



HELSINKI METROPOLIA UNIVERSITY OF APPLIED SCIENCES

Bachelor's Degree in Industrial Management

Bachelor's Thesis

**SETTING UP SAP LABORATORY FOR EDUCATION AND PROJECT PURPOSES
CASE: ERP CENTRAL COMPONENT**

**Author: Kaarle Glad
Instructor: Erkki Koskela
Instructor: Ansa Harju**

Approved: 9.6.2010

**Erkki Koskela
Senior Lecturer**



PREFACE

Writing this thesis gave me an excellent introduction to technical documentation. I also got good experience in installing information systems used widely in enterprises. I appreciate this opportunity offered by Metropolia University of Applied Sciences.

I would like to thank my instructors Erkki Koskela and Ansa Harju for their guidance and support during this study. I would like to thank the installation group members Raimo Öster and Matti Varelius for their help and professional advice within the installation project.

I also wish to thank my family and friends for their support throughout the study.

Helsinki, 2 June 2010

Kaarle Glad

ABSTRACT

Name: Kaarle Glad	
Title: Setting up SAP Laboratory for Education and Project Purposes – Case: ERP Central Component	
Date: 31 May 2010	Number of pages: 28 + 1 Appendix (42)
Degree Programme: Bachelor's Degree Programme in Industrial Management	
Instructor: Erkki Koskela, Senior Lecturer	
Instructor: D.Sc (Tech) Ansa Harju, Principal Lecturer	
<p>This Bachelor's Thesis study was initiated to document the installation of SAP ERP Central Component solution in SAP laboratory of Metropolia University of Applied Sciences. As the knowledge of the installation should not be dependent on certain people, a valid documentation was required. The main objective of the study was to define a documentation method that supports the maintenance and development as efficiently as possible.</p> <p>The theoretical background of this study consists of two parts. The first part introduces the research environment with an overview of the SAP Solution Manager and SAP ERP Central Component solutions. The second part includes theory on technical documentation.</p> <p>The documentation was compiled according to the defined method. The usability and comprehensiveness of the documentation was tested by installing a second SAP ERP Central Component solution according to the instructions of the documentation.</p> <p>The evaluation of the documentation consisted of analyzing the test results and comparing the documentation to the attributes of a good documentation defined in the study. Since the results were successful, it can be stated that the documentation can support the maintenance and development as an efficient source of information.</p>	
Key words: Technical documentation, SAP ERP Central Component (SAP ECC), SAP Solution Manager	

OPINNÄYTETYÖN TIIVISTELMÄ

Työn tekijä: Kaarle Glad	
Työn nimi: SAP- laboratorion perustaminen koulutus- ja projektitarkoituksiin – Tapaus: SAP ERP Central Component	
Päivämäärä: 31.5.2010	Sivumäärä: 28 + 1 liite (42)
Koulutusohjelma: Tuotantotalous	
Työn ohjaaja: Erkki Koskela, lehtori	
Työn ohjaaja: Ansa Harju, TkT, yliopettaja	
<p>Tässä insinööri työssä tarkoituksena oli dokumentoida Metropolia Ammattikorkeakouluun perustettavan SAP-laboratorion keskeisen sovelluksen, SAP ERP Central Componentin, asennus. Tutkimuksen tavoitteena oli määrittellä asennukselle dokumentointimenetelmä, joka tukee ylläpitoa ja kehitystä mahdollisimman tehokkaasti.</p> <p>Tutkimuksen teoreettinen tausta koostuu kahdesta osasta. Ensimmäinen osa esittelee tutkimusympäristön sekä sovellukset SAP Solution Manager ja SAP ERP Central Component. Toinen osa käsittelee teknisen dokumentoinnin teoriaa.</p> <p>Dokumentaatio laadittiin määritellyn dokumentointimenetelmän mukaisesti. Dokumentaation käytettävyys ja kattavuus testattiin asentamalla toinen SAP ERP Central Component -sovellus dokumentaation ohjeiden mukaan.</p> <p>Dokumentaatiota arvioitaessa analysoitiin testauksen tuloksia ja verrattiin dokumentaation sisältöä tutkimuksessa määritettyihin hyvän dokumentaation ominaisuuksiin. Toinen asennus suoritettiin onnistuneesti, ja dokumentaatio vastasi hyvän dokumentaation vaatimuksia. Tuloksista voidaan todeta, että laadittu dokumentaatio voi tukea ylläpitoa ja kehitystä tehokkaana tietolähteenä.</p>	
Avainsanat: Tekninen dokumentointi, SAP ERP Central Component (SAP ECC), SAP Solution Manager	

TABLE OF CONTENTS

PREFACE

ABSTRACT

TIIVISTELMÄ

TABLE OF CONTENTS

ACRONYMS

1	INTRODUCTION	1
2	RESEARCH ENVIRONMENT	4
2.1	SAP Solution Manager	5
2.2	SAP ERP Central Component	9
2.3	SAP IDES	11
3	TECHNICAL DOCUMENTATION	13
3.1	Documentation Standards	13
3.2	Documentation Structure	15
3.3	Documentation Process	17
3.4	Basic Attributes of Good Documentation	19
4	DOCUMENTATION PROJECT	21
5	RESULTS AND ANALYSIS	23
6	SUMMARY	26
	REFERENCES	27



ACRONYMS

ERP	Enterprise Resource Planning
HCM	Human Capital Management
SAP	Systems, Applications and Products in Data Processing
SAP BW	SAP Business Warehouse
SAP CRM	SAP Customer Relationship Management
SAP ECC	SAP ERP Central Component
SAP IDES	SAP Internet Demonstration and Evaluation System
PDF	Portable Document Format

1 INTRODUCTION

SAP Finland Oy has donated SAP solutions for educational and research use to Universities and Universities of Applied Sciences. At the time of writing this study, 21 Higher Education Organizations have signed a collaboration agreement. Metropolia University of Applied Sciences coordinates this co-operation by setting up a SAP laboratory. The laboratory will be introduced in the autumn of 2010.

The SAP laboratory includes various kinds of SAP solutions. Teachers and students are able to obtain knowledge on the solutions and model different business alternatives supported by Enterprise Resource Planning (ERP). The SAP collaboration also enables more extensive corporate assignments and graduate study opportunities for students. The present study concentrates on the installation and documentation of the SAP laboratory solutions.

The installation of the solutions requires valid documentation. Although SAP provides an installation guide for the solutions, there are still different ways of installing. The documentation produced by this study shows the tangible implementation of the installations and the features included.

Research Problem, Scope, and Objective

The main objective of the thesis is to define a documentation method for the SAP laboratory installation. The focus is on two fundamental solutions of the SAP environment, SAP Solution Manager and SAP ERP Central Component (SAP ECC). The documentation is compiled on the SAP ECC installation.

The main research question in this study is:

How the installation documentation has to be compiled, so that it supports maintenance and development as efficiently as possible?

This study also addresses the following sub questions:

What does a documentation process consists of?

What is included in good documentation?

Approach and Method

To find an answer to the research question: “How the installation documentation has to be compiled, so that it supports maintenance and development as efficiently as possible?” it is necessary to find an appropriate documentation method. The documentation is done on the basis of the decided method. The functionality of the method is tested by installing a new solution according to the documentation.

The literature section is divided into two parts. The first part introduces the research environment and consists of the presentation of the installed SAP solutions and the features they comprise. The second part concentrates on the technical documentation and introduces the applied documentation method and defines the attributes of good documentation.

The practical phase describes the installation and documentation process.

Structure of the Study

The structure of this study is illustrated in Figure 1.

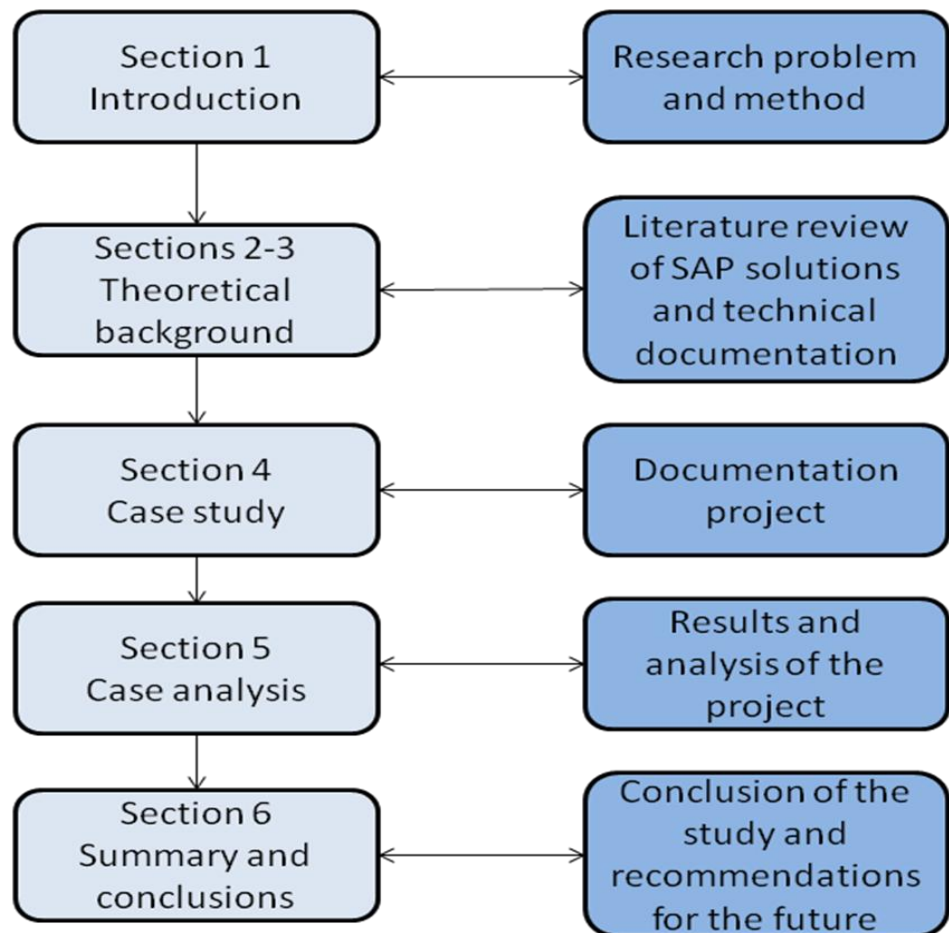


Figure 1: Structure of the Study

The study is divided into six sections. Section 1 introduces the study giving an overview of what the study is all about. Definitions of purpose, research problem and scope of the study are included in section 1, as well as the applied method and the structure of the study. Sections 2 and 3 give the theoretical background for the study. The research environment is presented in section 2 and there is a literature review of SAP in general, SAP Solution Manager, SAP ECC and SAP IDES. Section 3 includes presentation of technical documentation and also introduces the documentation method applied in the present study.

The documentation project of installation of SAP ECC is presented in section 4, and section 5 shows the results and analysis of the documentation. Section 6 concludes the study with a summary of the whole study and suggestions for the future.

2 RESEARCH ENVIRONMENT

This chapter introduces the research environment for the study. At first, the SAP laboratory and the solutions are presented. The sub-chapters offer deeper knowledge of the solutions.

The SAP laboratory is located in the IT laboratory of Metropolia University of Applied Sciences. The IT laboratory provides virtual servers for the installation of the SAP solutions. Every solution is installed to its own virtual server. The installation order was decided in the startup meeting in the beginning of February 2010. SAP Solution Manager, an application management solution, was set to be installed first. After that SAP ERP Central Component (SAP ECC) is installed. SAP ECC installation also includes SAP IDES database installation. SAP IDES consists of an initialized model company that has been set up for SAP ECC. The study focuses on these two solutions.

There was also a plan for installing SAP Business Warehouse (SAP BW) and SAP Customer Relationship Management (SAP CRM) solutions. These can be investigated in forthcoming Bachelor Theses.

Virtual Server

In a virtualized server, multiple server environments can operate on a single piece of physical hardware. The group of servers can consist of different environments, for example Windows and Linux. Server virtualization solutions are created by adding a thin layer over the physical server. The physical server is partitioned into separate areas by this layer and virtual servers operate on these areas. Each virtual server acts as its own entity, in spite of sharing the computing resources. If there appear problems in one server, it does not affect other virtual machines on that same physical server (IT Management 2010).

SAP

SAP is a company founded in Germany in 1972 by five former IBM engineers. SAP stands for Systems, Applications and Products in Data Processing. The vision for the company was to develop standard application software for real-time business processing. Today SAP is the leading

provider of business software (SAP 2010a). “SAP defines business software as comprising enterprise resource planning and related applications such as supply chain management, customer relationship management, product life-cycle management, and supplier relationship management” (SAP 2010b).

In 1973 the first software, R/1 System, was launched. The software was focused on financial accounting. The letter “R” stands for real-time data processing (SAP 2010a). SAP System R/2 was released in 1979. It was the first integrated, enterprise wide package. R/2 runs on mainframes (TheSpot4SAP.com 2010). The R/2 System also took into account the multinational customers with the features of different languages and currencies.

SAP R/3 was introduced in the early 1990s. It turned the software from mainframe computing to client-server architecture, which means three-tier architecture of database, application, and user interface (SAP 2010a). Client-server architecture can be described as a software concept that includes a set of service providers and service requesters. Individual software components act as service providers and/or service requesters and communicate with each other across preordained interfaces. Client-server technology distributes the workload of a computer application across several co-operating computer programs (Hernández 2000: 22).

To cover the complexity of the business world, R/3 systems include a large number of functions. Added to business functionalities, R/3 also includes implementation tools, development environment, and tools to monitor and manage the system (Hernández 2000: 7). SAP’s success can be explained with its standard package which can be adapted to the specific needs of a company and configured in multiple areas. With a wide range of business functions, there is also the possibility for further functionality and enhancements or adaptability to business practice changes (Hernández 2000: 4).

2.1 SAP Solution Manager

The SAP Solution Manager is an application management solution. It advances technical support for the entire SAP Solution environment. It covers solution deployment, operation and continuous improvement. An important attribute of Solution Manager is to increase the reliability of

solutions by combining tools, content, and direct access to SAP. Current and forthcoming SAP solutions are covered, and the toolset also supports non-SAP solutions. The focus of the Solution Manager is strongly on core business processes. The connection between business processes and IT infrastructure is supported, hence the communication becomes easier (SAP 2010c). Figure 2 presents the features of SAP Solution Manager.

