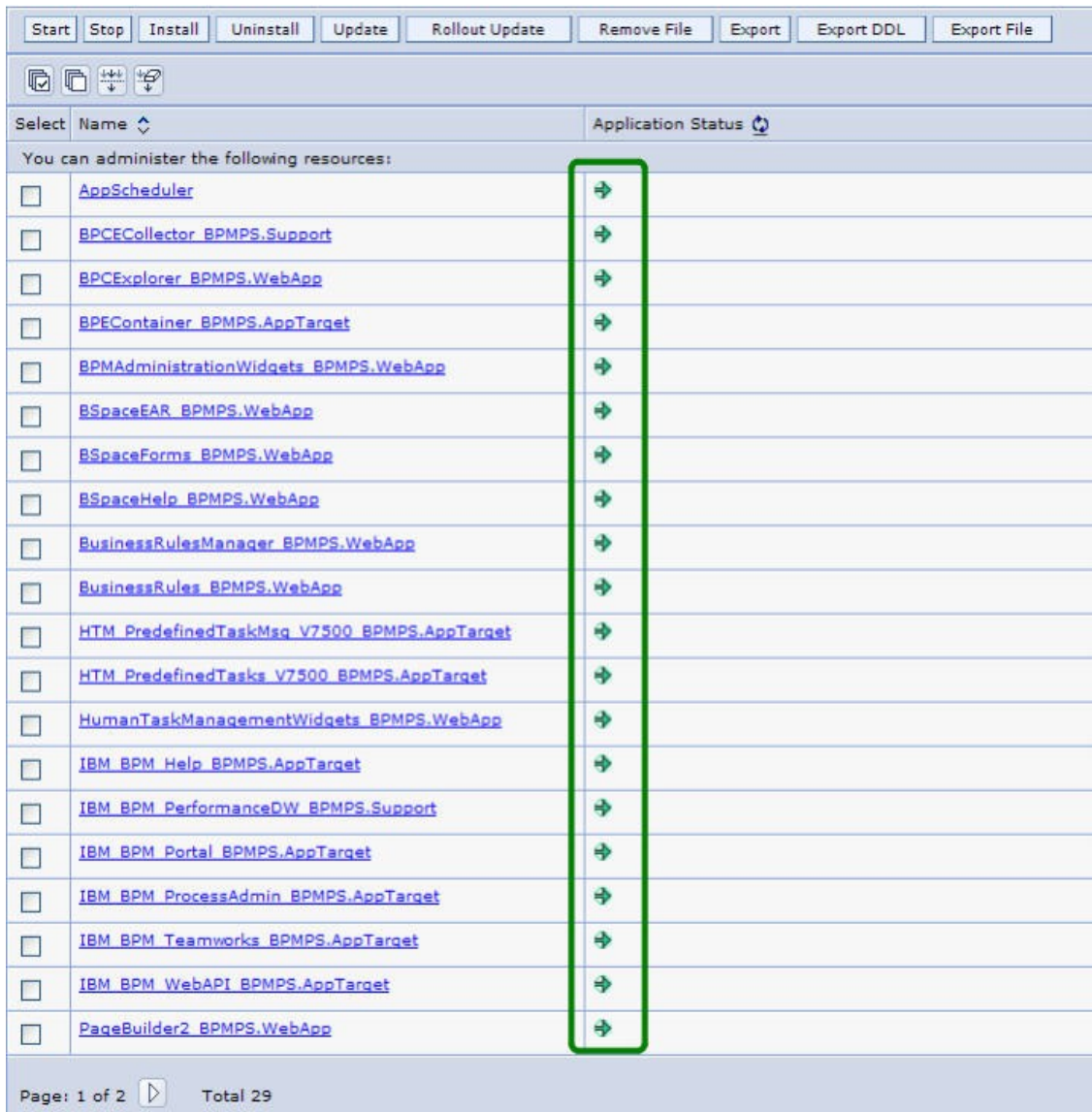
on fmtc4055:

```
/bpm75/profiles/Custom01/logs/BPMP.S.WebApp.fmtc4055Node01.0
```

Now check that all applications have been started successfully. Navigate to:

Applications
-> Application Types
-> WebSphere enterprise applications

Verify that all applications are started:



Select	Name	Application Status
<input type="checkbox"/>	AppScheduler	→
<input type="checkbox"/>	BPCECollector_BPMPs.Support	→
<input type="checkbox"/>	BPCEExplorer_BPMPs.WebApp	→
<input type="checkbox"/>	BPCEContainer_BPMPs.AppTarget	→
<input type="checkbox"/>	BPMAAdministrationWidgets_BPMPs.WebApp	→
<input type="checkbox"/>	BSpaceEAR_BPMPs.WebApp	→
<input type="checkbox"/>	BSpaceForms_BPMPs.WebApp	→
<input type="checkbox"/>	BSpaceHelp_BPMPs.WebApp	→
<input type="checkbox"/>	BusinessRulesManager_BPMPs.WebApp	→
<input type="checkbox"/>	BusinessRules_BPMPs.WebApp	→
<input type="checkbox"/>	HTM_PredefinedTaskMsg_V7500_BPMPs.AppTarget	→
<input type="checkbox"/>	HTM_PredefinedTasks_V7500_BPMPs.AppTarget	→
<input type="checkbox"/>	HumanTaskManagementWidgets_BPMPs.WebApp	→
<input type="checkbox"/>	IBM BPM Help_BPMPs.AppTarget	→
<input type="checkbox"/>	IBM BPM PerformanceDW_BPMPs.Support	→
<input type="checkbox"/>	IBM BPM Portal_BPMPs.AppTarget	→
<input type="checkbox"/>	IBM BPM ProcessAdmin_BPMPs.AppTarget	→
<input type="checkbox"/>	IBM BPM Teamworks_BPMPs.AppTarget	→
<input type="checkbox"/>	IBM BPM WebAPI_BPMPs.AppTarget	→
<input type="checkbox"/>	PageBuilder2_BPMPs.WebApp	→

Page: 1 of 2 Total 29

11.4.5 Verify transaction and recovery logs

Verify whether the transaction logs exist:

```
cd /BPMdata/SharedLogs/tranlogs/BPMPS.AppTarget.fmtc4054Node01.0
ll
```

```
... partnerlog
... tranlog
```

```
cd tranlog
ll
```

```
... DO NOT DELETE LOG FILES
... log1
... log2
```

```
cd ../partnerlog/
ll
```

```
... DO NOT DELETE LOG FILES
... log1
... log2
```

Repeat this verification step for the remaining cluster members:

- BPMPS.AppTarget.fmtc4055Node01.0
- BPMPS.Messaging.fmtc4054Node01.0
- BPMPS.Messaging.fmtc4055Node01.0
- BPMPS.Support.fmtc4054Node01.0
- BPMPS.Support.fmtc4055Node01.0
- BPMPS.WebApp.fmtc4054Node01.0
- BPMPS.WebApp.fmtc4055Node01.0

Verify whether the recovery logs exist:

```
cd /BPMdata/SharedLogs/recoverylogs/BPMPS.AppTarget.fmtc4054Node01.0
ll
```

```
... activity
... compensation
```

```
cd activity/compensation/
ll
```

```
... DO NOT DELETE LOG FILES
... log1
... log2
```

```
cd ../../compensation/logs/
```

```
... DO NOT DELETE LOG FILES
... log1
... log2
```

Repeat this verification step for the remaining application cluster member (BPMPS.AppTarget.fmtc4055Node01.0).

Chapter 12 Optional Configuration steps



Involved systems:

Deployment manager: fmtc4052.boeblingen.de.ibm.com

12.1 Configure a shared user repository

IBM Business Process Manager is configured for security by default. The admin user credentials provided at profile generation are stored in a file-based registry, attached via Virtual Member Manager (VMM) to the cell.

The following steps show how to integrate an existing shared user directory into the cell by leveraging VMM. Thus the scope of users is extended while keeping their storage location separated.

Navigate to:

Security
-> Global Security

The Global security settings are displayed:

The screenshot displays the 'Global Security' configuration page. At the top, there are two tabs: 'Security Configuration Wizard' and 'Security Configuration Report'. The page is organized into several sections:

- Administrative security:** Includes a checked checkbox for 'Enable administrative security' and links for 'Administrative user roles', 'Administrative group roles', and 'Administrative authentication'.
- Application security:** Includes a checked checkbox for 'Enable application security'.
- Java 2 security:** Includes a checkbox for 'Use Java 2 security to restrict application access to local resources', a checked checkbox for 'Warn if applications are granted custom permissions', and a checkbox for 'Restrict access to resource authentication data'.
- User account repository:** Shows 'Current realm definition' as 'Federated repositories'. Below this, 'Available realm definitions' is set to 'Federated repositories' (highlighted with a green box), with 'Configure...' and 'Set as current' buttons.
- Authentication:** Shows 'Authentication mechanisms and expiration' with 'LTPA' selected (highlighted with a green circle). Other options include 'Kerberos and LTPA', 'Kerberos configuration', 'Authentication cache settings', 'Web and SIP security', 'RMI/IIOP security', 'Java Authentication and Authorization Service', and 'Use realm-qualified user names'. There are also links for 'Security domains', 'External authorization providers', and 'Custom properties'.

1. Click **Configure** to work on **Federated repositories**.

General Properties

* Realm name
defaultWIMFileBasedRealm

* Primary administrative user name
admin

Server user identity

Automatically generated server identity

Server identity that is stored in the repository

Server user ID or administrative user on a Version 6.0.x node

Password

Ignore case for authorization

Repositories in the realm:

Select	Base Entry	Repository Identifier	Repository Type
<input type="checkbox"/>	o=defaultWIMFileBasedRealm	InternalFileRepository	File

You can administer the following resources:

Additional Properties

Related Items

- Property extension repository
- Entry mapping repository
- Supported entity types
- Manage repositories
- Trusted authentication realms - inbound

2. Click **manage repositories** to add the shared user directory

Select	Repository Identifier	Repository Type
<input type="checkbox"/>	InternalFileRepository	File

Total 1

3. Click **Add** and specify the repository credentials according planning section

General Properties

1 * Repository identifier
IQA_UserRepo

2 * Directory type
IBM Tivoli Directory Server

3 * Primary host name
looma1.boeblingen.de.ibm.c

4 Port
389

Failover server used when primary is not available:

Select	Failover Host Name	Port
None		

Support referrals to other LDAP servers
ignore

Security

Bind distinguished name

Bind password

Login properties
uid

LDAP attribute for Kerberos principal name

Certificate mapping
EXACT_DN

Certificate filter

Require SSL communications

Centrally managed
[Manage endpoint security configurations](#)

Use specific SSL alias
 CellDefaultSSLSettings [SSL configurations](#)

The additional properties will not be available until the general properties for this item are applied or saved.

Additional Properties

- Performance
- LDAP entity types
- Group attribute definition

Apply **5** OK Reset Cancel

4. Click **OK** and **Save** the changes.

Navigate to:

```
Security
-> Global Security
-> Federated Repositories
```

The federated repositories settings are displayed:

General Properties

* Realm name
defaultWIMFileBasedRealm

* Primary administrative user name
admin

Server user identity
 Automatically generated server identity
 Server identity that is stored in the repository
Server user ID or administrative user on a Version 6.0.x node
Password

Ignore case for authorization

Realms in the realm:
Add Base entry to Realm... Use built-in repository Remove

Select	Base Entry	Repository Identifier	Repository Type
<input type="checkbox"/>	o=defaultWIMFileBasedRealm	InternalFileRepository	File

5. Click **Add Base entry to realm** to specify the base entry into the directory tree.

General Properties

* Repository
IQA_UserRepo Add Repository...

1 * Distinguished name of a base entry that uniquely identifies this set of entries in the realm
dc=usaa,dc=com

2 Distinguished name of a base entry in this repository
dc=usaa,dc=com

3 Apply OK Reset Cancel

6. Click **OK** and **Save** the changes.

7. Repeat the previous step to add another Base entry.

General Properties

Repository: IQA_UserRepo [Add Repository...]

1 * Distinguished name of a base entry that uniquely identifies this set of entries in the realm: o=ibm.com

2 Distinguished name of a base entry in this repository: o=ibm.com

3 [Apply] [OK] [Reset] [Cancel]

8. Click **OK** , **Save** and **Synchronize** the nodes.

9. The result are the following federated repositories:

Repositories in the realm:

Select	Base Entry	Repository Identifier	Repository Type
<input type="checkbox"/>	dc=usaa,dc=com	IQA_UserRepo	LDAP:IDS
<input type="checkbox"/>	o=defaultWIMFileBasedRealm	InternalFileRepository	File
<input type="checkbox"/>	o=ibm.com	IQA_UserRepo	LDAP:IDS

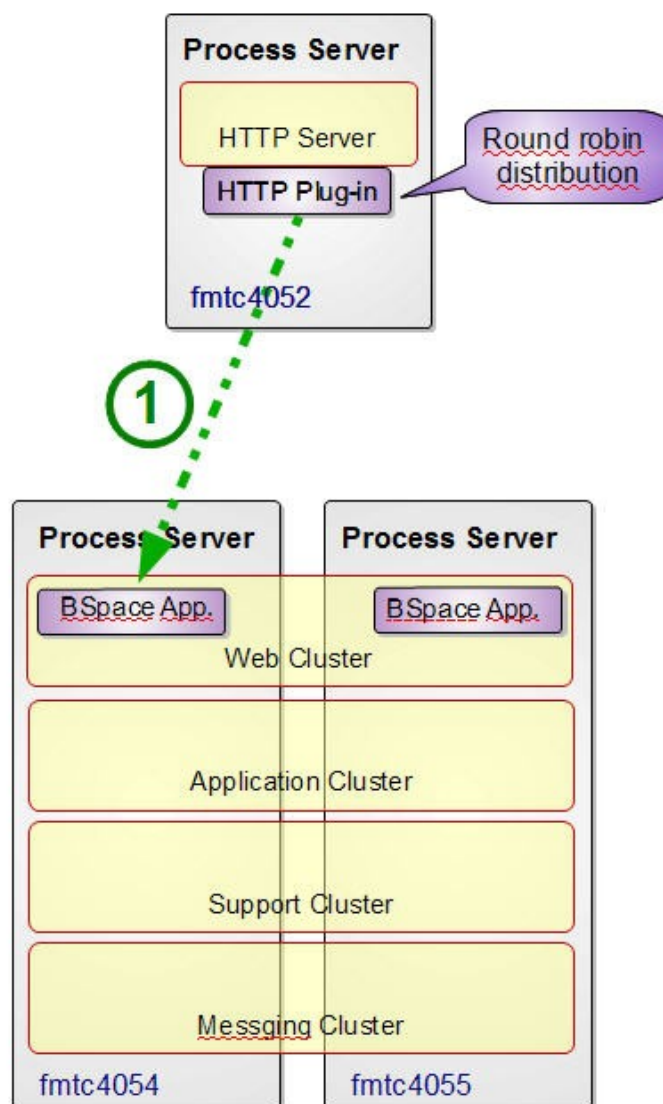
Note: The integration of the shared user repository in this special case does not need further configuration steps, because the LDAP user repository properties (e.g. LDAP Entity types) match BPM default configuration of VMM transformation file. If the user repository setup differs, additional configuration steps are required. Refer to the following link for additional information on VMM.

[Configuring the Virtual Member Manager people directory provider](#)

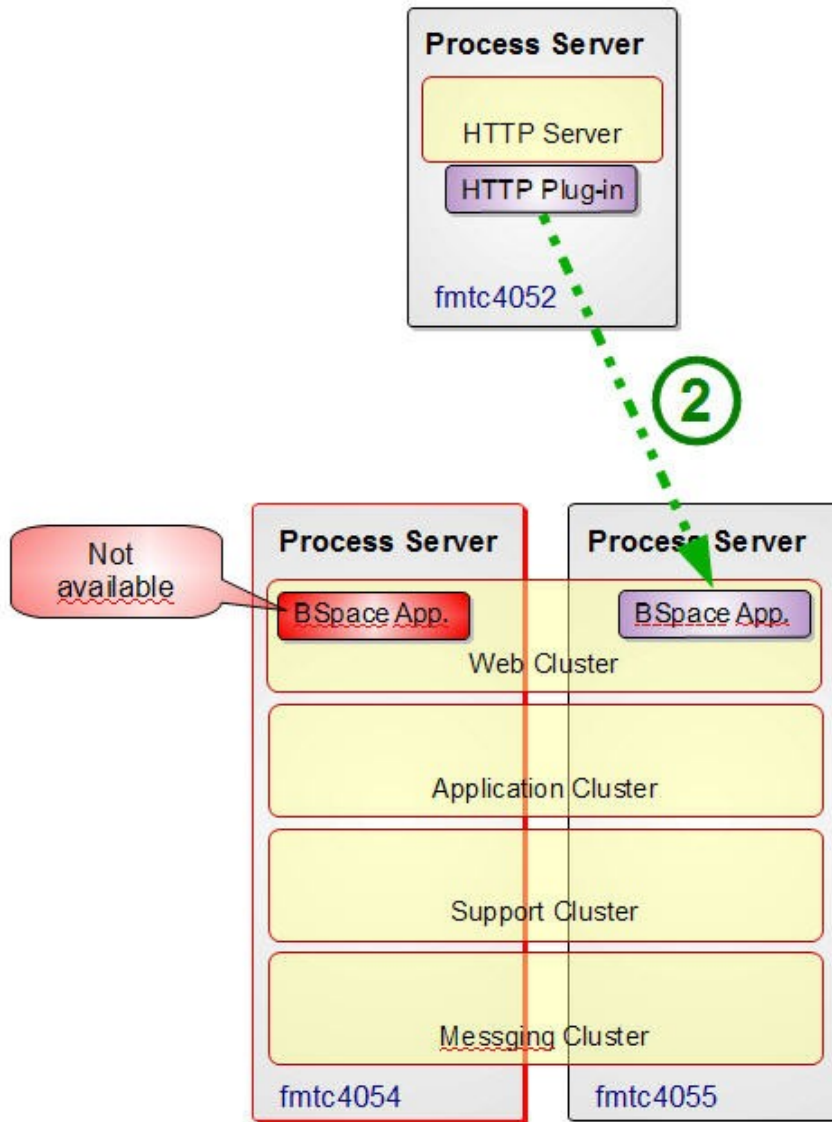
12.2 Install and configure IBM HTTP Server v7.0

This section describes how to install and configure IBM HTTP Server v7.0 (IHS) within a clustered environment. Based on the HTTP server Plug-in, HTTP and REST requests are routed to any available cluster member. In case an active cluster member fails subsequent requests are automatically routed to another active cluster member.

Note: Configuring high availability of the HTTP server is beyond the scope of this document. The entire HTTP communication is covered by a single HTTP server instead.



1. A HTTP request for a defined web resource arrives at the HTTP server. Based on the HTTP Plug-In and its selection algorithm (round robin or random) the request is routed to any available cluster member. The chosen cluster member will handle the request.



2. In case the cluster member which served the initial request fails, subsequent requests are routed to the available cluster member.

12.2.1 Install IHS binaries (silent-mode)

At this point it is assumed, that IHS binaries located on two supplement archives, have already been extracted to **/IHStmp** folder on the IHS target machine. In order to install IHS silently a response file is required.

Navigate to **/IHStmp/IHS**:

```
cd /IHStmp/IHS
```

Create a backup of the response file

```
cp responsefile.txt responsefileBACKUP.txt
```

1. Open **responsefile.txt** as user **root** in a text editor and modify the default values according planning section. Modifications applied to the original file are highlighted below:

```
-OPT silentInstallLicenseAcceptance="true"  
-OPT installLocation="/ihs70"  
-OPT createAdminAuth="true"  
-OPT adminAuthUser="ihsadmin"  
-OPT adminAuthPassword="<ihsadmin_password>  
-OPT adminAuthPasswordConfirm="<ihsadmin_password>"  
-OPT runSetupAdmin="true"  
-OPT setupAdminUser="ihsadmin"  
-OPT setupAdminGroup="ihsgroup"  
-OPT webserverDefinition="httpserver1"  
-OPT washostname="fmtc4052.boeblingen.de.ibm.com"
```

Save and close **responsefile.txt**.

2. To start the installation run following command:

```
/IHStmp/IHS/install -options "responsefile.txt" -silent
```

Wait until the command and thus the installation completes.

