Master Guide **CUSTOMER**

SAP BusinessObjects Financial Consolidation
Document Version: 10.1 Support Package 04 – 2017-06-21

SAP BusinessObjects Financial Consolidation Master Guide

Content

1 Getting Started

1.1 Typographic Conventions

Table 1:

Type Style	Represents
Bold	Names of windows, dialog boxes, menus, menu commands and buttons
> Command menu	Menu command
Code	Command line
Code on gray background	All or part of a configuration file to be checked or changed
Numbered list	Procedure or series of steps to be performed
< >	Value to be set
_	Compulsory space between settings
" "	To be inserted if spaces are used in a setting
[ ]	Optional setting

1.2 About this Document

1.2.1 Audience

This guide was written for the following types of users of SAP Financial Consolidation:

- Architects
- System Administrators
- Technology Consultants

You must also be experienced in systems and networks and with the technologies used by the financial consolidation application

1.2.2 Purpose

The Master Guide is the central starting point for the technical implementation of SAP Financial Consolidation. This guide provides you with an overview of the financial consolidation solution from a technical perspective and gives you a detailed description of the architecture of the application. This guide refers you to the required detailed documentation, mainly:

- SAP Financial Consolidation Administration Guide
- SAP Financial Consolidation Installation Guide

The Master Guide consists of the following main sections:

- Getting Started, which contains an overview of SAP Financial Consolidation
- Business Scenarios and Case Studies
- Software Units
- Hardware and Software Recommendations

> **Note**
>
> You can find the most current information on installing and configuring SAP Financial Consolidation on the SAP web site http://help.sap.com and on the SAP Service Marketplace at http://service.sap.com

1.2.3 Constraints

The business scenarios that are presented here serve as examples of how you can use SAP software in your company. The business scenarios are intended as models and do not necessarily run the way they are described here in your customer-specific system landscape. Be sure to check your requirements and systems to determine whether these scenarios can be used productively at your site. We recommend that you test these scenarios thoroughly in your test systems to ensure they are complete and free of errors before going live.

This Master Guide primarily discusses the overall technical implementation of SAP Financial Consolidation rather than its subordinate components. Additional software dependencies might exist without being mentioned explicitly in this document. You can find more information on component-specific software dependencies in the corresponding installation guides.

2 Application Overview

SAP Financial Consolidation is a consolidation and management reporting solution. The solution provides full process control and data transparency, permitting simulation of unlimited scenarios that address all performance management reporting requirements of an organization.

All calculations and consolidations occur in the database.

The solution combines legal and management reporting structures into one process, permitting consolidation and direct comparison of all possible views in one integrated data model. The integrated data model also allows organizations to perform side-by-side, what-if simulations.

All processes run with a detailed audit trail providing full traceability.

The data model ensures application scalability, enabling an organization to scale-up to meet new requirements as its growth demands. It allows a typical user to rapidly achieve consolidated projections and to perform the following tasks:

- Currency translation adjustments
- Minority interest and equity calculations
- Intercompany reconciliations
- Automatic cash flows

The application can handle multiple reporting channels with different charts of accounts, different account flows, or analysis dimensions over time. It also manages the retention of past reporting frameworks.

The financial consolidation solution allows companies to implement financial disclosure policies completely and from a single performance management solution. Data coming into the financial consolidation solution is intelligently checked and filtered based on the reporting framework and the rules defined by the organization's central finance team. Examples of automatic checkpoints include the following:

- GAAP presentation
- Required information breakdowns
- Starting dates, and end dates

Intelligent checking and filtering ensures data quality at every level of the corporate reporting cycle. The validations and controls in the application ensure that incoming information has the following characteristics:

- Is timely
- Is in the expected format
- Makes sense
- Is consistent, complete, and commented appropriately
- Goes through the right approval process

Using simple, standard reports, SAP Financial Consolidation provides a transparent view of accounting data, from source to disclosure. System-dedicated dimensions such as flow, audit ID, ledger name, journal entry number, and geographical origin, automatically feed the audit trail, revealing precise accounting movements and postings, whether manual or automatic.

The financial consolidation solution provides the following:

- Secure authentication

- Granular functional rights management
- Optimal data confidentiality and access control
- Thorough data access definition at the dimensional-value level

SAP Financial Consolidation tracks all maintenance activities, such as adding an account or user, and automatically generates log trails with author, date of creation, and modification. An event log provides an additional overview of any action performed in the system, enabling system managers to document and describe all changes.

SAP Financial Consolidation uses multi-tier client/server architecture. The following were developed as independent modules:

- Presentation layer
- Windows and web interfaces
- Function layer
- Data layer

in an environment comprised of the following:

- Microsoft Visual C++
- DCOM
- Microsoft Visual C#
- .NET
- ASP.NET
- DHTML

with strong object-oriented design.

SAP Financial Consolidation is a multi-thread application, which means that it can use all of the processors available on the server simultaneously and automatically by scaling-in, or increasing the number of processors on a single server.

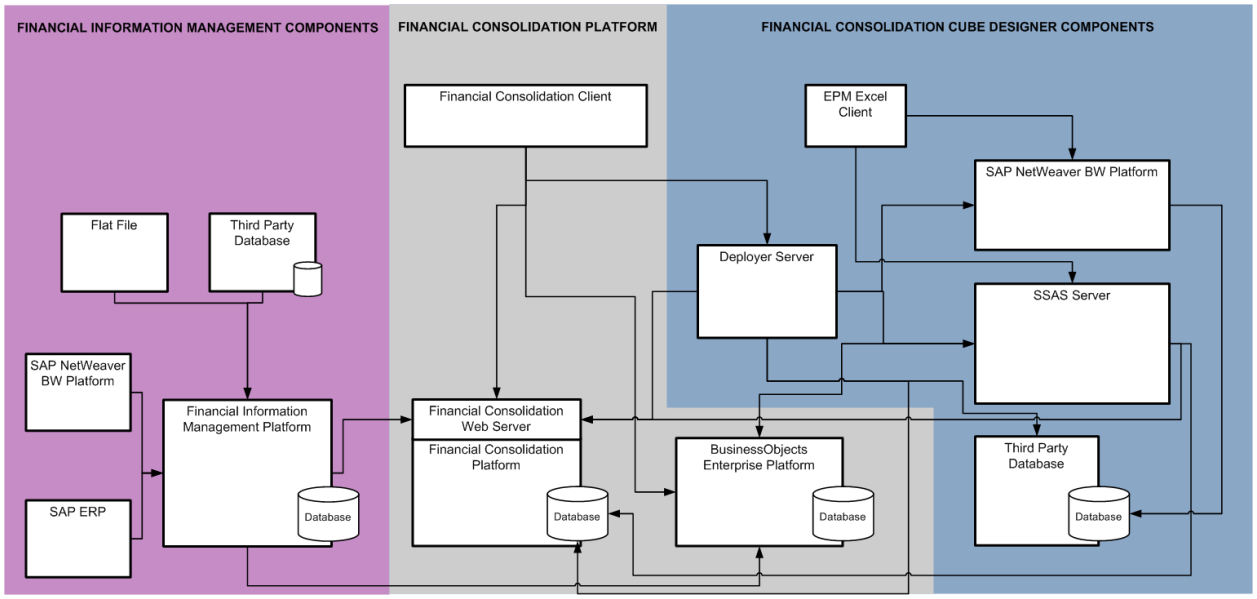
Multi-threading applies to all the following components:

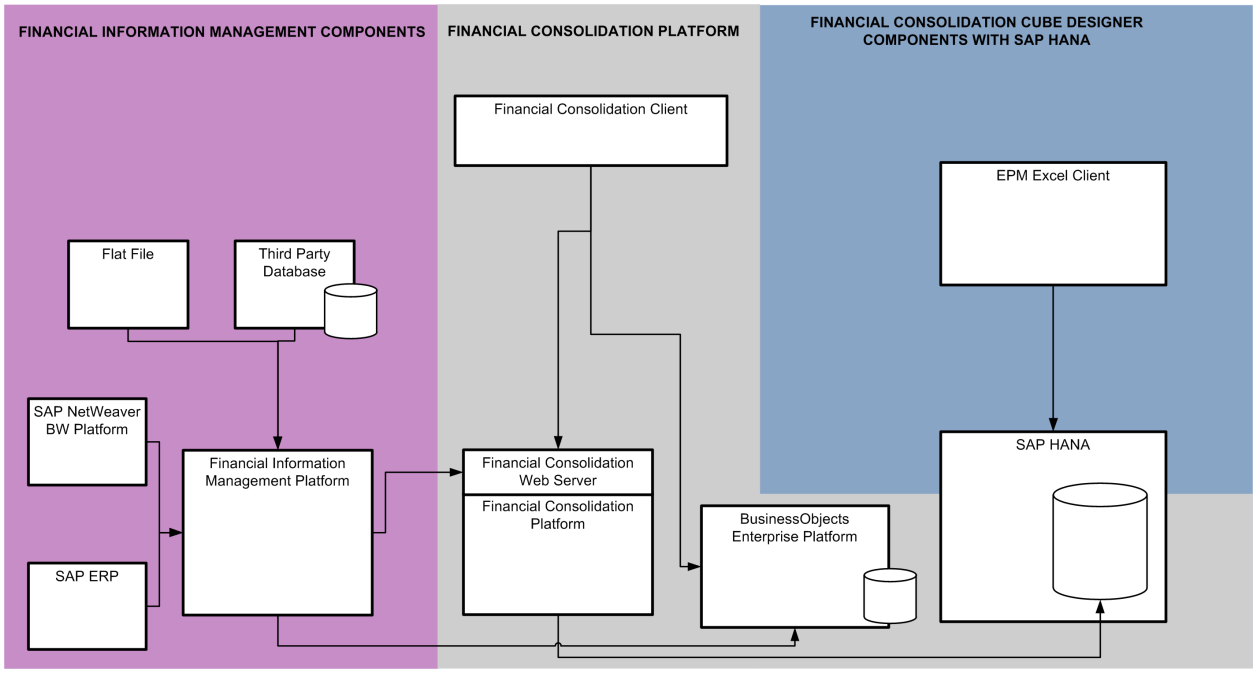
- Database servers
- Application servers
- Web servers
- Windows TS/Citrix servers

SAP Financial Consolidation also supports multi-server architecture, or scaling-out. You can increase the number of servers to adapt to the growing number of users with increased availability and deployment flexibility. Scaling-out applies to all components except database servers.

2.1 General Software Units

The SAP Financial Consolidation platform is composed of the following components:





The Financial Consolidation Platform

SAP Financial Consolidation is installed on the following multi tiers:

- The database server, which stores the data processed by the application,
- The web servers, which manages HTTP connections with users and generates HTML pages,
- The application server, which ensures that the link between the client and the database exists.
  You install the database client and OLE DB drivers on the application server and not on each client computer. The web server also generates the HTML pages requested by the web client. The application server uses a

cache that speeds up processing and limits the need for retrieving data directly from the database. All background processing are run on the application server.
- The SAP Financial Consolidation client, which can be the Windows client, Internet Explorer, or Excel.

The SAP HANA Platform

The SAP HANA Platform is used to host the Financial Consolidation database as well as SAP HANA Modeling Views generated with Cube Designer.

The Business Objects Enterprise XI 4 Platform

The SAP Financial Consolidation application needs to access the BusinessObjects Enterprise Central Management Server for user authentication. It also provides security and BI tools access (SAP Lumira, SAP BusinessObjects Web Intelligence). The CMS can be either the server installed from the BusinessObjects Enterprise CD, or a light version of the server, called SAP BusinessObjects User Management Server.

The Financial Consolidation Cube Designer tools

The Financial Consolidation Cube Designer tools architecture consists of the following main server components:

- One of the following components:
  - The SAP NetWeaver Business Intelligence platform
  - Or the SSAS server, which hosts the cubes and the Microsoft SSAS engine and the Data Pump server, which ensures the link between the SSAS server and the EPM add-in for Microsoft Office.
  - Or the SAP HANA platform, which hosts the Financial Consolidation database and the Analytic views.
- The SAP Financial Consolidation Web Services, which manages security and provides Financial Consolidation metadata to Financial Consolidation Cube Designer.
- The Financial Consolidation Cube Deployer server, which handles cubes creation and deployments.

> **Note**
>
> This component is not required when using the SAP HANA platform.

There are also the following main client components:

- The EPM add-in for Microsoft Office, which uses Microsoft Excel to create reports and to browse data
- The Financial Consolidation Cube Designer client running on a Windows client platform, which defines cubes
- The BusinessObjects platform BI tools (optional):
  - SAP BusinessObjects Web Intelligence
  - SAP Lumira

The Financial Information Management platform

The Financial Information Management application is used to load large volume data from:

- SAP NetWeaver BW platform
- SAP ERP
- SAP HANA
- Flat files
- Third Party Database

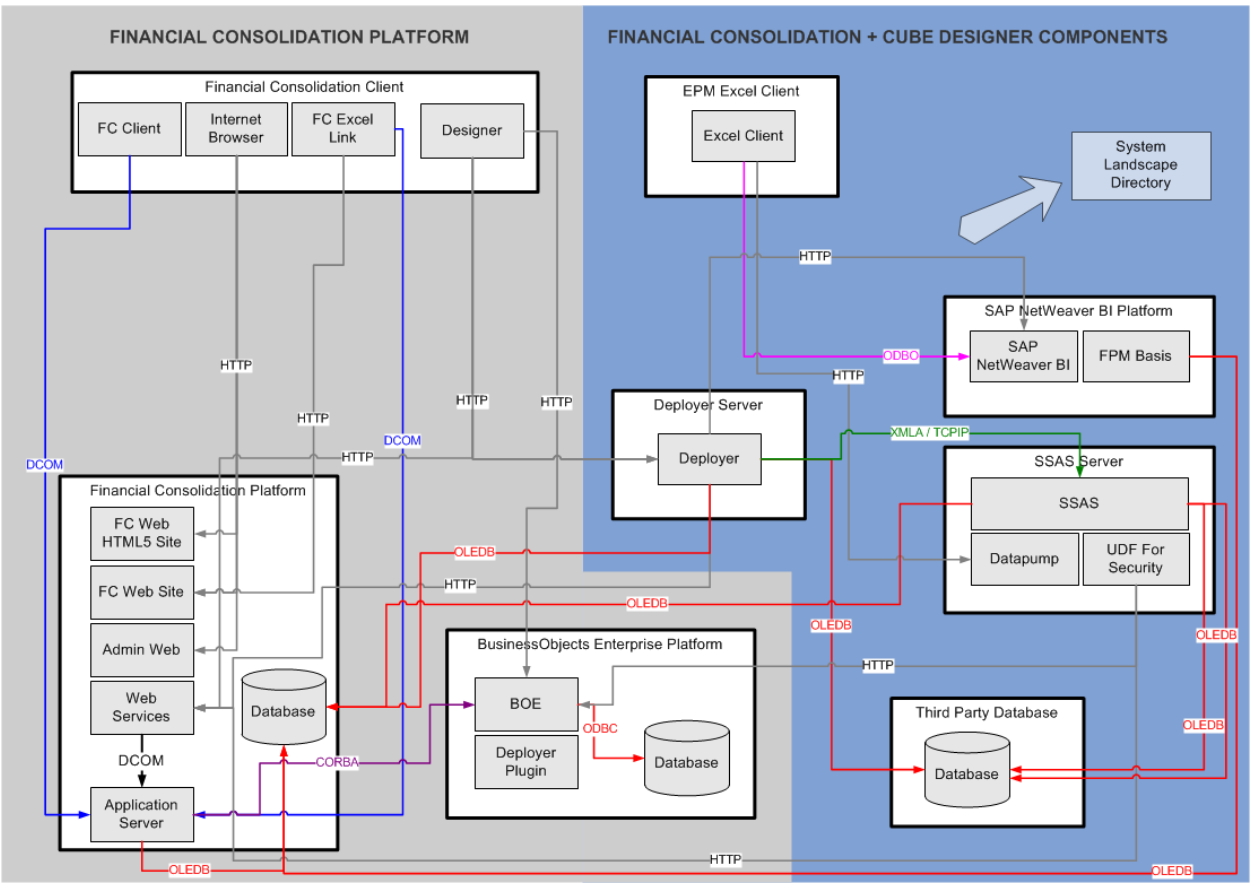
and other EPM applications into SAP Financial Consolidation.