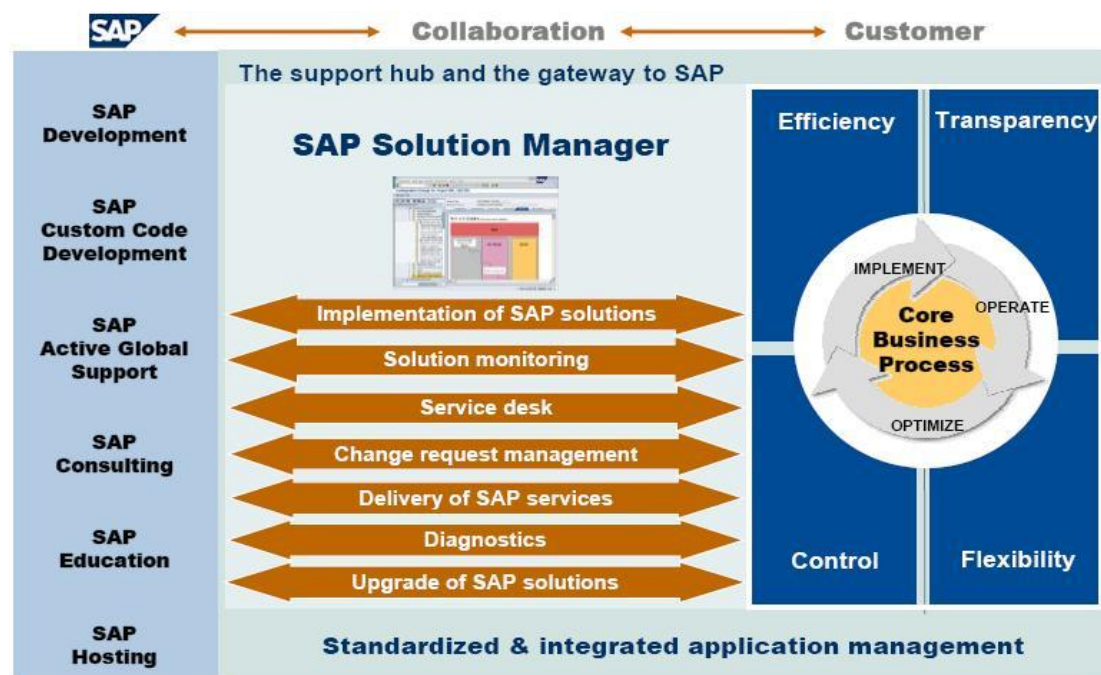


Figure 2: Features of SAP Solution Manager (SAPDB.info 2010)

The main features of the SAP Solution Manager are:

- Acceleration of implementation of SAP Solutions
- Control of all software configuration changes of the IT Solution
- Acceleration of test preparation and execution
- Identification, analysis, and resolution of problems with diagnostics functions
- Centralized, real-time monitoring of systems, business processes, and interfaces, (SAP 2010c).

SAP Solution Manager is SAP's service and support platform designed to assist in efficiently and effectively implementing and operating IT solution. It is a central component of the strategic SAP service and support that accompanies throughout the entire solution lifecycle and provides business process-oriented, transparent information for application management. SAP

Solution Manager acts as a portal for acquiring knowledge from SAP by allowing access to information in three different ways: Tools, Content and Services.

Tools help managing the tasks associated with the SAP solution including function for managing changes, centralized monitoring, and the Service Desk for end user support. Content presents examples of good solutions and methods that can be used as templates for projects. There are roadmaps for implementation and upgrade projects, templates for the flow of business processes, and process description for IT organization tasks. SAP experts offer services via SAP Solution manager. For example the business process management service is a tool-based concept to ensure that mission-critical business processes run smoothly (Schäfer et al 2007: 25 - 26).

There are six basic concepts that promote the effective transfer of know-how in SAP Solution Manager: Business process orientation, support throughout the entire lifecycle, integrated solution approach, openness, governance, and transparency. Business process orientation increases coherent communication and understanding of IT services between IT staff and the individual departments of organizations. The lifecycle of software applications consists of many phases, for example deployment, operation and continuous improvement. The interdependencies between the phases are important. Information about the current operation status is needed in order to optimize a solution. It is important to have an integrated approach that covers the entire software lifecycle.

There can be different software components for business processes: One for managing sales orders, one for logistics, one for invoicing, etc. All relevant components must be taken into account to ensure mutual interdependencies and interfaces between the components. Non-SAP products are, to a certain extent, integrated into business process management systems. This helps in avoiding delays when determining the cause of a problem and resolving it. SAP Solution Manager is a central platform for governing IT processes. It focuses on planning the tasks to be completed, on organizing the implementation of existing tools and on documenting the results (Schäfer et al 2007: 27 - 28).

Figure 3 shows the transparency in SAP Solution Manager. Solution Manager collects all information required and makes it centrally available. This is enabled with transparent documentation. Right decisions in IT strategy are necessary. That is why information on the status of IT solution is needed. SAP Solution Manager acts as a central data collection point. An overview of entire solution is available; list of available components, their release level, client allocation on each component and records of installed support packages. The information is also up to date (Schäfer et al 2007: 39).



Figure 3: Transparency in SAP Solution Manager (Schäfer et al 2007: 28)

SAP Solution Manager allows detection of dependencies between IT organization and business departments. It has an overview of which business processes are supported by IT, how the processes are operating, and which process steps are executed by which component. In case of component malfunction, affected business processes can be defined. Also relevant components can be prepared, if there appears an increase of volume of a certain business process.

Tracing of the component configurations is enabled in SAP Solution Manager. Various activities are documented so that the person who performed and the person who authorized it can be tracked down. Clarifying how the business processes are set up to operate is relevant for problem analysis and upgrade projects. SAP Solution Manager also provides support in the form of reporting options. There are fully configured reports and reporting templates for completely individualized reports (Schäfer et al 2007: 39 - 40).

2.2 SAP ERP Central Component

SAP ERP Central Component (ECC) is the latest upgrade package for SAP Enterprise Resource Planning (ERP) software. SAP ERP application supports essential functions of business processes and operations. Functions can be tailored to needs of specific industry. SAP ERP includes key solutions: Financial, Human Capital Management, Operations, and Corporate Services solutions (SAP 2010d).

Figure 4 illustrates the Solution Map of SAP ERP. There are listed the SAP ERP solutions and their features and functionalities. SAP ERP Financials is a complete, end-to-end enterprise financial management solution. It is designed so that it meets the requirements of the most complex, multinational organizations and it consists of applications such as: Financial and management accounting, Financial supply chain management, and Treasury applications. (SAP 2010e)

Self Services					
Analytics	Strategic Enterprise Management		Financial Analytics	Operations Analytics	Workforce Analytics
Financials	Financial Accounting	Management Accounting	Financial Supply Chain Management		Corporate Governance
Human Capital Management	Employee Life-Cycle Management		Employee Transaction Management	HCM Service Delivery	Workforce Deployment
Operations: Value Generation	Procurement	Inventory & Warehouse Management	Manufacturing	Transportation	Sales Order Management Customer Service
Operations: Support	Life-Cycle Data Management		Program & Project Management	Quality Management	Enterprise Asset Management
Corporate Services	Travel Management	Environment, Health & Safety	Incentive & Commission Management		Real Estate Management
SAP NetWeaver™	People Integration	Information Integration		Process Integration	Application Platform

Figure 4: Solution Map of SAP ERP (OneStopSAP.com 2010)

SAP ERP Human Capital Management (SAP ERP HCM) is a human resource management solution. This comprehensive and integrated solution is industry-independent and offers these features: Talent management, Workforce process management, and Workforce deployment (SAP 2010f).

SAP ERP Operations solution ensures control and integration of the entire chain including design, development, procurement, manufacturing, sales, until the delivery of products and services. The features of SAP ERP Operations are: Procurement and logistics execution, Product development and manufacturing, and Sales and service (SAP 2010g).

SAP ERP Corporate services solution includes features such as: Real estate management, Enterprise asset management, Project and portfolio

management, Travel management, Environment, health and safety management, Quality management and Global trade services (SAP 2010h).

2.3 SAP IDES

SAP IDES stands for The Internet Demonstration and Evaluation System. It is an initialized model company that has been set up for SAP ERP. The IDES System includes several companies. Companies can be used individually or in interaction with each other. The business tasks are predefined for each company. The IDES System demonstrates how functions and operations are integrated in SAP ERP. The IDES also shows the range of functions available.

Often used in training courses, self-learning programs, and for presentations, the IDES offers a useful learning environment. It prepares users for using SAP ERP in practice. System is fully customized and it contains real-life master data and transaction data. It provides extensive data description and process description for cross-application business processes.

There are three different subgroups: IDES America, IDES Asia, and IDES Europe. Subgroups have companies that each have a clear-cut business task within the corporate group. Legal and country-specific requirements are set for each company.

The IDES business processes are complete business processes. All logistical functions, purchasing, inventory management, production, and sales and distribution, are integrated into accounting. Controlling functions, overhead costs, costing, and profitability analysis, are enabled. Human Resource Management functions are included with management reports. Because there are organizational entities which all manufacture different products using a specified manufacturing process, the IDES System can be used for a specific industry sector. All the resources required for manufacturing all kinds of products are included.

The Financial Accounting and Reporting contains legal requirements. Region-specific business practices and legal regulations are taken into account for each individual subgroup. Controlling scenarios depend on the company in question. Scenarios vary from simple cost accounting to a fully

rounded controlling model that includes overhead costs, production costs and profitability analysis. The quantity and value flows are handled with Production Planning and Materials Management. Contribution margin analyses on the basis of market segments and analyses of internal and external success factors are conducted with Profitability Analysis and Enterprise Controlling.

The Human Resource Management component is assigned to areas of personnel administration, personnel organization, and personnel planning. These areas are integrated into all departments in IDES. The subgroups are organized so that payroll accounting can be performed. Payroll results are passed on to Accounting (SAP AG 1998: 1.1 – 1.5).

3 TECHNICAL DOCUMENTATION

High quality documentation is the main thing in developing information systems. Unfortunately it is usually the first part that is at risk when there are tight time limits. Documentation of matters related to defining and planning may not be done properly in a case of urgency. In turn, there can occur overdraw in compiling the documentation and too many documents are created. This may be due to bad prioritization or bureaucracy.

It can be hard to progress to further levels in developing projects if documentation is neglected. Lack of know-how in implementation technologies creates problems in planning and developing stages. Thus time is consumed on compiling more research material. Every implemented system requires basic documentation. Necessary quantity is defined by the project size and complexity (Pohjonen 2002: 70).

The essential reason for documentation is to retain the knowledge, so that it is not depended on certain people. There are some important steps one should consider when writing a technical documentation. The purpose of the documentation must be specified in order to define the content, the format and sometimes the way it is represented. It is also necessary to think who uses the documentation. It helps to adjust and adapt the style and the informational content of the document. Collecting information is vital. Manuals and user guides are good resources, but also it is good to get help from specialists of the area.

The writing should start with an outline. It identifies the different sections of the document. In the first draft it is not necessary to edit or format. This is the stage where all the elaborated information is presented. If the first draft is done properly, there is no need to add anything at the end. The final draft includes the most important and most useful information. The document formatting is done after the final draft is ready (IT Managers Inbox 2010).

3.1 Documentation Standards

The software and the software process are represented in documents. Standardized documents give consistency and logicity to the readers. Sommerville (2001) introduces three types of documentation standards:

documentation process standards, document standards and document interchange standards.

Documentation process standards define the process which should be followed during the documentation process. Procedures that belong to the document development are defined. Checking and refinement procedures add quality to the documents. The quality level is set by considering the document type and the readers of the document (Sommerville 2001: 542). Figure 5 illustrates the production process of a document.

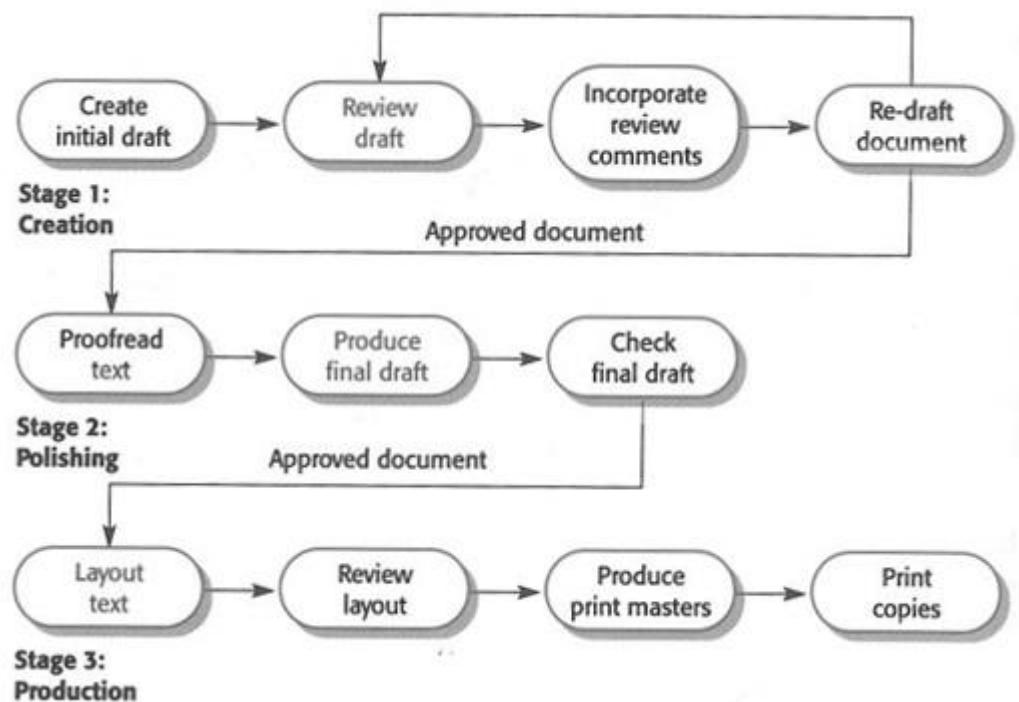


Figure 5: Document production process (Sommerville 2001: 542)

All the documents should be consistent and therefore style and appearance need to be kept in the same format. Document standards give consistent structure to the documents in a specific project but also it would be wise to consider using them in all documents produced by an organization. Sommerville (2001) presents some useful document standards which may be developed.

Document identification standards mean that each document must be uniquely identified. Document structure standards clarify the structure of

each class of document. Structure standards define the sections to be included and specify the practice for page numbering, sections and subsection numbering, and page header and footer information. Documentation presentation standards have a great contribution on document consistency. Fonts, styles, colors and use of company logos and names should be unified. Document update standards define the way document changes should be indicated. This can include using different colors of cover for document versions or changing bars in the margin to indicate modified or added paragraphs.