3. Check the last line of installation log file at location **/ihs70/logs/install** for **"INSTCONFSUCCESS"**.

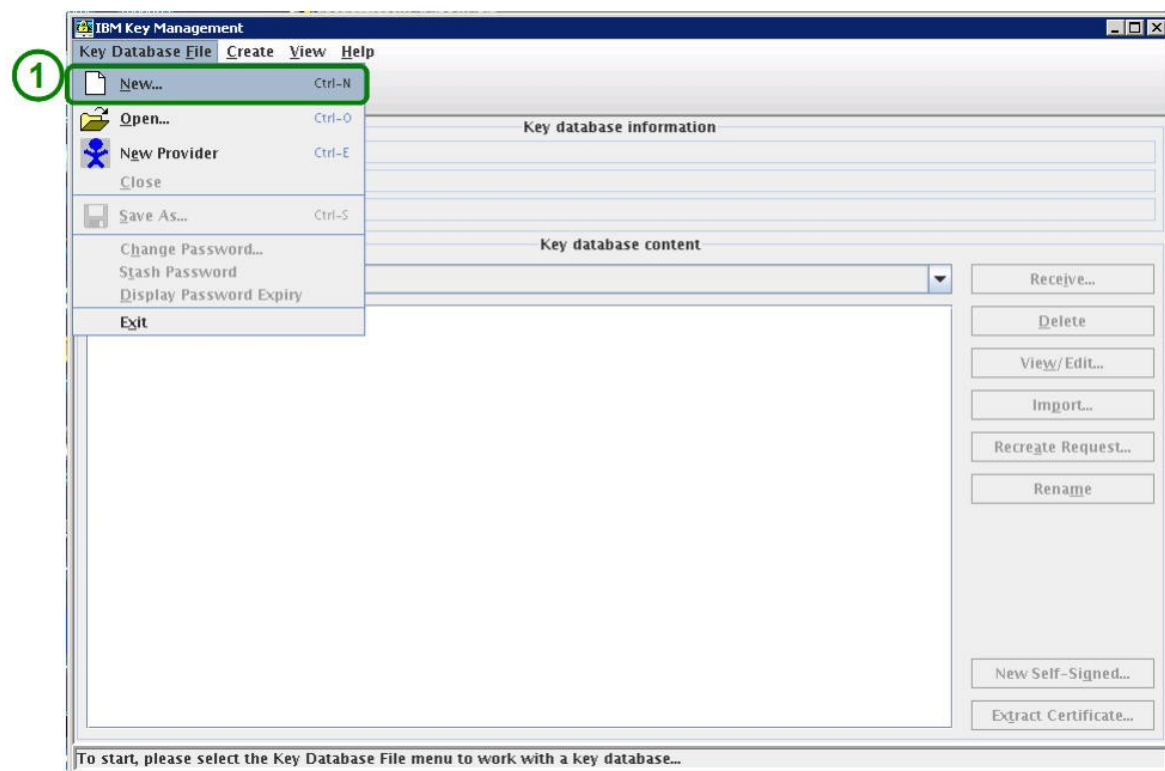
12.2.2 Configure SSL for the HTTP server

In this sample setup, certificates which are usually in place in a company are not available. Instead, self signed certificates for the cell which are created on profile generation are leveraged for the following SSL configuration. To create a self-signed certificate to ssl-secure the HTTP-transport between browser and HTTP server, the "ikeyman" utility is used.

Execute following command:

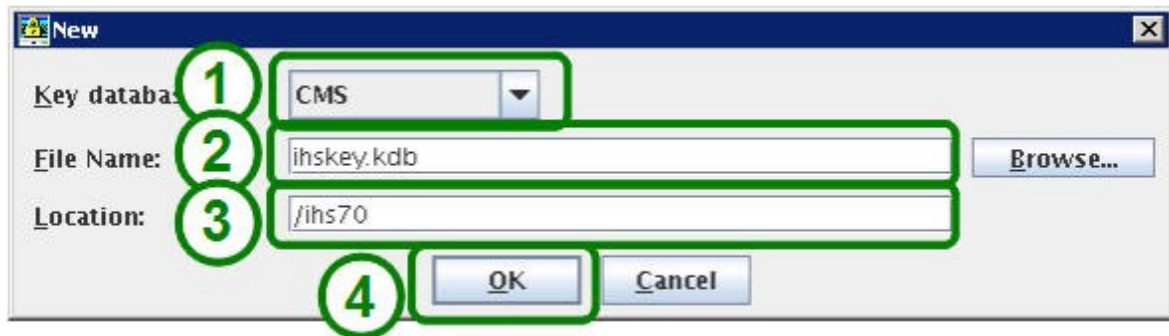
```
cd /ihs70/bin
./ikeyman
```

The ikeyman utility starts:



1. Select **Key Database File / New** .

The key file creation window is displayed:



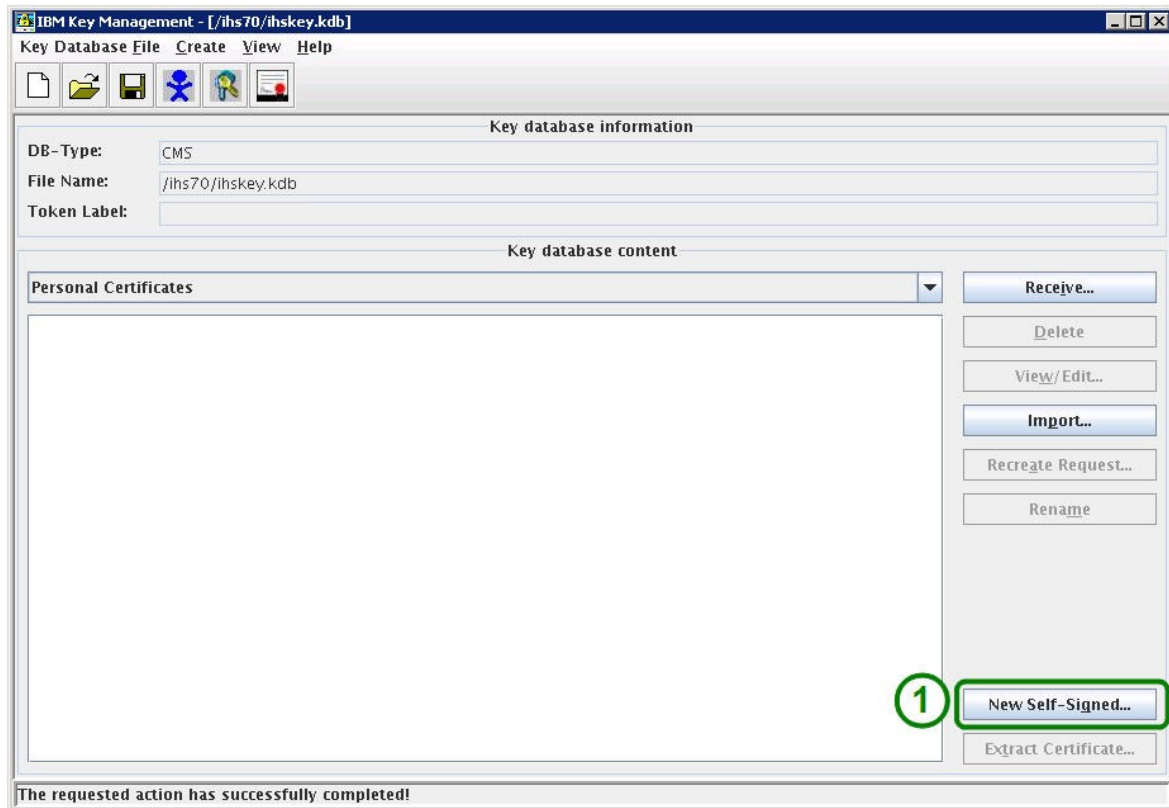
1. Specify CMS as key database type.
2. Specify a file name (ihskey.kdb).
3. Specify the location (/ihs70).
4. Click **OK**.

The password prompt is displayed:



1. Specify a password (ihspw).
2. Confirm the password (ihspw).
3. Select "Stash password to a file".
4. Click **OK**.

The ikeyman utility main window is displayed again:



1. Click **New Self-Signed**.

The Self-Signed Certificate configuration panel is displayed:

1

2

1. Specify a Key Label (ihscert).

2. Click **OK**.

The certificate is displayed in the list of Personal Certificates. Shut down ikeyman utility.

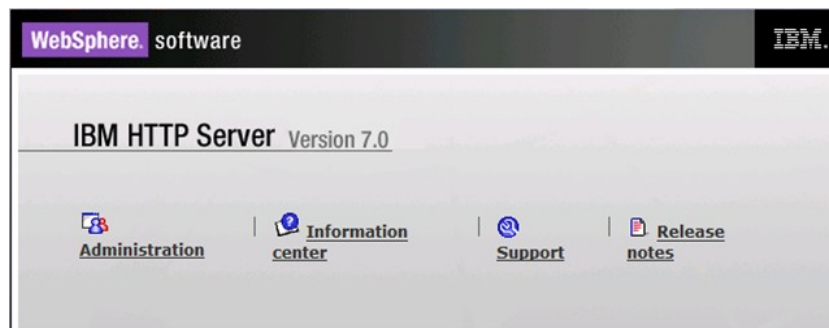
-
1. Open **httpd.conf** (located in <IHS_INSTALL_ROOT>/conf). Locate the following lines and remove the leading **#**. Also update the key file setting to reference the key file created in the previous step.

```
LoadModule ibm_ssl_module modules/mod_ibm_ssl.so
Listen 443
<VirtualHost *:443>
SSLEnable
SSLProtocolDisable SSLv2
</VirtualHost>
KeyFile /opt/ihs7/ihskey.kdb (Note: references the key file created in the
previous step)
```

2. Save and close **httpd.conf**
3. Execute the following command to start the http server:

```
cd /ihs70/bin
./apachectl start
```

4. Open a browser, enter **https://fmtc4052.boeblingen.de.ibm.com:443** and accept the certificate request. IBM HTTP server should be up and running:



5. Execute following command:

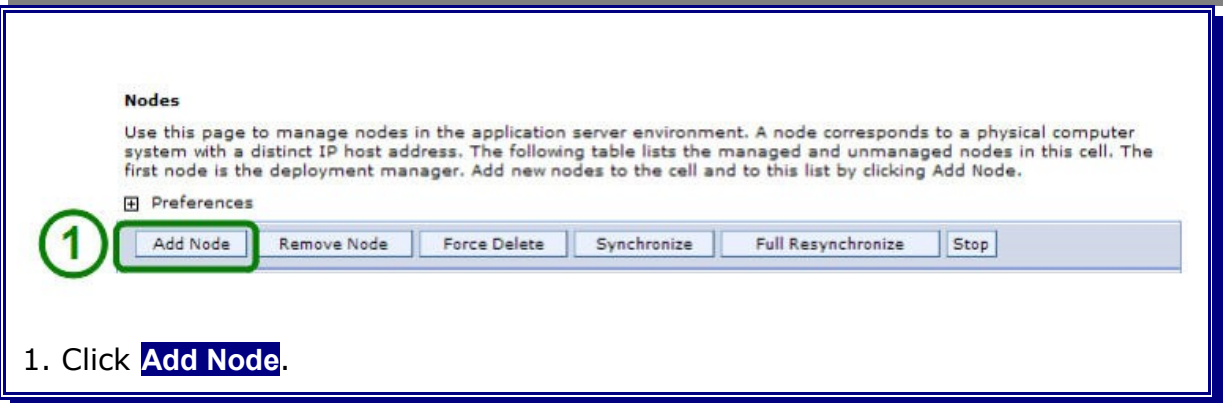
```
cd /ihs70/bin
./apachectl stop
```

12.2.3 Add IHS to the WPS cell

The HTTP Server will be integrated into the Cell as an unmanaged node. This allows to completely manage the HTTP server via its administration server from the administration console of the DMGR. Follow the steps below to integrate IHS as unmanaged node.

Navigate to:

System administration
-> Nodes



Nodes

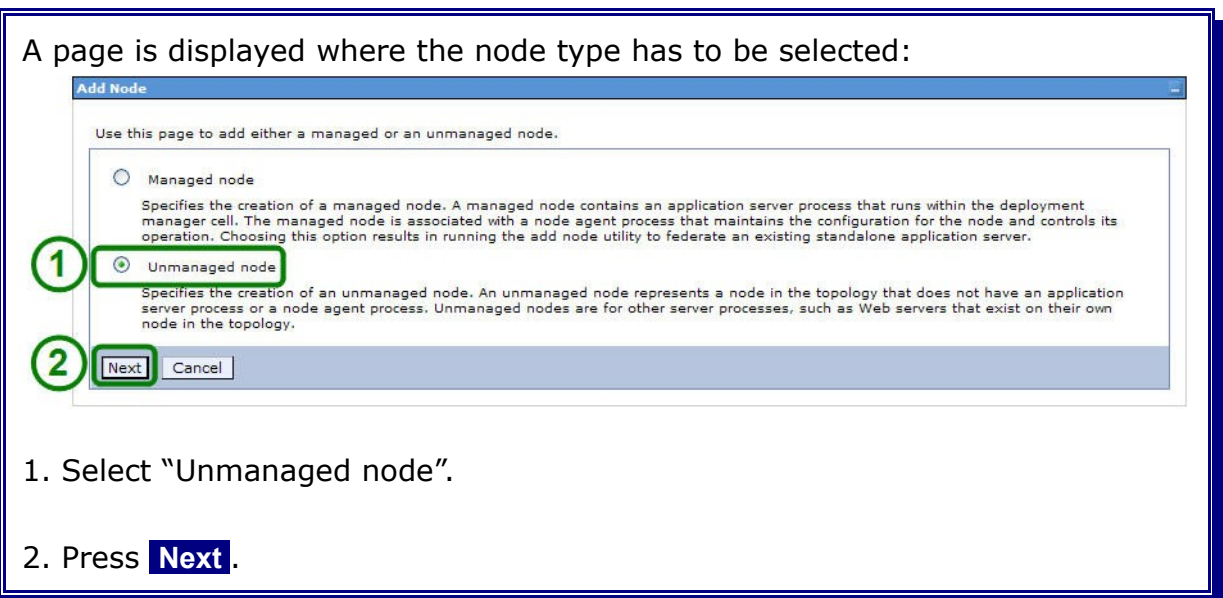
Use this page to manage nodes in the application server environment. A node corresponds to a physical computer system with a distinct IP host address. The following table lists the managed and unmanaged nodes in this cell. The first node is the deployment manager. Add new nodes to the cell and to this list by clicking Add Node.

⊞ Preferences

1 Add Node Remove Node Force Delete Synchronize Full Resynchronize Stop

1. Click **Add Node**.

A page is displayed where the node type has to be selected:



Add Node

Use this page to add either a managed or an unmanaged node.

Managed node
Specifies the creation of a managed node. A managed node contains an application server process that runs within the deployment manager cell. The managed node is associated with a node agent process that maintains the configuration for the node and controls its operation. Choosing this option results in running the add node utility to federate an existing standalone application server.

1 Unmanaged node
Specifies the creation of an unmanaged node. An unmanaged node represents a node in the topology that does not have an application server processes, such as Web servers that exist on their own node in the topology.

2 Next Cancel

1. Select "Unmanaged node".

2. Press **Next**.

Specify the basic settings for the unmanaged node:

Nodes > New

Use this page to view or change the configuration for an unmanaged node. An unmanaged node is a node defined in the cell topology that does not have a node agent running to manage the process. Unmanaged nodes are typically used to manage Web servers.

Configuration

General Properties

The additional properties will not be available until the general properties for this item are applied or saved.

Additional Properties

■ Custom Properties

* Name: ihsnode

* Host Name: fmtc4052.boeblingen.de.ibm

* Platform Type: Linux

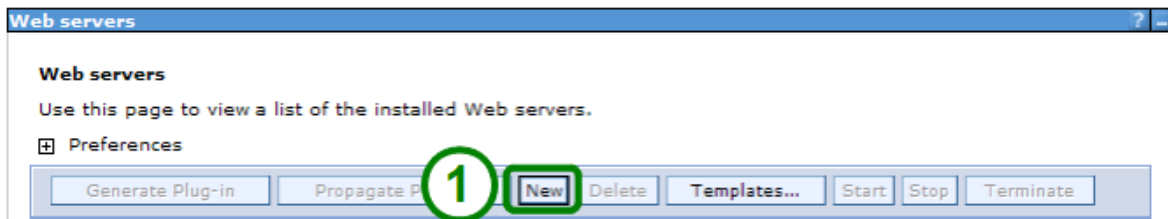
Apply OK Reset Cancel

1. Specify the Name of the unmanaged node (ihsnode).
2. Specify the Host Name the unmanaged node is supposed to be defined on ("DMGR" fmtc4052.boeblingen.de.ibm.com).
3. Specify the Platform Type (Linux)
- 4 Click **Apply** , then **Save** and **Synchronize** configuration.

Navigate to

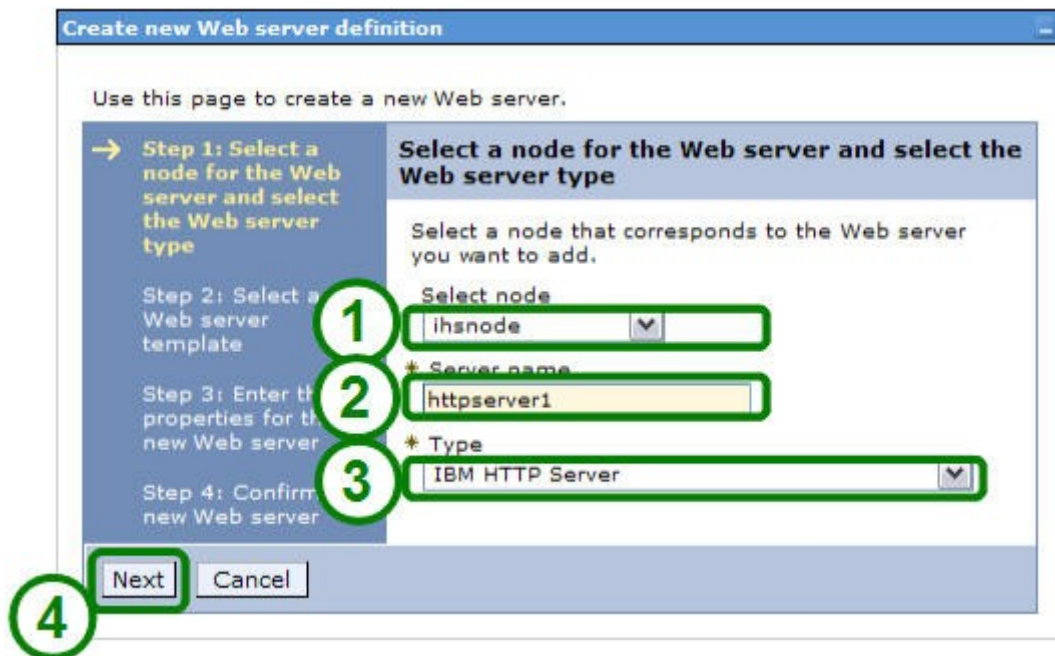
```
Servers
-> Server Types
-> Web servers
```

Create new Web server definition:



1. Click **New**

Create new Web server definition - Step 1:



1. Select the http server node **"ihsnode"**.

2. Specify the HTTP server name (httpserver). (Note: Be sure to match the name of the web server definition specified during installation of IHS).

3. Keep default type for HTTP server (**"IBM HTTP Server"**).

4. Click **Next**

Create new Web server definition - Step 2:

Use this page to create a new Web server.

Step 1: Select a node for the Web server and select the Web server type

→ **Step 2: Select a Web server template**

Step 3: Enter the properties for the new Web server

Step 4: Confirm new Web server

Select a Web server template

Select the template that corresponds to the server that you want to create.

Select	Template Name	Type	Description
<input checked="" type="radio"/>	IHS	System	The IHS Web Server Template

Previous **Next** Cancel

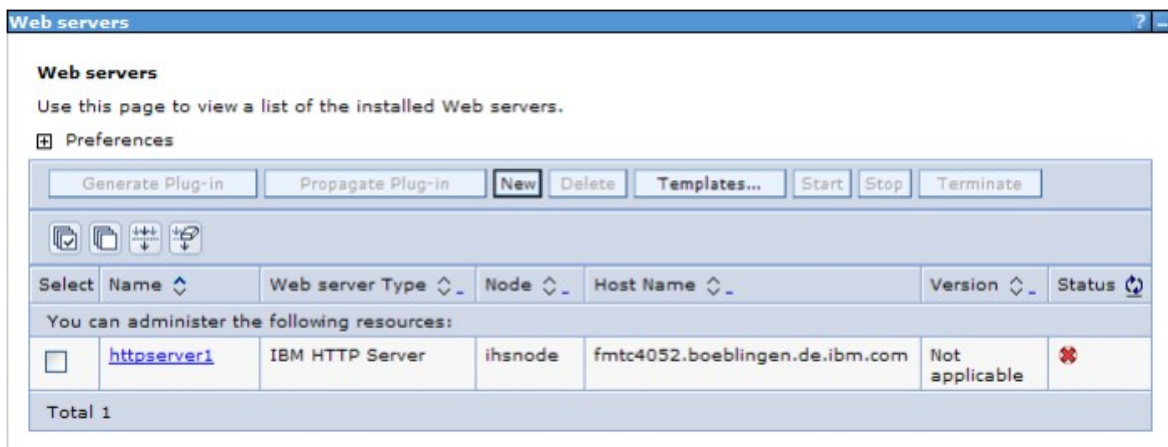
1

1. Press **Next** (There is only one pre-selected template).

Create new Web server definition - Step 3:

1. Specify the http Port (443).
2. Specify the Web server installation location **"/ihs70"**.
3. Specify the Plug-in installation location **"ihs/70/Plugins"**.
4. Specify the HTTP Administration Server port **"8008"**.
5. Specify administration user ID of HTTP Administration Server.
6. Enter password of the administration user ID.
7. Confirm the password password of the administration user ID.
8. Click **Next**, check *Summary*, click then **Finish**. Save and Synchronize configuration.