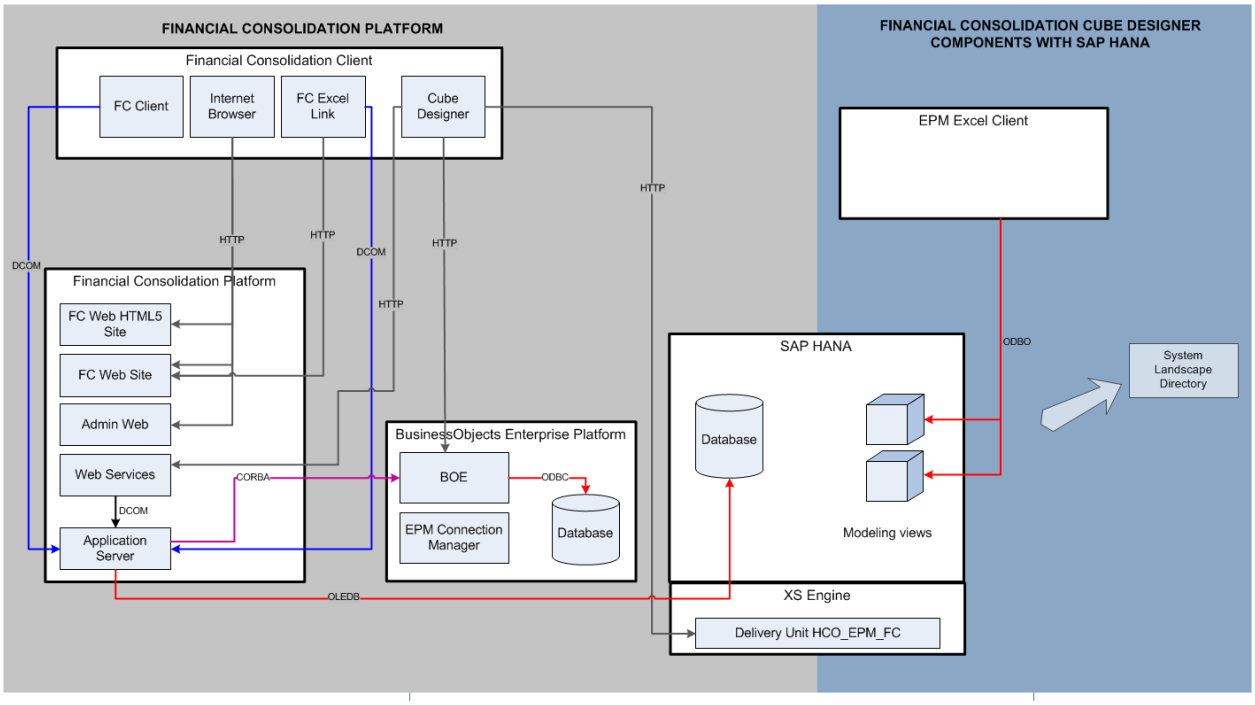
2.2 Detailed Software Units

The following detailed diagrams show:

- Financial Consolidation and the Financial Consolidation Cube Designer components
- Financial Consolidation Cube Designer components with SAP HANA

The subsequent paragraphs provide detailed explanations of each component.




FINANCIAL CONSOLIDATION PLATFORM
FINANCIAL CONSOLIDATION CUBE DESIGNER COMPONENTS WITH SAP HANA
Financial Consolidation Client
FC Client
Internet Browser
FC Excel Link
Cube Designer
EPM Excel Client
HTTP
DCOM
Financial Consolidation Platform
FC Web HTML5 Site
FC Web Site
Admin Web
Web Services
Application Server
CORBA
BusinessObjects Enterprise Platform
BOE
ODBC
EPM Connection Manager
Database
SAP HANA
Database
Modeling views
ODBO
System Landscape Directory
OLEDB
XS Engine
Delivery Unit HCO_EPM_FC

3 Software Units

3.1 Server Components

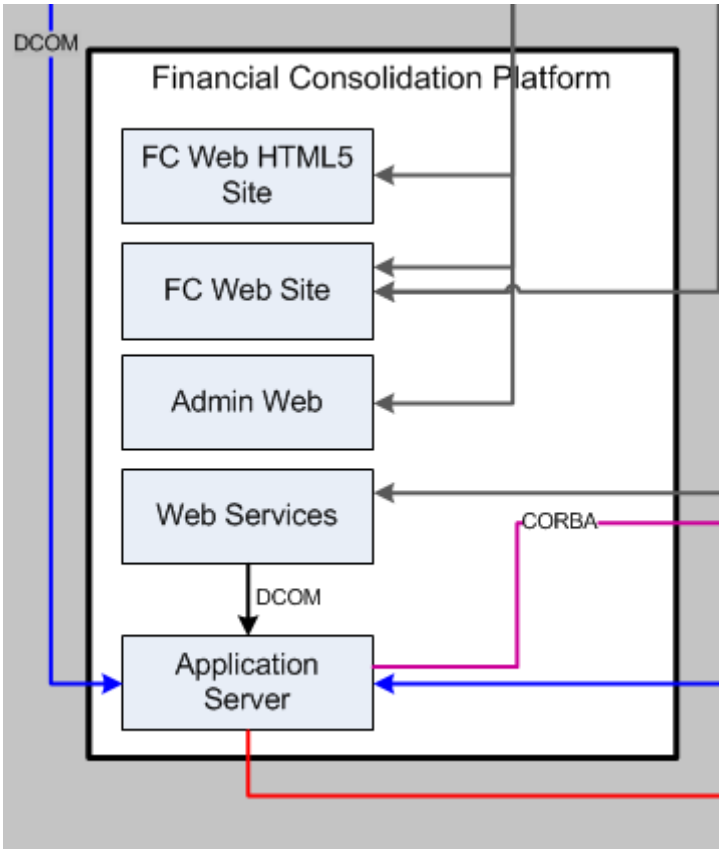
3.1.1 The Database Server

The database server contains all the data in the financial consolidation application. It supports the standard database engines. SAP Financial Consolidation supports Microsoft SQL Server, Oracle Database Server and SAP HANA.

The application server connects to the database server using OLE DB and the RDBMS client.

> **Note**
>
> We recommend that you do the following:
>
> - Provide the database with secured disk storage, for example, RAID 1, RAID 5, SAN
> - Perform regular backups,
> - Dedicate a server to database engines.

3.1.2 The Application Server



The application server performs the following tasks:

- Manages user connections using the DCOM protocol
- Connects to the database using OLE DB to manage the connection pool
- Uses internal applicative caching for the most frequently used objects
- Runs the processing required for ensuring data integrity and for locking objects
- Runs batch processing

The main function of the application server is to ensure that the link between the SAP Financial Consolidation clients and the database exists. The cache bridges the database and client computers and improves performance.

The application server runs the processing required for the consolidation and transmission of data, partially formats the data retrieved, and runs report bundles.

The application server also runs the processing required by the web clients. The SAP Financial Consolidation web enables client computers that do not have the application installed on their computers use Internet Explorer to access the application. Users can perform the same operation tasks using the same setup as the Windows client.

By configuring SAP Financial Consolidation with multiple application servers connected to the same database, you can manage a large number of concurrent user connections easily and ensure that the system is fault tolerant.

> **Note**
>
> The application server is identified by the *CtServer.exe* process.

3.1.3 The Data Source Manager

The data source manager is the storage point of all the information used by the various components and settings of SAP Financial Consolidation such as database, application servers, and web servers.

When you try to connect to SAP Financial Consolidation application you will contact the data source manager to select a database.

The data source manager is identified by the *CtBroker.exe* process. Its user interface is the web Administration Console.

You can change one of the servers in the financial consolidation application without affecting users in any way. Only the data source definition is changed.

Except in specific cases, there is only one data source manager. The data source manager is included in the SAP Financial Consolidation server installation. It does not require many resources and can be installed on any server in your environment, by itself on another machine, or in a cluster environment.

3.1.4 The Web Servers

To access SAP Financial Consolidation via the web, you must add web servers to the architecture. While the application server can manage requests from web clients, it cannot manage the flow of data in HTTP format.

The SAP Financial Consolidation web architecture is composed of the following:

- The Financial Consolidation web server, which manages HTTP connections with users and generates HTML pages,
- The Financial Consolidation web HTML5 server, which manages HTTP connections with users and generates HTML pages, based on the SAPUI5 Library.
- The Administration console (the graphical interface of the ctbroker.exe component) manages datasources,
- The web services component allows SAP Financial Consolidation to interface with other SAP Business Objects products, for example SAP BusinessObjects Data Services. This web service is an ASP.NET application that must be deployed in Microsoft IIS.

The web server is independent from SAP Financial Consolidation; it relies on Microsoft IIS technology.

