SAP BPC

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About the Tutorial

SAP Business Planning and Consolidation (BPC) tool helps to automate and streamline business forecast, planning, and consolidation activities in an organization. It is used to support all operational and financial activities in an organization. Using SAP BPC, it also becomes easier to use reporting tools. This tutorial explains the key concepts of SAP BPC.

Audience

This tutorial is designed for those who want to learn the basics of SAP BPC and advance in the field of software development.

Prerequisites

You need to have a basic understanding of any programming language to make the most of this tutorial. However, moderate skills in BI, ABAP, and data modeling is a plus.

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1. SAP BPC – Overview

SAP Business Planning and Consolidation (BPC) tool is used to support all operational and financial activities in an organization. SAP BPC helps in automating and streamlining business forecast, planning, and consolidation activities in your organization.

SAP BPC supports two types of migration - SAP NetWeaver and Microsoft Excel. BPC with Microsoft version enables you to perform modeling, application maintenance, importing data and applying transformations, creating scripts, etc. It leverages the power of MS Excel and provides the user with an Enterprise Power Management (EPM) solution, collaborative tool with robust, readily accepted environment.

SAP BPC provides support for existing Microsoft functionality and various enhancement features like drag and drop report builder, etc.

Following are the key benefits provided by SAP BPC:

- It allows the user to make better business decisions by supporting What-If analysis and allows you to perform scenario-based planning.
- It allows you to collaborate data and thus increase accuracy in business planning and accountability.
- It helps in aligning your plans with strategic goals and hence decrease the cycle time.
- You have an option to choose the version of SAP NetWeaver or Microsoft Platform.

Following are the key benefits that can be achieved by using BPC:

- Business Forecasting
- Analytical Reporting and Analysis
- Budget Planning
- Predictive Analysis and Recommendations
- Improve Compliance
- Consolidation
- Business Process Flows and Smooth Collaboration

What is EPM?

SAP Enterprise Performance Management (EPM) allows your organization to improve its financial and operational performance management. SAP EPM supports various functionalities with SAP Business Planning and Consolidation - BPC-NW or BPC-MS, like financial consolidation, financial information management, supply chain performance management, strategy management and many more areas.

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SAP BPC NetWeaver vs BPC MS

SAP Business Planning and Consolidation NW version is based on the functionality of NetWeaver platform. This is built on NetWeaver HTML5 and supports various user environment capabilities. It also provides various prebuilt components to reuse in different applications.

SAP BPC NW version supports RESTful connection to ABAP backend component and provides regular access to user interface. It also supports client-side logging capabilities.

The following table illustrates the name of the platform and the supported components:

Client	Microsoft Windows Vista 32 bit and 64 bit, MS windows 7 32 bit and 64 bit Window Server 2003, 2008 and 2008 R2 terminal server 32 bit and 64 bit	Microsoft Office 2007, 2010 and 2013 Internet Explorer 9.0 and 10.0 Mozilla Firefox 17 and higher Apple Safari for iPad IOS7 and upper versions
NetWeaver Application Server	Any OS supported by NetWeaver	SAP NetWeaver 7.4. Refer PAM for supported database

SAP BPC for NetWeaver provides various advantages since it is integrated with BW system and allows you to store data in InfoCubes.

Some key advantages of using SAP BPC with NW system are:

Star Schema for Exceptional Reporting: SAP BPC uses NW InfoCubes to store the data. The dimension model used is extended star schema so it makes BPC with NW system and exceptional system for reporting.

No Database Dependence Version: BPC NW version is not dependent on database version and can run common databases like DB2, Oracle, SQL Server, etc.

BW Accelerator Support: SAP NetWeaver BW accelerator tool is an additional feature that can be used to enhance the performance of reporting in the system, even if you are using large datasets. It indirectly helps in saving the cost for a company as less number of performance issues are reported.

BAdI Development and ABAP Support: SAP BPC with NetWeaver allows you to use ABAP programming to develop K2 script logic. It enables to create business add-in BAdi interface in the back-end system, which can be called later from script logic developed in BPC system.

It helps in solving the complex business requirements and to reduce the development time for an organization.

Some **key advantages** of using **SAP BPC MS** are:

Apart from common features provided in BPC like currency translation, allocations, validation and account transformations, automatic adjustments and carry forward of opening balance, the following features can be achieved in BPC MS version:

- **Dimension Logic**: This can be configured in BPC system using simple mathematical formulas.

- **Business Rules**: This allows you to create rules in BPC system to perform specific functions.

- **K2 Script Logic**: This is used to perform some specific functions which can't be achieved using out-of-box functionality to meet business requirements. You can create K2 script logics to perform certain functions, which can be performed in a standard system.

Many organizations use MS Excel to manage business planning and consolidation but it has some disadvantages. Following are the **disadvantages** of using **BPC MS over NetWeaver**:

- **Tough to Manage Excel Spreadsheets**: As business planning and consolidation data is stored in the form of spreadsheets, it creates a security issue and an option to control access is by keeping the files on the shared network drive. In SAP BPC, you can save the data in database and this provides security of data.

- **Version Control**: To create a new version of data, SAP BPC with NW allows you to maintain the version of data in the system and you can maintain the current data too. While using Excel spreadsheets for data store, you need to name the file with new name every time.

- **Integrity of Spreadsheets**: Using spreadsheets make it tough to manage the integrity of the sheets as the same file is accessed by multiple users and it's tough to find out the latest version of spreadsheet. However, SAP system has a central repository to maintain financial and business planning data.

- **Collaboration**: SAP BPC allows you to collaborate data from different users and you can put comments on critical information and Excel doesn't support collaboration feature.