The newly created HTTP server appears in the list of available web servers (Note: the server is not started, yet).



12.2.4 Verify HTTP server management configuration

In order to be able to manage the http server using the admin console of the DMGR, the corresponding HTTP Administration Server needs to be started.

Execute following command:

```
cd /ihs70/bin  
./adminctl start
```

```
./adminctl start: admin http started
```

Navigate to

Servers
-> Server Types
-> Web servers

Web servers management:

Web servers

Web servers

Use this page to view a list of the installed Web servers.

Preferences

Generate Plug-in Propagate Plug-in New Delete Template Start Stop Refresh

Select	Name	Web server Type	Node	Host Name	Version	Status
<input checked="" type="checkbox"/>	httpserver1	IBM HTTP Server	ihsnode	fmtc4052.boeblingen.de.ibm.com	Not applicable	✖

Total 1

1. Select the new created HTTP server (httpserver).
2. Click **Start**. The HTTP server should start successfully.

Messages

ihsnode/httpserver1 server started successfully.

3. Click **Stop**. The HTTP server should stop successfully.

Messages

ihsnode/httpserver1 server stopped successfully.

12.2.5 Map Web modules to HTTP server

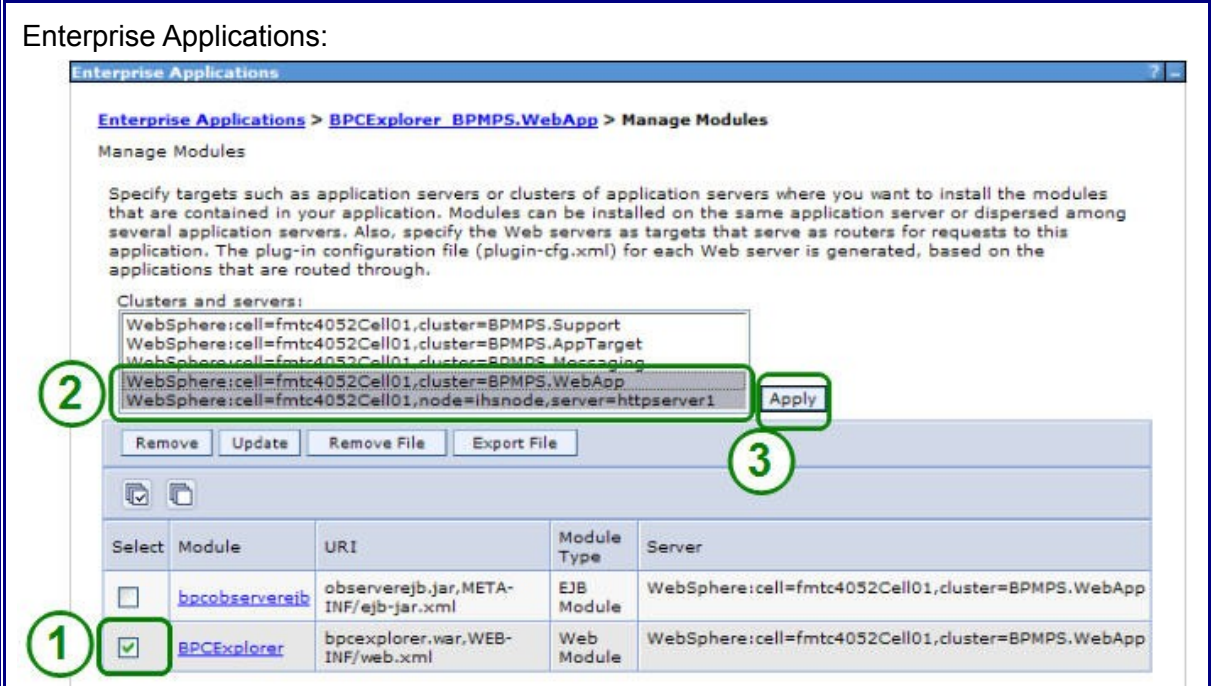
This configuration step is necessary to enable the plug-in to route the HTTP requests to the web modules running on WebApp cluster.

Note: In case new applications, containing web modules, are installed, the mapping step needs to be applied again.

Navigate to

```
Enterprise Applications
-> BPCEXplorer_BPMPs.WebApp
-> Modules
-> Manage Modules
```

Enterprise Applications:



Enterprise Applications > BPCEXplorer_BPMPs.WebApp > Manage Modules

Manage Modules

Specify targets such as application servers or clusters of application servers where you want to install the modules that are contained in your application. Modules can be installed on the same application server or dispersed among several application servers. Also, specify the Web servers as targets that serve as routers for requests to this application. The plug-in configuration file (plugin-cfg.xml) for each Web server is generated, based on the applications that are routed through.

Clusters and servers:

- WebSphere:cell=fmtc4052Cell01,cluster=BPMPs.Support
- WebSphere:cell=fmtc4052Cell01,cluster=BPMPs.AppTarget
- WebSphere:cell=fmtc4052Cell01,cluster=BPMPs.Messaging
- WebSphere:cell=fmtc4052Cell01,cluster=BPMPs.WebApp
- WebSphere:cell=fmtc4052Cell01,node=ihsnode,server=httpserver1

Remove Update Remove File Export File

Select	Module	URI	Module Type	Server
<input type="checkbox"/>	bpcobservereib	observerejb.jar,META-INF/ejb-jar.xml	EJB Module	WebSphere:cell=fmtc4052Cell01,cluster=BPMPs.WebApp
<input checked="" type="checkbox"/>	BPCEXplorer	bpcexplorer.war,WEB-INF/web.xml	Web Module	WebSphere:cell=fmtc4052Cell01,cluster=BPMPs.WebApp

1. Select the web module to be mapped “BPCEXplorer”.

2. Select the clusters/nodes to map the module to (hold down shift key for multiple selections).

3. Click Apply

Enterprise Applications:

Remove Update Remove File Export File

Select	Module	URI	Module Type	Server
<input type="checkbox"/>	bpcobserveib	observeejb.jar,META-INF/ejb-jar.xml	EJB Module	WebSphere:cell=fmtc4052Cell01,cluster=BPMP.S.WebApp
<input type="checkbox"/>	BPCExplorer	bpcexplorer.war,WEB-INF/web.xml	Web Module	WebSphere:cell=fmtc4052Cell01,node=ihsnode,server=httpserver1 WebSphere:cell=fmtc4052Cell01,cluster=BPMP.S.WebApp

1

1. The mapping result shows the additional HTTP server mapping introduces.
2. Click **OK**, **Save** and **Synchronize** the change.

Repeat this web module mapping sequence for the following applications (map the web modules additionally to the web server while keeping the existing mapping):

- BPEContainer_BPMP.S.AppTarget
- BPMAAdministrationWidgets_BPMP.S.WebApp
- BSpaceEAR_BPMP.S.WebApp
- BSpaceForms_BPMP.S.WebApp
- BSpaceHelp_BPMP.S.WebApp
- BusinessRulesManager_BPMP.S.WebApp
- BusinessRules_BPMP.S.WebApp
- HumanTaskManagementWidgets_BPMP.S.WebApp
- IBM_BPM_Teamworks_BPMP.S.AppTarget
- REST Services Gateway
- REST Services Gateway Dmgr
- TaskContainer_BPMP.S.AppTarget
- mm.was_BPMP.S.WebApp
- webbWidget_BPMP.S.WebApp

12.2.6 Update HTTP Plug-in configuration

This step updates the HTTP Plug-in configuration file with port and node mapping information of the BPM clusters, in order to allow proper request routing by the HTTP Plug-in.

This step has to be performed each time changes to the module mapping have been executed. This also includes installation of new applications containing Web modules.

Navigate to

```
Servers
-> Server Types
-> Web servers
```

Web servers management:

The screenshot shows the 'Web servers' management interface. At the top, there are buttons for 'Generate Plug-in', 'Propagate Plug-in', 'New', 'Delete', 'Templates...', 'Start', 'Stop', and 'Terminate'. Below these is a table of installed web servers. The table has columns for 'Select', 'Name', 'Web server Type', 'Node', 'Host Name', 'Version', and 'Status'. One server, 'httpserver1', is selected, and its row is highlighted. The 'Generate Plug-in' button and the selected row are both circled in green with numbers 2 and 1 respectively.

Select	Name	Web server Type	Node	Host Name	Version	Status
<input checked="" type="checkbox"/>	httpserver1	IBM HTTP Server	ihsnode	fmtc4052.boeblingen.de.ibm.com	Not applicable	

1. Select the HTTP server to generate the Plug-in configuration for "httpserver1".
2. Click **Generate Plug-in** to generate the Plug-in configuration file locally on the DMGR.

Messages

```
PLGC0005I: Plug-in configuration file
= /bpm75/profiles/Dmgr01/config/cells/fmtc4052Cell01/nodes/ihsnode/servers/httpserver1/plugin-
cfg.xml
PLGC0052I: Plug-in configuration file generation is complete for the Web server,
fmtc4052Cell01.ihsnode.httpserver1.
```

Stay at the Web servers management panel:

Web servers management:

Web servers management console screenshot. The 'Web servers' section shows a table of installed servers. The 'httpserver1' server is selected, and the 'Propagate Plug-in' button is highlighted. A message pane at the bottom shows the propagation of the plug-in configuration file.

Select	Name	Web server Type	Node	Host Name	Version	Status
<input checked="" type="checkbox"/>	httpserver1	IBM HTTP Server	ihsnode	fmtc4052.boeblingen.de.ibm.com	Not applicable	✖

Total 1

Messages

- PLGC0062I: The plug-in configuration file is propagated from /bpm75/profiles/Dmgr01/config/cells/fmtc4052Cell01/nodes/ihsnode/servers/httpserver1/plugin-cfg.xml to /ihs70/Plugins/config/httpserver1/plugin-cfg.xml on the Web server computer.
- PLGC0048I: The propagation of the plug-in configuration file is complete for the Web server. fmtc4052Cell01.ihsnode.httpserver1.

1. Again, select the HTTP server “httpserver” to distribute the generated plug-in.
2. Click **Propagate Plug-in**.

12.2.7 Configure SSL for the HTTP Plug-in

The configuration to secure the route between HTTP Plug-in and BPM clusters can be done in different ways. This document describes the management capabilities of the admin console instead of updating and distributing key stores manually.

12.2.7.1 Troubleshooting Plug-in key management

Due to an known problem which is caused by missing files (Plug-in keystore and stashfile) in the WebServer definition and missing key store entry management functions are not working properly and need troubleshooting first.

1. Navigate to the Plug-in properties panel to check if the problem exists:

```
Servers
-> Server Types
   -> Web server
       -> httpserver1
           -> Additional Properties
               -> Plug-in properties
```

Plug-in properties:

Plug-in properties

Ignore DNS failures during Web server startup

* Refresh configuration interval
60 seconds

Repository copy of Web server plug-in files:

* Plug-in configuration file name
plugin-cfg.xml

Automatically generate the plug-in configuration file

Automatically propagate plug-in configuration file

* Plug-in key store file name
plugin-key.kdb

1

Web server copy of Web server plug-in files:

* Plug-in configuration directory and file name
/ihs70/Plugins/config/httpserver1/plugin-cfg.xml

* Plug-in key store directory and file name
/ihs70/Plugins/config/httpserver1/plugin-key.kdb

Plug-in logging:

* Log file name
/ihs70/Plugins/logs/httpserver1/http_plugin.log

Log level
Error

Additional Properties

- [Request and Response](#)
- [Caching](#)
- [Request Routing](#)
- [Custom Properties](#)

1. If the two actions are disabled, follow the troubleshooting Technote "Manage keys and certificates link for plugin-key.kdb is broken in the WebSphere Application Server administrative console".

Technote "Manage keys and certificates link broken":
<http://www.ibm.com/support/docview.wss?uid=swg21426980>

2. Copy missing **plugin-key.kdb** and **plugin-key.sth** to the Application Server configuration directory:

```
cd
/bpm75/profiles/Dmgr01/config/cells/fmtc4052Cell01/nodes/ihsnode/servers/httpserver1
cp /ihs70/Plugins/config/httpserver1/plugin-key.sth .
cp /ihs70/Plugins/config/httpserver1/plugin-key.kdb .
```

Note: The two actions appear active now.

3. Navigate to

```
Security
-> SSL certificate and key management
  -> Configuration settings
    -> Manage endpoint security configurations
      -> Inbound
        -> ihsnode
          -> servers
            -> httpserver1
              -> Related Items
                -> Key stores and certificates
```

SSL certificate and key management:

SSL certificate and key management

SSL certificate and key management > Manage endpoint security configurations > httpserver1 > Key stores and certificates

Defines keystore types, including cryptography, RACF(R), CMS, Java(TM), and all truststore types.

Keystore usages

SSL keystores

Preferences

1 New Delete Change password... Exchange signers...

Select	Name	Description	Path
<input type="checkbox"/>	CellDefaultKeyStore	Default key store for fmtc4052Cell01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/key.p12
<input type="checkbox"/>	CellDefaultTrustStore	Default trust store for fmtc4052Cell01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/trust.p12

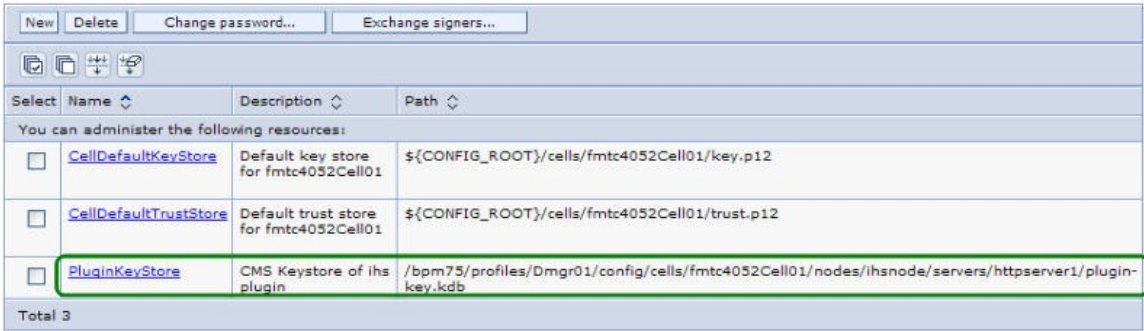
Total 2

1. Click **New** to create the missing key store entry for the plug-in.

SSL certificate and key management:

1. Specify Keystore name **"PluginKeyStore"**.
2. Enter a description.
3. Specify the path to the keystore file **"/bpm75/profiles/Dmgr01/config/cells/fmtc4052Cell01/nodes/ihsnode/servers/httpserver1/plugin-key.kdb"**.
4. Enter the default password **"WebAS"** for the keystore of the plug-in.
5. Re-enter the default password.
6. Select keystore type **"CMSKS"**.
7. Click **OK**, **Save** and **Synchronize** the changes.

4. The result is the following key store entry:



Select	Name	Description	Path
<input type="checkbox"/>	CellDefaultKeyStore	Default key store for fmtc4052Cell01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/key.p12
<input type="checkbox"/>	CellDefaultTrustStore	Default trust store for fmtc4052Cell01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/trust.p12
<input type="checkbox"/>	PluginKeyStore	CMS Keystore of ihs plugin	/bpm75/profiles/Dmgr01/config/cells/fmtc4052Cell01/nodes/ihsnode/servers/httpserver1/plugin-key.kdb

Total 3

5. To verify the troubleshooting action, navigate to:

```
Servers
-> Server Types
   -> Web server
       -> httpserver1
           -> Additional Properties
               -> Plug-in properties
```

Plug-in properties:



Plug-in properties

Ignore DNS failures during Web server startup

* Refresh configuration interval
60 seconds

Repository copy of Web server plug-in files:

* Plug-in configuration file name
plugin-cfg.xml [View](#)

Automatically generate the plug-in configuration file

Automatically propagate plug-in configuration file

* Plug-in key store file name
plugin-key.kdb

1 [Manage keys and certificates](#)
[Copy to Web server key store directory](#)

1. Check if the management buttons are now active and working properly.

12.2.7.2 Configure SSL for the plug-in

Navigate to:

```
Security
-> SSL certificate and key management
  -> Related Items
    -> Key stores and certificates
```

SSL certificate and key management:

[SSL certificate and key management](#) > Key stores and certificates

Defines keystore types, including cryptography, RACF(R), CMS, Java(TM), and all truststore types.

Keystore usages

SSL keystores

Preferences

Select	Name	Description	Management Scope	Path
<input type="checkbox"/>	CellDefaultKeyStore	Default key store for fmtc4052Cell01	(cell):fmtc4052Cell01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/key.p12
<input checked="" type="checkbox"/>	CellDefaultTrustStore	Default trust store for fmtc4052Cell01	(cell):fmtc4052Cell01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/trust.p12
<input type="checkbox"/>	NodeDefaultKeyStore	Default key store for fmtc4054Node01	(cell):fmtc4052Cell01; (node):fmtc4054Node01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/nodes/fmtc4054Node01/key.p12
<input type="checkbox"/>	NodeDefaultKeyStore	Default key store for fmtc4055Node01	(cell):fmtc4052Cell01; (node):fmtc4055Node01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/nodes/fmtc4055Node01/key.p12
<input type="checkbox"/>	NodeDefaultTrustStore	Default trust store for fmtc4054Node01	(cell):fmtc4052Cell01; (node):fmtc4054Node01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/nodes/fmtc4054Node01/trust.p12
<input type="checkbox"/>	NodeDefaultTrustStore	Default trust store for fmtc4055Node01	(cell):fmtc4052Cell01; (node):fmtc4055Node01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/nodes/fmtc4055Node01/trust.p12

1. Click “**CellDefaultTrustStore**”.

Note: Depending on the desired scope of access the related SSL certificate to be exported is chosen. Using the CellDefaultTruststore for this action will allow SSL connections to all members of the Cell.

Navigate to:

Additional Properties
-> Signer certificates

SSL certificate and key management:

The screenshot shows the 'SSL certificate and key management' window. The breadcrumb path is 'SSL certificate and key management > Key stores and certificates > CellDefaultTrustStore > Signer certificates'. Below the breadcrumb, there is a 'Preferences' section with buttons for 'Add', 'Extract', and 'Retrieve from port'. The 'Extract' button is circled with a green '2'. Below this is a table with columns: 'Select', 'Alias', 'Issued to', 'Fingerprint (SHA Digest)', and 'Expiration'. The table contains two entries: 'datapower' and 'root'. The 'root' entry is selected, indicated by a checked checkbox and a green circle with the number '1'. The 'root' entry details are: Issued to: 'CN=fmtc4052.boeblingen.de.ibm.com, OU=Root Certificate, OU=fmtc4052Cell01, OU=fmtc4052CellManager01, O=IBM, C=US'; Fingerprint: '7F:47:83:55:A7:94:9C:F8:76:6B:08:B0:92:3A:C7:51:17:5F:B0:A2'; Expiration: 'Valid from Jun 19, 2011 to Jun 15, 2026.' The total count at the bottom is 'Total 2'.

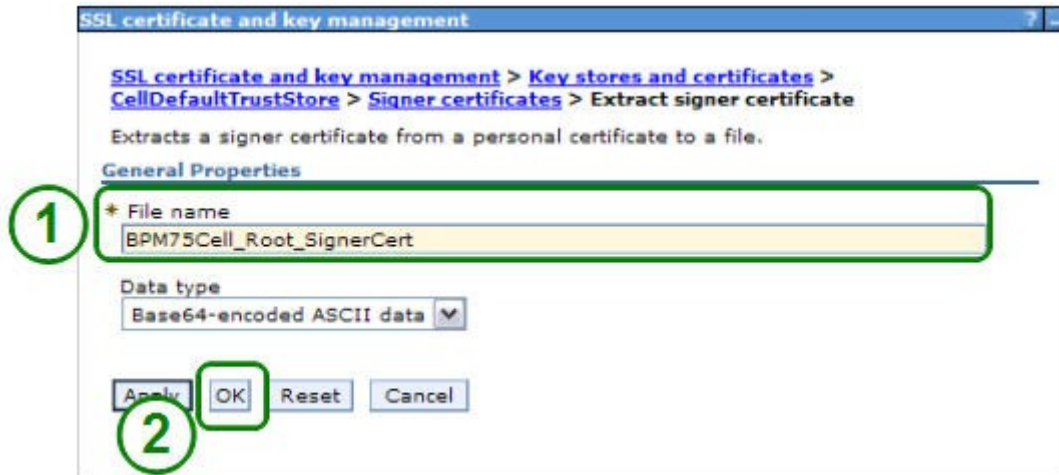
1. Check “root” signer certificate
2. Click **Extract**.