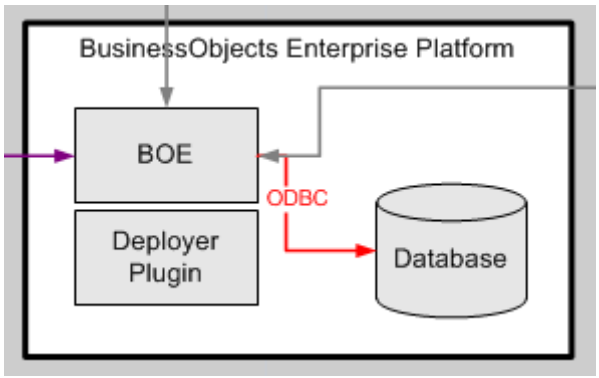
The web server is linked to the SAP Financial Consolidation application server via the web connector, an ASP.NET application. The system setup automatically installs the .NET framework.

The web connector monitors user sessions and converts HTTP requests to DCOM remote procedure calls for the application server. The web connector also formats the HTML pages received by the application server before sending them to the clients.

SAP Financial Consolidation uses the SSL and VPN security protocols to encrypt the data. The client computer stores a cookie, consisting of only a number for to identify SAP Financial Consolidation sessions.

> **Note**
>
> We recommend that you use a local network of 100 Mbps to communicate between the SAP Financial Consolidation web server and the SAP Financial Consolidation application server.

3.1.5 SAP BusinessObjects Enterprise XI 4 platform



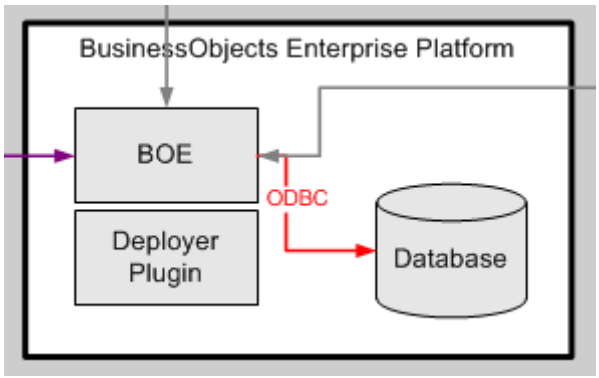
Requirements:

- BusinessObjects Enterprise XI 4
- EPM Solutions Connection Manager (Deployer Plugin)
- The SQL Server 2008 OLEDB provider

Function:

BusinessObjects Enterprise XI 4 includes specialized services including SAP BusinessObjects Web Intelligence, SAP BusinessObjects BI Launch Pad and Crystal Reports components, and a set of Dashboard and Analytics services for metrics management, predictive analysis, and process analysis. It provides you with all authentication and security management tools that are needed with this version of SAP Financial Consolidation Cube Designer.

3.1.6 SAP Information Platform Services



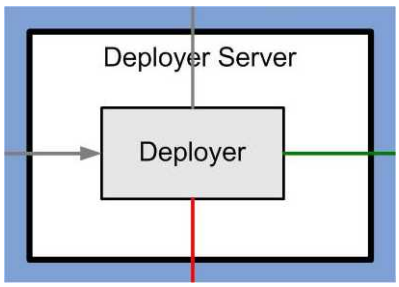
Requirements:

- SAP Information Platform Services 4
- SAP Financial Consolidation EPM Connection Manager
- The SQLServer 2008 OLEDB provider

Function:

SAP Information Platform Services provides you with all authentication and security management tools that are needed with this version of SAP Financial Consolidation Cube Designer.

3.1.7 Financial Consolidation Cube Deployer Server



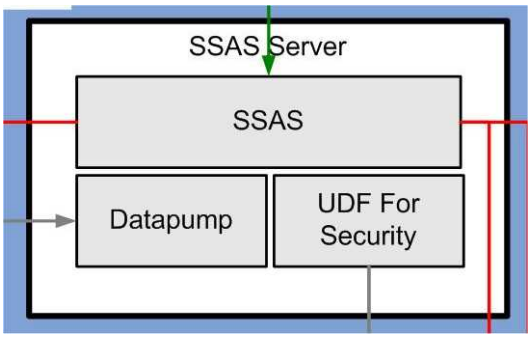
Required components:

- Microsoft components:
  - Microsoft .NET Framework 4.5.1
  - Internet Information Services
  - Microsoft WSE 3.0
  - SQL Server 2012 component: sqlncli.msi
  - SQL Server 2014 components: SharedManagementObjects.msi, SQL_AS_OLEDB.msi, SQLSysClrTypes.msi
- SAP components:
  - Financial Consolidation Cube Deployer

Function:

- Financial Consolidation Cube Deployer with SSAS
  Solutions for cube deployment are defined and managed in the SAP Cube Designer client, and then processed by the Financial Consolidation Cube Deployer server. The Deployer server sends the deployment descriptions to the SSAS server; which processes them. Deployer server does not process the cube deployment by itself. Deployer server connects to the SAP Financial Consolidation database and to SSAS.
- Financial Consolidation Cube Deployer with SAP NetWeaver Business Intelligence
  Solutions for cube deployment are defined and managed in the SAP Cube Designer client, and then processed by the Deployer server. The Deployer server sends the deployment descriptions to the SAP NetWeaver Business Intelligence server; which processes them. Deployer server does not process the cube deployment by itself. Deployer server connects to the SAP Financial Consolidation database and to the SAP NetWeaver Business Intelligence server.

3.1.8 SSAS Server and Datapump Component



SSAS Server

Required components:

- Microsoft components:
  - Microsoft SSAS Enterprise Edition
  - Internet Information Services
- SAP BusinessObjects components:
  - Financial Consolidation UDF for security: this component enables SAP Financial Consolidation security to be used in SSAS

Function:

This server hosts the SSAS engine, which is the Microsoft OLAP engine. It also stores the cubes created in SAP BusinessObjects Cube Designer which are consulted by the EPM Excel client that connects through the SAP BusinessObjects BI Launch Pad portal.

The Financial Consolidation UDF for security component must be installed on the SSAS server in order to apply the Business Objects security to data instead of the standard Microsoft integrated security. This component is configured through a web service from the BOE platform.

Once it is authenticated by the BusinessObjects Enterprise XI 3.1 platform or SAP BusinessObjects User Management System 7.5 (the CMS), the UDF for Security component will then check SAP Financial Consolidation for user rights for all of the dimensions (ie. the Data Access Group of each SAP Financial Consolidation user defined for Data Analysis Access and the Default Category). As a result, Business Objects data security is applied to the data stored in the cube.

The SSAS server is accessed by the Financial Consolidation Cube Deployer server, by the EPM Excel client connecting through the Data Pump component.

Datapump component

> ⚠ Caution
>
> This applies only if this component is installed on a machine other than the SSAS server.

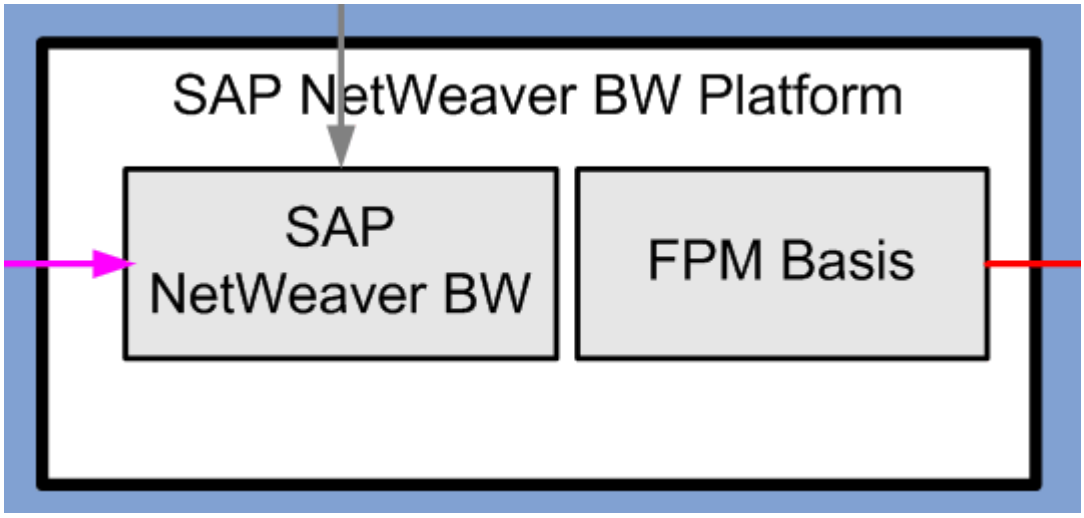
Required components:

- Microsoft components:
  - Internet Information Services
  - Microsoft .NET Framework 3.5 SP1
  - MSXML Parser 6.0
  - Microsoft SQL Server 2008 Analysis Services 9.0 OLE DB Provider
  - Data Pump for SSAS 2005 SP2 or higher, or Data Pump for SSAS 2008

Function:

This server hosts the Microsoft Data Pump for SSAS 2005 component. It must be deployed in order to allow the EPM Excel client to connect directly to cubes using the XMLA over HTTP protocol instead of XMLA over TCP/IP (HTTP being more manageable than TCP/IP).