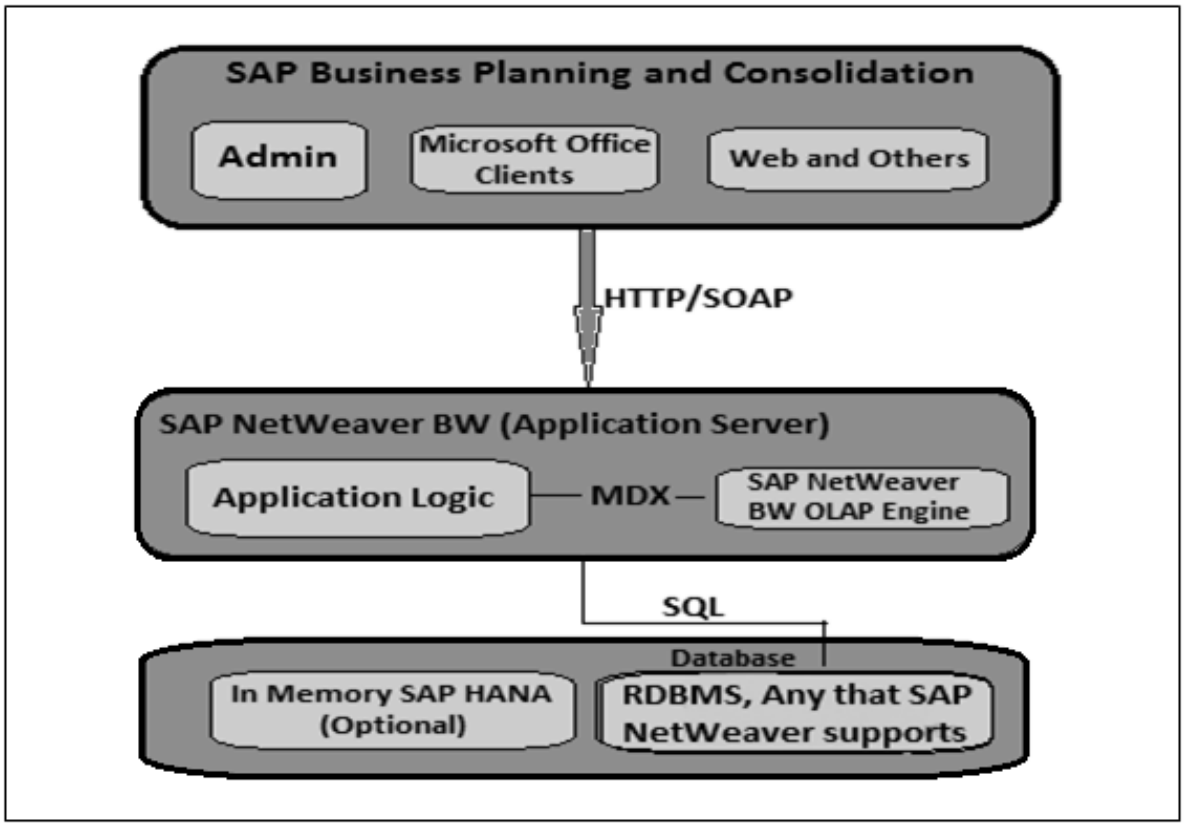
SAP BPC with NetWeaver Architecture

Requirement: SAP NetWeaver ABAP 7.3 or 7.31

Database: Any of the above version of SAP NetWeaver support.

Operating System: Any supported version of SAP NetWeaver system and database engine.

The following figure shows SAP BPC 10.0 architecture.



SAP NetWeaver BW Objects

Difference between SAP BPC v7.5 and v10 is Web Server component. SAP BPC 7.5 NetWeaver uses Microsoft ISS, while BPC 10.0 NW and BPC 10 on HANA use the web server that is part of SAP NetWeaver.

SAP NW 10 is more scalable than SAP NW 7.5 (IIS in 32bit mode) and it simplifies the system topology as no separate Web Server and Network Load Balancing components are required as these were part of BPC 7.5 implementations.

Another difference between the two is version of SAP NetWeaver. SAP BPC 7.5 NW supports SAP NetWeaver 7.01 and 7.02. However, SAP BPC 10 NetWeaver and BPC 10 HANA doesn't support NW 7.01, 7.02 versions. Also note that NW 7.01 and 7.02 requirements are quite different from SAP NetWeaver 7.3.

It means SAP BPC 7.5 NW systems in many organizations are running on older versions of Operating Systems and RDBMS is not supported by SAP NetWeaver 7.3.

Following are the key NetWeaver BW Objects:

- InfoObject
- InfoProvider

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SAP BPC Objects

As per the above architecture, following are the key objects in BPC 10.0:

Client Interface: At the top, you have client interface which is a web-based tool used for configuration and reporting for business planning. It consists of MS Office client, Excel based admin clients, and web-based tool for reporting.

Microsoft-based admin tool is used for configuration of application and Microsoft Office tools such as Word and PowerPoint are used for reporting data.

Web Server and .NET Application Server: This tool uses web services to connect to .NET Application Server. It receives the request from client interface and directs all the requests to ABAP server, which is a part of SAP NetWeaver BW system.

This server is used for data conversion between client tools and SAP NetWeaver BW system.

SAP NetWeaver Application Server: This server is used to process all the requests from client tool. The request from .NET Application server is processed in this server as Remote Function Call RFC. This is used to process requests to create reports or to update the database.

When a request is processed by the Application Server, it gets the data and passes to .NET Application Server, and then sends it back to client interface.

Database Server: This layer is responsible to store all the data in the database. SAP NW back-end system is responsible to create objects and data is stored for BPC system. The NetWeaver supports most of the databases like SQL Server, DB2, Oracle and many more.

Release Strategy

Following are the release notes from SAP for SAP BPC 10.0:

- Product Version 10.0, SAP NetWeaver
- Area CPM-BPC

BPC now supports the following platforms:

- **Server Support:** Any operating system that is supported by SAP NetWeaver. VMware support as per SAP standard. Virtualization, VMware, Microsoft, Windows, Hyper-V, XEN, vSphere, IBM, INxHY, KVM, zBX. SAP NetWeaver Support for NW 7.3. No support for older versions.

- **Database Support:** BPC supports all database that are supported by SAP NetWeaver system.

- **Client Support:** Microsoft Windows, WIN XP (32 bit), Windows Vista (32 bit and 64 bit), and Windows 7 (32 bit and 64 bit).

- **Microsoft .Net Framework:** .Net Framework 3.5 is required.

- **Web Browser Support:** BPC supports the web browsers - IE 8.0 and IE 9.0.

- **Microsoft Office Support:** Microsoft Office 2007 (32 bit and 64 bit) and Microsoft Office 2010 (32 bit and 64 bit). .NET server is no longer required in latest BPC versions.

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2. SAP BPC - Terminologies

On comparing BPC 7.5 and BPC 10.0, following are the key terminology differences between the two.

BPC 7.5	BPC 10.0
AppSet	Environment
Dimensions	Dimensions
Applications	Models
Business Rules	Business Rules
Validation Rules	Control Settings
Script Logic	Logic Script
Work Status Settings	Work Status Settings
Journal Templates	Journal Templates
System Report Settings	Audit Report Settings

Environment: It is defined as the starting point for creating any application or model. It was called Application sets or AppSet in older versions of BPC.

Dimensions: You can mark a dimension as secure. You need to grant read and write access to the users who use the model so they can access data.

Properties: This is used to provide additional information to the dimension.

Dimension Members: Each dimension member record shows master, text and hierarchy data associated with the keys of dimension.