SSL certificate and key management:

This screenshot is identical to the one above, showing the 'SSL certificate and key management' window with the 'root' certificate selected and the 'Extract' button highlighted. The table data and annotations are the same as in the previous screenshot.

1. Check “root” signer certificate
2. Click **Extract**.

SSL certificate and key management:



1. Specify a filename for the certificate export.

2. Click **OK**.

3. Take note of the created export file:



Navigate to:

```
Servers
-> Server Types
  -> Web server
    -> httpserver1
      -> Additional Properties
        -> Plug-in properties
```

Plug-in properties:

Plug-in properties

Ignore DNS failures during Web server startup

* Refresh configuration interval
60 seconds

Repository copy of Web server plug-in files:

* Plug-in configuration file name
plugin-cfg.xml [View](#)

Automatically generate the plug-in configuration file

Automatically propagate plug-in configuration file

* Plug-in key store file name
plugin-key.kdb

1 [Manage keys and certificates](#)

[Copy to Web server key store directory](#)

1. Click [Manage keys and certificates](#)

Navigate to:

Additional Properties
-> Signer certificates

Plug-in properties:

Web servers

[Web servers](#) > [httpserver1](#) > [Plug-in properties](#) > [PluginKeyStore](#) > [Signer certificates](#)

Manages signer certificates in key stores.

⊕ Preferences

1 [Add](#) [Delete](#) [Extract](#) [Retrieve from port](#)

📄 📄 📄 📄

Select Alias [⌵](#) Issued to [⌵](#) Fingerprint (SHA Digest) [⌵](#)

You can administer the following resources:

1. Click [Add](#) to import the Cell root certificate.

Plug-in properties:

Web servers

Web servers > httpserver1 > Plug-in properties > PluginKeyStore > Signer certificates > Add signer certificate

Adds a signer certificate to a key store.

General Properties

* Alias
BPM75Cell_Root_SignerCert

* File name
/bpm/profiles/Dmgr01/etc/BPM75Cell_Root_SignerCert

Data type
Base64-encoded ASCII data

Apply OK Reset Cancel

1. Specify an Alias name for the Certificate **“BPM75Cell_Root_SignerCert”**.
2. Specify the location of the exported cell root certificate **“/bpm75/profiles/Dmgr01/etc/BPM75Cell_Root_SignerCert”**.
3. Click **OK**, **Save** and **Synchronize** the change.

Transfer the updated keystore file to the Web server machine by navigating to:

```
Servers
-> Server Types
  -> Web server
    -> httpserver1
      -> Additional Properties
        -> Plug-in properties
```

Plug-in properties:

Plug-in properties

Ignore DNS failures during Web server startup

* Refresh configuration interval
60 seconds

Repository copy of Web server plug-in files:

* Plug-in configuration file name
plugin-cfg.xml [View](#)

Automatically generate the plug-in configuration file

Automatically propagate plug-in configuration file

* Plug-in key store file name
plugin-key.kdb

[Manage keys and certificates](#)

1 [Copy to Web server key store directory](#)

1. Click **Copy to Web server key store directory**.

2. The successful file transfer is confirmed by following message:

Messages

I PLGC0064I: The plug-in keyring file is propagated from /bpm75/profiles/Dmgr01/config/cells/fmtc4052Cell01/nodes/ihsnode/servers/httpserver1/plugin-key.kdb to /ihs70/Plugins/config/httpserver1/plugin-key.kdb on the Web server computer.

I PLGC0069I: The propagation of the plug-in keyring is complete for the Web server. fmtc4052Cell01.ihsnode.httpserver1.

12.2.7.3 Configure SSL for the REST services gateway

Note: Start the HTTP server

The REST services gateway leverages additional http calls to the dedicated endpoints. Depending on the chose topology, a SSL configuration for these calls is also required. As the topology described n this document uses a single HTTP server to accomplish the entire HTTP traffic, a SSL signer certificate exchange between the BPM cell and the HTTP server is required to allow HTTP calls made by the REST services gateway.

Navigate to:

```
Security
-> SSL certificate and key management
-> Related Items
-> Key stores and certificates
```

SSL certificate and key management:

[SSL certificate and key management](#) > Key stores and certificates

Defines keystore types, including cryptography, RACF(R), CMS, Java(TM), and all truststore types.

Keystore usages

SSL keystores

Preferences

New Delete Change password... Exchange signers...



Select	Name	Description	Management Scope	Path
<input type="checkbox"/>	CellDefaultKeyStore	Default key store for fmtc4052Cell01	(cell):fmtc4052Cell01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/key.p12
<input checked="" type="checkbox"/>	CellDefaultTrustStore	Default trust store for fmtc4052Cell01	(cell):fmtc4052Cell01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/trust.p12
<input type="checkbox"/>	NodeDefaultKeyStore	Default key store for fmtc4054Node01	(cell):fmtc4052Cell01: (node):fmtc4054Node01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/nodes/fmtc4054Node01/key.p12
<input type="checkbox"/>	NodeDefaultKeyStore	Default key store for fmtc4055Node01	(cell):fmtc4052Cell01: (node):fmtc4055Node01	\${CONFIG_ROOT}/cells/fmtc4052Cell01/nodes/fmtc4055Node01/key.p12
<input type="checkbox"/>	NodeDefaultTrustStore	Default trust store for	(cell):fmtc4052Cell01:	\${CONFIG_ROOT}/cells/fmtc4052Cell01/nodes/fmtc4055Node01/trust.p12

1. Click “CellDefaultTrustStore”.

Navigate to:

```
Additional Properties
-> Signer certificates
```

SSL certificate and key management:

SSL certificate and key management > Key stores and certificates > CellDefaultTrustStore > Signer certificates

Manages signer certificates in key stores.

Preferences

Add Delete **1** Retrieve from port

Select	Alias	Issued to	Fingerprint (SHA Digest)	Expiration
<input type="checkbox"/>	datapower	OU=Root CA, O="DataPower Technology, Inc.", C=US	A9:BA:A4:B5:BC:26:2F:5D:2A:80:93:CA:BA:F4:31:05:F2:54:14:17	Valid from Jun 11, 2003 to Jun 6, 2023.
<input checked="" type="checkbox"/>	root	CN=fmtc4052.boeblingen.de.ibm.com, OU=Root Certificate, OU=fmtc4052Cell01, OU=fmtc4052CellManager01, O=IBM, C=US	7F:47:83:55:A7:94:9C:F8:76:6B:08:80:92:3A:C7:51:17:5F:B0:A2	Valid from Jun 19, 2011 to Jun 15, 2026.

Total 2

1. Click **Retrieve from port**.

SSL certificate and key management:

SSL certificate and key management > Key stores and certificates > CellDefaultTrustStore > Signer certificates > Retrieve from port

Makes a test connection to a Secure Sockets Layer (SSL) port and retrieves the signer from the server during the handshake.

General Properties

1 Host
fmtc4052.boeblingen.de.ibm.com

2 Port
443

SSL configuration for outbound connection
CellDefaultSSLSettings

3 Alias
ihs

4 Retrieve signer information

Apply OK Reset Cancel

1. Enter hostname of HTTP server "fmtc4052.boeblingen.de.ibm.com".
2. SSL Port "443".
3. An Alias for the signer certificate of the HTTP server
4. Click **Retrieve signer information**.

SSL certificate and key management:

Retrieved signer information

Serial number	1309967090
Issued to	CN=fmtc4052.boeblingen.de.ibm.com
Issued by	CN=fmtc4052.boeblingen.de.ibm.com
Fingerprint (SHA digest)	99:FA:87:F9:C5:58:BE:18:D1:20:4C:02:35:9F:7D:7B:43:58:39:29
Validity period	Jul 5, 2012

Apply OK Reset Cancel

1

1. Verify result of retrieval and click **OK**, **Save** and **Synchronize** the change.

12.2.8 Verify the HTTP server configuration

The following Web applications should now be accessible through the HTTP Server leveraging SSL:

BPC Explorer:

<https://fmtc4052.boeblingen.de.ibm.com/bpc>

Business Space:

<https://fmtc4052.boeblingen.de.ibm.com/BusinessSpace>

Business Rules Manager:

<https://fmtc4052.boeblingen.de.ibm.com/br>

12.2.9 Configure BFM and HTM REST endpoints

Navigate to:

Services
-> REST services
-> REST service Providers

REST service providers:

Provider Application	Scope
IBM_BPM_Teamworks_BPMPs.AppTarget	Cluster=BPMPs.AppTarget
BPEContainer_BPMPs.AppTarget	Cluster=BPMPs.AppTarget
TaskContainer_BPMPs.AppTarget	Cluster=BPMPs.AppTarget
REST_Services_Gateway_Dmgr	Node=fmtc4052CellManager01,Server=dmgr
REST_Services_Gateway	Cluster=BPMPs.WebApp
Total 5	

1. Click "**IBM_BPM_Teamworks_BPMPs.AppTarget**" to edit the REST API settings.

REST service providers:

REST service providers

REST service providers > IBM_BPM_Teamworks_BPMP5.AppTarget

Configure Representational State Transfer (REST) services in the selected service provider. Enable or disable each REST service and modify the description, which describes the purpose of each REST service.

Configuration

General Properties

Scope: Cluster=BPMP5.AppTarget

Provider application: IBM_BPM_Teamworks_BPMP5.AppTarget

Protocol: https://

* Host name or virtual host in a load-balanced environment: **fmtc4052.boeblingen.de.ibm.com**

* Port: **443**

Context root: /rest/bpm/wle

Enabled	Type	Description	URL
<input checked="" type="checkbox"/>	Process services (7.5.0.0)	REST services for processes (Business process definition)	https://fmtc4052.boeblingen.de.ibm.com:443/rest/bpm/wle/
<input checked="" type="checkbox"/>	Task services (7.5.0.0)	REST services for tasks (Business process definition eng)	https://fmtc4052.boeblingen.de.ibm.com:443/rest/bpm/wle/

Total 2

OK Reset Cancel

1. Edit the hostname and port to match the SSL Port of the HTTP server, **"fmtc4052.boeblingen.de.ibm.com", "443"**.

2. Click **OK**.

REST service providers:

1. Repeat this configuration step for the remaining four service providers:

Provider Application	Scope
IBM_BPM_Teamworks_BPMP5.AppTarget	Cluster=BPMP5.AppTarget
BPEContainer_BPMP5.AppTarget	Cluster=BPMP5.AppTarget
TaskContainer_BPMP5.AppTarget	Cluster=BPMP5.AppTarget
REST Services Gateway Dmgr	Node=fmtc4052CellManager01,Server=dmgr
REST Services Gateway	Cluster=BPMP5.WebApp

Total 5

2. When done, **Save** and **Synchronize** the changes.

3. Restart the entire cell.

Chapter 13 Final verification

Note: Ensure that the entire Cell is up and running including (Dmgr, Nodes, Deployment Environment, HTTPserver)

The final verification is done by deploying and running two different types of applications. The Claims Handling sample application is a traditional .EAR covering a BPEL process and human tasks. The Procurement sample application has been developed with BPM75 development tools and leverages the united WPS and Lombardi world.

13.1 Deploy the Claims Handling sample application

For an advanced verification of the configuration, download the ClaimsHandling Sample application from the "Business Process Management Samples" page:

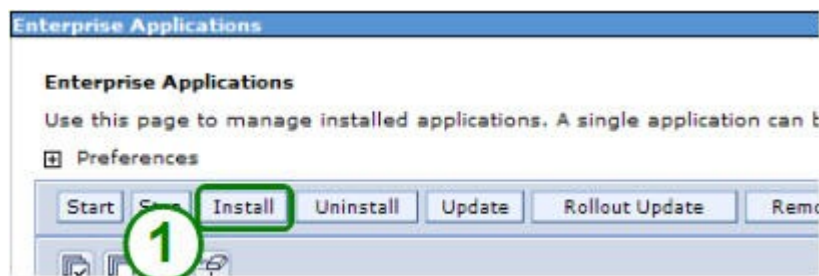
<http://publib.boulder.ibm.com/bpcsamp/scenarios/claimsHandling.html>

Navigate to the download section and make sure to download the application for a clustered environment, that is **ClaimsHandlingApp_cluster** ear and **ClaimsHandlingJSPApp_cluster** ear.

Use the admin console to install both WPS V7 ear files. Navigate to:

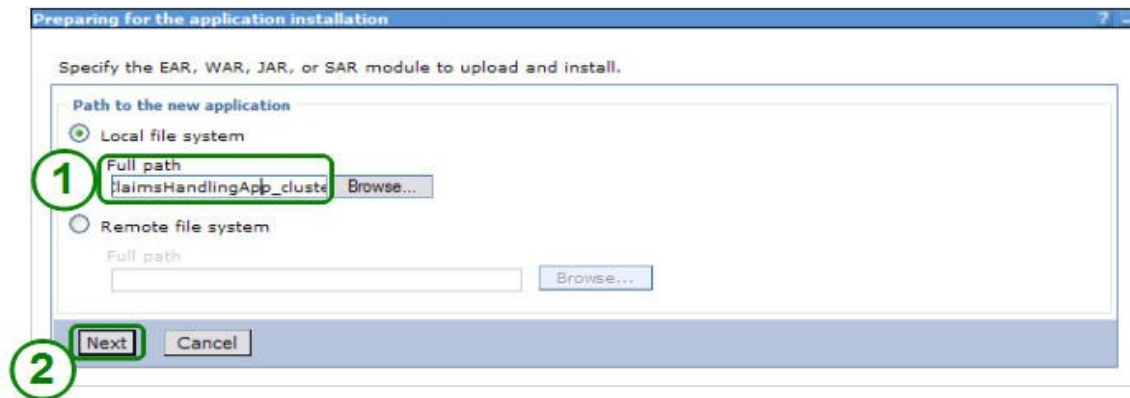
Applications
-> *Application Types*
-> *WebSphere Enterprise Applications*

Enterprise Applications:



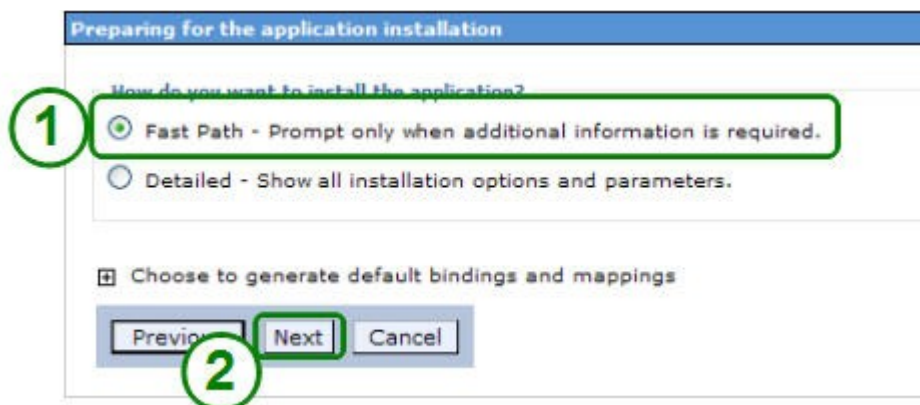
1. Click **Install**.

Prepare for the application installation:



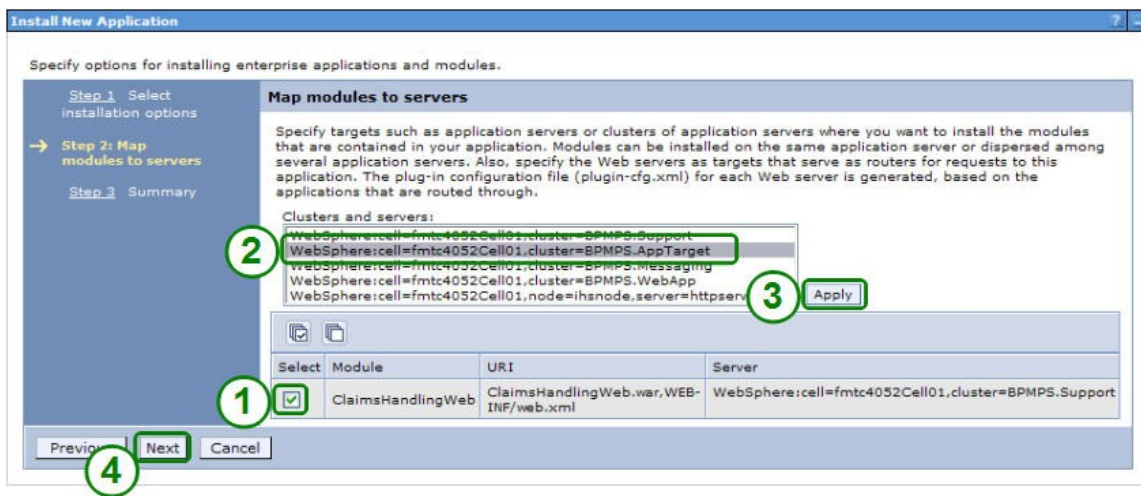
1. Select "Local file system" and browse to the **ClaimsHandlingApp_cluster** ear file.
2. Click **Next**.

Prepare for the application installation:



1. Select "Fast Path".
2. Click **Next**.
3. Leave defaults on panel "Step 1: Select installation options". Click **Next**.

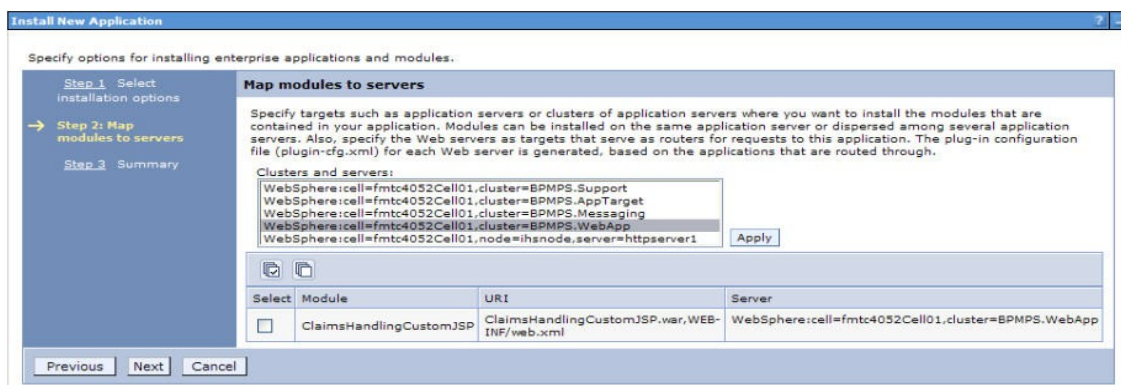
Prepare for the application installation:



1. Tick the box next to "ClaimsHandlingWeb"
2. Select "BPMP.S.AppTarget"
3. Click **Apply**. "ClaimsHandlingWeb" is mapped to the application cluster.
4. Click **Next** then **Finish**. On successful installation **Save** and **Synchronize** the configuration.

Repeat the previous steps to install the ClaimsHandlingJSPApp_cluster ear file as well. The steps are identical, except that the module contained within the ear (ClaimsHandlingCustomJSP) needs to be mapped to the WebApp Cluster.

Prepare for the application installation:

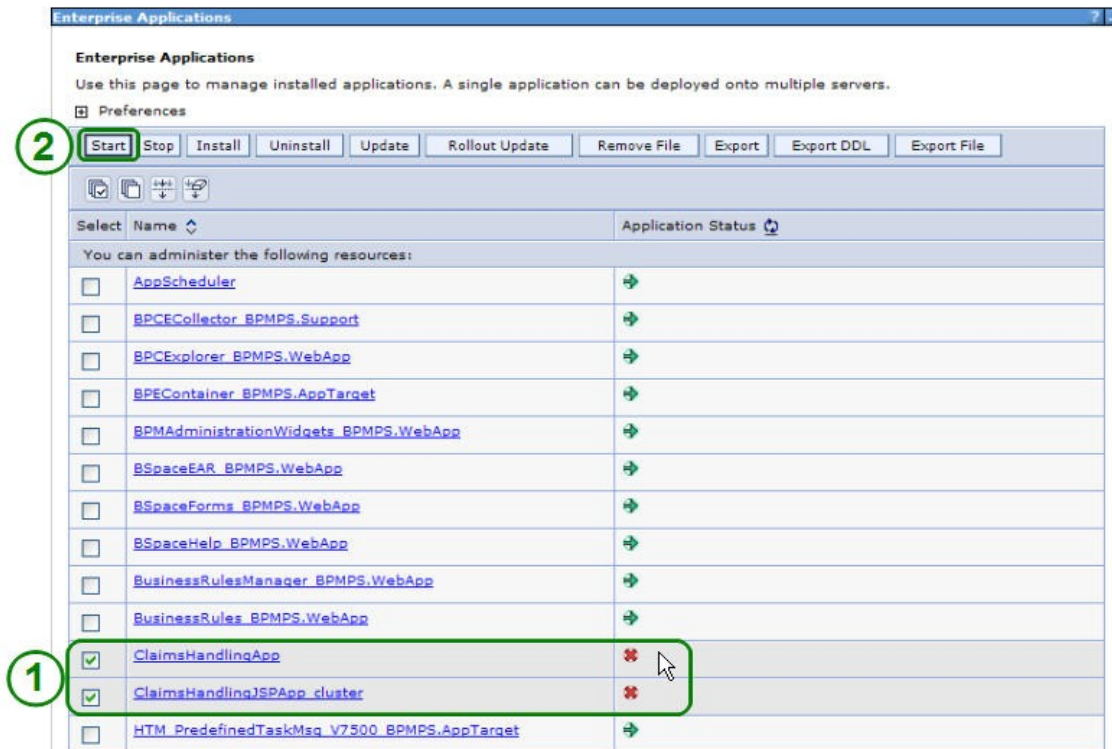


On successful installation **Save** and **Synchronize** the configuration.