Document interchange standards enable documents to be transferred electronically and re-created in their original form. This is important because electronic copies of documents are interchanged. Interchange standards set limits to using documentation tools and style sheets. It allows everybody with different equipment to use the documents (Sommerville 2001: 542 - 543).

3.2 Documentation Structure

The information on installation, production, operation and maintenance is usually divided into parts or objects. This improves efficiency. Defining objects and the system of their interdependence are called structuring and the result is called a structure. Different structures suit different working tasks. SFS (2006) presents some structures; for example, a function-oriented structure, a product-oriented structure and a location-oriented structure.

Figure 6 shows a hierarchy that every information structure forms. A node represents the object of chosen aspect. Node is divided into its constituents, lower-level objects, which are indicated by the branches. These constituent parts can in turn be divided into their constituent branches, etc (SFS 2006).

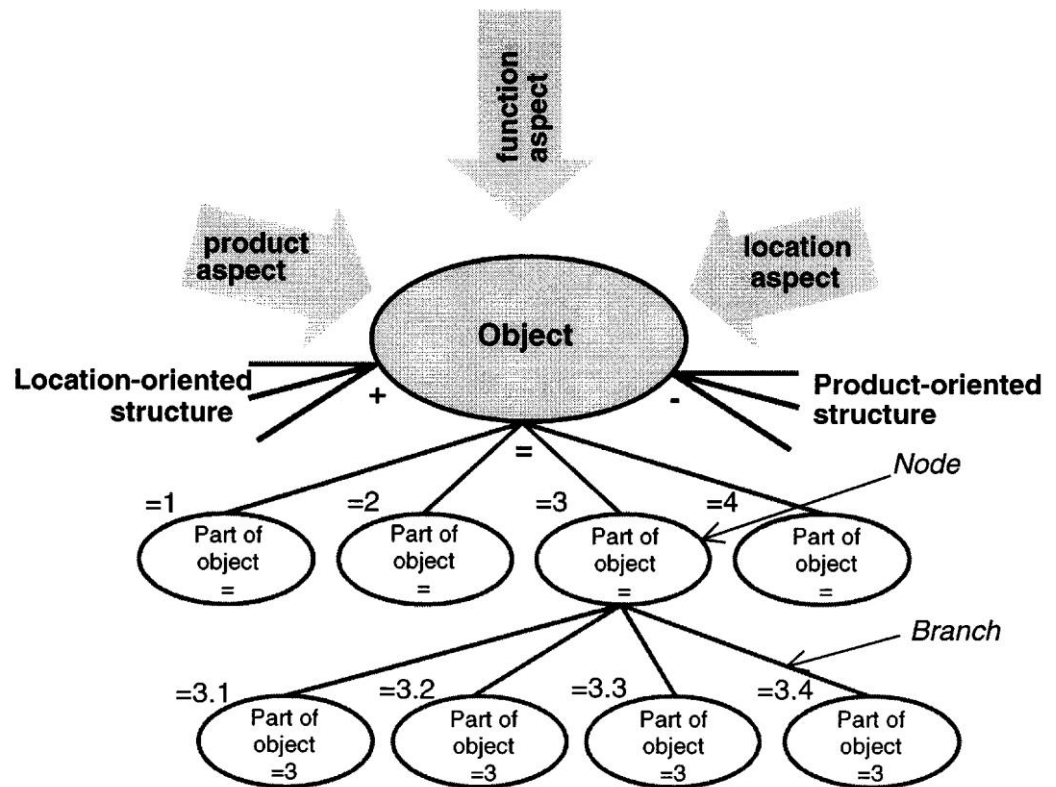


Figure 6: General structuring of objects (SFS 2006)

SFS (2006) defines the structures as follows:

“A function-oriented structure is based on the purpose of a system. A function-oriented structure shows the subdivision of the system into constituent objects with respect to the function aspect, without necessarily taking into account the location and/or the products implementing the functions. Documents giving information based upon a function-oriented structure describe, graphically and/or textually, how the functions of the system are divided into sub-functions that are combined to fulfill the intended purpose.

A product-oriented structure is based on the way a system is built up to become a product. A product-oriented structure shows the subdivision of the system into constituent objects with respect to the product aspect without necessarily taking into account functions and/or locations. Documents giving information based upon a product-oriented structure describe, graphically and/or textually, how a product is divided into sub-products that are manufactured, assembled, or packaged together to implement or deliver the product.

A location-oriented structure is based on the topographical layout of the system, and/or the environment in which the system is situated. A location-oriented structure shows the subdivision of the system into constituent objects with respect to the location aspect without necessarily taking into account products and/or functions. Documents giving information based upon a location-oriented structure describe, graphically and/or textually,

where the products implementing a system are physically located.” (SFS 2006)

3.3 Documentation Process

It is necessary to use project management in producing documentation in order fit the project to the predefined budget and schedule. TCeurope (2004) introduces these steps to be followed in documentation project management:

- Definition of objectives
- Documentation planning
- Project monitoring
- Creation of documentation testing plans
- Consistent writing instructions
- Project conclusion
- Project follow-up, (TCeurope 2004)

Definition of objectives describes the documentation project outcome. Things to be considered and defined are: documentation focus group analyzing, and publication format and language of the documentation. Project objectives should be concrete and realistic so that they are attainable with the project resources. Objectives must be taken into notice at every stage of the project.

Documentation planning ensures that the project outcome is comprehensive enough and responds to the issued quality requirements. Project objectives must be obtained in the limits of the budget and schedule. The plan should include definitions of the documentation tools and software, and also how the documentation is produced. The responsibilities of project participants should be defined in order for every task to have its own person in charge. Risk management should be considered. Project risks must be analyzed and there should be a plan to minimize the risks. The project plan must be kept up to date and it is important to make sure that the plan is followed during the project. There could also be a backup plan for the possible changes in the project.

Project monitoring ensures that the project goes on upon the objectives. Project costs, schedule, changes and risks are checked regularly. If there emerges a problem in the project, it should be recognized and resolved on an early stage so that time and money will be saved. There should be someone responsible for the process monitoring who has a wide general view of the whole project.

Documentation testing increases the creditability and usability of the documentation. There are several ways of testing documentation. Document content testing ensures that the content is accurate where as functionality of the directories and links are tested with technical functionality testing. Usability testing ensures that the users of the documentation can find the information needed and they can operate according to that. Documentation testing plans can help in finding errors in the documentation before it is published. Documentation testing can also reveal failures from the product itself. Product developers must be informed of these findings.

Testing plan defines the scope and methods of testing. Tests are designed so that clear and straightforward answers are achieved. A common institution of documentation testing is to test if a test person can execute the described task by following the instruction of the documentation. When selecting the test person or persons, it is important to match them with the persons that will use the documentation in the future. Tests are good for checking that there is nothing necessary left out from the documentation. It is also essential that the documentation cannot be interpreted incorrectly. Usually a testing group of five persons is large enough to get reliable results.

Proper terminology and consistent style are features of good quality documentation. Consistent writing instructions can be created with the help of style guides. There might be a need for creating a special vocabulary for the used terms in the documentation.

When the documentation project is nearby closure, there should be made a document which analyzes and archives the experiences. The document includes a summary of the positive and the negative experiences and suggestions for upcoming projects. The estimations of schedule and workload are analyzed comparing them to the actual schedule and workload. This information can be used for planning the projects in the future.

The project follow-up starts when the project is finished. It enables making corrections and changes to the documentation if necessary. User experiences should be collected because they reveal if there are some insufficiencies in the documentation. Enhanced versions of the documentation should be made easily available for the users. Internet is a good distribution channel for that (TCeurope 2004).

3.4 Basic Attributes of Good Documentation

According to TCeurope (2004), attributes of good documentation are:

- Comprehensiveness
- Good structure
- Clear content
- Figures and charts that optimize communication
- Publication channel fit for need, (TCeurope 2004)

The information of quality documentation is well organized and structured. Good structure is important for the user to get the needed information efficiently. Documents are often used to perform a single task, so the content should be compact and foolproof. Documentation ought to be comprehensive in order that user can access to all necessary information. Good planning saves time on the production stage of the documentation.

Logical structure is forged for example by presenting basic facts before more detailed information. Information must be divided in chapters and sub-chapters. Too deep hierarchy levels can confuse the reader, so maximum third level headers should be used (for example 1.1.1). Headers should describe the chapter content well. A table of contents in the documentation is useful as well as a list of tables and figures.

Language of the documentation should be clear, compact and easy to understand. Synonyms can be confusing to the reader, hence it is important to use one term for each concept. Real creativity is shown when parts of information are organized clearly, consistently and logically. Simplicity is preferred, so one must avoid using too much text modifications such as bold, italic or colors. Text modifications can be used in highlighting essential terms.

Because the documentation must be understandable, clear terminology is undisputed. Abbreviations and product-specific terminology are defined for the reader and abbreviations should be explained when used for the first time. Clear terminology reduces problems if the documentation is translated to other languages.

Figures and charts are used for amplifying imparted information of text content as some readers find figures more understandable than written text. Every figure should present only one new part of information. It is important that the figures in the documentation resemble exactly the same figures the user faces while using the product and they should be associated with captions or numbering (TCeurope 2004).

4 DOCUMENTATION PROJECT

This chapter introduces the documentation project of installing SAP ECC application. The documentation project follows the documentation process steps of the SecureDoc research assigned by TCeurope. The outcome of the documentation can be seen in the Appendix section.

Definition of Objectives

The focus group of this documentation is quite small. Documentation is mainly used in a case of a development project to find out what decisions have been made during the installation. The projects are operated by IT personnel, who have a strong IT background. Considering this fact, it is not necessary to explain or define the basic computer operations. However, the application-specific functionalities must be defined. The documentation is written in English.

The publication format for the documentation is Portable Document Format (PDF). It is convenient with the ability of small file size. The final version is modified with Adobe Acrobat Professional software. With the bookmark option, the headers and sub headers can be added to a table of contents screen. This enables quick and clear navigation through the documentation. Also printed versions are created.

Documentation Planning

The documentation planning phase includes scheduling the project. The project deadline was set to the end of April 2010. Figure 7 shows the scheduling for the installations and documentation.

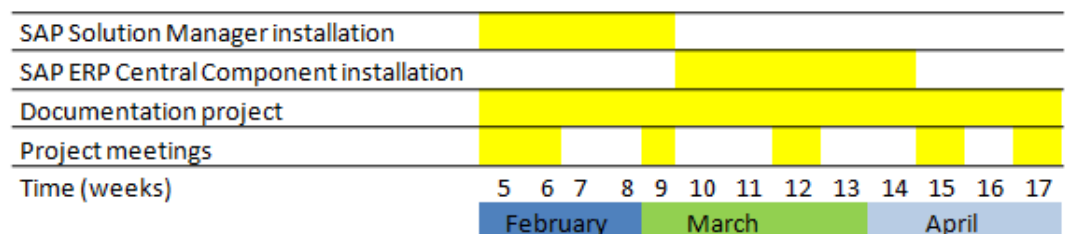


Figure 7: Schedule of the Project

The possible risks of the project were straight related to the installation project. In case of delays in installation, there are obviously holdups in the documentation project. Delays are taken into consideration with a relatively loose installation schedule. Time given for the installation project was approximately two months leaving flexibility to resolve potential problems and errors.

The documentation was created during the installation. The plan was to collect information as much as possible from the installation and from the installers. Notes were created of all the steps and of the installation. Also screenshots were taken from the steps. Although not every screenshot is used in the final version of the documentation, it is important that nothing essential is left out.

Project Monitoring

Regular meetings ensure that the documentation project is constantly monitored. If there are changes made concerning the project, they can be processed during these meetings. The meetings are held approximately twice a month.

Creation of Documentation Testing Plan

It was decided that the documentation usability and creditability was to be tested by installing a second SAP ECC application according to the instructions in the created documentation. Although the documentation should be tested with more people and more times, the time and resource constraints have to be taken into consideration.

The test person will be the documentation creator, Kaarle Glad. Given that he has no precedent experience in the installation of SAP solutions, he can be regarded as an appropriate person for the testing operation. SAP installer, Raimo Öster, will be the supervisor in the testing event to ensure the reliability and validity of the test. The test installation is operated when the content of the documentation is ready. The testing gives a possibility to detect, if the operations are in a correct order and if there are mistakes in the documentation.

5 RESULTS AND ANALYSIS

In this section, the documentation is analyzed and evaluated. The usability of the documentation is measured by testing it in an actual installation and comparing it to the attributes of good documentation.

Second Installation

The second installation of SAP ECC (EC2) took place after the first installation (EC1) was successfully completed and the documentation was finished. The installation environment in EC2 was almost identical with EC1. The alteration concerned the location of the installation files. In EC1, the files were located in a hard drive shared from another server. This, however, led to problems in installation. SAP installation creates user accounts for the server. If the installation files are not located in the server hard drive, the users must be granted administrator rights to continue the installation. To avoid this interruption, the installation files were downloaded directly to the server hard drive where EC2 installation took place.

The installation of EC2 proceeded according to the documentation. One known error occurred during the installation. In the phase, when SAP independently installs the system, there is a point where the installation starts the SAP system on its own. However, this does not actualize, and the installation indicates an error. This can be solved by stopping all the database and SAP services, and restarting them again. This problem appeared also in the installation of EC1, so it was easy to solve.

Apart from this incident, the installation was successfully completed. So the usability of the documentation can be justified according to the second installation.

Evaluation of the Documentation

The evaluation of the documentation is performed by examining structure, comprehensiveness, content, language, and figures of the documentation. The documentation structure is shown in Figure 8.