Model: To meet the Business Planning and Consolidation requirement of an organization, you need to build a model in an environment which is defined as collection of several dimensions.

Data Manager Package: To execute common tasks in BPC, you need data manager package.

Business Rules: To manage operations in different countries, different set of business rules are required. BPC includes rule-based table to meet some requirements for business planning and consolidation. Various rules can be set related to business planning and consolidation like - currency translation, balance carry forward, intercompany elimination, and data validation, etc.

Logic Scripts: This is defined as a set of SQL or MDX programming structure to perform some customize functions for flexibility and manage data models. When some specific requirements are not achieved using business rules that can be met by the use of Logic Scripts.

User: A user is defined as an individual who uses the application in Appset.

Team: A team is defined as a group of users based on user roles.

Task: All the activities that are performed in SAP BPC system are called tasks.

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3. SAP BPC – Applications

An **Application** in BPC system is defined as multidimensional data model used in EPM. Few examples of Applications are - Operation, Legal or Finance team.

There are two types of applications in BPC system - Reporting and Non-Reporting. **Reporting applications** are used for analysis purpose and you can pass inputs from the users. **Non-Reporting applications** are used to contain reference data like currency rates, carry forward balances, etc.

An **Appset** consists of one or multiple applications in system. Each application consists of the master data for an application, which is used to control data in the application set. An application can also share one or multiple dimensions with other applications.

Application Architecture

Each Reporting application consists of a dimension, properties to hold the additional information, and dimension members.

Consider a Consolidation Rate application, which consists of Rate app to store currency exchange rates and an Owner application, which stores the relationship between Owner company and its subsidiary companies.

Consolidation	Ownership	Rate
Account (A)	O_Account (A)	R_Account (A)
Category (C)	Category (C)	Category (C)
Entity (E)	Entity (E)	R_Entity (E)
Groups (R)	Groups (R)	InputCurrency (R)
Time (T)	Time (T)	Time (T)
InterCompany (I)	InterCompany (I)	
DataSource (D)		
Flow (S)		

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Creating Applications and Applying Dimensions

To add an application to the Application set, you can use an existing application by selecting reference applications and any set of business rules. You can also add dimensions in new application and these can be defined as secure or non-secure. When you define dimensions as secure it ensures the read and write access is controlled through user profiles.

You can add an application through an admin console: Application -> Add a New Application

To copy an application: Application -> Copy an Application

To create a Consolidation application, you need to define AppSet for consolidation and dimension set for consolidation.

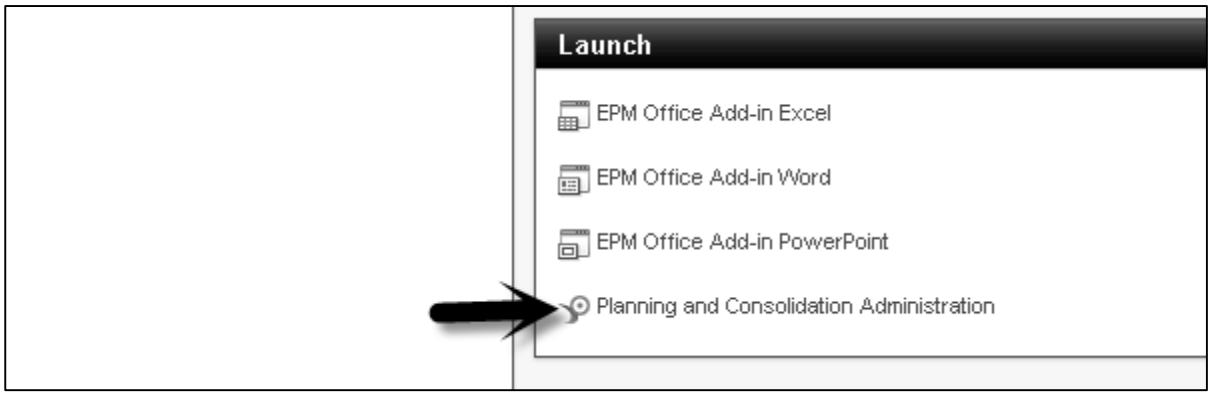
You should set the following parameters after creating the application set.

- ALLOW_FILE_SIZE
- UPLOADTEMP
- TEMPLATEVERSION
- JREPORTZOOM
- LOGLEVEL
- SYSTEM
- MESSAGE
- STATUS

In SAP BPC NetWeaver version, all these parameters are maintained in ABAP DDIC table.

Once the application set is created, the next step is to set up the parameters for Dimension set.

You can add a new dimension or copy an existing dimension. In the Administration Console, go to Dimension and Model.



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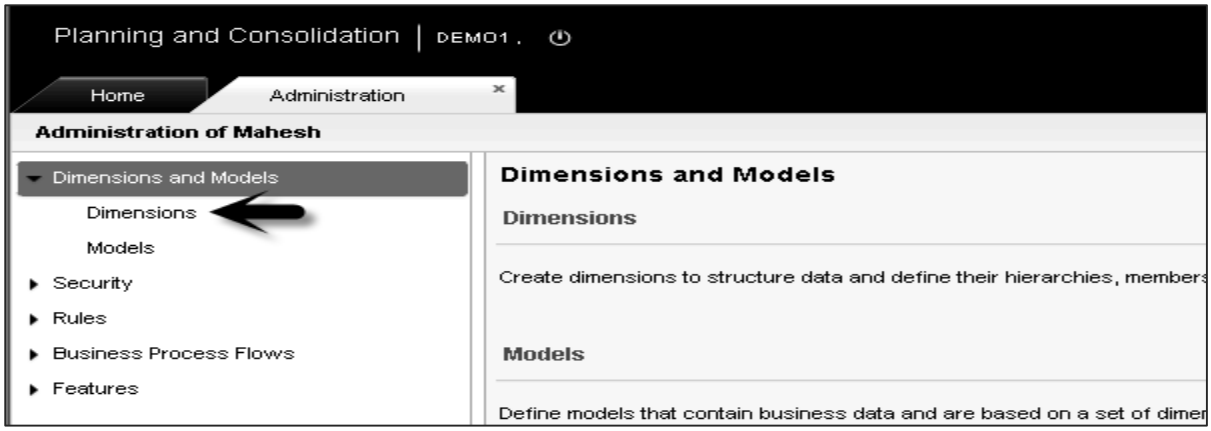
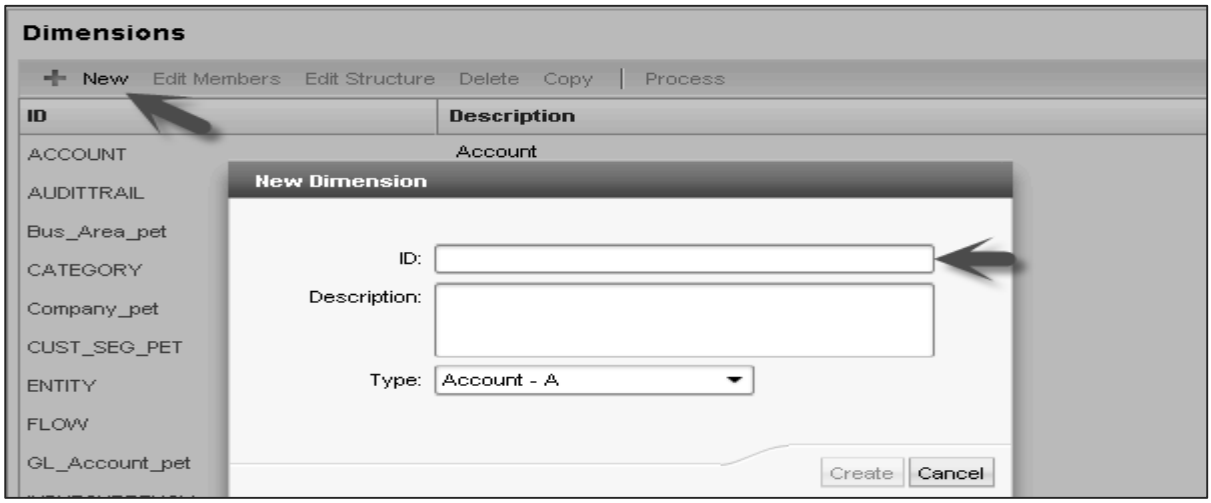
Go to Dimensions and Models -> Dimension.