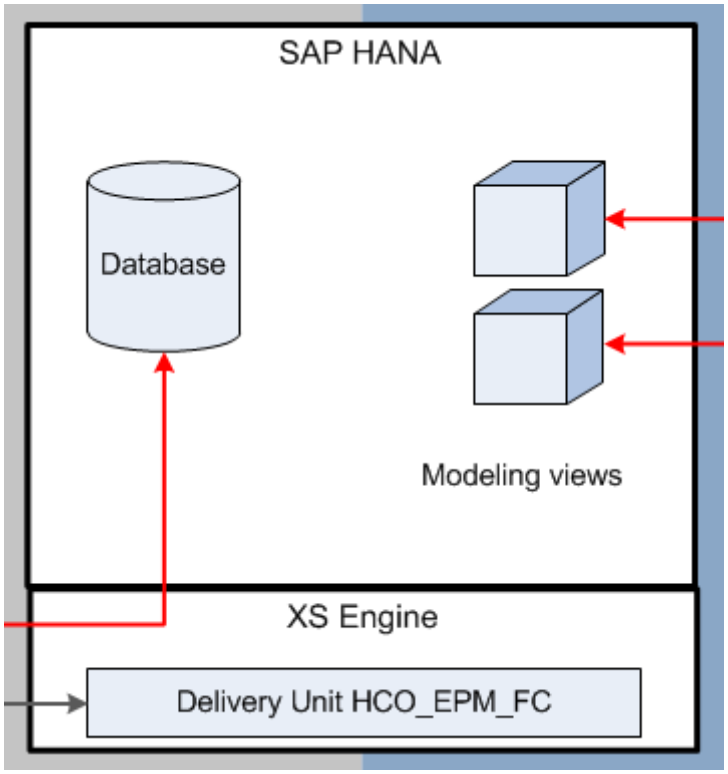
3.1.9 SAP Netweaver BW Platform



SAP Netweaver Business Warehouse (SAP NetWeaver BW) is the name of the Business Intelligence, analytical, reporting and Data Warehousing solution produced by SAP.

- Required components:
  - SAP Netweaver Business Warehouse 7.4
  - FPM Basis 2.0
- Function:
- BW server hosts the cubes (BW infoarea and infocubes) created by Cube Designer which are consulted by the EPM add-in for Microsoft Office that connects through the SAP BusinessObjects BI Launch Pad portal. BW server is accessed by the Financial Consolidation Cube Deployer server, by the EPM add-in for Microsoft Office connecting through BW ODBO provider.

3.1.10 The SAP HANA Platform



The SAP HANA platform replaces both the database server and the OLAP engine. It contains all the data of the Financial Consolidation application. The Financial Consolidation application server connects to the SAP HANA server using OLEDB and the SAP HANA client.

It also stores the SAP HANA Modeling Views created with Financial Consolidation Cube Designer, which are consumed by the EPM Excel client.

The SAP HANA Platform is accessed by the Financial Consolidation application server and by the EPM Excel client using the ODBO provider and the SAP HANA client.

3.2 Client Components

3.2.1 Terminal Services Technology

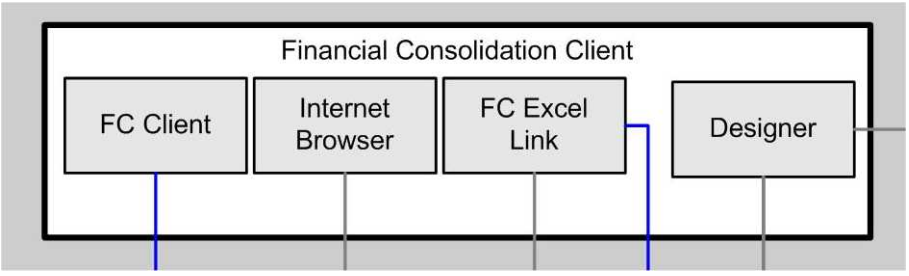
The Windows Terminal Services and the Citrix architecture supports application server computing, which enables the application to run on a server for multiple users.

SAP Financial Consolidation clients can be installed in Windows Terminal Services as part of the 3-tier architecture, in which screen changes in the user interface are sent to the individual client computer.

The SAP Financial Consolidation Windows client can also be installed on Citrix.

All of the processing in the application is performed on the terminal services server. Regardless of the line speed, the server is able to send screen changes to the client computer without any loss in performance, using any type of LAN, WAN, or other communication network.

3.2.2 Financial Consolidation Client



The SAP Financial Consolidation Windows client does the following:

- Communicates with the application server using DCOM on the local network
- Uses local applicative caching that is synchronized with the cache on the SAP Financial Consolidation application server
- Is installed using the SAP Financial Consolidation setup
- Is used to perform the following tasks:
  - Data entry
  - Formatting
  - Running of controls
  - Data retrieval
  - Management of the OLAP hypercube loaded to the client computer memory
  - Customization

> **Note**
>
> The Windows client is identified by the *Finance.exe* process.

3.2.3 Financial Consolidation Cube Designer Client

Required components

> **Remember**
>
> The SAP Financial Consolidation Windows client must be installed before installing the Financial Consolidation Cube Designer client.

- DBMS clients for the SAP Financial Consolidation database access (Microsoft SQL Server or Oracle)

- Microsoft components:
  - Microsoft .NET Framework 4.5.1
  - Microsoft WSE 3.0
- SAP components:
  - Financial Consolidation Cube Designer

Function

SAP Cube Designer is a modeling tool that:

- allows the Financial Consolidation Cube Designer to define how the SAP Financial Consolidation IDM (Integrated Data Model) will be represented in the OLAP server.
- stores these definitions consistently as SAP Financial Consolidation Model Definitions.
- creates the appropriate OLAP model in the SSAS server through the Deployer server from the Model Definition specified by the user.
- creates automatically universes.
- deploys SAP NetWeaver Business Warehouse cubes.

The SAP Cube Designer client connects to the SAP Financial Consolidation platform, the SAP Financial Consolidation database and the Deployer server.

3.2.4 BusinessObjects Enterprise XI 4 Clients

Required components:

- Internet Explorer.

Function:

The BusinessObjects Enterprise XI 4 provides several BI applications, like:

- SAP BusinessObjects Web Intelligence and Voyager that can be used to consult Financial Consolidation cubes.
- SAP BusinessObjects BI Launch pad is a web portal used to store EPM Add-in for Microsoft Office Client work books.
- The CMC is used to configure your Financial Consolidation Cube Designer application.

3.3 Communication and Protocols between Components

3.3.1 Communication Among the Servers

The servers communicate with one another as follows:

- The web browser connects to the web server using the HTTP protocol.
- The web server transfers the requests to the .NET framework.
- The web connector hosted in the ASP.NET application processes the requests. It communicates with the application servers via the DCOM protocol.
- The SAP Financial Consolidation server application accesses the database via the OLE DB protocol.
- The application server generates a response that is sent to the web server. The web server then translates the response into HTML.
- The web server delivers the required HTML documents to the web browser.

By configuring multiple web servers to connect to a single SAP Financial Consolidation application, you can manage a large number of concurrent user connections easily and ensure that the system is fault tolerant. Depending on the type of configuration selected, you may need to implement a load-balancing solution in HTTP multi-server mode. The load-balancing solution must support session affinity.

The SAP Financial Consolidation web server, application server, and database server must be on the same local network because of the quantity of information exchanged between servers.

3.3.2 Protocols Used in the SAP Financial Consolidation Software Architecture

The financial consolidation application uses the following protocols:

- OLE DB
- HTTP / HTTPS
- DCOM
- CORBA
- RDP
- ICA

OLE DB is the standard for relaying data between an application and a data server such as a database engine. OLE DB is an upgraded object-oriented version of ODBC. OLE DB can be used to access all types of databases and can therefore support several RDBMS with the same product. It is one of the software modules belonging to MDAC (Microsoft Data Access Components).

HTTP is used to call web services of different applications and to manage web user interfaces.