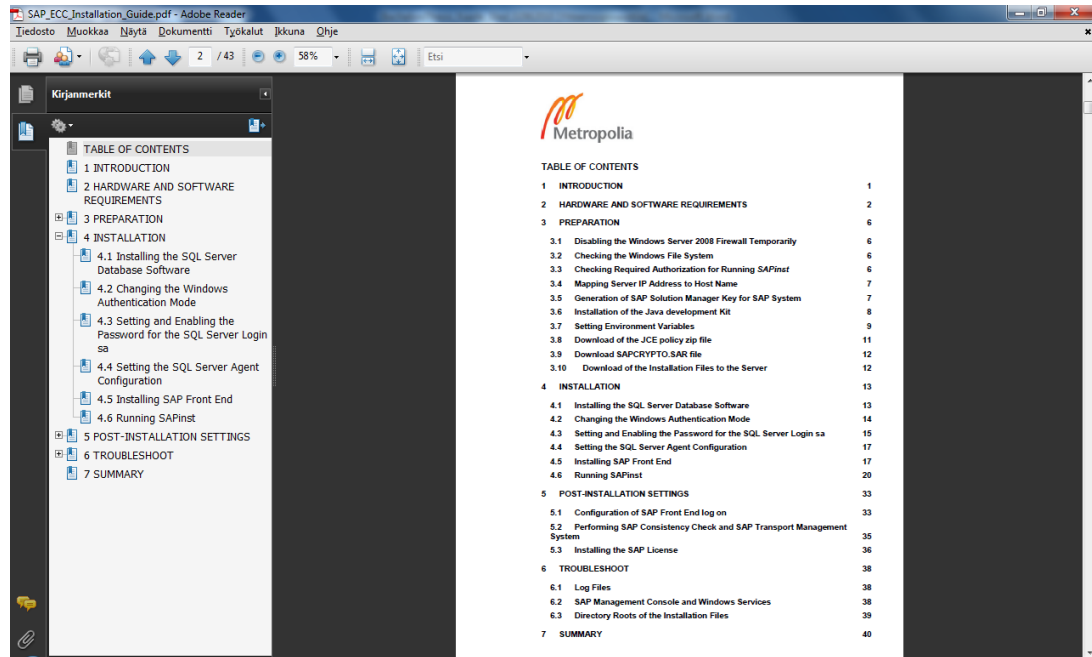


Figure 8: Structure of the documentation

The documentation is divided to seven chapters: Introduction, Hardware and software requirements, Preparation, Installation, Post-installation settings, Troubleshoot, and Summary. After the Introduction, Hardware and Software Requirements assign the requirements for the server environment. Preparation chapter defines the needed actions to be performed before the actual installation and Installation and Post-installation chapters describe the installation process step by step. Problems, errors, and methods for problem solving are compiled to Troubleshoot chapter and the Summary chapter concludes the documentation.

The navigation through the documentation is made simple with clear chapters and sub-chapters. The reader can easily get the information needed. With the Bookmark panel, the reader is able to find the subject location just by clicking the chapter or sub-chapter name.

Figure 9 displays the usage of figures in the documentation. Figures are screenshots taken during the installation. All the figures are not captioned or numbered. However, every figure points to the installation step, which is numbered.

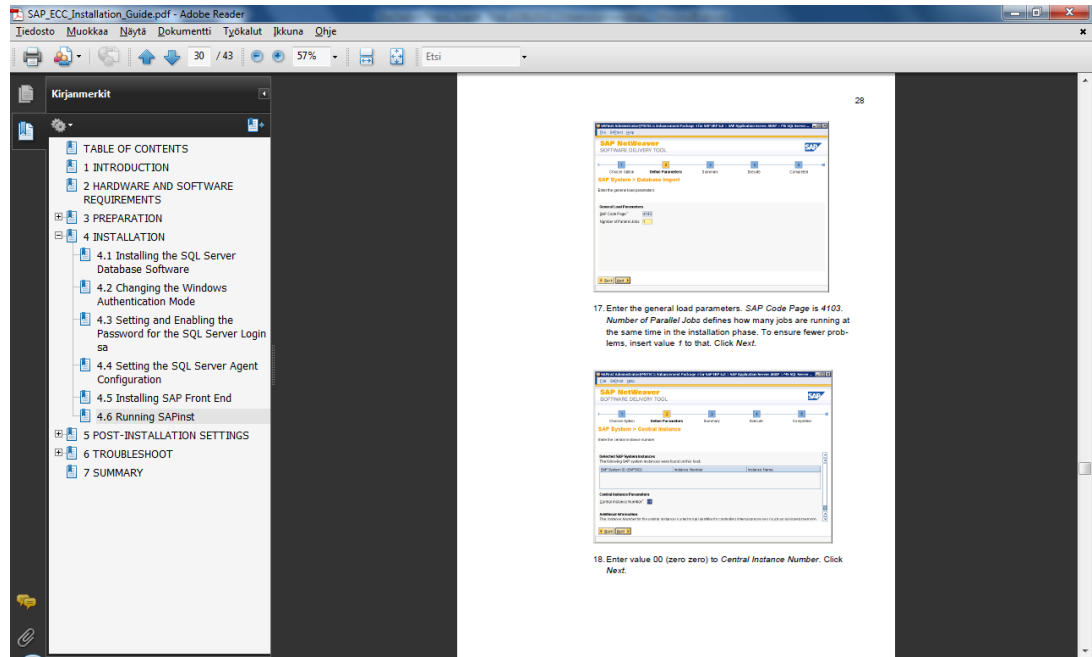


Figure 9: Figures in the documentation

Language of the documentation is made as simple as possible. Only one term is used for each action. Text modifications are used systematically and essential terms are highlighted with italic or bold.

6 SUMMARY

This Bachelor's Thesis study was assigned due to the SAP laboratory implementation at Metropolia University of Applied Sciences. As the implementation of information systems is complex, there is a need for documentation of the project. The installation work is done by few people, so it is important to retain the knowledge by documenting how the installation is carried out.

The focus of the study was in documenting the installation of SAP ECC solution. In order to answer to the requirements appointed to the documentation, there was a necessity to define a documentation method.

The documentation was compiled according to the documentation method of the SecureDoc research assigned by TCeurope. The documentation was analyzed and its usability was evaluated by testing it with a second installation. The second installation was completed successfully. The documentation was also compared to the basic attributes of good documentation indicated by the SecureDoc research. The results were successful.

The study answers to question of how the installation documentation has to be compiled, so that it supports maintenance and development as efficiently as possible. On the basis of the evaluation of the documentation, it can be stated that the documentation can support the maintenance and development as an efficient source of information. The documentation includes the information of the steps and decisions made during the installation, thus maintaining the system becomes easier. If errors occur in the system, problem solving can be improved with the help of the documentation. If there appears a need for changes or development in the system, the accurate and clear information in the documentation can be useful.

To really test the documentation for development purposes, there could be a project where some new features are installed for the SAP ECC solution. Then the documentation could not be used as a step by step installation guide, but primarily as a source of information for the project.

REFERENCES

Hernández, J. A. (2000). *The SAP R/3 Handbook. 2nd edition*. USA: McGraw-Hill Companies Inc.

IT Management (2010). *Server Virtualization FAQ*.

<http://www.itmanagement.com/faq/server-virtualization/> (Accessed May 18, 2010).

IT Managers Inbox (2010). *How To Write IT Technical Documentation*.

<http://itmanagersinbox.com/1556/how-to-write-it-technical-documentation/> (Accessed May 18, 2010).

OneStopSAP.com (2010). *SAP ERP: A Trusted Foundation for Business Excellence and Innovation*. <http://www.onestopsap.com/SAP-ERP/> (Accessed May 18, 2010).

Pohjonen, R. (2002). *Tietojärjestelmien kehittäminen*. Jyväskylä: Docenco.

SAP (2010a). *SAP History*. <http://www.sap.com/about/company/history/index.epx> (Accessed May 18, 2010).

SAP (2010b). *SAP: Delivering IT-Powered Business Innovation*.

<http://www.sap.com/about/index.epx> (Accessed May 18, 2010).

SAP (2010c). *Components and Tools of SAP Netweaver – SAP Solution Manager*.

<http://www.sap.com/platform/netweaver/components/solutionmanager/index.epx> (Accessed May 18, 2010).

SAP (2010d). *ERP Software from SAP*. <http://www.sap.com/solutions/business-suite/erp/index.epx> (Accessed May 18, 2010).

SAP (2010e). *SAP ERP Financials*. <http://www.sap.com/solutions/business-suite/erp/financials/featuresfunctions/index.epx> (Accessed May 18, 2010).

SAP (2010f). *SAP ERP HCM*. <http://www.sap.com/solutions/business-suite/erp/hcm/featuresfunctions/index.epx> (Accessed May 18, 2010).

SAP (2010g). *SAP ERP Operations*. <http://www.sap.com/solutions/business-suite/erp/operations/featuresfunctions/index.epx> (Accessed May 18, 2010).

SAP (2010h). *SAP ERP Corporate Services*. http://www.sap.com/solutions/business-suite/erp/corporate_services/index.epx (Accessed May 18, 2010).

SAP AG (1998). *Functions in Details – IDES*. Germany: SAP AG.

SAPDB.info (2010). *SAP Solution Manager 7*. <http://www.sapdb.info/sap-solution-manager-7/> (Accessed May 18, 2010).

Schäfer, M. O., Melich, M. (2007). *SAP Solution Manager*. USA: SAP Press.

SFS (2006). SFS-KÄSIKIRJA 174-1. *Tekninen dokumentointi. Osa 1*. Helsinki: Suomen Standardoimisliitto.

Sommerville, I. (2001). *Software engineering*. Harlow: Addison-Wesley.

TCeurope (2004). *SecureDoc - Käytettävät ja turvalliset käyttöohjeet kuluttajatuotteille*. http://kotisivukone.fi/files/diasol.palvelee.fi/tiedostot/securedoc_fin.pdf (Accessed May 18, 2010).

TheSpot4SAP.com (2010). *SAP – The Basics Series: Article 1*. http://www.thespot4sap.com/Articles/TheBasics_1.asp (Accessed May 18, 2010).

HELSINKI METROPOLIA UNIVERSITY OF APPLIED SCIENCES

Installation Guide
SAP ERP Central Component

Author: Kaarle Glad

TABLE OF CONTENTS

1	INTRODUCTION	3
2	HARDWARE AND SOFTWARE REQUIREMENTS	4
3	PREPARATION	8
3.1	Disabling the Windows Server 2008 Firewall Temporarily	8
3.2	Checking the Windows File System	8
3.3	Checking Required Authorization for Running <i>SAPinst</i>	8
3.4	Mapping Server IP Address to Host Name	9
3.5	Generating SAP Solution Manager Key for SAP System	9
3.6	Installing the Java Development Kit	10
3.7	Setting Environment Variables	11
3.8	Downloading the JCE Policy Zip File	13
3.9	Downloading the SAPCRYPTO.SAR File	14
3.10	Downloading the Installation Files to the Server	14
4	INSTALLATION	15
4.1	Installing the SQL Server Database Software	15
4.2	Changing the Windows Authentication Mode	16
4.3	Setting and Enabling the Password for the SQL Server Login sa	17
4.4	Setting the SQL Server Agent Configuration	19
4.5	Installing SAP Front End	19
4.6	Running <i>SAPinst</i>	22
5	POST-INSTALLATION SETTINGS	35
5.1	Configuring SAP Front End Log on	35
5.2	Performing SAP Consistency Check and SAP Transport Management System	37
5.3	Installing the SAP License	38
6	TROUBLESHOOT	40
6.1	Log Files	40
6.2	SAP Management Console and Windows Services	40
6.3	Directory Roots of the Installation Files	41
7	SUMMARY	42

1 INTRODUCTION

This documentation is an installation guide for SAP ERP Central Component (SAP ECC) solution in the SAP laboratory of Metropolia University of Applied Sciences. The software used in the installation is SAP enhancement package 4 SR1 for SAP ERP 6.0. The installation guide is compiled using the information from the installation guide provided by SAP and from the actual installation.

The procedures are presented with written instructions and screenshots taken during the installation.

2 HARDWARE AND SOFTWARE REQUIREMENTS

This section shows the hardware and software requirements for the installation.

Hardware Requirement	Requirement	How to Check
Minimum disk space	<ul style="list-style-type: none"> • Database Software: 4 GB • Database for IDES Software: 230 GB • SAP system files (not including paging file): 5 GB (x64) • SAP database files (not including paging file): 2 GB • Up to 2 GB for each usage type or software unit you want to install. • 4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk 	<p>To check disk space:</p> <ol style="list-style-type: none"> 1. Choose <i>Start</i> → <i>Control Panel</i> → <i>Administrative Tools</i> → <i>Computer Management</i> → <i>Storage</i> → <i>Disk Management</i>. 2. Right-click the <i>drive</i> and choose <i>Properties</i>.

Minimum RAM	<ul style="list-style-type: none"> • 4 GB 	<p>To check RAM:</p> <p>In the <i>Windows Explorer</i>, choose <i>Help</i> → <i>About Windows</i>.</p>
Paging file size	<ul style="list-style-type: none"> • 1 times RAM plus 14 GB 	<p>To check paging file size:</p> <ol style="list-style-type: none"> 1. Choose <i>Start</i> → <i>Control Panel</i> → <i>System</i>. 2. Choose <i>Advanced</i> (Windows Server 2003) or <i>Advanced system settings</i> (Windows Server 2008). 3. Select <i>Performance Settings</i> → <i>Advanced</i>. 4. If required, in section <i>Virtual memory</i>, choose <i>Change</i>.

Software Requirement	Requirement	How to Check
Windows operating system	<ul style="list-style-type: none"> • English international 64-bit version of one of the following Windows Server Editions: • Windows Server 2003 <ul style="list-style-type: none"> ○ Windows Server 2003 Standard Edition ○ Windows Server 2003 Enterprise Edition ○ Windows Server 2003 Datacenter Edition • Windows Server 2008 <ul style="list-style-type: none"> ○ Windows Server 2008 Standard Edition ○ Windows Server 2008 Enterprise Edition ○ Windows Server 2008 Datacenter Edition ○ Windows Server 2008 for Itanium-Based Systems Edition • For any version of Windows Server, you need the latest supported service pack • A suitable Windows Resource Kit is strongly recommended 	<p>To check your Windows version:</p> <ol style="list-style-type: none"> 1. Choose <i>Start → All Programs → Accessories → Command Prompt</i> 2. Enter the command <i>winver</i>

Database Software	<ul style="list-style-type: none">• One of the following SQL Server Enterprise Edition server software:<ul style="list-style-type: none">○ MS SQL Server 2005 Enterprise Edition: Server Software○ MS SQL Server 2008 Enterprise Edition: Server Software○ Latest service pack and hotfix or cumulative update, if available○ Unicode collation SQL_Latin1_General_CP850_BIN2	
-------------------	--	--

3 PREPARATION

This section includes the preparation steps before the actual installation.

3.1 Disabling the Windows Server 2008 Firewall Temporarily

Windows Server 2008 Firewall is turned on by default and it is configured to allow only a small set of Windows-specific inbound IP connections. Therefore the firewall must be temporarily disabled to avoid any problems with non-configured TCP/IP ports that are used by the SAP System. When the installation is finished, make sure that you turn on the firewall again.

1. Choose *Start* → *Administrative Tools* → *Windows Firewall with Advanced Security*.
2. Right-click *Windows Firewall with Advanced Security* and choose *Properties*.
3. Set *the Firewall state* to *Off* from all the profiles: Domain Profile, Private Profile and Public Profile.

3.2 Checking the Windows File System

You need to check that you are using the Windows file system NTFS on hosts where you want to install the SAP system. NTFS supports full Windows security and long file names. Remember **NOT** to install the SAP System on a FAT partition.