Click on +New -> Enter ID, Description, Type -> Create



To create a Legal Consolidation application, following dimension types are needed. These are default dimensions and can be created in Web Portal as shown in the above image.

- **C_Acct (A)** - For maintaining Charts of Account.
- **C_Category (C)** - To define Category.
- **Groups (R)** – Like GROUP A (USD), GROUP B (EUR), and GROUP C (RMB).
- **Entity (E)** – It contains the business unit used to derive process.
- **C_Datasrc (D)** - Data Source Dimension.
- **IntCo (I)** - It determines the level of entity hierarchy at which level the elimination needs to be performed.
- **Time (T)** – Time in all dimensions.
- **Flow (S)** – To keep track of movements in Consolidation.

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To create a rate application which contains the exchange rate, following dimension types are needed:

- **R_Acct (A)** - For maintaining different types of Rate.
- **InputCurrency(R)** – Currency Type Dimension.
- **C_Category (C)** - To define Category.
- **R_Entity (E)** – Rate application.
- **Time (T)** – Time in all dimensions.

To create an ownership, Consolidation application contains the ownership information. The following dimension types are needed:

- **O_Acct (A)** - for Ownership
- **C_Category (C)** - To define Category
- **Entity (E)** - It contains the business unit used to derive process.
- **IntCo (I)** - It determines level of the entity hierarchy at which level the elimination needs to be performed.
- **Groups (R)** – Used to implement separate group type.
- **Time (T)** – Time in all dimensions.

To set up a consolidation application, three applications are required - Rate, Ownership, and Consolidation.

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4. SAP BPC – Model Design

With the release of BPC 10.1 with NetWeaver, there are two models that can be used to fulfill the business requirements. BPC models are often referred to as BPC applications and BPC environment is normally called Application.

Building Models in BPC

The following types of model can be built in BPC:

Standard Model

This model provides an option within host BW's protected namespace "/CPMB/". When you separate the BPC transaction data and master data inside the namespace ("/CPMB/"), all the sub-processes that are associated with standard model are closely secured, and only closely managed by the department running the app.

This model is designed by SAP to provide a protected area for customers who to plan and consolidate in their own department without wanting to share or coordinate the resources with other Business Warehouse community users.

As the code set of Standard model has been coordinated with version BPC 10.0 so all the changes to BPC 10.0 are shown in BPC 10.1 Standard model and changes to the version BPC 10.1 Standard model are shown in version BPC 10.0.

This allows a code compatibility between BPC 10.0 and BPC 10.1, and clients can easily perform migrations while upgrading BPC version from 10.0 to 10.1 Standard Model.

In short, you can say in Standard model, BPC environment contains the BPC applications or models and each model generates a BW InfoCube which is hidden.

Embedded Model

This model is different from Standard model and includes data access to all community users. For Embedded design model, initial versions used were SAP BW Integrated Planning and Planning Application Kit i.e. BW-IP and PAK.

This model provides a different level of data access where master and transactional data from host EDW environment is accessible by the application. In Embedded model, it allows easy access to transactional and master data within the host BW, and this data is shared with many other users and controlled by the administrator group.

In Embedded model, migration from older versions of Business Warehouse IP, BW-IP to this data model is relatively easy and migration from earlier versions like (BPC 10.0 and earlier) is considered as a new implementation.

In short, you can say that in embedded model, any number of InfoProviders can be assigned to a single BPC model/application.

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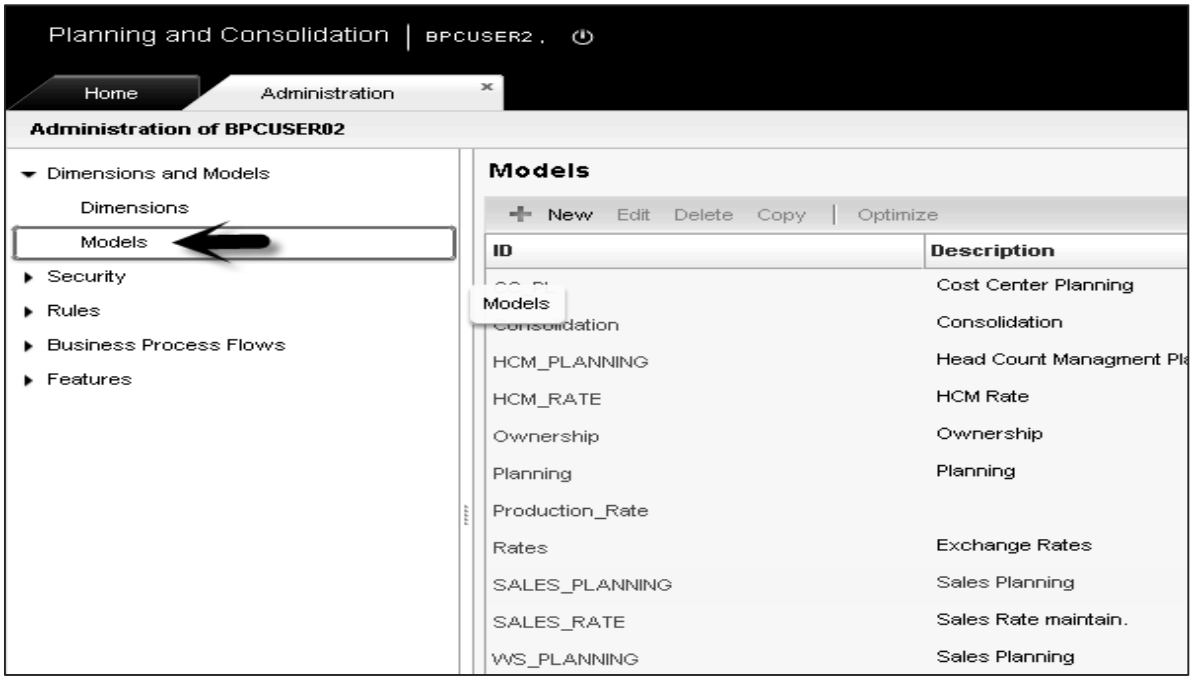