Start both applications using the admin console. Navigate to:

Applications
-> **Application Types**
-> **WebSphere enterprise applications**

The deployed applications on the cell are shown:



1. Select **ClaimsHandlingApp** and **ClaimsHandlingJSPApp_cluster**
2. Click **Start** and wait until both applications are started (indicated by a green arrow).

13.2 Run the Claims Handling sample application

Open the BPC Explorer:

<https://fmtc4052.boeblingen.de.ibm.com/bpc>

Navigate to:

Process Templates
-> *Currently Valid*

BPC Explorer – Currently Valid Process Templates:

Business Process Choreographer Explorer

Welcome admin | Logout | Manage Views | Customize | Help | About

Views Reports

Process Templates
Currently Valid
All Versions

Process Instances
Started By Me
Administered By Me
Critical Processes
Terminated Processes
Failed Compensations

Activity Instances

Currently Valid Process Templates

Use this page to view process templates on which you can work. ⓘ

Start Instance Instances View Structure Refresh

Process Template Name	Valid From	Proc
<input checked="" type="checkbox"/> ClaimsHandlingProcess	11/17/2009 5:35:50 PM GMT+02:00	

Items found: 1 Items selected: 1 << Page 1 of 1

1. Select process instance **"ClaimsHandlingProcess"**.
2. Click **Start Instance** to create an instance of this process template.

BPC Explorer – Process Input Message:

Process Input Message

Use this page to provide the input that is needed to start an instance of a process. ⓘ

3

Submit

Process Template Name ClaimsHandlingProcess
Process Description

Operation handleClaim

Process Name **1** myFirstProcess

Process Input Message

Form View

2 request customerNo 123
claimRecord 456

Edit Source

1. Specify a **"Process Name"**.
2. Specify some input data for "customerNo" (123) and "claimRecord" (456).
3. Click **Submit**

BPC Explorer – Currently Valid Process Templates:

Business Process Choreographer Explorer

Welcome admin | Logout | Manage Views | Customize | Help | About

Views Reports

Process Templates
Currently Valid
All Versions

Process Instances
Started By Me
Administered By Me
Critical Processes
Terminated Processes
Failed Compensations

Currently Valid Process Templates

Use this page to view process templates on which you can work. ⓘ

Start Ins **2** Instances View Structure Refresh

<input type="checkbox"/>	Process Template Name	Valid From	Proc
<input checked="" type="checkbox"/>	ClaimsHandlingProcess	11/17/2009 5:35:50 PM GMT+02:00	

Items found: 1 Items selected: 1 Page 1 of 1

1. Select the "**ClaimsHandlingProcess**".
2. Click **Instances** to display the process instances for this template.

BPC Explorer – Process Instances for Process Templates:

Process Instances for Process Templates

Use this page to work with process instances that belong to specific process templates. ⓘ

Migrate Terminate Delete Suspend Resume Restart Compensate Claim Ownership Work Items Create Work **2** View Process State Related


1 <input checked="" type="checkbox"/>	Process Instance Name	Process Template Name	Valid From	Process App	Snapshot
	myFirstProcess	ClaimsHandlingProcess	11/17/2009 5:35:50 PM GMT+02:00		

Items found: 1 Items selected: 1 <<< Page 1 of 1 >>> Items per page: 20

1. Select process instance "**myFirstProcess**".
2. Click **View Process State** to display the process model.

BPC Explorer – Process State View:

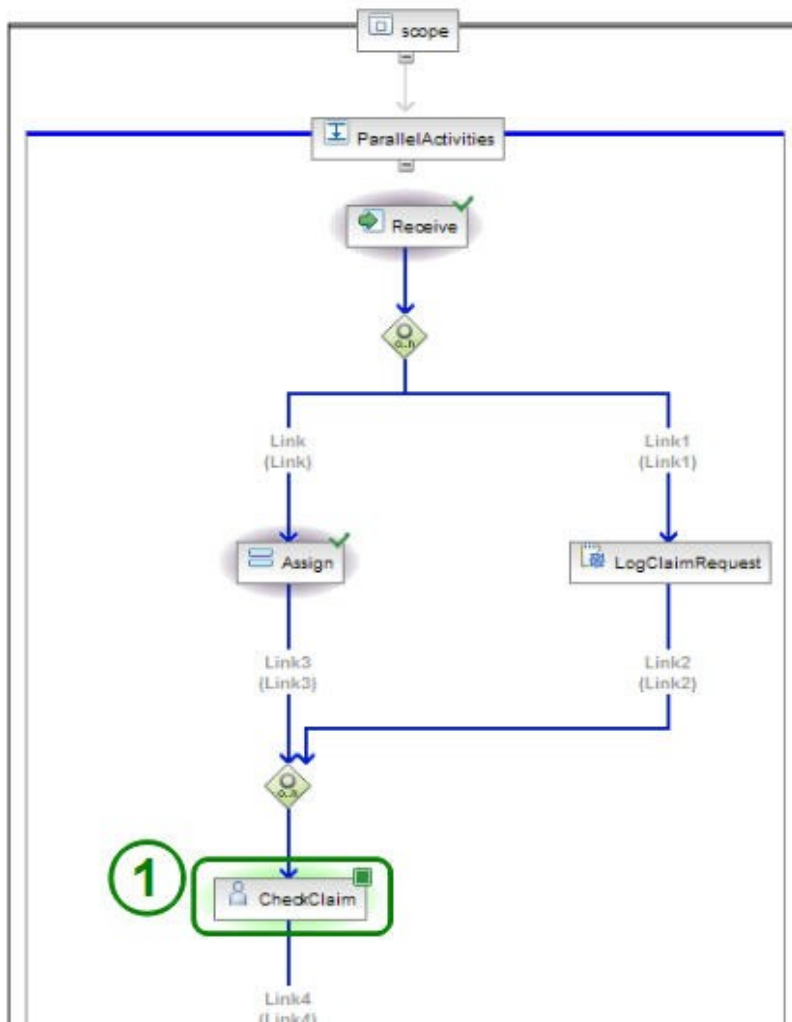
Process State View

Use this page to view a graphical image of the process instance. 

[Refresh](#) [View Process Instance Details](#) [View Process Template Details](#)

Process Instance Name: myFirstProcess
Process Template Name: ClaimsHandlingProcess
State: Running

Detail level:  Zoom: 



1. Verify that "CheckClaim" activity (HumanTask) is highlighted in green (indicating that the process has been navigated to this activity).

Navigate to:

Task Instances
-> **My To-dos**

BPC Explorer – My To-dos:

Priority	Task Name	State	Kind	Owner	Originator	Escalated	Suspended	Activated
5	CheckClaim	Ready	To-do Task	admin	no	no		7/9/2011 10:27:30 AM GMT+02:00

1. Select the task "**CheckClaim**".

2. Click **Work on**.

BPC Explorer – Task Message:

Task Name: CheckClaim

Task Input Message

Task Output Message

Form View

claim	customerNo	123
	claimRecord	456

View Source

Compensate
 Reject
 Follow-Up

1. Click "**Complete**" to finish the human task.

Navigate to:

Process Instances
-> **Administered By Me**

BPC Explorer – Process Instance Administered By Me:

Process Instances Administered By Me

Use this page to work with process instances for which you are the process administrator. 

Process Instance Name  Process Template Name 
Items found: 0 Items selected: 0 Items per page: 20 

1. Check if the process instance has finished correctly. Due to set "Delete on completion" successfully finished process instances are deleted automatically.

13.3 Verify the Business Space

Open the Business Space:

<https://fmtc4052.boeblingen.de.ibm.com/BusinessSpace>

Business Space log-on:

1 User ID
admin

Password

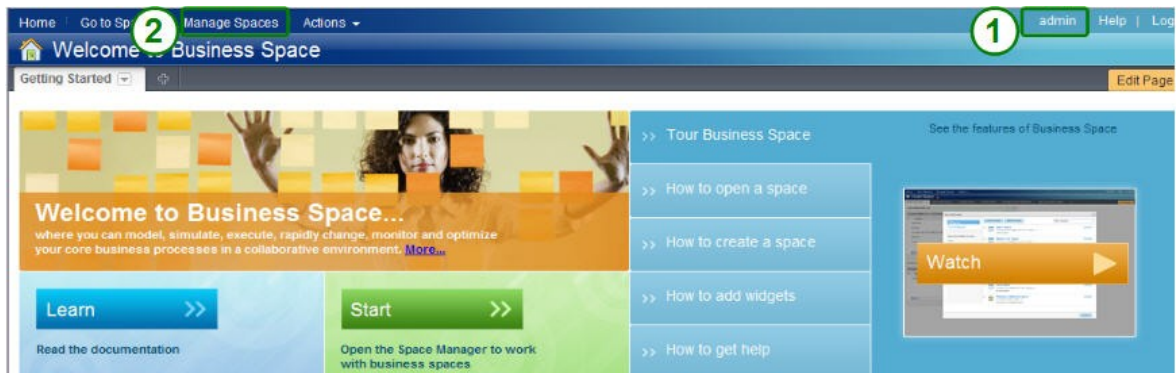
2 Login

Licensed Materials - Property of IBM, © Copyright 2006, 2011 IBM Corporation. IBM, the IBM logo, and WebSphere are trademarks of IBM Corporation, registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies.

IBM. powered by WebSphere.

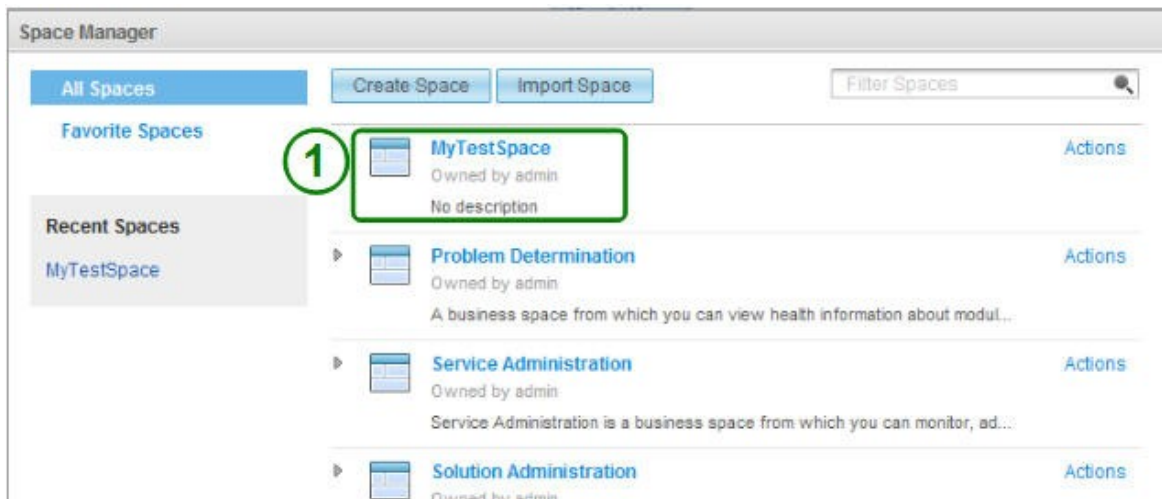
1. Login with BPM admin user **"admin"**.
2. Click **Login**.

Welcome to Business Space:



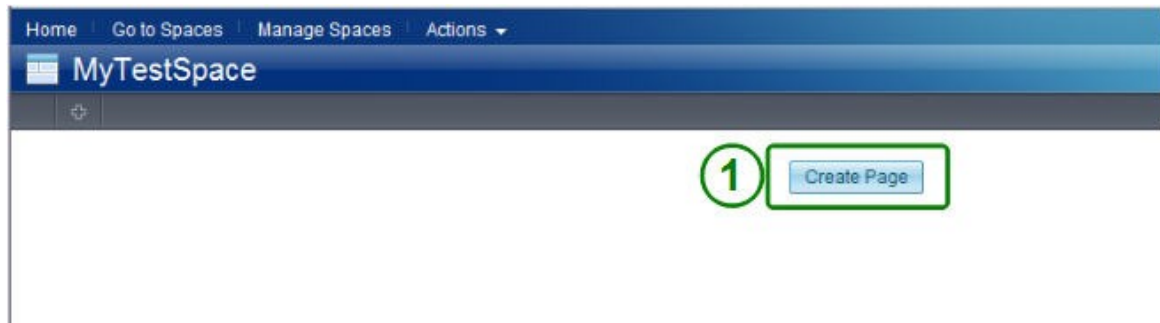
1. The welcome screen is displayed, showing the userID admin logged on.
2. Click **Manage Spaces** and click **Create Space** in Space Manager panel.
3. Enter Space name **"MyTestSpace"**, select a style and a Space icon.
4. Click **Save**.

Space Manager:



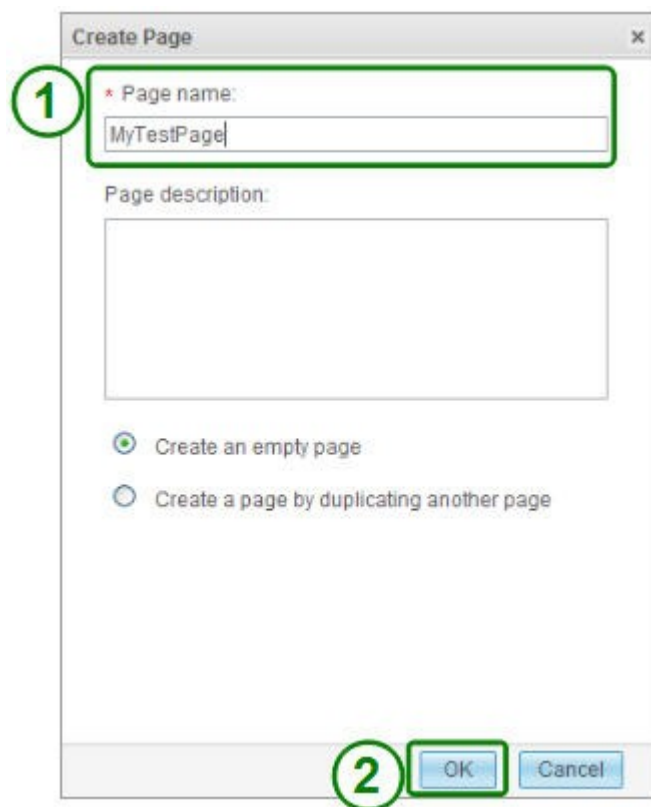
1. Click on the created Space **"MyTestSpace"** to open it.

MyTestSpace:



1. Click **Create Page** to work on the content to be displayed.

Create Page:

A screenshot of a 'Create Page' dialog box. The dialog has a title bar with 'Create Page' and a close button. It contains a text input field for 'Page name' with the value 'MyTestPage' entered. Below this is a larger text area for 'Page description'. There are two radio button options: 'Create an empty page' (which is selected) and 'Create a page by duplicating another page'. At the bottom of the dialog, there are 'OK' and 'Cancel' buttons. The 'OK' button is highlighted with a green rectangular box, and a circled number '2' is placed to its left.

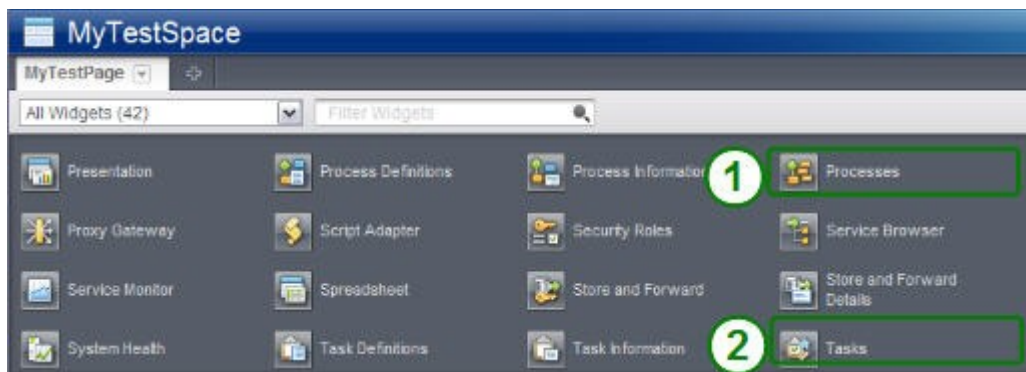
1. Enter a page name, **"MyTestPage"**.
2. Click **OK**.

MyTestSpace:



1. Click **Edit Page** to work on the content to be displayed.

MyTestPage:



Add the **"Processes"** and the **"Tasks"** widget to the page by dragging and dropping or clicking **+** next to the widget name. Click **Save** to save the changes.

Use another Browser window to create a new Claimshandling process instance.
Open the BPC Explorer:

<https://fmtc4052.boeblingen.de.ibm.com/bpc>

Navigate to:

Process Templates
-> **Currently Valid**

BPC Explorer – Currently Valid Process Templates:

1. Select process instance "**ClaimsHandlingProcess**".
2. Click **Start Instance** to create an instance of this process template.

Operation
Process Name
Process Input Message

3

handleClaim

mysecondProcess

Form View

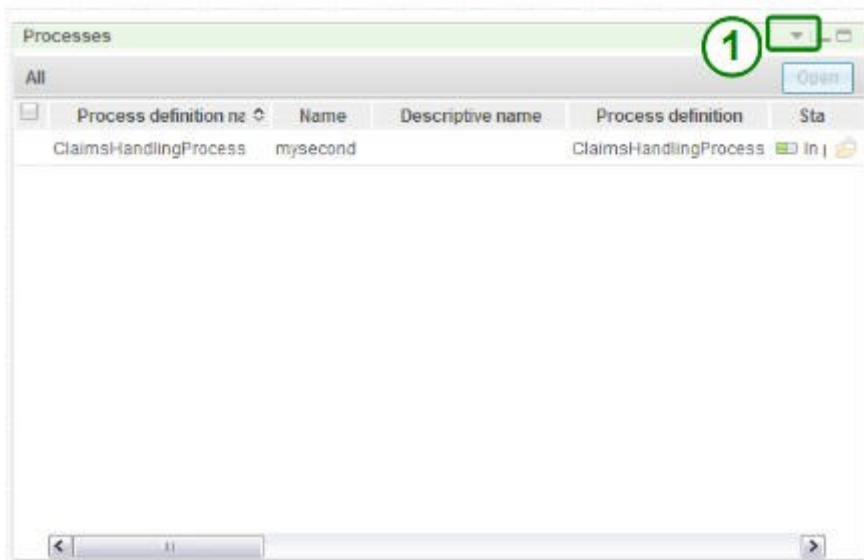
request	customerNo	567
	claimRecord	890

Edit Source

3. Provide the process input details as strings
4. Click **Submit**.

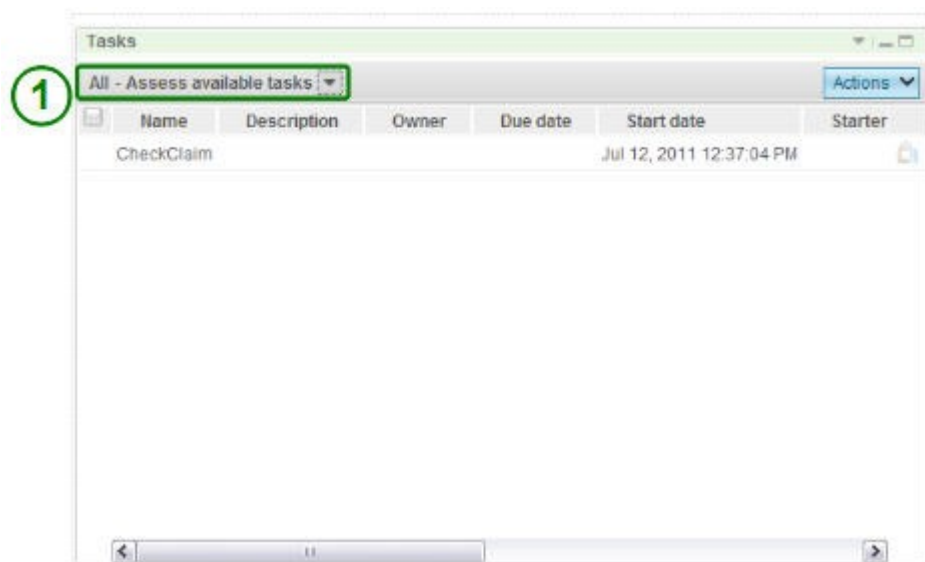
Switch to the Business Space Browser window check if the created Process and related Task are displayed in the "**MyTestPage**":

MyTestPage:



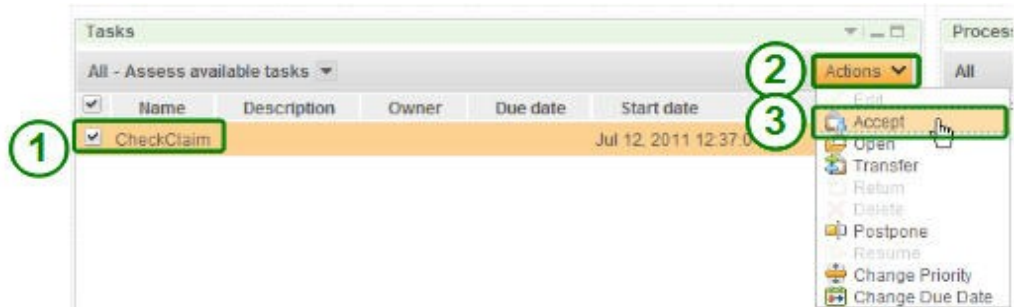
1. Use the process widget actions to refresh the content and check if the newly created process is display.