DCOM is a network-distributed object protocol. It defines the remote procedure call that enables DLL objects to be run remotely over the network, regardless of their location. These objects can be located on the same computer as the client program or on another computer in the network.

DCOM, which is a component of Windows, uses the IP, IPX or Net BEUI network protocols.

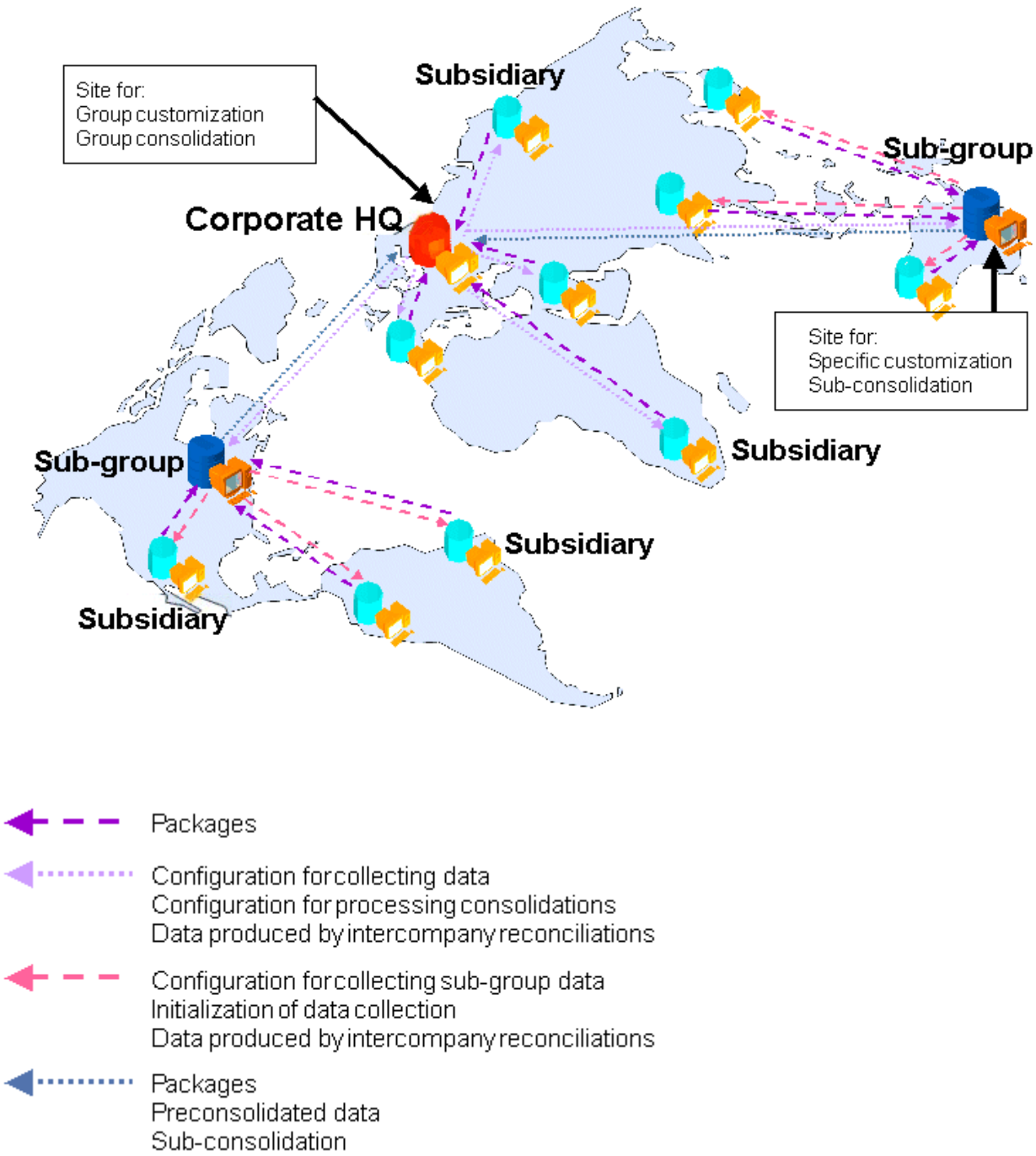
> **Note**
>
> You can only use the IP network protocol with SAP Financial Consolidation.

CORBA is a network-distributed object protocol as DCOM, but unlike DCOM, it is a multi-platform protocol. It is used by the Business Objects Enterprise platform.

RDP is the Remote Desktop Protocol used by Windows Terminal Services to transfer the display to client workstations.

ICA is the presentation services protocol used by Citrix MetaFrame.

4 Business Scenarios for SAP Financial Consolidation



This diagram shows the different possible configurations:

- One TOP site, where users directly enter data through the Financial Consolidation web site, or locally through a standalone configuration with a local database. Packages are sent via transfers.
- Sub-groups for sub-consolidations sites. Setup can be customized for each sub-group. Users enter data through the Financial Consolidation web site, or locally through a standalone configuration with a local database. Packages are sent via transfers.

5 Overall Installation Sequence

Prerequisites

There are a number of requirements that must be met before you install SAP Financial Consolidation, depending on the database that you use and the software components that you plan to install. See the following guides for detailed information on the pre-requisites:

- SAP Financial Consolidation Installation Guide
- SAP Financial Consolidation Administration Guide

Context

The overall installation sequence of SAP Financial Consolidation is:

Procedure

1. Install the SAP Financial Consolidation application.
2. Deploy the Web Administration console.
3. Configure the data source in the Administration console.
4. Initialize or migrate the database.
5. Install other web component that you may want to use: the Financial Consolidation web site or web HTML5 site or the Financial Consolidation Web Services.
6. Install the Financial Consolidation Cube Deployer server (and the associated components like SSAS, the Data Pump,etc. if needed)
7. Install the SAP Financial Consolidation client components: Financial Consolidation heavy client, Excel Link, Cube Designer.
8. Start SAP Financial Consolidation.

6 Hardware and Software Recommendations

The software and hardware platform presented in this chapter is the reference platform supported by SAP Financial Consolidation. This platform applies to the product version indicated on the cover page of this document. Unless otherwise mentioned, all operating systems and software components specified are supported in the following languages only:

- English
- French
- German
- Japanese
- Spanish
- Chinese simplified
- Italian
- Dutch
- Russian
- Korean
- Portuguese Brazil
- Swedish
- Polish
- Norwegian Bokmal
- Danish
- Finnish
- Turkish
- Lithuanian
- Romanian
- Hungarian

For hardware and software recommendations on BusinessObjects Enterprise XI 4 platform and SAP NetWeaver Business Intelligence platform, refer to their respective guides, which are available on the SAP Help website.

Caution

We recommend that SAP Financial Consolidation components are installed on dedicated servers.

Tip

You can use SAP Financial Consolidation on other platforms. To find out more about other platforms, please contact SAP Software Support.

6.1 Support of platform virtualization tools

Platform virtualization tools such as VmWare Server or VmWare ESX Server are supported.

However, since this type of platform can significantly impact performance, you should carefully study the architecture that will be implemented and apply the following hardware recommendations for virtualized platforms.

For example, if a dual-processor server with 2 GB of RAM is recommended, the virtual image must also have 2 processors and 2 GB of RAM.

Furthermore, if several virtual images are hosted on the same physical server, performance may be considerably reduced.

> **Note**
>
> A poorly estimated virtual architecture may significantly reduce the performance of Financial Consolidation.