1. Open the *Windows Explorer*.
2. Check the relevant disk you want to install the SAP System to.
3. Choose *Properties* → *General*.
4. The system displays the type of file system in use. Check that the file system is NTFS.

3.3 Checking Required Authorization for Running SAPInst

The account used for the installation needs to be a member of the local Administrators group of the machine involved.

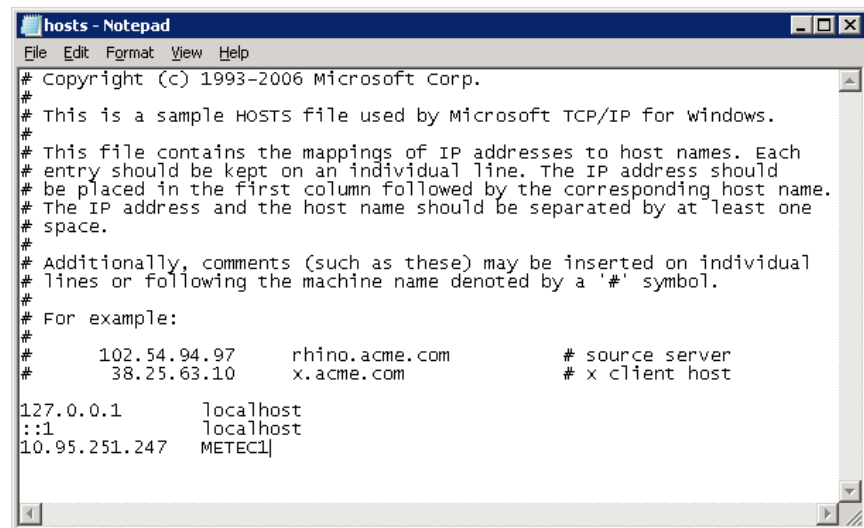
1. Check that the account used for the installation is a member of the local Administrators group.
2. If required, obtain these rights by asking the system administrator to enter the account as a member of the local Administrators group.

3.4 Mapping Server IP Address to Host Name

The hosts file can be found in the following location:

`C:\WINDOWS\system32\drivers\etc\`

Open the hosts file with Notepad. Type server IP address and server name as in the figure. Figure 1 displays the view of hosts file.



```

# Copyright (c) 1993-2006 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#       102.54.94.97       rhino.acme.com       # source server
#       38.25.63.10      x.acme.com           # x client host

127.0.0.1       localhost
::1            localhost
10.95.251.247  METECL

```

Figure 1: Mapping server IP address to host name

3.5 Generating SAP Solution Manager Key for SAP System

1. Log on to *SAP Solution Manager* server.
2. Double-click *SAP Logon* icon.
3. Choose *Solution Manager 7.0* and sign in.
4. Sign in with username and password.
5. Enter transaction code *SMSY*.
6. Open *Systems* and right-click *SAP ECC*.
7. Choose *Create New System*.
8. Enter following information:

System: system ID (in this case EC1)

Product: SAP ECC

Product Version: SAP ECC 6.0

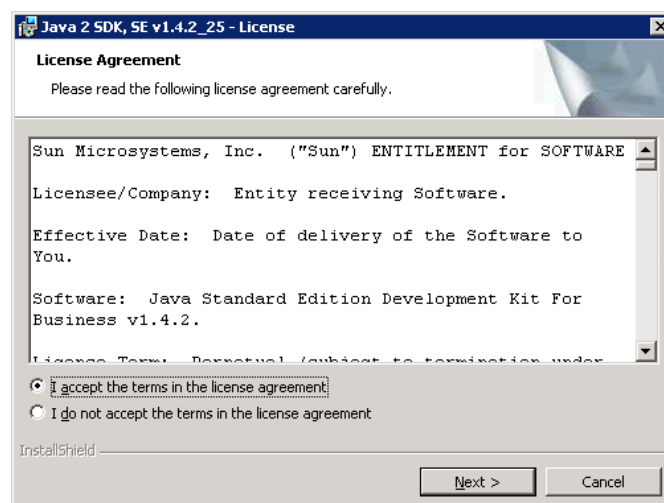
Installation Number: 00

9. Click *Create and Edit Product*.
10. Click *Landscape Components*.
11. Click *Other Object*.
12. Choose your system and click *Generate Installation/Upgrade Key*.
13. Enter following:
 - System ID: EC1 (SAP ECC System ID, in this case EC1)
 - System Number: 00
 - Message Server: METEC1 (SAP ECC server name, in this case METEC1)
14. Click *Generate Key*.
15. The installation key code appears to *Installation/Upgrade Key* section.

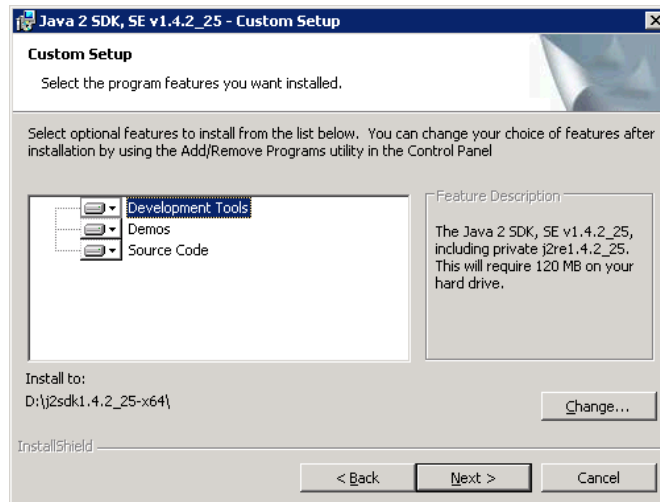
3.6 Installing the Java Development Kit

The system needs to be prepared for the Java EE Engine by installing the Java Development Kit (JDK). The Java Engine requires a Java Development Kit (Java™ 2 SDK, Standard Edition = JDK) on every host where the Java Engine is to be installed.

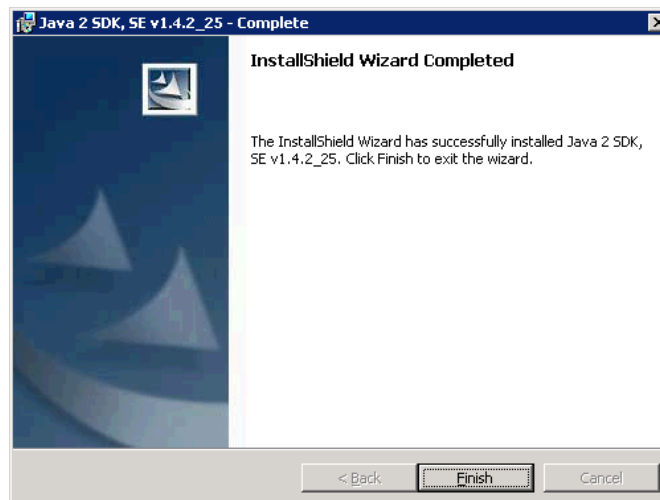
1. Go to http://www.sun.com/software/javaforbusiness/sap_download.jsp
2. Download *Java for Business 1.4.2 Java Developer Kit (Update 25)*.
(Or the newest update)
3. Execute the downloaded file.



4. Accept the License Agreement and click *Next*.



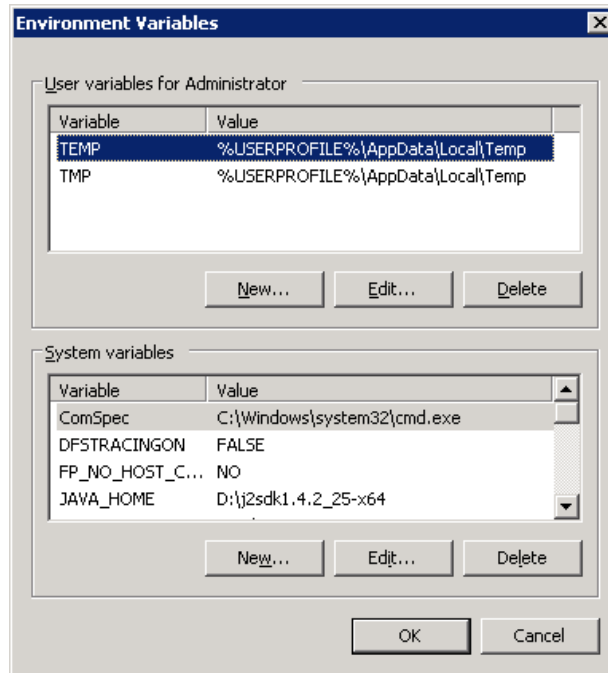
5. Make sure that all features will be installed. Click *Next*.



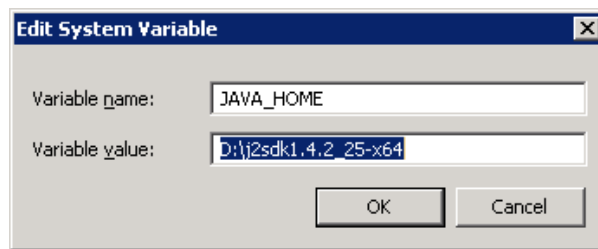
6. After installation, click *Finish*.

3.7 Setting Environment Variables

1. Choose *Start* → Right-click *Computer* and choose *Properties* → Choose *Advanced system settings* → In *Advanced* tab choose *Environment variables*.



- In *System Variables* choose *JAVA_HOME* and click *Edit*. (If there is not *JAVA_HOME*, click *New*)



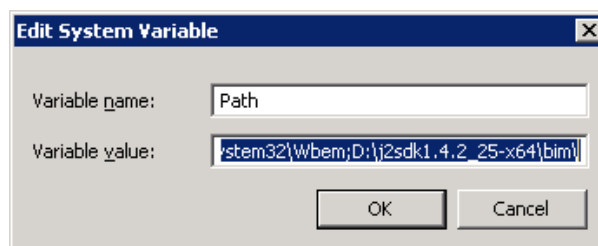
- In Edit System Variable window, enter following:

Variable name: *JAVA_HOME*

Variable value: The directory root you have installed the Java Development Kit (In this case, *D:\j2sdk1.4.2_25-x64*)

Click *OK*.

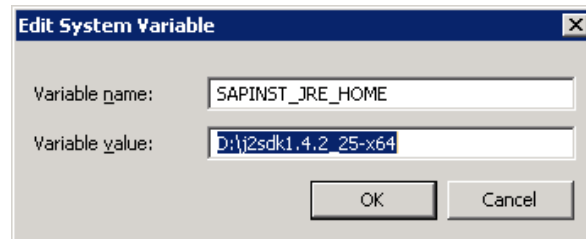
- Choose *Path* in *System variables* and click *Edit*.



5. Go to the end of Variable value and add semicolon and the Java Development Kit directory root and \bin\. (In this case, ;D:\j2sdk1.4.2_25-x64\bin\)

Click *OK*.

6. Click *New* in *System variables* section.



7. Enter the following:
 Variable name: SAPINST_JRE_HOME
 Variable value: The directory root you have installed the Java Development Kit (In this case, *D:\j2sdk1.4.2_25-x64*)

Click *OK*.

3.8 Downloading the JCE Policy Zip File

As of SAP NetWeaver 7.0 strong encryption is mandatory for the Java EE Engine and for all usage types that are deployed on it. You need to obtain the Java(TM) Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy Files for the JDK you are using beforehand so that SAPinst can install them. The JCE Unlimited Strength Jurisdiction Policy Files archive (JCE policy zip file) is specific for each Java VM provider and is available as a free download from the corresponding vendor's site.

1. Go to
http://www.sun.com/software/javaforbusiness/sap_download.jsp
2. Download *the Java Cryptography Extension 1.4.2 (JCE_policy.zip –file)*
3. Do **NOT** unzip the archive, as SAPinst installs the JCE policy files during the installation process.

3.9 Downloading the SAPCRYPTO.SAR File

1. Go to <http://service.sap.com>.
2. Choose *Downloads* tab.
3. Choose *Download* → *SAP Cryptographic Software*.
4. Download CAR file SAP Cryptographic Library Microsoft Windows 2003 for x86_64

3.10 Downloading the Installation Files to the Server

You copy the relevant installation files to the server. The needed files are in the following DVDs:

- Installation Master DVD
- Kernel DVD
- RDBMS DVD (SQL Server 2005)
- Installation Export DVDs (1-4)

The DVDs include files for different operating systems. Make sure that you copy the right files for your operating system.

4 INSTALLATION

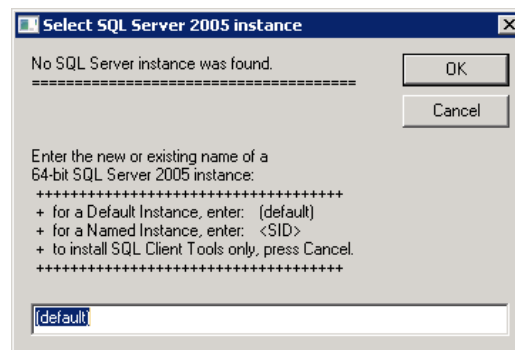
This section shows the installation steps of SQL Server 2005, SAP Front End, and Enhancement Package 4 for SAP ERP 6.0.

4.1 Installing the SQL Server Database Software

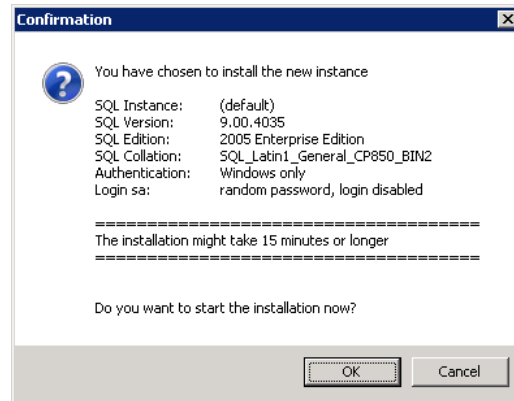
The SQL Server software has to be installed on each host in the system where SAP instance is planned to set up. Depending on the type of host involved, the software must be installed for the database server or client.

The software can be installed automatically or manually. With SQL4SAP.VBS you can automatically install the SQL Server 2005 or SQL Server 2008 database software on various Windows operating systems. The SQL4SAP script installs both the SQL Server database server and Native Access Client software automatically.