MyTestPage:



1. Use the task widget filter to display the available tasks to work on.

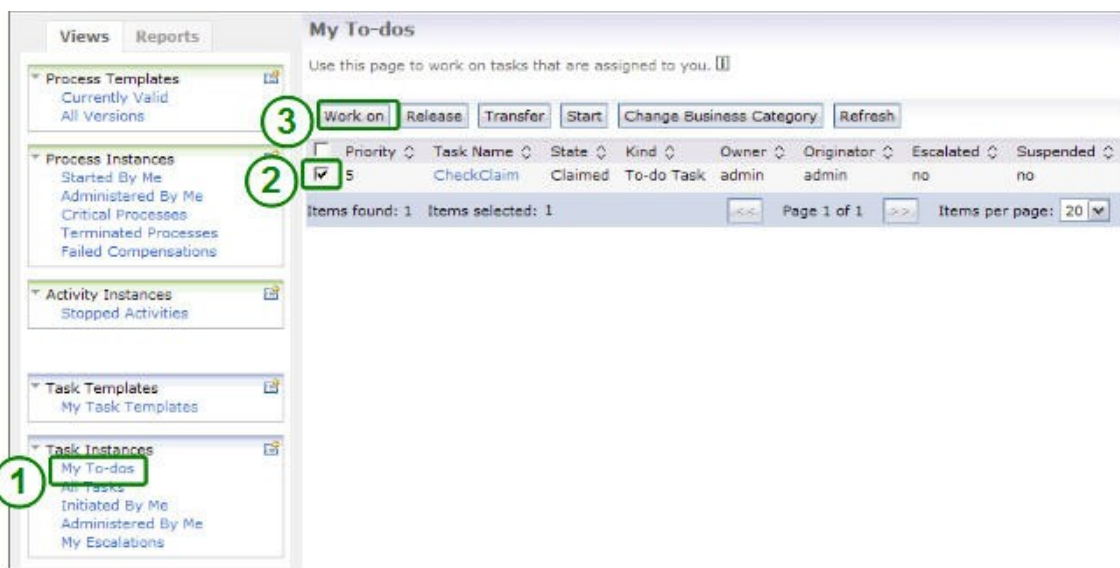
MyTestPage:



1. Select the task to work on it.
2. Open Widget actions
3. Click **Accept** to claim the task.

Switch to the BPC Explorer window and complete the task:

BPC Explorer – Task Instances - My To-dos:



1. Select **"My To-dos"**.
2. Select the task to work on.
3. Click **Work on** to complete the task by clicking **Complete**.

Switch to the Business Space Browser window, refresh the panels and check if the process and the task list is empty now:

MyTestPage:

The screenshot displays two panels from the Business Space Browser. The top panel, titled 'Tasks', has a dropdown menu set to 'All - Work on my tasks' and an 'Actions' button. Below the header, a table lists columns: Name, Description, Owner, Due date, Start date, Starter, and Status. The content area shows 'No tasks were found.'. The bottom panel, titled 'Processes', has a dropdown menu set to 'All' and an 'Open' button. Its table lists columns: Process definition nr, Name, Descriptive name, Process definition, and Status. The content area shows 'No processes were found.'

13.4 Deploy Procurement sample application

For an advanced verification of the configuration, download the Procurement sample application from the "Business Process Management Samples" page:

```
http://publib.boulder.ibm.com/bpcsamp/v7r5/interactionSamples/procurementsample75.html
```

Navigate to the download section and download the application.

Because the sample is provided in .TWX format and the chosen deployment mode for the production topology is **offline-mode**, a running Process Center is required to create the deployment package for offline deployment. Import into Process Center, Offline server creation and deployment package generation are not covered by this documentation. For more info about these steps refer to the BPM 75 infocenter:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/topic/com.ibm.wbpadmin.doc/topics/releasing\_installing\_procs\_D.html
```

In case of an already installed application version, a new snapshot allows to install the new version on top of the existing.

Assumption for the following deployment and usage sequence is, that deployment package named "**PSTEST.zip**" has been generated.

The application has two deployment parts. The deployment package and an EAR file containing the Forms allowing to work on the human Task by leveraging Business Sapce.

Install the deployment package "**PSTEST.zip**":

```
cd /bpm75/BPM/Lombardi/tools/process-installer
./installProcessAppPackage.sh -nodeName fmtc4054Node01 -serverName
BPMP5.AppTarget.fmtc4054Node01.0 -host fmtc4054.boeblingen.de.ibm.com
-port 9080 -username admin -password <admin_password> PSTEST.zip
```

```
...
getConfigLocationServer:
init.config:
installPackage:
BUILD SUCCESSFUL
Total time: 1 second
  Migrating in-flight instances for package finished ...
  Package has been successfully installed.
```

Install the forms part of the business process application using the admin console.
Navigate to:

Applications
-> Application Types
-> WebSphere Enterprise Applications

Enterprise Applications:

1. Click **Install**.

Prepare for the application installation:

Preparing for the application installation

Specify the EAR, WAR, JAR, or SAR module to upload and install.

Path to the new application

Local file system

1 Full path
ple\Sample_PageGA201 Browse...

Remote file system

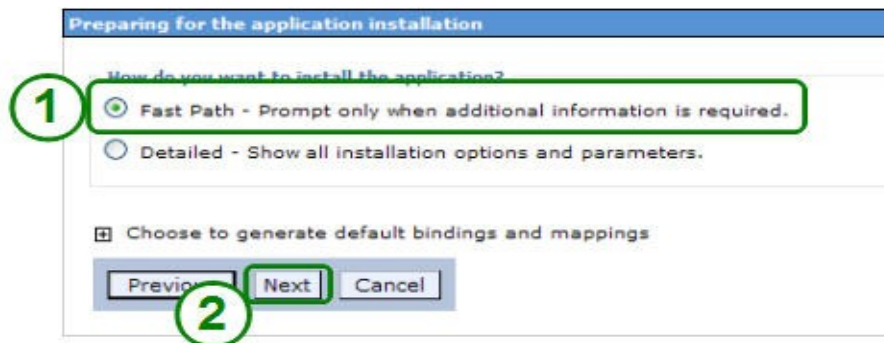
Full path
Browse...

2 Next Cancel

1. Select "Local file system" and browse to the **Procurement_Sample_BPELProcess_FormsEARFile** ear file.

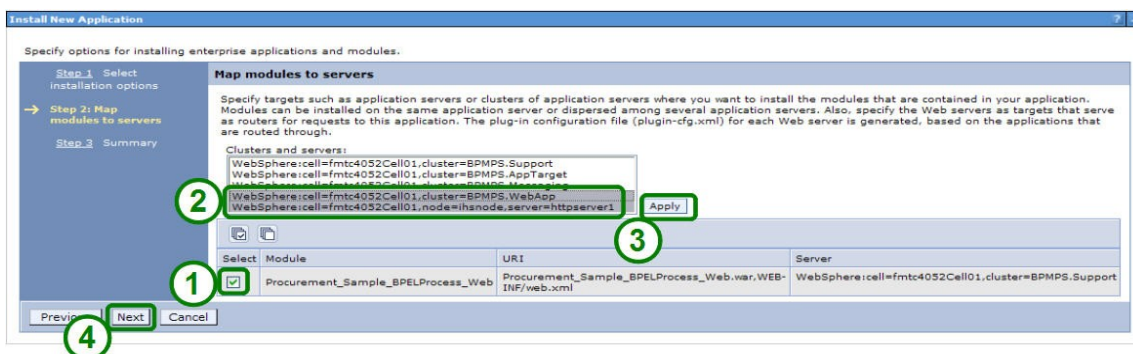
2. Click **Next**.

Prepare for the application installation:



1. Select "Fast Path".
2. Click **Next**.
3. Leave defaults on panel "Step 1: Select installation options". Click **Next**.

Prepare for the application installation:



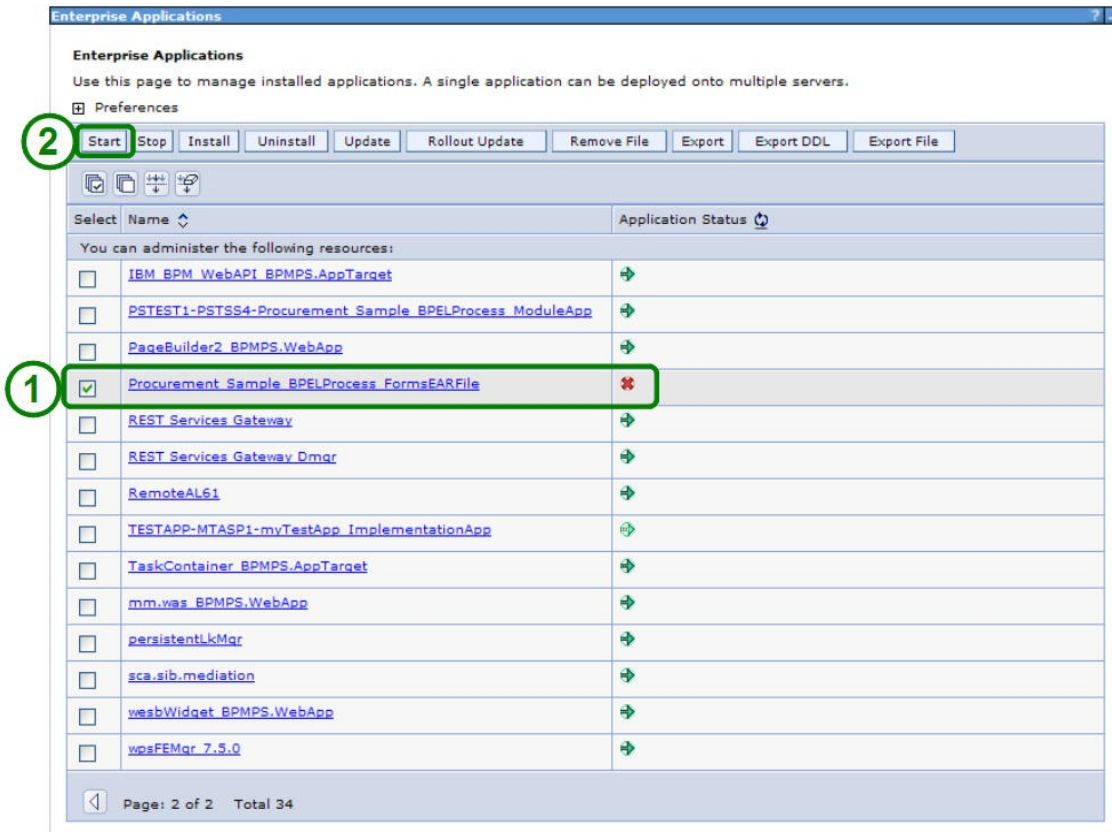
1. Tick the box next to "**Procurement_Sample_BP_ELPProcess_Web**"
2. Select "**BPMP5.WebAppTarget**" and "**httpserver1**"
3. Click **Apply**. "**Procurement_Sample_BP_ELPProcess_Web**" is mapped to the Web application cluster and to the HTTP server.
4. Click **Next** then **Finish**. On successful installation **Save** and **Synchronize** the configuration.

Start the forms applications using the admin console. Navigate to:

Applications
-> Application Types
-> WebSphere enterprise applications

The deployed applications on the cell are shown:

1. Select **Procurement_Sample_BPELProcess_FormsEARFile**.



2. Click **Start** and wait until the application is started (indicated by a green arrow).

Note: The application part deployed via deployment package is automatically started after deployment and does not need an explicit start action.

Note: HTTP plug-in configuration re-generation and distribution is required because a new application with http server dependency has been installed and mapped accordingly. Regenerate and distribute the http plugin now and restart the HTTP server.

13.5 Run Procurement sample application

Open the BPC Explorer:

<https://fmtc4052.boeblingen.de.ibm.com/bpc>

In order to test the second user repository attached, logon this time using credentials related to a user of the shared LDAP user repository:

BPC Explorer Logon:

Welcome to Business Process Choreographer Explorer.

The page you requested is only available to registered users. Enter your username and password and click Login.

User Name:

Password:

Navigate to:

Process Templates
-> Currently Valid

BPC Explorer – Currently Valid Process Templates:

Currently Valid Process Templates

Use this page to view process templates on which you can work.

2

<input type="checkbox"/>	Process Template Name	Valid From	Process App	Snapshot
<input type="checkbox"/>	ClaimsHandlingProcess	11/17/2009 5:35:50 PM GMT+02:00		
1 <input checked="" type="checkbox"/>	ReplenishmentBPEL	7/15/2011 12:19:25 PM GMT+02:00	Procurement_Sample_Test1	Procurement_

Items found: 2 Items selected: 1 Page 1 of 1 Items per page: 20

1. Select process instance **"ReplenishmentBPEL"**.
2. Click **Start Instance** to create an instance of this process template.

BPC Explorer – Process Input Message:

Process Input Message

Use this page to provide the input that is needed to start an instance of a process. [i](#)

3 **Submit**

Process Template Name ReplenishmentBPEL
Process Description

Operation startReplenishmentOrder
Process Name **1** **myfirstReplanishment**
Process Input Message

Form View

input1	orderID	100
	partNumber	99
	quantity	
	orderAmount	
	approved	- Add
	comment	

1. Specify a **"Process Name"**.
2. Specify some input data for "orderID" (100) and "partNumber" (99).
3. Click **Submit**.

BPC Explorer – Process Instances for Process Templates:

Welcome user00001 | Logout | Help | About

Process Instances Administered By Me

Use this page to work with process instances for which you are the process administrator. [i](#)

1 **2** **View Process State**

Process Instance Name	Process Template Name	Valid From	State
<input checked="" type="checkbox"/> myfirstReplanishment	ReplenishmentBPEL	7/15/2011 12:19:25 PM GMT+02:00	Running

Items found: 1 Items selected: 1 Page 1 of 1 Items per page: 20

1. Select process instance **"myfirstReplanishment"**.
2. Click **View Process State** to display the process model.

BPC Explorer – Process State View:

Process State View

Use this page to view a graphical image of the process instance. 

[Refresh](#)

[View Process Instance Details](#)

[View Process Template Details](#)

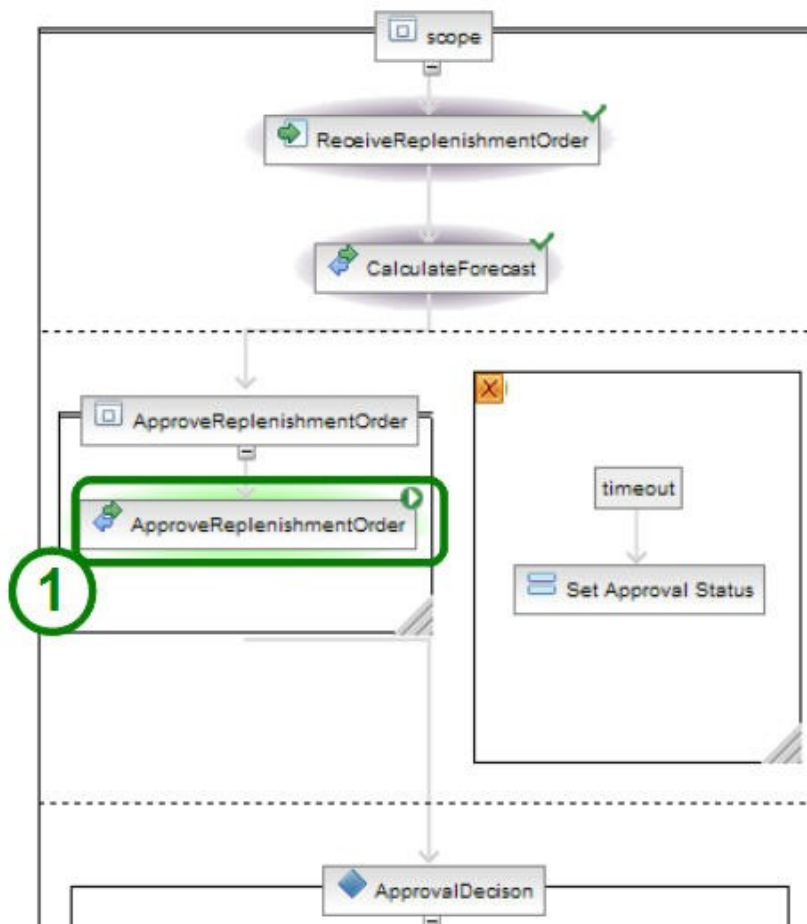
Process Instance Name myfirstReplenishment
Process Template Name ReplenishmentBPEL
State Running

Detail level:

less detail | more detail

Zoom:

small



1. Verify that "**ApproveReplenishmentOrder**" activity (HumanTask) is high-lighted in green (indicating that the process has been navigated to this activ-ity).

Open the Business Space:

<https://fmtc4052.boeblingen.de.ibm.com/BusinessSpace>

Business Space log-on:

Business Space

1 User ID
admin

Password

2 Login

Licensed Materials - Property of IBM. © Copyright 2008, 2011 IBM Corporation. IBM, the IBM logo, and WebSphere are trademarks of IBM Corporation, registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies.

IBM powered by WebSphere.

1. Login with BPM admin user "**admin**".

2. Click **Login**.

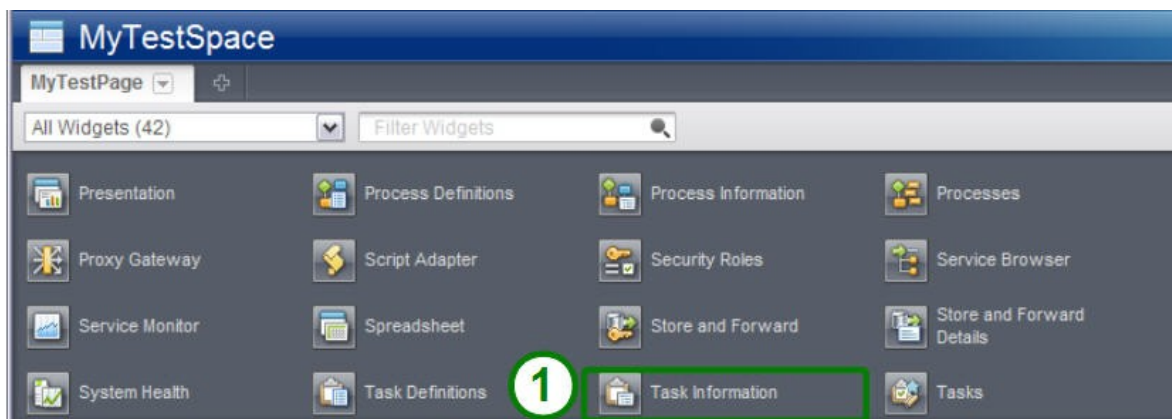
Navigate to the existing Page "MyTestPage" to add the Task information widget:

MyTestSpace:



1. Click **Edit Page** to work on the content to be displayed.

MyTestPage:



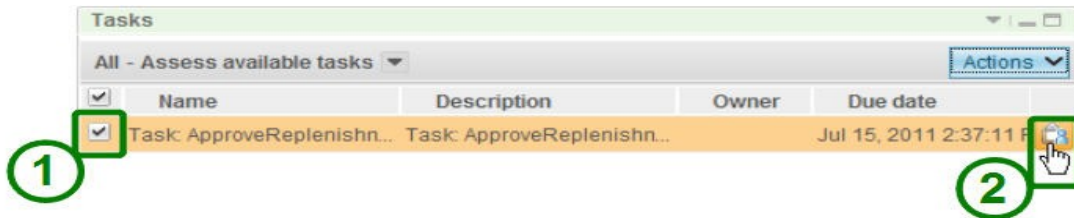
1. Add **"Task Information"** widget to the page by dragging and dropping or clicking **+** next to the widget name.

Note: Another option could be to import the sample Space of the application provided for download on the procurement sample page.

Navigate to:

Task widget
-> All - Assess available tasks

MyTestPage:



1. Select the Replenish task and click "accept and edit" action to work on the task.

The task details are displayed:

MyTestPage:

The screenshot shows a 'Task Information' dialog box for 'Task: ApproveReplenishmentOrder'. The 'Replenish Order Data' section is visible, showing fields for Order ID, Part Number, Quantity, Order Amount, Approved, and Comment. The 'Quantity' field is highlighted with a green circle and the number 1, the 'Comment' field is highlighted with a green circle and the number 2, and the 'Ok' button is highlighted with a green circle and the number 3.

1. Change some Order information e.g. "Quantity".
2. Add a comment for the change.
3. Click **Ok** to complete the task.

Switch to BPC Explorer and navigate to:

Process Instances
-> Administered By Me

BPC Explorer – Process Instances Administered By Me:

Process Instances Administered By Me

Use this page to work with process instances for which you are the process administrator. [i](#)

Process Instance Name Process Template Name
Items found: 0 Items selected: 0 Items per page: 20

Check for completed process instance. Due to set "Delete on completion" flag, the instance is deleted automatically.

Congratulation – Configuration and verification completed successfully.
Production setup of a clustered Process Server with Oracle 11g using IBM Business Process Manager Advanced Edition Version 7.5 is ready for use.

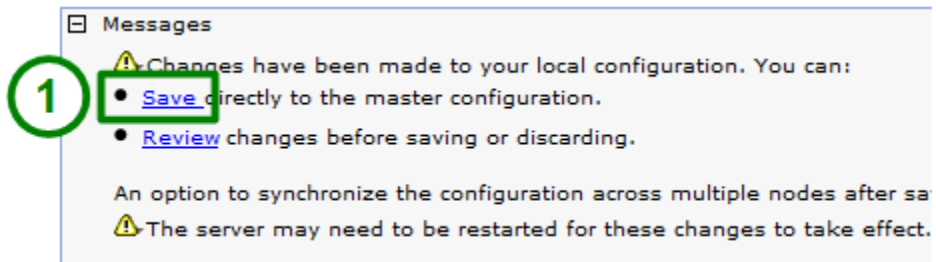
Appendix

Chapter 14 How To and Planning Information

14.1 BPM How To

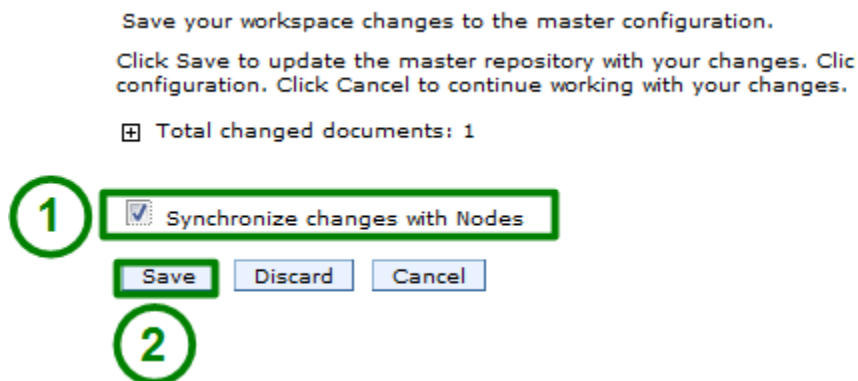
14.1.1 Save changes and synchronize nodes

The "Save changes" section is displayed on top of a page:



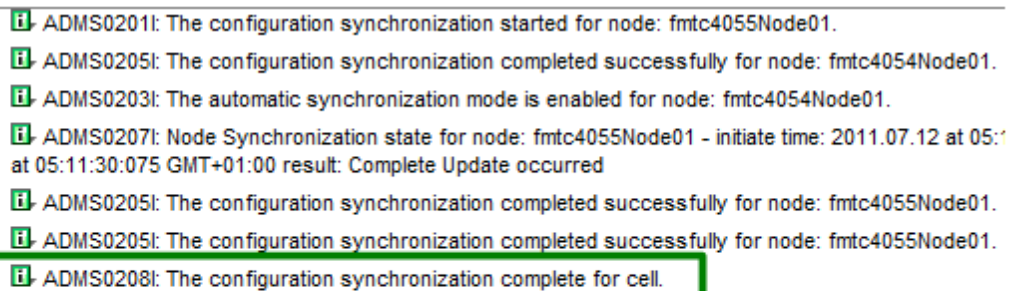
1. Click **Review**.

The "Save" page is displayed:



1. Check "Synchronize changes with Nodes".
2. Click **Save**.

The "Synchronize changes with Nodes" page is displayed:



i ADMS0201: The configuration synchronization started for node: fmtc4055Node01.
i ADMS0205: The configuration synchronization completed successfully for node: fmtc4054Node01.
i ADMS0203: The automatic synchronization mode is enabled for node: fmtc4054Node01.
i ADMS0207: Node Synchronization state for node: fmtc4055Node01 - initiate time: 2011.07.12 at 05:11:30:075 GMT+01:00 result: Complete Update occurred
i ADMS0205: The configuration synchronization completed successfully for node: fmtc4055Node01.
i ADMS0205: The configuration synchronization completed successfully for node: fmtc4055Node01.
i ADMS0208: The configuration synchronization complete for cell.

1

2

OK

1. Verify that synchronization is complete.
2. Click **OK**.

14.1.2 Start/stop the deployment manager and the node agents

This section describes how to stop and start the node agents and the deployment manager. Deployment manager and node agents are the parts of the cell.

14.1.2.1 Stop the deployment manager and the node agents

Before restarting the entire cell all clusters in the cell should be stopped.

In the admin console navigate to:

```
System administration
-> Node agents
```

The "Node agents" page is displayed:

The screenshot shows the 'Node agents' page in the admin console. At the top, there are three buttons: 'Stop', 'Restart', and 'Restart all Servers on Node'. Below these are several icons for actions like 'Select', 'Copy', 'Move', and 'Refresh'. The main part of the page is a table with the following columns: 'Select', 'Name', 'Node', 'Host Name', 'Version', and 'Status'. The table contains two rows of data, both representing 'nodeagent' resources. The first row has a checked checkbox in the 'Select' column, highlighted with a green box and a circled '1'. The 'Status' column for both rows shows a green arrow icon. At the bottom of the table, it says 'Total 2'.

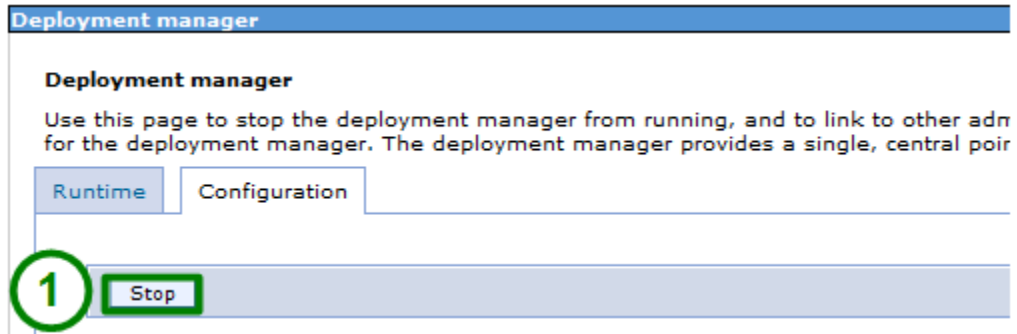
Select	Name	Node	Host Name	Version	Status
<input checked="" type="checkbox"/>	nodeagent	fmtc4054Node01	fmtc4054.boeblingen.de.ibm.com	ND 7.0.0.17 BPMAPS 7.5.0.0 SCA FEP 1.0.1.11 XML FEP 1.0.0.9	➔
<input checked="" type="checkbox"/>	nodeagent	fmtc4055Node01	fmtc4055.boeblingen.de.ibm.com	ND 7.0.0.17 BPMAPS 7.5.0.0 SCA FEP 1.0.1.11 XML FEP 1.0.0.9	➔

1. Select the node agents that are supposed to be stopped.
2. Click **Stop**.

In the admin console navigate to:

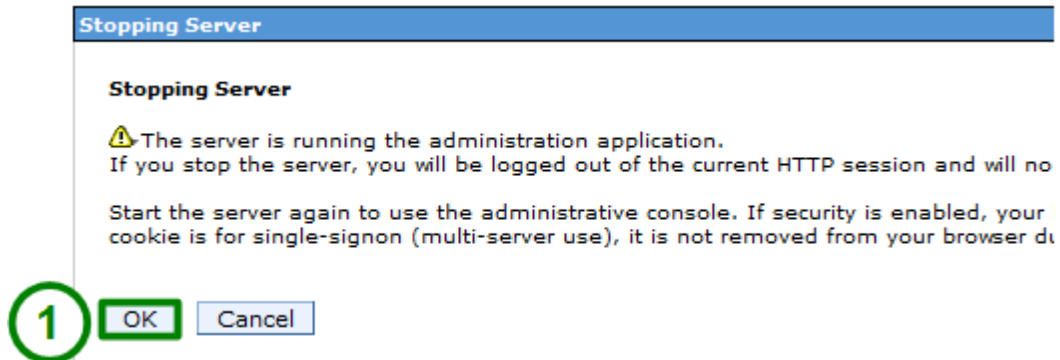
System administration
-> Deployment manager

The "Deployment manager" page is displayed:



1. Click **Stop**.

The "Stopping Server" page is displayed:



1. Click **Ok**.

You can also stop the node agents and the deployment manager by running the following commands as user **root** on the several hosts:

1. On all custom profile node hosts:

```
cd /bpm75/profiles/<custom_profile_name>/bin
./stopNode.sh -username admin -password <admin_password>
```

```
ADMU0116I: Tool information is being logged in file
/
<install_root>/profiles/<custom_profile_name>/logs/nodeagent/stopServer.log
ADMU0128I: Starting tool with the <custom_profile_name> profile
ADMU3100I: Reading configuration for server: nodeagent
ADMU3201I: Server stop request issued. Waiting for stop status.
ADMU4000I: Server nodeagent stop completed.
```

2. On the deployment manager host:

```
cd /bpm75/profiles/<dmgr_profile_name>/bin
./stopManager.sh -username admin -password <admin_password>
```

```
ADMU0116I: Tool information is being logged in file
/<install_root>/profiles/<dmgr_profile_name>/logs/dmgr/stopServer.log
ADMU0128I: Starting tool with the <dmgr_profile_name> profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3201I: Server stop request issued. Waiting for stop status.
ADMU4000I: Server dmgr stop completed.
```

14.1.2.2 Start the deployment manager and the node agents

To start the deployment manager and the node agents execute the following commands as user **root** on the corresponding host:

1. On the deployment manager host:

```
cd /<install_root>/profiles/<dmgr_profile_name>/bin
./startManager.sh
```

```
ADMU0116I: Tool information is being logged in file
/<install_root>/profiles/<dmgr_profile_name>/logs/dmgr/startServer.log
ADMU0128I: Starting tool with the <dmgr_profile_name> profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server dmgr open for e-business; process id is 8941
```

2. On all node hosts:

```
cd /<install_root>/profiles/<custom_profile_name>/bin
./startNode.sh
```

```
ADMU0116I: Tool information is being logged in file
/
<install_root>/profiles/<custom_profile_name>/logs/nodeagent/startServer.l
og
ADMU0128I: Starting tool with the <custom_profile_name> profile
ADMU3100I: Reading configuration for server: nodeagent
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server nodeagent open for e-business; process id is 7000
```

14.2 IHS How To

14.2.1 Starting and stopping the HTTP server

To start the http server run the following commands as user **root** on the http host:

```
cd /ihs70/bin
./apachectl start
```

To stop the http server run the following commands as user **root** on the http host:

```
cd /ihs70/bin
./apachectl stop
```

14.2.2 Starting and stopping the HTTP admin server

To start the http admin server run the following commands as user **root** on the http host:

```
cd /ihs70/bin
./adminctl start
```

```
./adminctl start: admin http started
```

To stop the http admin server run the following commands as user **root** on the http host:

```
cd /ihs70/bin
./adminctl stop
```

```
./adminctl stop: admin http stopped
```

14.2.3 Verification/Configuration How To

14.2.3.1 Verify/Configure JDBC providers

In the admin console, navigate to:

Resources
-> **JDBC**
-> **JDBC providers**

Verify JDBC providers existence:

Select	Name	Scope	Description
<input type="checkbox"/>	Oracle JDBC Driver (XA)	Cell=fmtc4052Cell01	Oracle JDBC Driver (XA)
<input type="checkbox"/>	Oracle JDBC Driver (XA)	Cluster=BPMP.S.Support	Oracle JDBC Driver (XA)
<input type="checkbox"/>	Oracle JDBC Driver (XA)	Cluster=BPMP.S.AppTarget	Oracle JDBC Driver (XA)
<input type="checkbox"/>	Oracle JDBC Driver (XA)	Cluster=BPMP.S.Messaging	Oracle JDBC Driver (XA)
<input type="checkbox"/>	Oracle JDBC Driver (XA)	Cluster=BPMP.S.WebApp	Oracle JDBC Driver (XA)

Total 5

1. Verify that the JDBC providers shown above have been created.
2. Verify each JDBC provider by clicking the provider link (Screenshot shows JDBC provider details of Support Cluster):

JDBC Provider > Oracle JDBC Driver (XA)

JDBC Provider

Configuration

General Properties

* Scope
cells:fmtc4052Cell01:clusters:BPMPs.Support

* Name
Oracle JDBC Driver (XA)

Description
Oracle JDBC Driver (XA)

1 Class path
\${ORACLE_JDBC_DRIVER_PATH}/ojdbc6.jar

Native library path

Isolate this resource provider

2 * Implementation class name
oracle.jdbc.xa.client.OracleXADataSource

Apply OK Reset Cancel

1. Verify that the "Class path" to "\${ORACLE_JDBC_DRIVER_PATH}/**ojdbc6.jar**". Environment variable e.g. path definitions can be found in the Environment section of the admin console.
2. Verify that the "Implementation class name" is set to "oracle.jdbc.xa.client.OracleXADataSource".
3. Click **Ok**.
4. Repeat these steps for the other four JDBC providers.

14.3 Oracle How To

14.3.1 Starting and stopping the database listener

This chapter describes how to manage the Oracle database listener.

14.3.1.1 Starting the database listener

Login to the database system as user **oracle** and run following command:

```
lsnrctl start
```

```
LSNRCTL for Linux: Version 11.2.0.2.0 - Production on 15-JUL-2011 17:00:35
Copyright (c) 1991, 2010, Oracle. All rights reserved.

Starting /opt/oracle/product/11.2.0/bin/tnslsnr: please wait...

TNSLSNR for Linux: Version 11.2.0.2.0 - Production
System parameter file is
/opt/oracle/product/11.2.0/network/admin/listener.ora
Log messages written to
/opt/oracle/diag/tnslsnr/fmtc6152/listener/alert/log.xml
Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc) (KEY=EXTPROC1521)))
Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)
(HOST=fmtc6152.boeblingen.de.ibm.com) (PORT=1521)))

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=IPC) (KEY=EXTPROC1521)))
STATUS of the LISTENER
-----
Alias                LISTENER
Version              TNSLSNR for Linux: Version 11.2.0.2.0 -
Production
Start Date           15-JUL-2011 17:00:37
Uptime               0 days 0 hr. 0 min. 0 sec
Trace Level          off
Security             ON: Local OS Authentication
SNMP                 OFF
Listener Parameter File
/opt/oracle/product/11.2.0/network/admin/listener.ora
Listener Log File
/opt/oracle/diag/tnslsnr/fmtc6152/listener/alert/log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc) (KEY=EXTPROC1521)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)
(HOST=fmtc6152.boeblingen.de.ibm.com) (PORT=1521)))
The listener supports no services
The command completed successfully
```

Note: The Oracle Listener needs about 1 minute to discover all services. Trying to connect to a database before all services are discovered will lead to an ORA error.

14.3.1.2 Stopping the database listener

Login to the database system as user **oracle** and run following command:

```
lsnrctl stop
```

```
LSNRCTL for Linux: Version 11.2.0.2.0 - Production on 15-JUL-2011 17:12:48
Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=IPC)(KEY=EXTPROC1521)))
The command completed successfully
```

14.3.1.3 Displaying the database listener status

Login the database system as user **oracle** and execute the following command:

```
lsnrctl status
```

```
LSNRCTL for Linux: Version 11.2.0.2.0 - Production on 15-JUL-2011 17:12:29
Copyright (c) 1991, 2010, Oracle. All rights reserved.

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=IPC)(KEY=EXTPROC1521)))
STATUS of the LISTENER
-----
Alias                LISTENER
Version              TNSLSNR for Linux: Version 11.2.0.2.0 -
Production
Start Date           15-JUL-2011 17:11:06
Uptime                0 days 0 hr. 1 min. 22 sec
Trace Level          off
Security              ON: Local OS Authentication
SNMP                  OFF
Listener Parameter File
/opt/oracle/product/11.2.0/network/admin/listener.ora
Listener Log File
/opt/oracle/diag/tnslsnr/fmtc6152/listener/alert/log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=EXTPROC1521)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcip)
(HOST=fmtc6152.boeblingen.de.ibm.com)(PORT=1521)))
Services Summary...
Service "ORA11DB.fmtc6152" has 1 instance(s).
  Instance "ORA11DB", status READY, has 1 handler(s) for this service...
The command completed successfully
```

14.3.2 Starting and stopping the database

This chapter describes how to start and stop the oracle database ORA11DB.

14.3.2.1 Starting the database

To start the database ORA11DB run following commands as user **oracle**:

```
sqlplus / AS SYSDBA
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Fri Jul 15 17:48:21 2011  
Copyright (c) 1982, 2010, Oracle. All rights reserved.  
Connected to an idle instance.
```

```
SQL> startup
```

```
ORACLE instance started.  
  
Total System Global Area 1887350784 bytes  
Fixed Size 2227592 bytes  
Variable Size 520094328 bytes  
Database Buffers 1358954496 bytes  
Redo Buffers 6074368 bytes  
Database mounted.  
Database opened.
```

```
SQL> quit
```

14.3.2.2 Stopping the database

To stop the database ORA11DB run following commands as user **oracle**:

```
sqlplus / AS SYSDBA
```

```
SQL*Plus: Release 11.2.0.2.0 Production on Fri Jul 15 16:42:49 2011  
Copyright (c) 1982, 2010, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit  
Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing  
options
```

```
SQL> shutdown immediate
```

```
Database closed.  
Database dismounted.  
ORACLE instance shut down.
```

```
SQL> quit
```

14.3.3 Starting and stopping the Oracle Enterprise Manager Console

This chapter describes how to manage the Oracle Enterprise Manager Console (OEM) and how to access the OEM website.

14.3.3.1 Starting the Oracle Enterprise Manager

To start the Oracle Enterprise Manager Console run following command as user **oracle**:

```
emctl start dbconsole
```

```
Oracle Enterprise Manager 11g Database Control Release 11.2.0.2.0
Copyright (c) 1996, 2010 Oracle Corporation. All rights reserved.
https://fmtc6152.boeblingen.de.ibm.com:1158/em/console/aboutApplication
Starting Oracle Enterprise Manager 11g Database Control ..... started.
-----
Logs are generated in directory
/opt/oracle/product/11.2.0/fmtc6152.boeblingen.de.ibm.com_ORA11DB/sysman/1
og
```

14.3.3.2 Displaying the Oracle Enterprise Manager status

To display the status of the Oracle Enterprise Manager Console run following command as user **oracle**:

```
emctl status dbconsole
```

```
Oracle Enterprise Manager 11g Database Control Release 11.2.0.2.0
Copyright (c) 1996, 2010 Oracle Corporation. All rights reserved.
https://fmtc6152.boeblingen.de.ibm.com:1158/em/console/aboutApplication
Oracle Enterprise Manager 11g is running.
-----
Logs are generated in directory
/opt/oracle/product/11.2.0/fmtc6152.boeblingen.de.ibm.com_ORA11DB/sysman/1
og
```

14.3.3.3 Stopping the Oracle Enterprise Manager

To stop the Oracle Enterprise Manager Console execute the following command as user **oracle**:

```
emctl stop dbconsole
```

```
Oracle Enterprise Manager 11g Database Control Release 11.2.0.2.0
Copyright (c) 1996, 2010 Oracle Corporation. All rights reserved.
https://fmtc6152.boeblingen.de.ibm.com:1158/em/console/aboutApplication
Stopping Oracle Enterprise Manager 11g Database Control ...
... Stopped.
```

14.3.3.4 Accessing the Oracle Enterprise Manager

To access the Oracle Enterprise Manager type the following url in the web browser:

```
https://fmtc6152.boeblingen.de.ibm.com:1158/em
```

The port can differ and may be found in the file \$ORACLE_HOME/install/portlist.ini.

14.3.4 Resetting a user password in the Oracle database

There is sometimes a need to reset the password for a database user in the Oracle database.

To reset the password of a database user execute the following commands as user **oracle**:

```
# sqlplus / AS SYSDBA

SQL*Plus: Release 11.2.0.2.0 - Production on Fri Jul 15 09:16:52 2011

Copyright (c) 1982, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

```
SQL> ALTER USER <username> IDENTIFIED BY <password>;
```

```
User altered.
```

```
SQL>
```

e.g. resetting the password for the database user "sys":

```
SQL> ALTER USER SYS IDENTIFIED BY <password>;
```

```
User altered.
```

```
SQL>
```

14.3.5 Compute database statistics

14.3.5.1 Prepare the database

Execute the following script :

```
sqlplus sys/<password>@<oracle_sid> AS SYSDBA
@$ORACLE_HOME/rdbms/admin/dbmsstat.sql;
```

to create the dbms_stats packages in the database.