6.2 Web Client

Table 2:

Category	Minimum configuration	Recommended configuration
Processor	Intel Core Solo Processor 1.2 GHz or a Pentium compatible processor	-
RAM	512 MB or more (depending on the operating system)	1 GB
Disk space	100 MB available disk space	-
Operating system	Microsoft Windows 7, 32 or 64-bit editions Microsoft Windows 8.1, 32 or 64-bit editions Microsoft Windows 10, 32 or 64-bit editions	-

Category	Minimum configuration	Recommended configuration
Software components	Adobe Flash Player last version The HTML5 Web Client supports the following web browsers: • Internet Explorer 11 • Mozilla Firefox 47 and higher • Microsoft Edge • Google Chrome The Legacy Web Client supports: • Internet Explorer 11 For the Financial Consolidation Excel Web Schedules module: • Microsoft Excel 2007 SP1 • Microsoft Excel 2010 • Microsoft Excel 2013 • Microsoft Excel 2016 32-bit edition	Internet Explorer 11 Microsoft Excel 2010 or 2013 (32-bit edition only)
Network connection	Connection at 64 Kbps or greater dedicated to daily operations Connection at 32 Kbps for one-off operations By default, the HTTP flow is compressed and enables you to use a network connection of only 32 Kbps	An ADSL connection or equivalent can improve performance

6.3 Windows Client

These recommendations applies to the following client components:

- SAP Financial Consolidation heavy client
- SAP Financial Consolidation Cube Designer Client
- SAP Financial Consolidation Excel Link

Table 3:

Category	Minimum configuration	Recommended configuration
Processor	Intel Core Solo Processor 1.4 GHz or a Pentium compatible processor	Intel Core 2 Duo 2 GHz or greater

Category	Minimum configuration	Recommended configuration
RAM	1 GB	2 GB
Disk space	3 GB available disk space for installing SAP Financial Consolidation	-
Screen resolution	1024 X 768	-
Operating system	Microsoft Windows 7, 32 or 64-bit editions Microsoft Windows 8.1, 32 or 64-bit editions Windows Server, 2008, 2008 R2, 2012 Terminal Services, 32 or 64-bit editions Microsoft Windows 10, 32 or 64-bit editions **Caution** IA 64-bit (Itanium) versions are not supported	-
Software components	Internet Explorer 11 Framework .NET 4.5.1 Adobe Flash Player last version If Excel Link is used: • Microsoft Excel 2007 SP1 • Microsoft Excel 2010 • Microsoft Excel 2013 • Microsoft Excel 2016 32-bit edition	Microsoft Excel 2010 or 2013 (32-bit edition)
Network connection	Ethernet 10 MB/s IP Network Adress translation (NAT) is not compatible with the Windows clients	Ethernet 100 MB/s

Note

In the case of complex configurations, the client computer's performance (RAM available and processor performance) can have a significant impact on the application's performance.

6.4 Terminal Services Client

Table 4:

Category	Minimum configuration	Recommended configuration
Processor	Intel® Core™ Solo Processor 1.2 GHz or a Pentium compatible processor	
RAM	256 MB or more	
Disk space	500 MB available disk space for installing the Terminal Services client or Citrix MetaFrame ICA client or 100 MB available disk space for installing the Web browser, e.g. Internet Explorer	
Operating system	Any client supported by Terminal Services or Citrix (such as Windows 7, Windows 8.1)	
Network connection	Connection modem 15 Kbps, WAN or LAN	

Note

In addition to Windows Server 2008, 2008 R2, 2012 or 2012 R2 Terminal Services, you can use complementary technology such as Citrix XenServer. All types of configuration supported by the Windows Terminal Services or Citrix XenServer can be used.

6.5 Local Data Entry / Standalone Configuration

Table 5:

Category	Minimum configuration	Recommended configuration
Processor	Intel Core Solo Processor 1.4 GHz or a Pentium compatible processor	Intel Core 2 Duo 2 GHz or greater
RAM	2 GB	4 GB
Disk space	10 GB of disk space available to install SAP Financial Consolidation, Microsoft SQL Server and the local database	20 GB

Category	Minimum configuration	Recommended configuration
Screen resolution	1024 X 768	-
Operating system	Microsoft Windows 7, 32 or 64-bit editions Microsoft Windows 8.1, 32 or 64-bit editions Microsoft Windows 10, 32 or 64-bit editions	-
Software components	Internet Explorer 11 Framework .Net 4.5.1 Adobe Flash Player last version Microsoft SQL Server 2008 Express Edition or higher If Excel Link is used: • Microsoft Excel 2007 SP1 • Microsoft Excel 2010 • Microsoft Excel 2013 • Microsoft Excel 2016 32-bit edition	Microsoft Excel 2013 or 2016 32-bit edition
Network connection	A network card is not required for decentralized data entry	-

Note

This configuration should not be installed in Windows Server Terminal Services.

6.6 Data Source Manager (CtBroker)

Table 6:

Category	Minimum configuration	Recommended configuration
Processor	Intel® Core™ Solo Processor 1.4 GHz or a Pentium compatible processor	Intel® Core™2 Duo 2 GHz or greater
RAM	512 MB	1 GB
Disk space	3 GB	-

Category	Minimum configuration	Recommended configuration
Operating system	Windows Server 2008, or 2008 R2, 2012 or 2012 R2 64-bit edition **Caution** IA 64-bit (Itanium) versions are not supported **Note** The Microsoft cluster environments are supported	-
Software components	Framework .Net 4.5.1 Internet Explorer 10 and higher	Internet Explorer 11
Network connection	Ethernet 10 MB/s	Ethernet 100 MB/s or greater

Note

The data source manager should not be installed in non server Windows editions (Windows 7, Windows 8.1).

6.7 Microsoft SQL and Oracle Database Server

Table 7:

Category	Minimum configuration	Recommended configuration
Processor	Intel® Core™2 Duo 2 GHz or a Pentium compatible processor Xeon processor or any other non-Intel processor with equivalent performance recommended Mono- or multi-processors, multi-core processors are supported	Intel® Xeon® Processor 2 GHz or greater Multi-processor recommended if more than 10 users
RAM	At least 4 GB, depending on the number of users	16 GB

Category	Minimum configuration	Recommended configuration
Disk space	At least 100 GB for the database, RAID 1 or RAID 5 secured disk storage recommended	Plan for 3 volumes: - one for the operating system - one for the data - one for the logs
Operating system	All server operating systems supported by the DBMS providers. To find out more, please contact SAP Software Support.	
Software components	- Microsoft SQL Server 2014 (including in a Microsoft Cluster environment) - Microsoft SQL Server 2012 (including in a Microsoft Cluster environment) - Microsoft SQL Server 2008 R2 Standard Edition (including in a Microsoft Cluster environment) - Microsoft SQL Server 2008 Standard Edition (including in a Microsoft Cluster environment) - Oracle Database 11g Release 2 (including Oracle RAC configuration) - Oracle Database 12c as of version 12.1.0.1.0 (including Oracle RAC configuration)	
Network connection	Ethernet 100 MB/s or greater	Ethernet 1 GB/s or greater

Note

SAP only validates the English versions of the database engines listed above. Versions in other languages are not tested and are not recommended (especially since the Service Packs are generally available later in other languages). As the database engine is not visible for end-users, localized versions are not necessary.

6.8 SAP HANA Database Server

Table 8:

Category	Minimum configuration	Recommended configuration
Server	SAP HANA Appliance Box Small size (256 GB of RAM)	Depending on the size of your SAP Financial Consolidation database. For more information, see the SAP HANA Master guide
Software components	- SAP HANA SPS 11 revision 112 and higher	

> **Caution**
>
> For SAP HANA Databases hardware recommendations, please contact SAP.

6.9 Web Server

Table 9:

Category	Minimum configuration	Recommended configuration
Processor	Intel® Core™2 Duo 2 GHz or greater Multi-processor computers and multi-core processors are supported Calculate one core for every 150 users	Intel® Xeon® Processor 2 GHz or greater Multi-processor recommended
RAM	2 GB Approx. 5 MB per user	8 GB
Disk space	10 GB	20 GB disk mirroring recommended
Operating system	Windows Server 2008, 2008 R2, 2012 or 2012 R2, 64-bit edition **Caution** IA 64-bit (Itanium) versions are not supported	

Category	Minimum configuration	Recommended configuration
Software components	HTTP server: Microsoft IIS Framework .Net 4.5.1 Internet Explorer 11	
Network connection	Ethernet 100 MB/s	Ethernet 1 GB/s

> **Note**
>
> The Web server should not be installed in non server Windows editions.

6.10 Application Server

Table 10:

Category	Minimum configuration	Recommended configuration
Processor	Intel Core 2 Duo 2 GHz or greater Multi-processor computers and multi-core processors are supported Calculate one core for every 30 users	Intel Xeon Processor 2 GHz or greater Multi-processor recommended
RAM	2 GB Up to 4 GB per instance with a 64-bit edition	8 GB
Disk space	20 GB	If the transfer functionalities are used, you should have 100 GB. Disk mirroring recommended
Operating system	Windows Server 2008, 2008 R2, 2012 or 2012 R2, 64-bit edition **Caution** IA 64-bit (Itanium) versions are not supported	

Category	Minimum configuration	Recommended configuration
Software components	DBMS clients: **Caution** As the application is a 32-bit application, DBMS clients must be 32-bit editions - Oracle 11g Release 2 and Oracle 12c for Windows, 32-bit edition - Microsoft SQL Server 2008 or higher client, 64-bit edition (*) - Microsoft SQL Server 2012 or higher client, 64-bit edition - Microsoft SQL Server 2014 or higher client, 64-bit edition - SAP HANA SPS 11 revision 112 and higher 32-bit Client Framework .Net 4.5.1 Internet Explorer 11	Internet Explorer 11
Network connection	Ethernet 100 MB/s	Ethernet 1 GB/s or greater

Caution

The application server should not be installed in non server Windows editions.