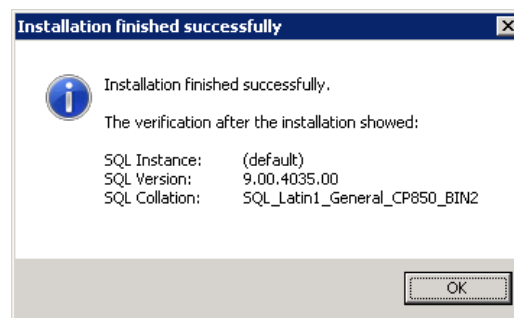
1. Go to the directory you have copied the MS SQL Server 2005 installation files.
2. Double-click *SQL4SAP.VBS* located in the root directory.



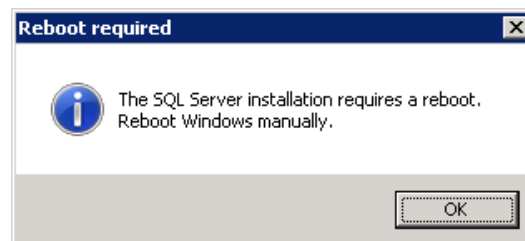
3. Click *OK*.



4. Click *OK* to start the installation.



5. Click *OK*.



6. Click *OK*.

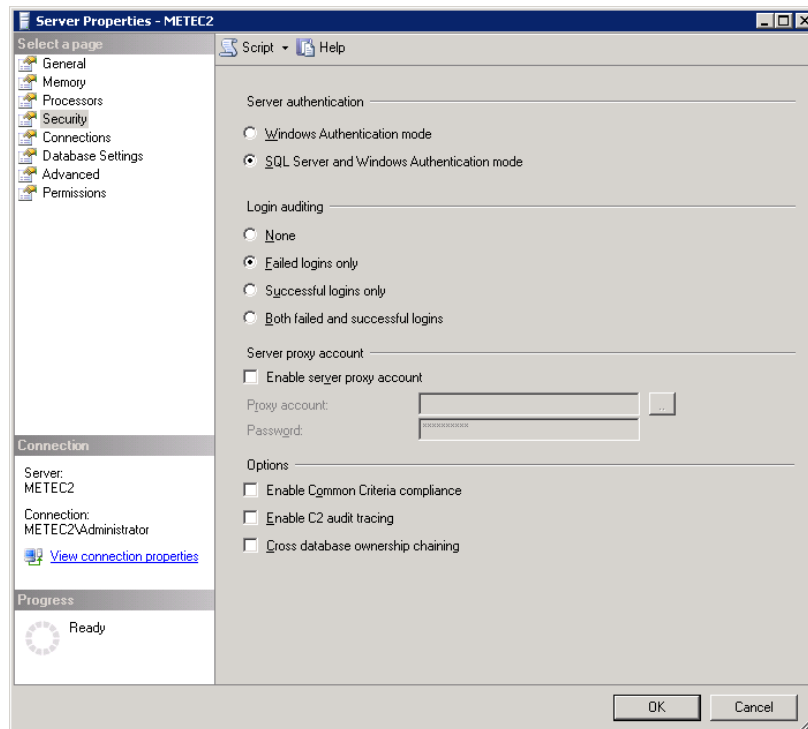
7. Reboot the Windows Server 2008.

4.2 Changing the Windows Authentication Mode

The SQL4SAP.VBS script installs Microsoft SQL Server in Windows Authentication mode and sets a random password for the sa login. If the use of sa login is preferred, the authentication mode must be changed to *SQL Server and Windows Authentication mode*, the sa login must be enabled, and its password must be set manually.

1. Choose *All Programs* → *Microsoft SQL Server 2005* → *SQL Server Management Studio*.

2. In the *Connect to Server* window, enter the server name (if required), and choose *Connect*.
3. Right-click the *SQL Server instance* and choose *Properties*.
4. Choose *Security*.
5. For *Server authentication*, choose *SQL Server and Windows Authentication mode*.

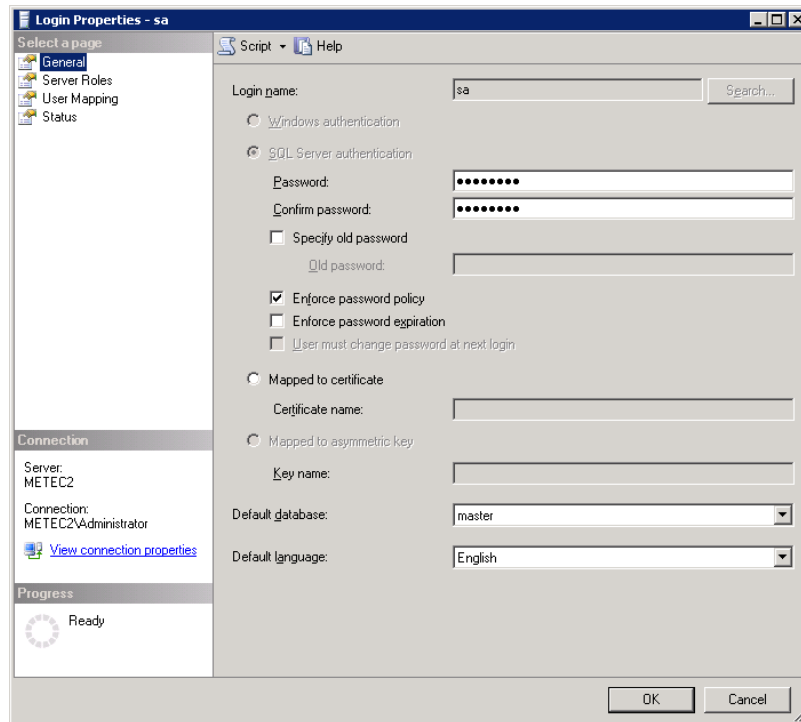


6. Choose **OK**.

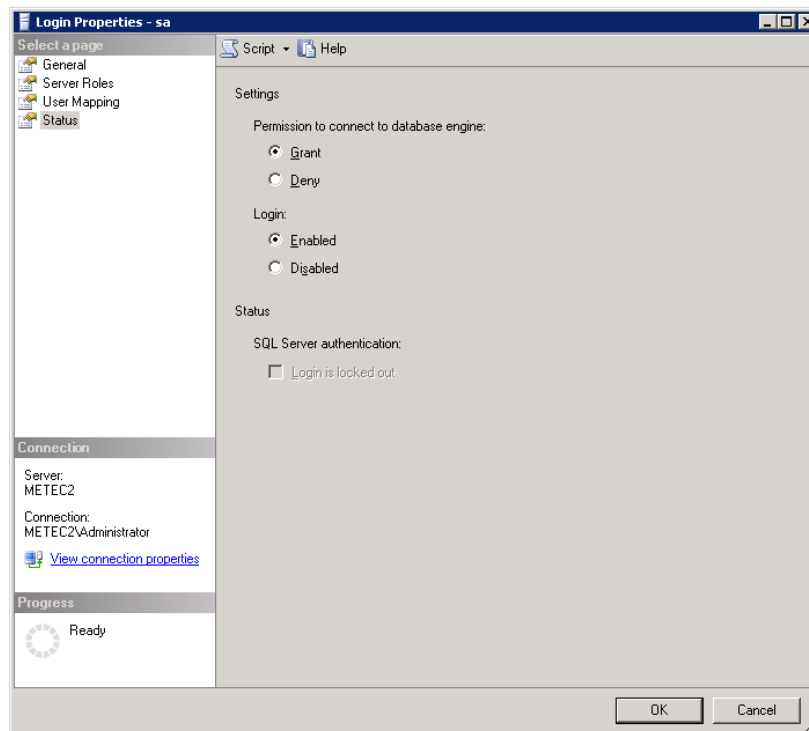
4.3 Setting and Enabling the Password for the SQL Server Login sa

To set the password for the *sa* login, use the SQL Server Management Studio:

1. Choose *All Programs* → *Microsoft SQL Server 2005* → *SQL Server Management Studio*.
2. In the *Connect to Server* window, enter the server name (if required), and choose *Connect*.
3. Choose *the SQL Server instance* → *Security* → *Logins*.
4. Right-click *sa* and choose *Properties*.



5. Under *General*, enter and confirm the password for the *sa* login.



6. Under *Status*, choose *Login Enabled*.

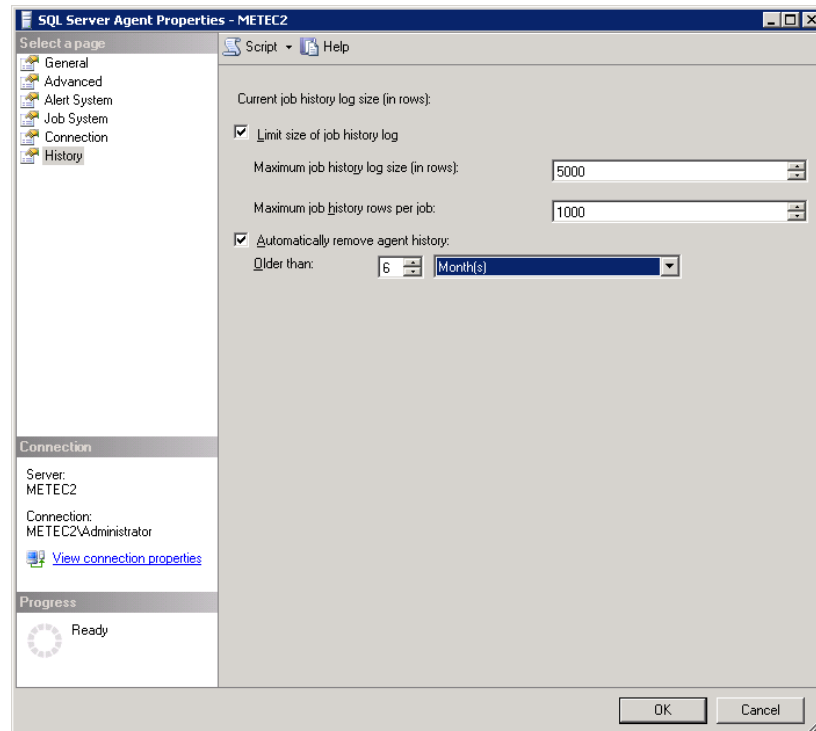
7. Choose *OK*.

8. Restart Windows Server.

4.4 Setting the SQL Server Agent Configuration

After installing the SQL Server, the configuration must be set for the SQL Server Agent.

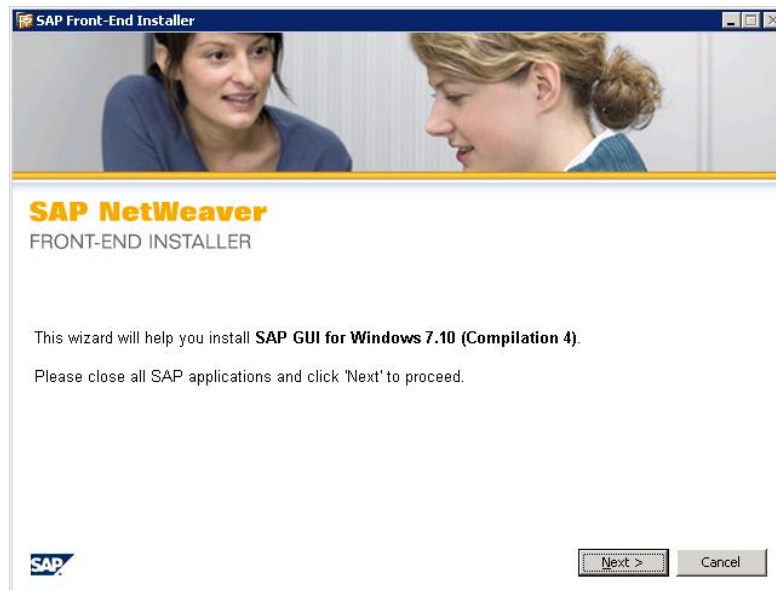
1. Start the *SQL Server Management Studio*.
2. Right-click SQL Server Agent and choose Properties.
3. Choose History.



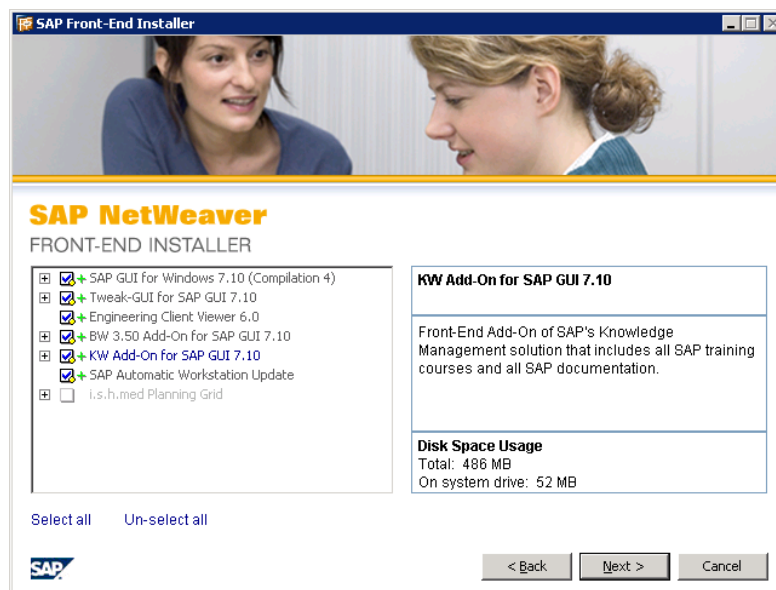
4. Set the value for column Maximum job History log size (in rows) to 5000 (minimum).
5. Set the value for column Maximum job history rows per job to 1000 (minimum).
6. Check the column Remove agent history and set a value 6 months for this column.
7. Choose OK to save the settings.
8. Restart Windows server

4.5 Installing SAP Front End

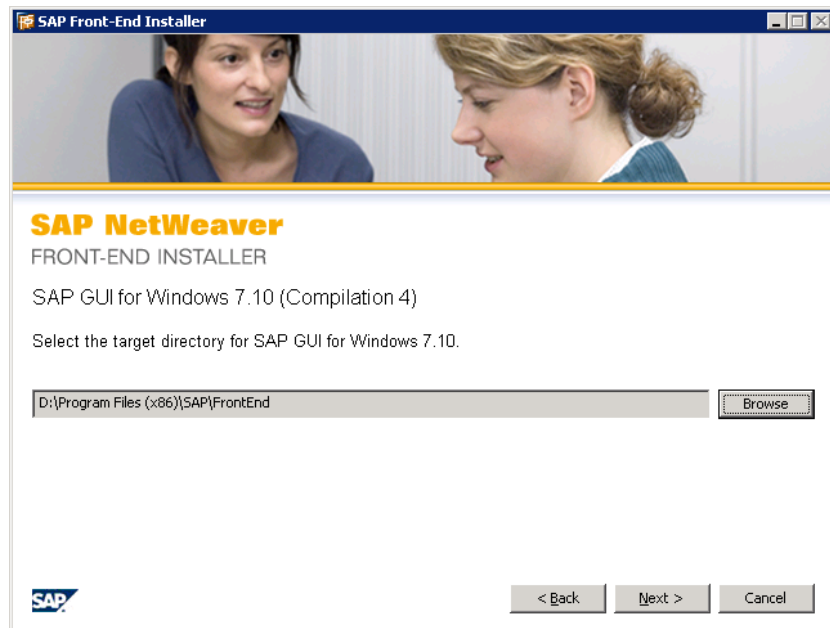
1. Go to the directory you have copied the SAP Front End installation files.
2. Run SapGuiSetup.exe