Environment Management

An application in BPC is also known as a model, like an environment is called an AppSet. You can create an application by going to Admin console in Enterprise Performance Management (EPM) System. BPC environment or AppSet has the group of applications or models. All these applications share the planning dimensions and are linked with each other.

As mentioned earlier, applications are called multidimensional data models in EPM. You can add a new application or also copy an existing application.

Environment management includes setting up work status for applications and adding the business rules to the applications.

Work Status Determination in Environment

Work status determines who can make changes to data or who can change the work state on the data set.

In Environment management, you can also carry out applications optimization. When a new application is created, it contains only a small amount of data. As time passes, data in application increases and it is always recommended to perform application performance optimization in BPC environment.

Deleting an Application in Environment Management

It is also possible to delete any application in BPC environment when required by going to admin console. You need to be an administrator to perform this function.

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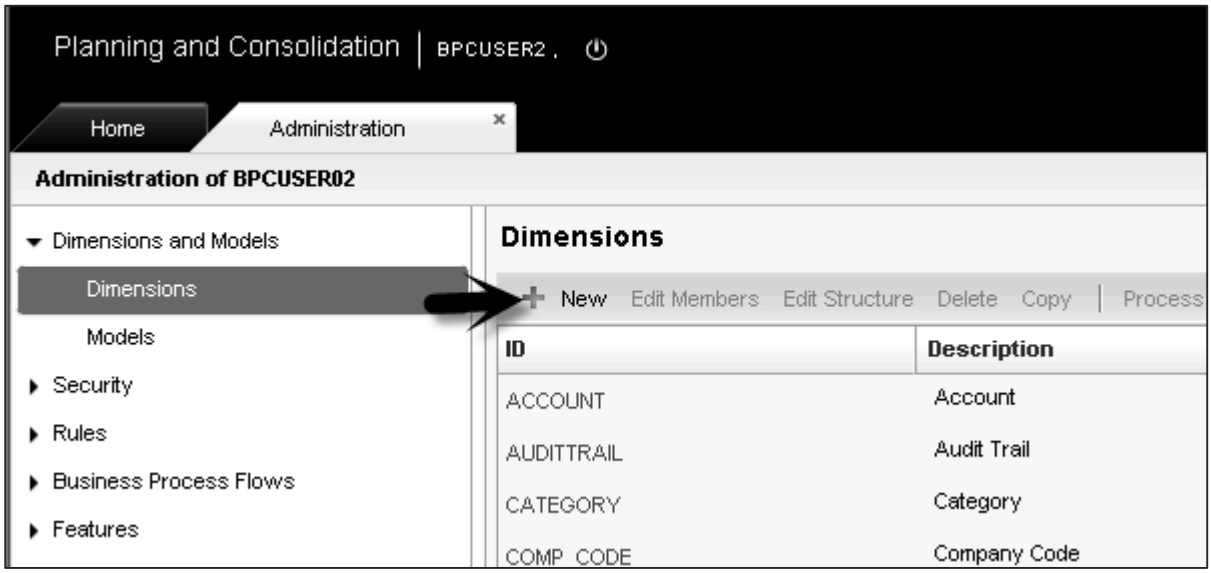
Dimension Management

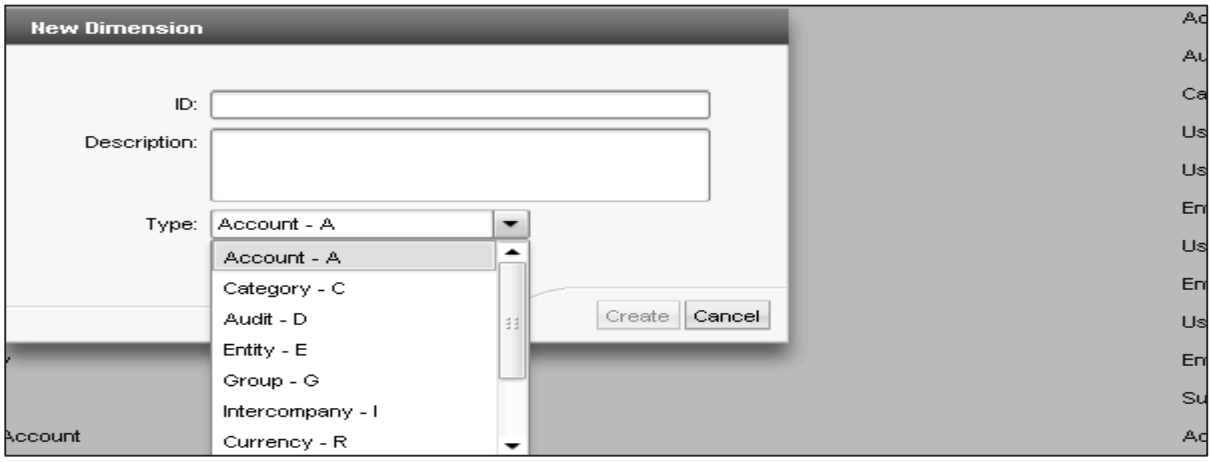
Dimension management in BPC includes creating new dimensions, defining members in dimensions, and assigning properties. Dimension contains member and there is a hierarchy between members that is defined like parent, child and sibling.

You can create a new dimension by going to Admin Console -> Dimension -> New Dimension.



Dimension name is not case sensitive and it should be unique.