Note: The dbms_stats packages are normally created during the database creation.

14.3.5.2 Gather the database statistics

To gather statistics log in with:

```
sqlplus sys/<password>@<oracle_sid> AS SYSDBA
```

and start the function:

```
execute dbms_stats.Gather_database_stats;
```

14.3.6 Work with Redo Log Groups

14.3.6.1 Sizing the Redo Log Groups

The size of the redo log files depends on the database load. The 1500 MB of the Oracle database chapter are only a rule of thumb. It may be, that greater redo log files are needed.

If a redo log file is full, the database switches to the next redo log file in a round robin manner. On every log switch the database generates a checkpoint. This is very IO extensive. So too small log files are downgrading the database performance.

With Oracle 10g a sizing advisor was introduced. A precondition of this advisor is that the database is on load.

An important parameter of this method is the parameter `FAST_START_MTTR_TARGET`. This is the mean time that the database should be able to recover if a database crash occurs. This parameter is specified in seconds and possible values are between 0 and 3600.

Connect to the database executing the following command as user `oracle`:

```
# sqlplus sys/<password>@<oracle_sid> AS SYSDBA

SQL*Plus: Release 11.2.0.2.0 - Production on Fri Jul 15 09:16:52 2011
Copyright (c) 1982, 2010, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
```

The result of the following SQL statement is the advice for the size in MB of the redo log files:

```
SQL> SELECT OPTIMAL_LOGFILE_SIZE FROM V$INSTANCE_RECOVERY;

OPTIMAL_LOGFILE_SIZE
-----
nnnn
```

14.3.6.2 Changing the redo log size

The size of a redo log file cannot be changed. You have to delete it and recreate it with the right size.

Oracle uses the redo log files in a round robin order. So if you have three redo log files, one is active and two are inactive. You are able to drop a logfile member with the following command:

```
ALTER DATABASE DROP LOGFILE MEMBER  
'/opt/oracle/oradata/<DBNAME>/redo01.log' ;
```

In this command you have to change the name and location of the redo log file. When a redo log member is dropped from the database, the operating system file is not deleted from disk. Rather, the control files of the associated database are updated to drop the member from the database structure. After dropping a redo log file, make sure that the drop completed successfully, and then use the appropriate operating system command to delete the dropped redo log file.

To drop a member of an active group, you must first force a log switch.

To force a log switch, you must have the ALTER SYSTEM privilege:

```
ALTER SYSTEM SWITCH LOGFILE;
```

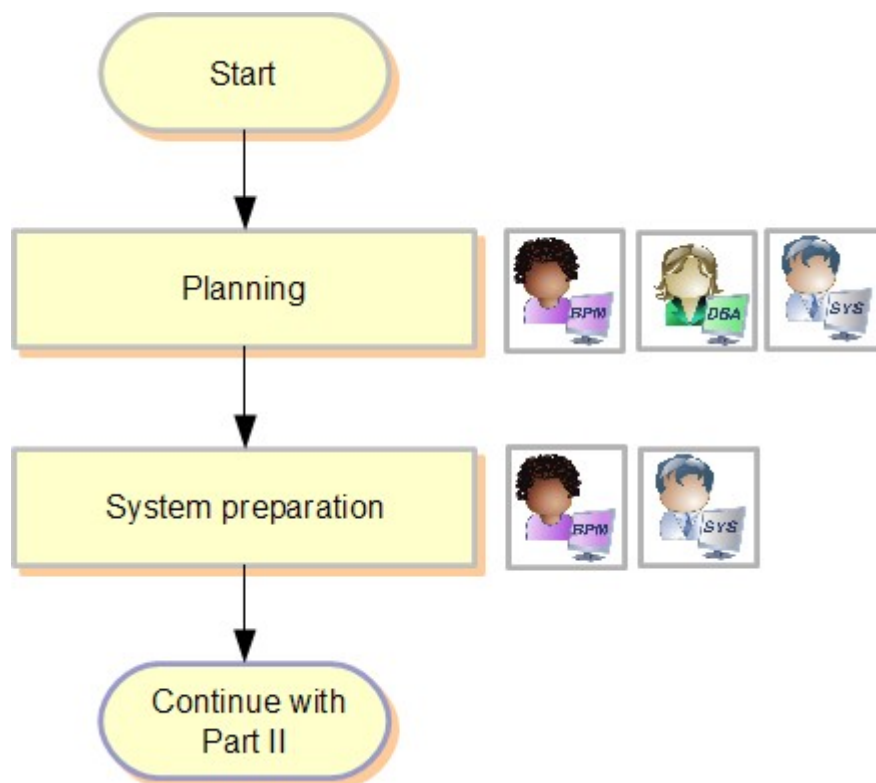
To add a new logfile member use:

```
ALTER DATABASE ADD LOGFILE MEMBER  
'/opt/oracle/oradata/<DBNAME>/redo01.log' SIZE <new log size>M TO GROUP  
<your_group>;
```

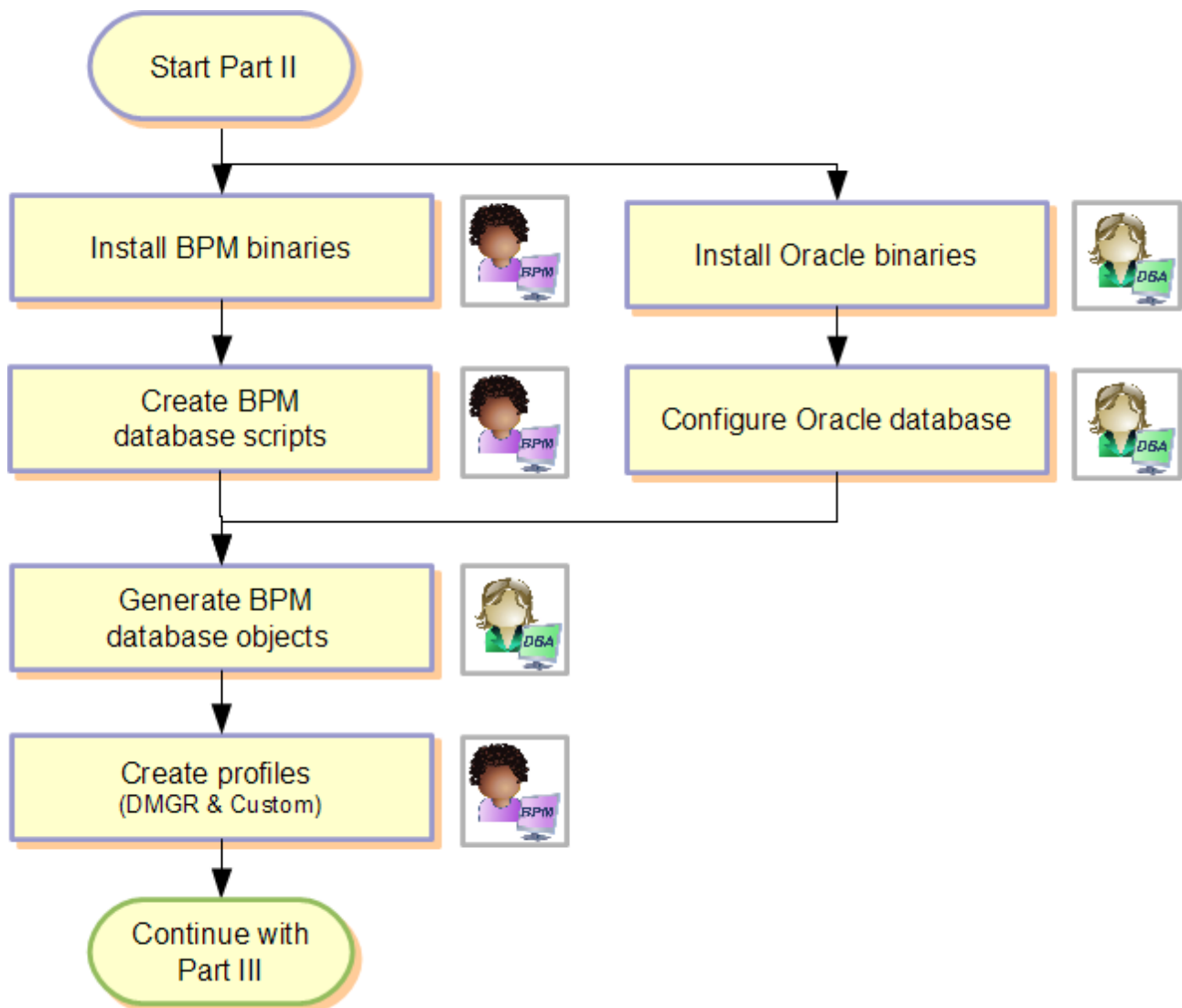
14.4 Planning Information

14.4.1 Diagrams of Setup Sequence

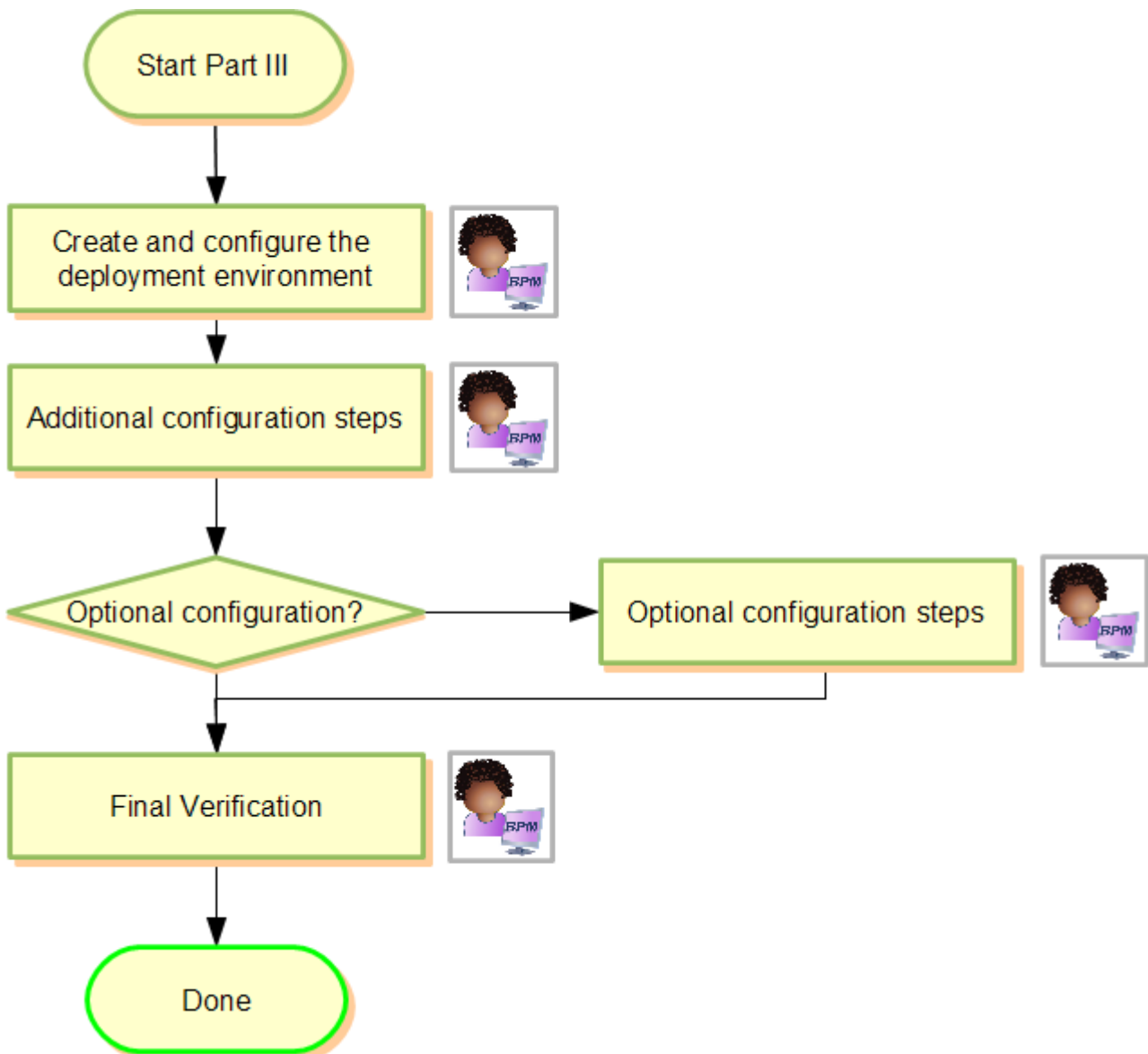
Part I:
Installation and Configuration planning tasks



Part II: Combined BPM Administrator and Database Administrator (DBA) tasks



Part III: BPM Administrator (BPM Admin) tasks



14.4.2 BPM planning

Use this chapter to note the configuration settings that are specific for your setup.

14.4.2.1 General BPM installation planning

Description	Setting	
Linux BPM administrator (Linux system user for the BPM installation)	User name	password
BPM administrator	User name	password
BPM binary location (the location the BPM binaries are extracted to)		
BPM installation location		
Oracle JDBC driver directory		
Installation Manager installation location		
BPM Process Server features		

14.4.2.2 BPM user directory planning

Description	Setting
LDAP server host	
LDAP server port	
Base realm entry 1	
Base realm entry 2	
LDAP anonymous bind	

14.4.2.3 BPM nodes planning

14.4.2.4 BPM Deployment Manager planning

Following settings for the BPM Deployment Manager will be used:

Description	Setting	
Profile name		
Profile path		
Template path		
Server type		
Cell name		
Node name		
Host name		
Enable service		
Enable admin security		
DB type		
DB hostname		
DB server port		
DB name		
DB design enabled		
DB delay config		
DB driver type		
DB JDBC classpath		
DB create new		
Admin user name	User name	password

14.4.2.5 BPM Custom Node planning

Following settings for the first BPM custom node will be used:

Description	Setting
Profile name	
Profile path	
Template path	
Cell name	
Node name	
Host name	
DB type	
DB JDBC classpath	

14.4.2.6 BPM Custom Node planning

Following settings for the second BPM custom node will be used:

Description	Setting
Profile name	
Profile path	
Template path	
Cell name	
Node name	
Host name	
DB type	
DB JDBC classpath	

14.4.2.7 IBM HTTP server node planning

Following settings for the HTTP server node will be used:

Description	Setting	
Node type		
Node name		
Server name (WAS)		
Server type		
Host name		
IHS installation location		
Plug-in installation location		
HTT port		
HTTP administration port		
Create user ID for IHS administration		
Setup IHS administration server		
Install IHS plug-in for WAS		
Webserver name (IHS)		
Admin user name IHS	User name	password
Admin user name admin server	User name	Group

14.4.2.8 BPM Deployment Environment planning

Description	Setting						
Deployment Environment name							
Deployment Environment features							
Deployment Environment pattern							
Utilized nodes							
Cluster member/node ratio							
Application cluster name							
Application cluster member names							
Messaging cluster name							
Messaging cluster member names							
Support cluster name							
Support cluster member names							
Web Application cluster name							
Application cluster member names							
System REST Service Endpoints							
Database Settings	Data Source name	Database name	Schema	Create tables	User name	Password	Server
CEI JMS authentication alias	User name			password			

SCA authentication alias	User name	password
Business Process Choreographer authentication alias	User name	password
Process Server / Process Center online configuration		
JMS API authentication	User name	password
Escalation user authentication	User name	password
Administration job user authentication	User name	password
Enable e-mail service		
Context root	BPC	BPC Rules Manager
NFS mount point for log sharing (transaction log & recovery logs)		
Shared logs top folder (transaction log & recovery logs)		
Transaction log folder AppTarget Custom Node 1		
Transaction log folder AppTarget Custom Node 2		
Transaction log folder Messaging Custom Node 1		
Transaction log folder Messaging Custom Node 2		
Transaction log folder Support Custom Node 1		
Transaction log folder Support Custom Node 2		
Transaction log folder WebApp Custom Node 1		
Transaction log folder WebApp Custom Node 2		
Recovery log folder AppTarget Custom Node 1		
Recovery log folder AppTarget Custom Node 2		

14.4.3 Database Planning

14.4.3.1 General Oracle installation planning

Description	Setting	
Oracle DB Admin (Linux system user for the database installation)	User name	password
Oracle DB SYSDBA (User for the DB objects creation)	User name	password
Oracle Inventory Group		
Oracle Admin Group		
Oracle DB Host		
Oracle DB Port		
Oracle DB Name (SID)		
ORACLE_BASE		
ORACLE_HOME		
Oracle Inventory Location		
Oracle DB File Location		
Oracle Temp Directory (to unzip the install binaries)		

14.4.3.2 BPM database planning

Description	Setting
Oracle DB SGA Size	
Oracle DB PGA Size	
Oracle DB Processes	
OPEN_CURSORS	
SESSION_CACHED_CURSORS	
FAST_START_MTTR_TARGET	
Tablespace SYSAUX	
Tablespace SYSTEM	
Tablespace TEMP	
Tablespace UNDOTBS1	
Tablespace USERS	
Redo Log File Size	

14.4.3.3 BPM schema planning

Based on the naming convention following Schema (=users) will be used:

Component	Deployment Manager	Setup	Profile #	Schema	
				(=User name)	Password
Business Process Choreographer (BPC)					
Performance Data Warehouse (PDW)					
Process Server (PSS)					
Business Space (BSP)					
Common BPM functionality (COM)					
BPC Messaging (BPCMSG)					
PDW Messaging (PDWMSG)					
PSS Messaging (PSSMSG)					
CEI Messaging (CEIMSG)					
SCA SYS Messaging (SCASYSMSG)					
SCA APP Messaging (SCAAPPMSG)					
XA Recovery (XAREC)					

14.4.3.4 BPM tablespaces planning

The tables defined under the BPM schema have to be created in dedicated tablespaces. Here two types of tablespaces are distinguished:

Predefined tablespaces (PDT)

Predefined tablespaces are tablespaces that are created by generated scripts. Following BPM schemas make use of predefined tablespaces:

- BPC4052C01 (incl. Reporting function)
- BSP4052C01

User defined tablespaces (UDT)

User defined tablespaces are required for those BPM schema that do **NOT** provide predefined scripts for tablespace creation. User defined tablespaces are required for for following BPM schema:

- PDW4052C01
- PSS4052C01
- COM4052C01
- BPCMSG4052C01
- PDWMSG4052C01
- PSSMSG4052C01
- CEIMSG4052C01
- SCASYSMSG4052C01
- SCAAPPMSG4052C01

Schema (=User name)	Tablespace		
	Name	Type	Description
BPC4052C01		PDT	Tablespace for audit log items
		PDT	Tablespace for indexes for all tables
		PDT	Tablespace for instance items
		PDT	Tablespace for large objects for all tables
		PDT	Tablespace for scheduler items
		PDT	Tablespace for staff query items
		PDT	Tablespace for template items
		PDT	Tablespace for work item tables and indexes
		PDT	Tablespace for Reporting function indexes
		PDT	Tablespace for Reporting function large objects
	PDT	Tablespace for Reporting function tables	
PDW4052C01		UDT	Tablespaces for Performance Data Warehouse tables
PSS4052C01		UDT	Tablespaces for Process Server tables
BSP4052C01		PDT	Tablespaces for BusinessSpace function tables
		PDT	Tablespaces for BusinessSpace user data table
COM4052C01		UDT	Tablespaces for common BPM functionality tables
BPCMSG4052C01		UDT	Tablespaces for BPC messaging
PDWMSG4052C01		UDT	Tablespaces for PDW messaging
PSSMSG4052C01		UDT	Tablespaces for PSS messaging
CEIMSG4052C01		UDT	Tablespaces for CEI messaging
SCASYSMSG4052C01		UDT	Tablespaces for SCASYS messaging
SCAAPPMSG4052C01		UDT	Tablespaces for SCAAPP messaging