3. Click Next.



4. Choose *Select all* and click *Next*.



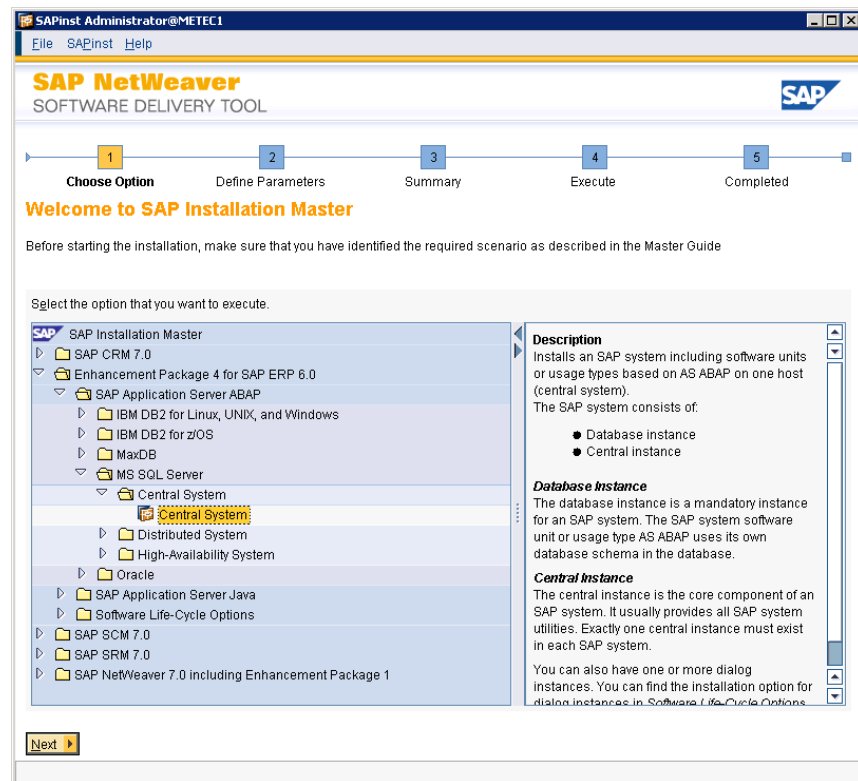
5. Select the target directory. Use directory *D:\Program Files\SAP\FrontEnd*. Click *Browse* and choose the directory from the directory tree. Click *Next*.



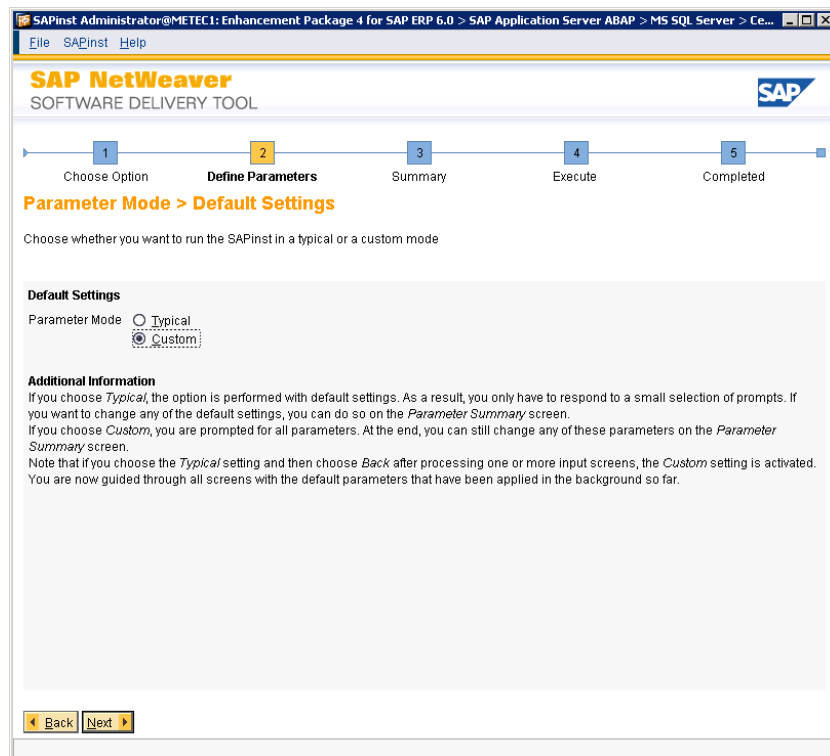
6. The screen informs that the installation is successfully completed. Click *Done*.

4.6 Running SAPinst

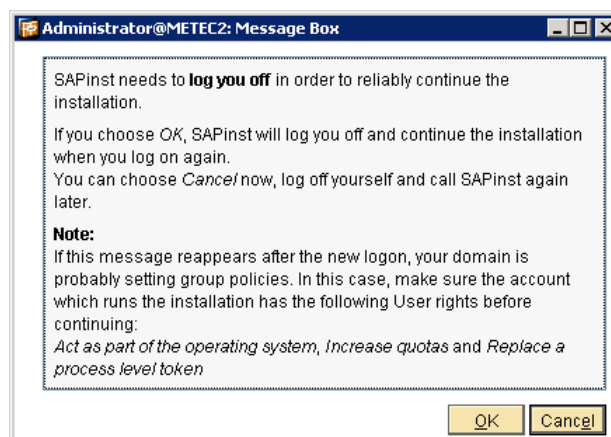
1. Go to the directory root you have copied the *Installation Master files*.
2. Start SAPinst by double-clicking *sapinst.exe*.



3. The GUI starts automatically by displaying the Welcome screen. Choose *Enhancement Package 4 for SAP ERP 6.0* → *SAP Application Server ABAP* → *MS SQL Server* → *Central Instance*. Click *Next*.



4. Choose *Custom* in Parameter Mode. Click *Next*.



5. SAPInst requires log off in order to continue the installation. Click *OK* and log on again. The installation continues automatically after you log on.

SAPinst Administrator@METEC1: Enhancement Package 4 for SAP ERP 6.0 > SAP Application Server ABAP > MS SQL Server > Ce...

File SAPinst Help

SAP NetWeaver
SOFTWARE DELIVERY TOOL

1 Choose Option 2 **Define Parameters** 3 Summary 4 Execute 5 Completed

SAP System > General Parameters

Enter the system ID and installation drive

SAP System Parameters

SAP System ID (SAPSID) * EC1

Installation Drive D:

Unicode System (recommended)

Additional Information
The SAP System ID is an identifier for your SAP system. It must be unique throughout your system landscape. The system will be installed under <Installation Drive>:\usr\sap\<SAPSID>\...

Back Next

6. Type SAP System ID (Have to begin with letter, letters in capital, usually two letters and one number, in this case *EC1*) and choose *D:* for Installation Drive. Click *Next*.

SAPinst Administrator@METEC1: Enhancement Package 4 for SAP ERP 6.0 > SAP Application Server ABAP > MS SQL Server > Ce...

File SAPinst Help

SAP NetWeaver
SOFTWARE DELIVERY TOOL

1 Choose Option 2 Define Parameters 3 Summary 4 **Execute** 5 Completed

SAP System > Master Password

Enter the master password all users

Master Password
The password will be used for all accounts SAPinst creates and for the secure store key phrase. Check the F1 help for restrictions and dependencies.

Password for all users of this SAP system * *****

Confirm * *****

Additional Information
If you want to set an individual password for each user, you can do this in the corresponding parameter section on the Parameter Summary screen. If you set individual passwords, a new master password will not overwrite these individual settings.

Back Next

7. Here a Master Password can be set for all accounts SAPinst creates. There are restrictions for Master Password:

- Must be 8 to 14 characters long
- Must contain at least one letter (a-z, A-Z)
- Must contain at least one digit (0-9)
- Must not contain \ (backslash) and " (double quote)
- Must not contain the name of a Java user created during the installation

Click *Next*.

SAPinst Administrator@METEC1: Enhancement Package 4 for SAP ERP 6.0 > SAP Application Server ABAP > MS SQL Server > Ce...

File SAPinst Help

SAP NetWeaver
SOFTWARE DELIVERY TOOL

1 Choose Option 2 **Define Parameters** 3 Summary 4 Execute 5 Completed

SAP System > Windows Domain

Enter the Windows domain in which the SAP system accounts are created

SAP System User Domain

Domain Model

Local installation
 Use domain of current user
 Use different domain

Windows Domain

Additional Information

If you want the SAP system to run on a single machine, you can perform a *Local installation*.
For high availability with MSCS you must perform a domain installation.
If you want the system to be distributed across more than one machine, we strongly recommend a domain installation. In this case, you have to be a domain administrator to create the operating system users during the installation, or all operating system users have to be created before the installation.
For more information about Windows domain structures, see the Windows documentation.

Back Next

8. Choose *Local Installation*. Click *Next*.

SAPinst Administrator@METEC1: Enhancement Package 4 for SAP ERP 6.0 > SAP Application Server ABAP > MS SQL Server > Ce...

File SAPinst Help

SAP NetWeaver
SOFTWARE DELIVERY TOOL

1 Choose Option 2 **Define Parameters** 3 Summary 4 Execute 5 Completed

SAP System > OS User Passwords

Enter the passwords of the operating system users

SAP System Administrator
Account: METEC1\ec1adm
Password of SAP System Administrator* [masked]
Confirm* [masked]

SAP System Service User
Account: METEC1\SAPServiceEC1
Password of SAP System Service User* [masked]
Confirm* [masked]

Back Next

9. Master Password is set for the SAP users so just click *Next*.

SAPinst Administrator@METEC1: Enhancement Package 4 for SAP ERP 6.0 > SAP Application Server ABAP > MS SQL Server > Ce...

File SAPinst Help

SAP NetWeaver
SOFTWARE DELIVERY TOOL

1 Choose Option 2 Define Parameters 3 Summary 4 **Execute** 5 Completed

MS SQL Server > Database Connection Information

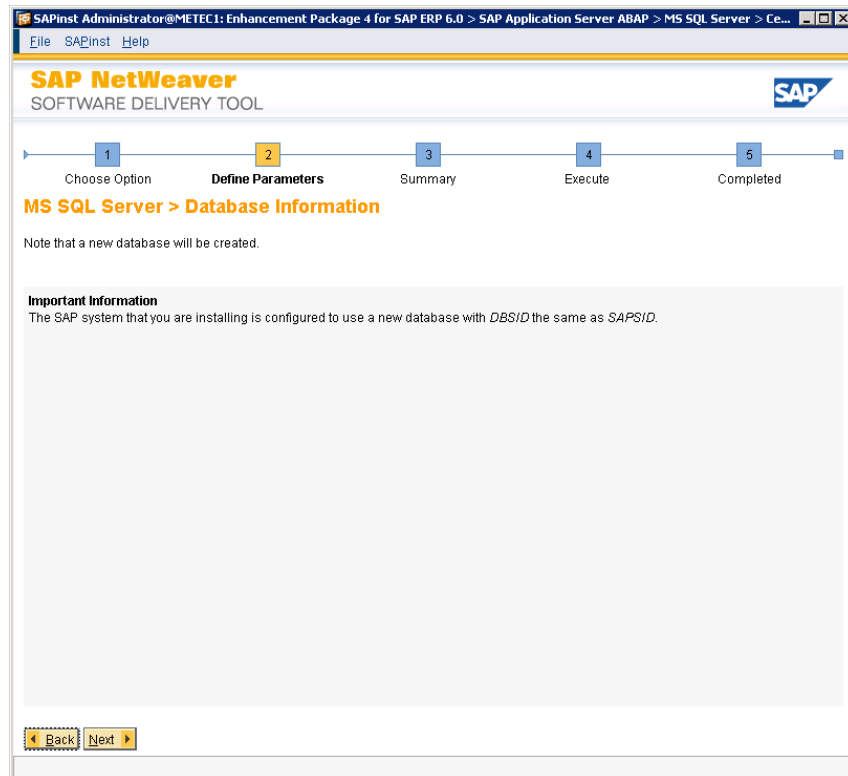
Enter the MS SQL Server instance name.

Database Connection
Local MS SQL Server Instances: METEC1

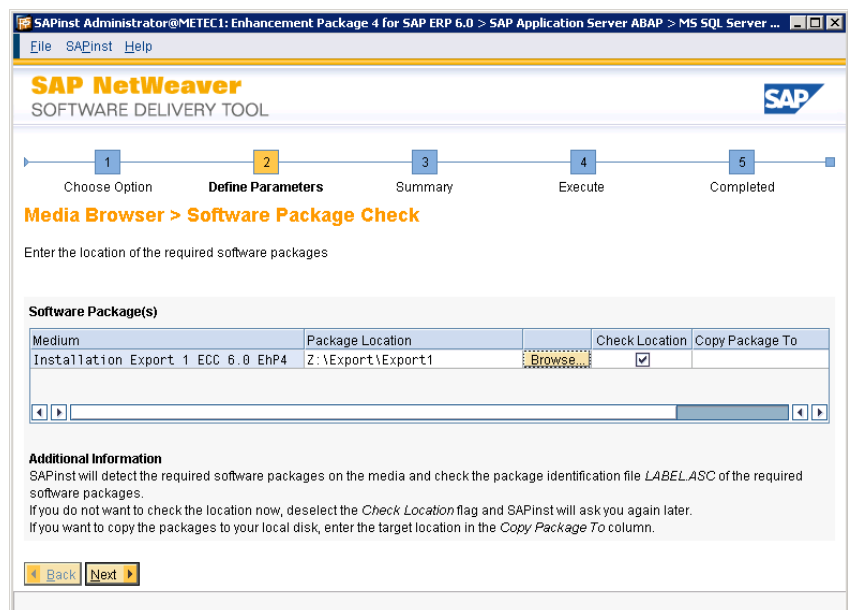
Additional Information
Make sure that your database is running. The database server connection uses Windows authentication. You can only use a local host of MS SQL Server for this installation type.