When adding a new dimension, you have to enter reference type. Planning and Consolidation checks the value of reference type while processing the dimension.



Click Create button in the above window. You have to enter referential integrity for Rate type in the new window. Click 'Save' icon.

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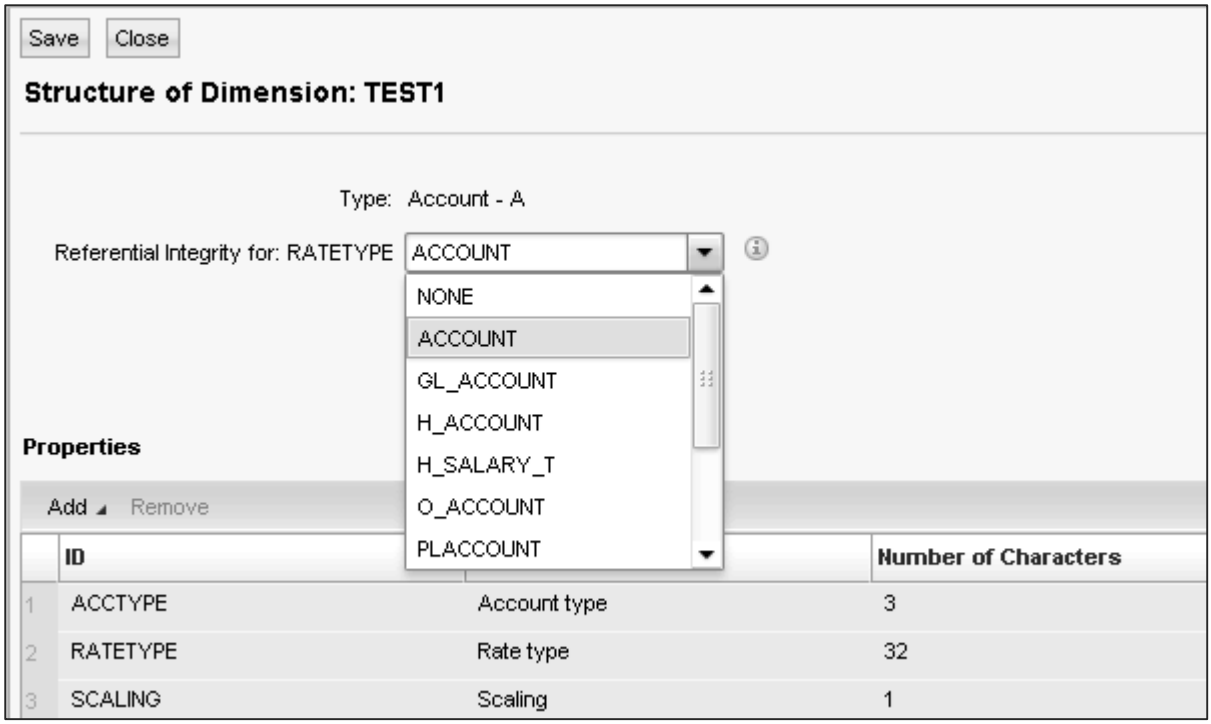
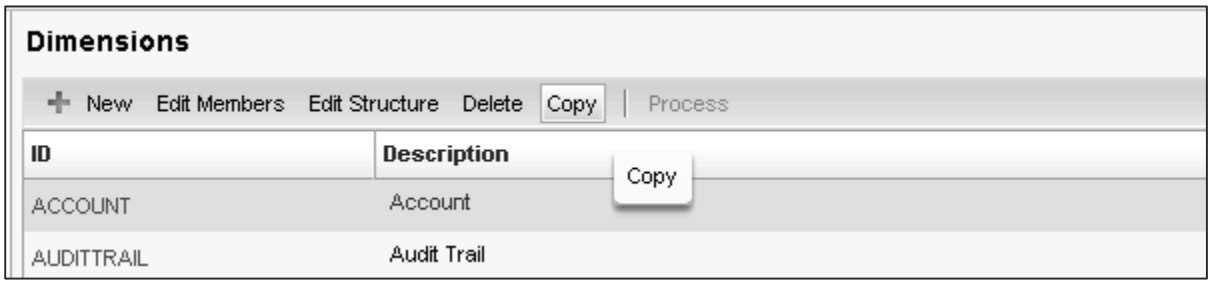
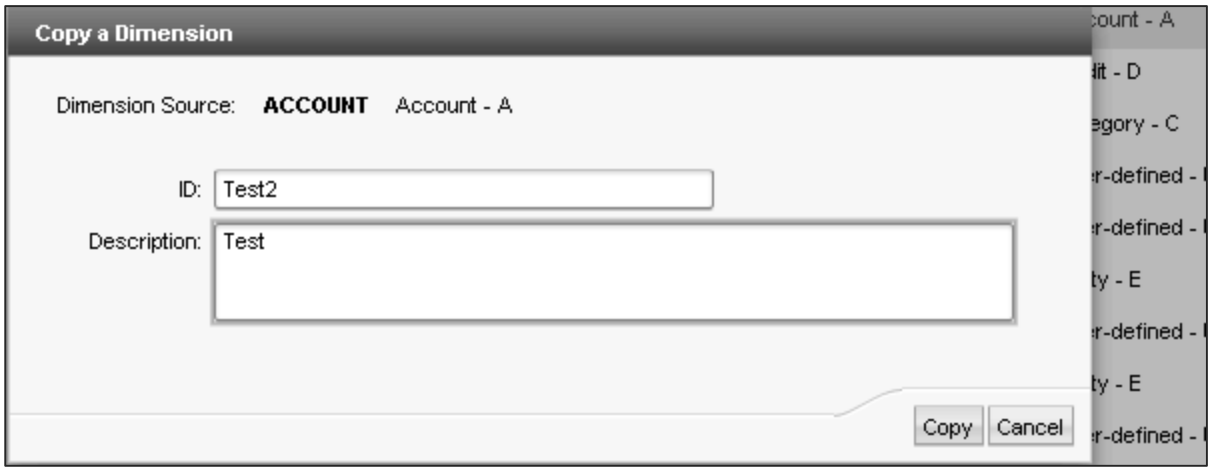


You can also edit structure, edit members, delete or copy an existing dimension. To copy a dimension, select an existing dimension and go to Copy.



Enter the name of dimension and description. Click 'Copy' button.