Note

The maximum memory of a 32-bit Windows process with a 64-bit Windows OS is 4 GB. However, you can use all the available memory on your server by creating several instances on the same server (in the Financial Consolidation Administration console).

Caution

(*) You can not install the SQL Server client 32-bit edition on a Windows 64-bit edition OS. You must therefore install the SQL Server client 64-bit edition which includes the 32-bit edition client.

6.11 Windows Terminal Services Server

Table 11:

Category	Minimum configuration	Recommended configuration
Processor	Intel Core 2 Duo 2 GHz or a Pentium compatible processor for every 15 users Multi-processors are supported	Intel Xeon Processor 2 GHz or greater Multi-processor recommended
RAM	At least 2 GB, depending on the number of users Up to 3 GB with the Windows /3G mode in 32-bit mode	8 GB or more
Disk space	20 GB	Disk mirroring recommended, RAID 1
Operating system	Windows Server 2008, 2008 R2, 2012 or 2012 R2 Terminal Services, 32 or 64-bit editions ⚠ Caution IA 64-bit (Itanium) versions are not supported	-
Software components	Internet Explorer 10 and higher Framework .Net 4.5.1 Adobe Flash Player last version If Excel Link is used: • Microsoft Excel 2007 SP1 • Microsoft Excel 2010 • Microsoft Excel 2013 • Microsoft Excel 2016 32-bit edition	Internet Explorer 11
SAP Financial Consolidation components	- Windows client - Financial Consolidation Cube Designer client - SAP EPM Add-in for Microsoft Office - Excel Link	-
Network connection	Ethernet 100 MB/s or greater	Ethernet 1 GB/s

> **Note**
>
> In addition to Windows Server 2008, 2008 R2, 2012 Terminal Services, you can use complementary technology such as Citrix XenServer. All types of configuration supported by the Windows Terminal Services or Citrix XenServer can be used.

> **Note**
>
> The SAP Financial Consolidation server processes (application servers, Web server, data source manager, database server) are not supported in the Terminal Services environment.

6.12 Cube Deployer Server

Category	Supported configuration	Recommended configuration
Processor	Intel® Core™2 Duo 2 GHz or a Pentium compatible processor Mono- or multi-processors, multi-core processors are supported Intel Itanium	Intel Xeon Processor 2 GHz or greater
RAM	1 GB	2 GB
Disk space	10 GB	
Operating system	Windows Server 2008, 2008 R2, 2012 or 2012 R2, 64-bit edition IA 64-bit (Itanium) versions are supported	Windows Server 64 bits editions
Software components	Microsoft IIS Framework .Net 4.5.1 Internet Explorer 11 and higher Web Services Enhancements (WSE) 3.0 for Microsoft .NET Redistributable Package Microsoft SQL Server 2012 Native Client (x64) Microsoft SQL Server 2014 Client components:	

Category	Supported configuration	Recommended configuration
	• Microsoft SQL Server 2014 Analysis Services OLE DB provider (x64) • Microsoft SQL Server 2014 CLR Types (x64) • Microsoft SQL Server 2014 Shared Management Objects (x64) • Microsoft SQL Server 2014 Analysis Services ADOMD.NET (x64) • Microsoft SQL Server 2014 Analysis Management Objects (x64) Oracle client with the Oracle OLEDB Provider For the SSAS database access: • 64-bit editions client components corresponding to your SSAS database version	
Network connection	Ethernet 100 Mbps	Ethernet 1 Gbps

6.13 SSAS Server

Category	Supported configuration	Recommended configuration
Processor	Intel® Core™2 Duo 2 GHz or a Pentium compatible processor Mono- or multi-processors, multi-core processors are supported Intel Itanium	Intel® Xeon® Processor 2 GHz or greater
RAM	4 GB	8 GB or higher
Disk space	50 GB Depends on the volume of data	Secured disks recommended (RAID or other technologies)
Operating system	Windows Server 2008, 2008 R2, 2012 or 2012 R2, 64-bit edition	

Category	Supported configuration	Recommended configuration
	⚠ Caution IA 64-bit (Itanium) versions are not supported	
Software components	DBMS clients: For the Financial Consolidation database access: - Microsoft .NET Framework 4.5.1 - Oracle 11g Release 2 or 12c client - Microsoft SSAS 2008, 2008 R2 Enterprise Edition or higher, 64-bit edition - Microsoft SSAS 2012, 2014 Business Intelligence Edition or higher, 64-bit edition - Microsoft Internet Information Services (IIS) - Microsoft SQL Server 2012 Native Client 11.0.2100.60 - Web Services Enhancements (WSE) 3.0 for Microsoft® .NET Redistributable Package	
Network connection	Ethernet 100 Mbps or higher	Ethernet 1 Gbps

⚠ Caution

Since SAP Financial Consolidation Cube Designer uses functionality only available in the Enterprise or Business Intelligence editions, only Enterprise or Business Intelligence editions of SQL Server are supported on the SSAS Server.

6.14 Microsoft Data Pump

Category	Supported configuration	Recommended configuration
Processor	Intel® Core™ Solo Processor 1.5 GHz or a Pentium compatible processor Multi-processors are supported	Intel® Core™2 Duo 2 GHz or greater

Category	Supported configuration	Recommended configuration
	Xeon processor or any other non-Intel processor with equivalent performance recommended	
RAM	1 GB	2 GB
Disk space	10 GB	
Operating system	Windows Server 2008, 2008 R2 or 2012 or 2012 R2, 32 or 64-bits editions	Windows Server 64 bits editions
Software components	Microsoft .NET Framework 3.5 SP1 Microsoft Internet Information Services (IIS) Microsoft SQL Server 2012 Analysis Services 11.0 OLE DB Provider 11.0.2100.60 Microsoft SQL Server 2008 Analysis Services 10.0 OLE DB Provider 10.0.1600.60 Web Services Enhancements (WSE) 3.0 for Microsoft® .NET Redistributable Package	
Network connection	Ethernet 100 Mbps	Ethernet 1 Gbps

Caution

The SAP recommendation is to install this component on the SSAS Server. Nethertheless, if you have a DMZ, you can install it on a separated machine.

6.15 BusinessObjects Enterprise XI 4 platform

For supported and recommended configuration, refer to the BusinessObjects Enterprise XI 4 platform documentation.

The supported versions of the BusinessObjects Enterprise XI 4 platform with SAP Financial Consolidation 10.1 are BusinessObjects Enterprise XI 4.1 and 4.2.

Note

Only the Windows version of the BusinessObjects Enterprise XI 4 platform is supported with SAP Financial Consolidation.

> **Note**
>
> Only the Java version of the BusinessObjects Enterprise XI 4 platform is supported with SAP Financial Consolidation (the .net version is not supported).

> **Caution**
>
> Do not uninstall the MDAS component that is automatically installed with the BusinessObjects Enterprise XI 4.

6.16 SAP Information Platform Services

Category	Supported configuration	Recommended configuration
Processor	Intel® Core™2 Duo 1.5 GHz or a Pentium compatible processor Multi-processors are supported	-
RAM	2 GB	-
Disk space	10 GB hard disk space	-
Operating system	Windows Server 2008, 2008 R2, 2012 or 2012 R2, 64-bit edition Microsoft SQL Server 2008 Analysis Services 10.0 OLE DB Provider 10.0.1600.60 **Caution** IA 64-bit (Itanium) versions are not supported	-
Software components	SAP Information Platform Services 4.1 and 4.2	-
Network connection	Ethernet 100 Mbps or higher	Ethernet 1 Gbps

> **Caution**
>
> Only the Windows version of the SAP Information Platform Services is supported with SAP Financial Consolidation.

7 Solution-Wide Topics

This section provides general information for the application.

Localization

SAP Financial Consolidation is distributed as a standard version and does not include localized reporting and consolidation functionality. However, you can run the application in a number of languages and, with the appropriate configuration, the application supports customized planning and consolidation processes. For more information see the application help.

8 Additional Guides

You can find the following guides on the SAP Service Marketplace:

- SAP Financial Consolidation Administrator's Guide
- SAP Financial Consolidation Installation Guide

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