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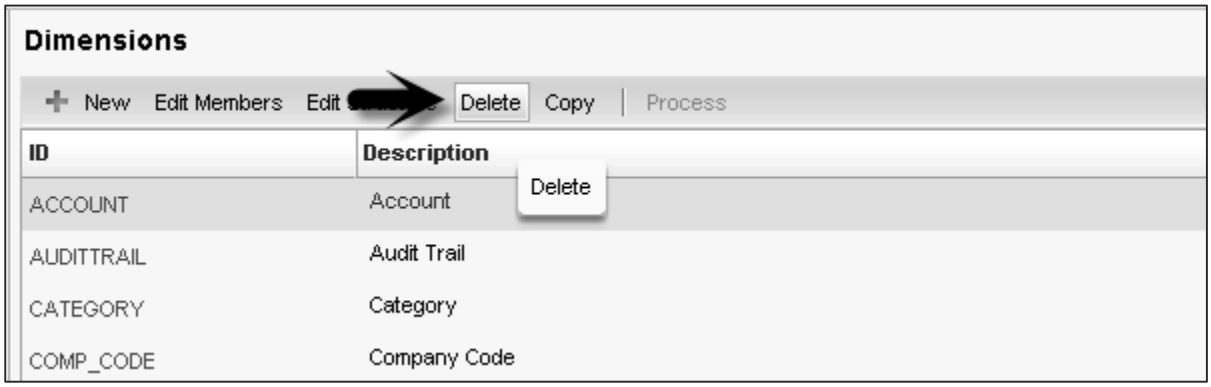
Naming Conventions in Dimensions: You shouldn't use special characters while naming a dimension, member, and application in BW table.

You can create dimension name up to 16 characters and it shouldn't contain comma, double comma, back slashes, ampersands. However, you can use underscore.

You shouldn't use the following names - App, AppAccess, AvlObject, CategoryAccess, CollabDoc, CollabIcons, CollabRecipient, CollabSupport, CollabType, DBVERSION, Defaults, DesktopStyleDef, Dimension, DrillDef, DTIParam, Function, Formula, Group, InvestParam, MemberAccess, MessageLog, Packages, PageDef, Permission, PublishedBooks, Rate, ReportParam, SectionDef, Status, StatusCode, TaskAccess, User, UserGroup, UserPackages, UserPovDef, WebContents, SOURCE, SIGNEDDATA.

Description of dimension shouldn't be more than 50 characters.

You can delete a dimension by selecting it and clicking the 'Delete' button.



Designing Security Model

BPC security is managed in Administration console. You have to login to BPC portal and go to Planning and Consolidation Administration.

There are four key components in BPC security:

- Users
- Teams
- Task Profiles
- Data Access Profiles

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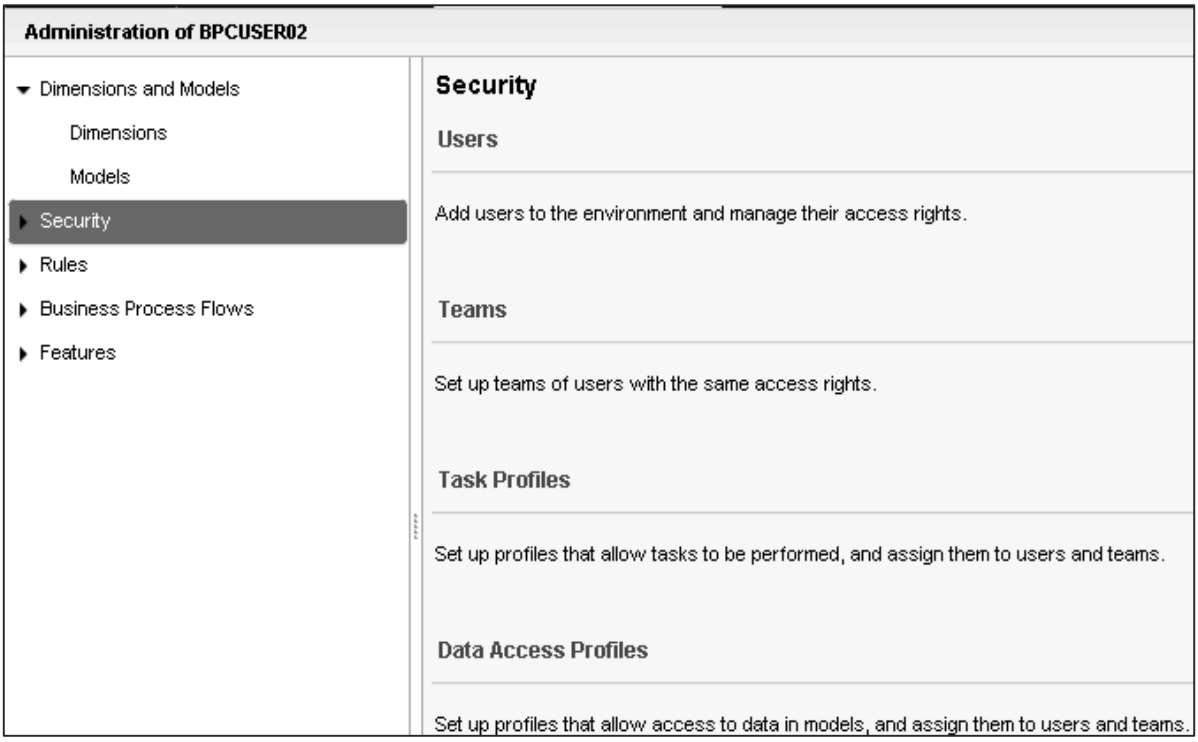


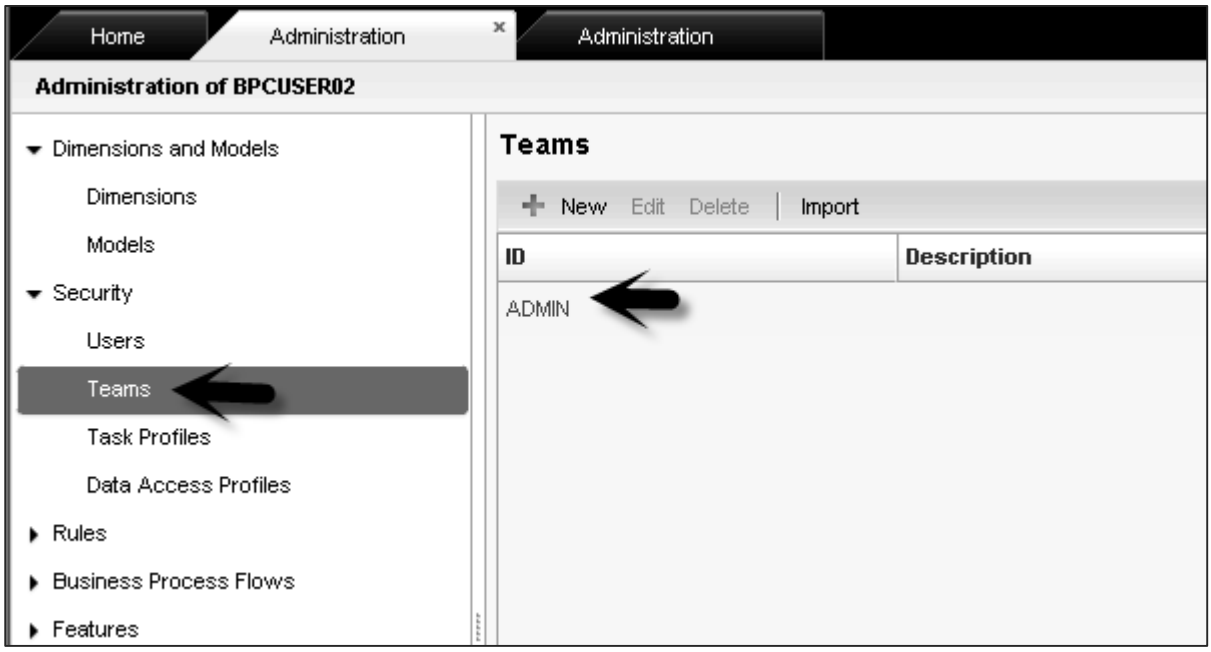
Users - This is used to add users to environment and manage their access rights.

Teams - This is not so important and you can define a team of users with the same access rights.

Task Profiles - This allows setting up profiles for tasks to be performed and assign them to users and teams.

Data Access Profiles - This is used to set up profiles that allow access to data in models and assign them to users and teams.

Click 'Team' tab under Security, select Admin team and double-click.



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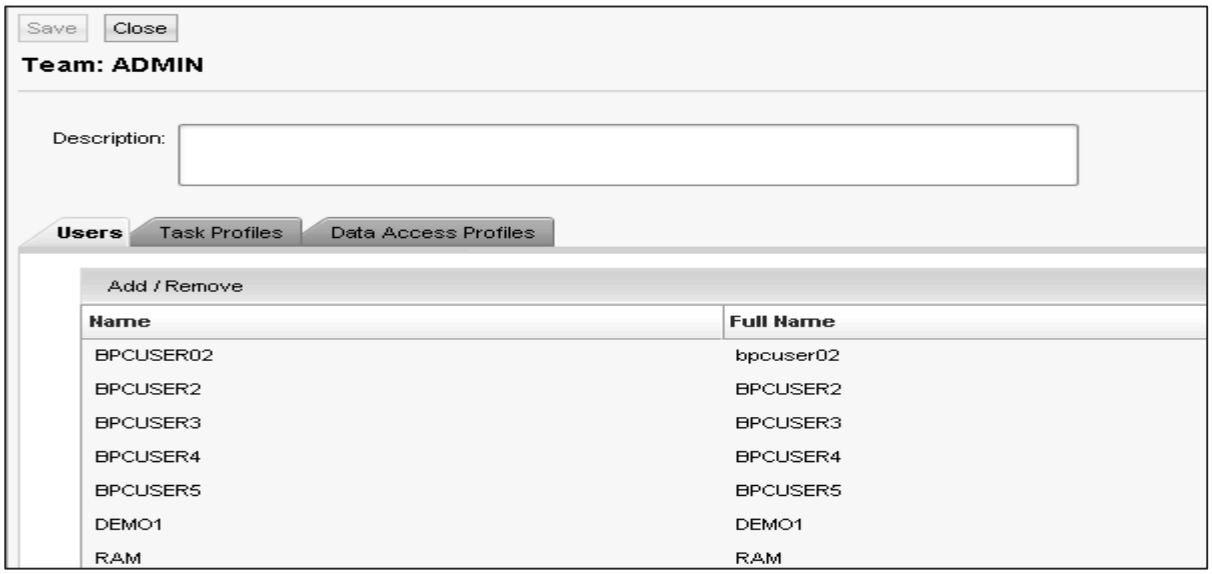
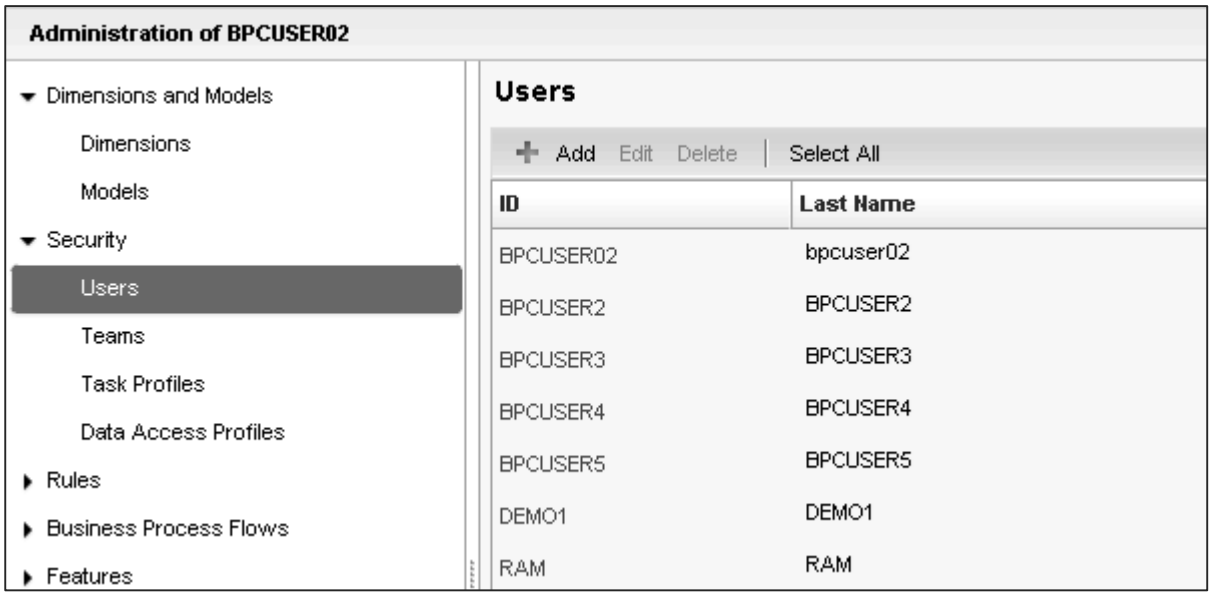
You will see the details of Team name – ADMIN, which users are part of this team, task profiles, and data access profiles.



You can edit the team details and click 'Save' icon to apply changes.

Going to the user tab, you can add new users, edit existing users, and delete any user.



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