Back Next

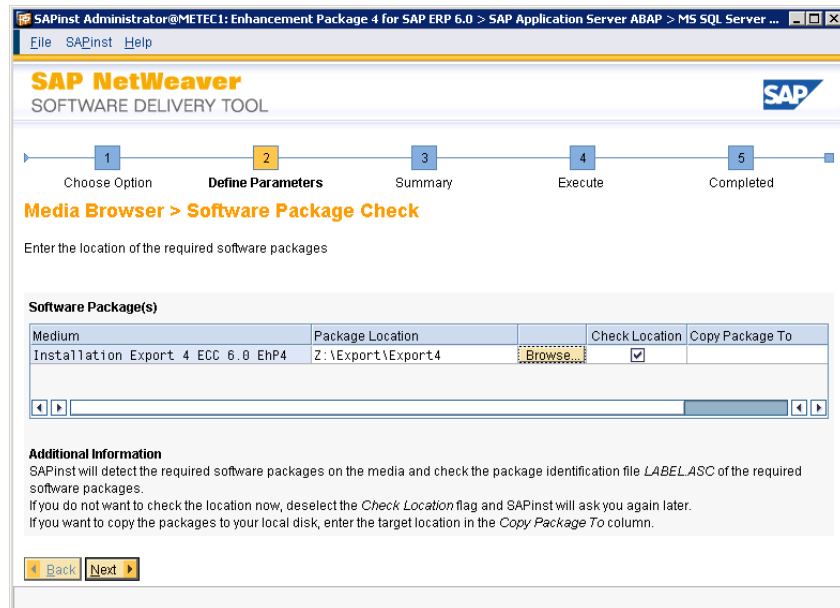
10. Select the local MS SQL Server Instance from the list. In this case *METEC1*. Click *Next*.



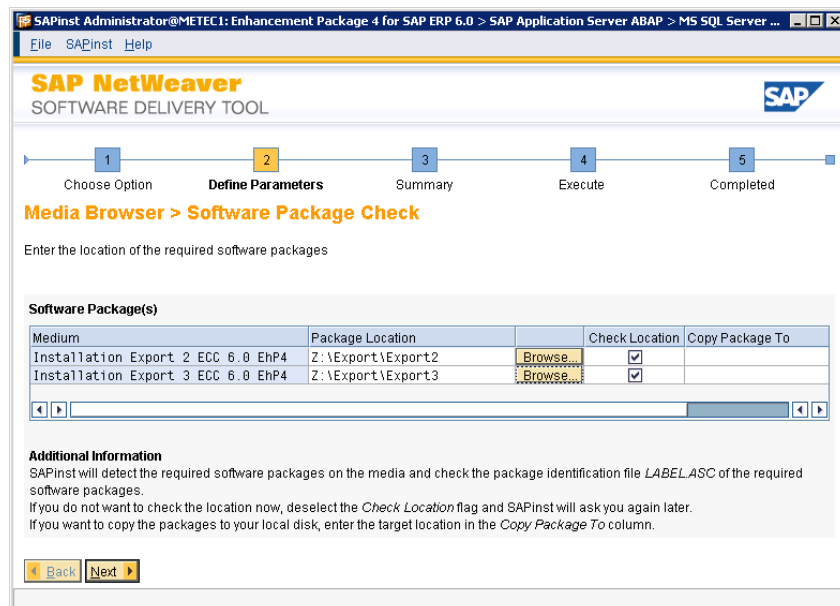
11. Click *Next*.



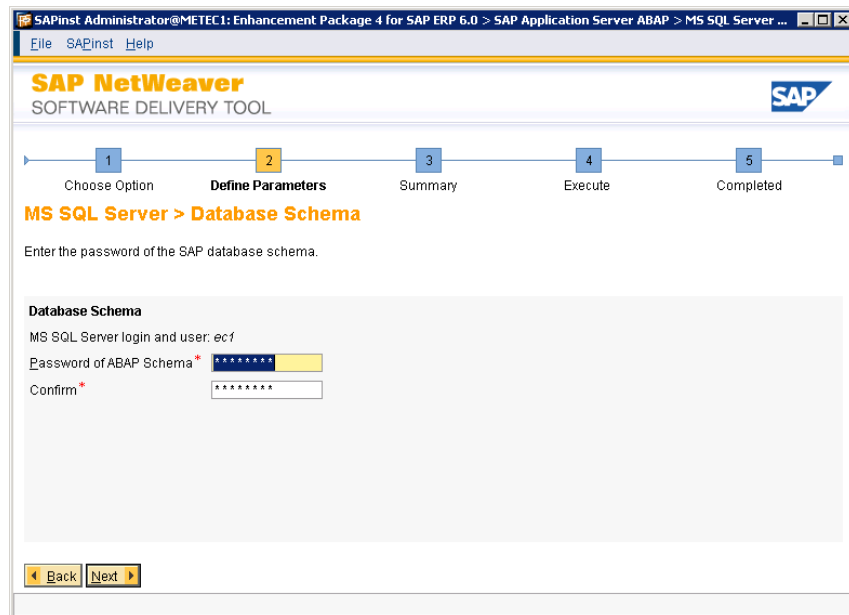
12. Enter the location of the *Installation Export 1* software package. It can be located from the directory tree by clicking *Browse*. If the *Check location* tab is chosen, the system checks the validity of the package location path. Click *Next*.



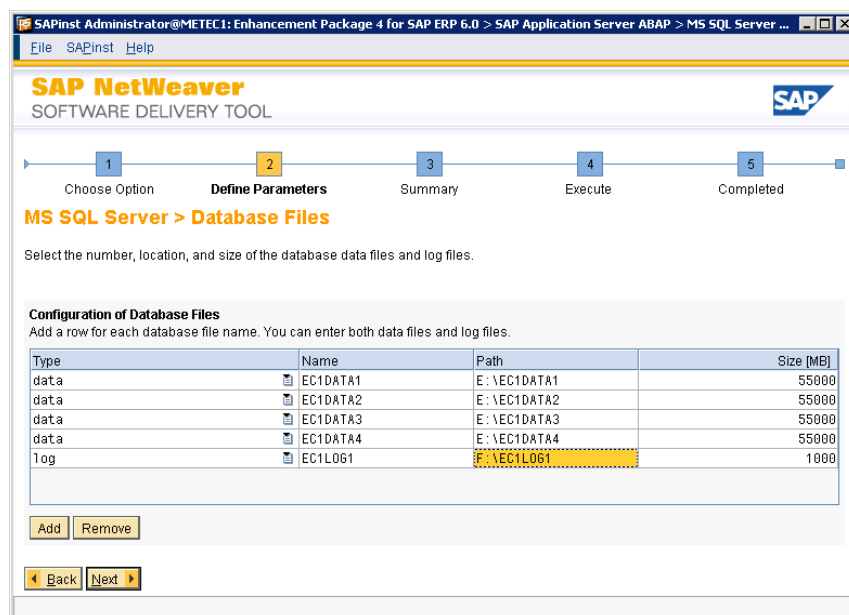
13. Enter the location of the *Installation Export 4* software package. It can be located from the directory tree by clicking *Browse*. If the *Check location* tab is chosen, the system checks the validity of the package location path. Click *Next*.



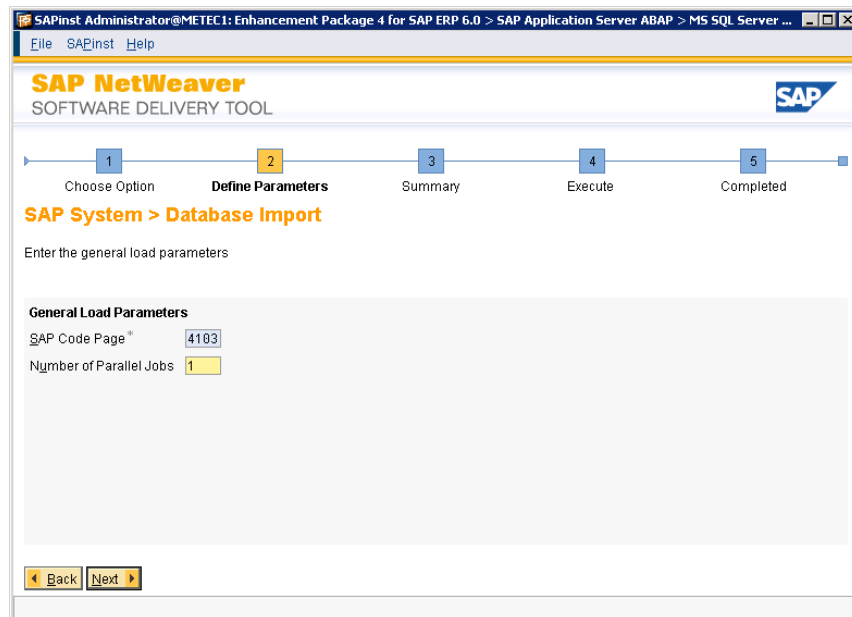
14. Enter the location of the *Installation Export 2* and *Installation Export 3* software packages. It can be located from the directory tree by clicking *Browse*. If the *Check location* tab is chosen, the system checks the validity of the package location path. Click *Next*.



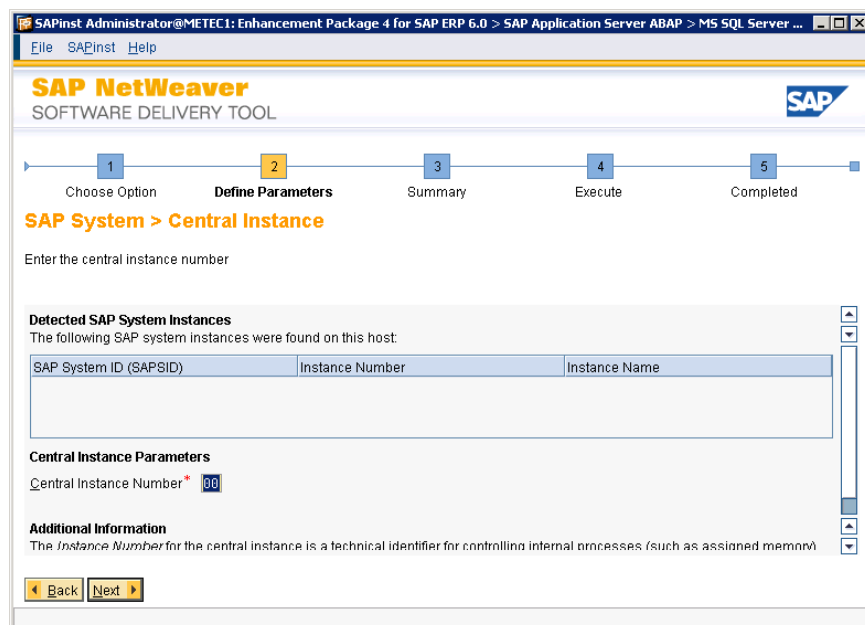
15. Master Password is set for the SAP database schema so just click *Next*.



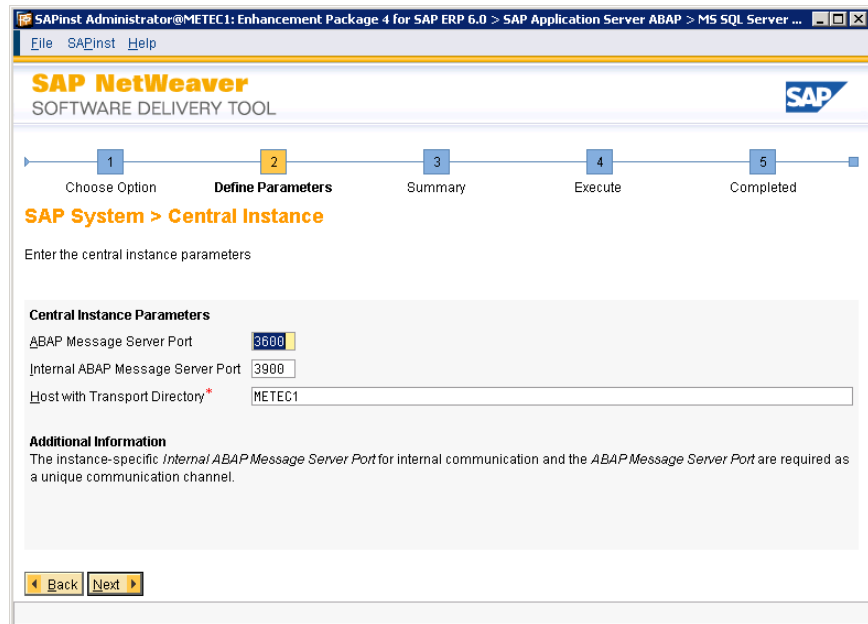
16. Select the paths for data and log files. In this case, the data files are installed to E drive and log file to F drive. Click *Next*.



17. Enter the general load parameters. *SAP Code Page* is 4103. *Number of Parallel Jobs* defines how many jobs are running at the same time in the installation phase. To ensure fewer problems, insert value 1 to that. Click *Next*.



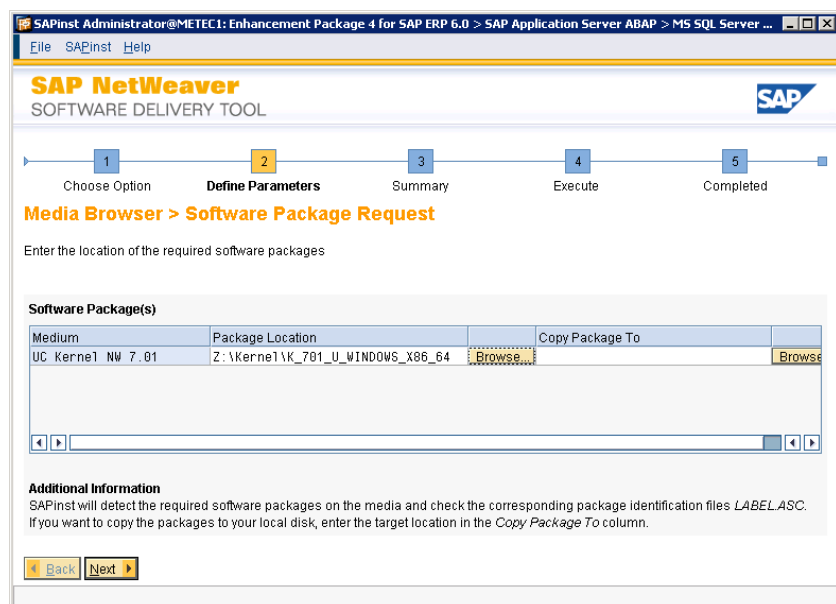
18. Enter value 00 (zero zero) to *Central Instance Number*. Click *Next*.



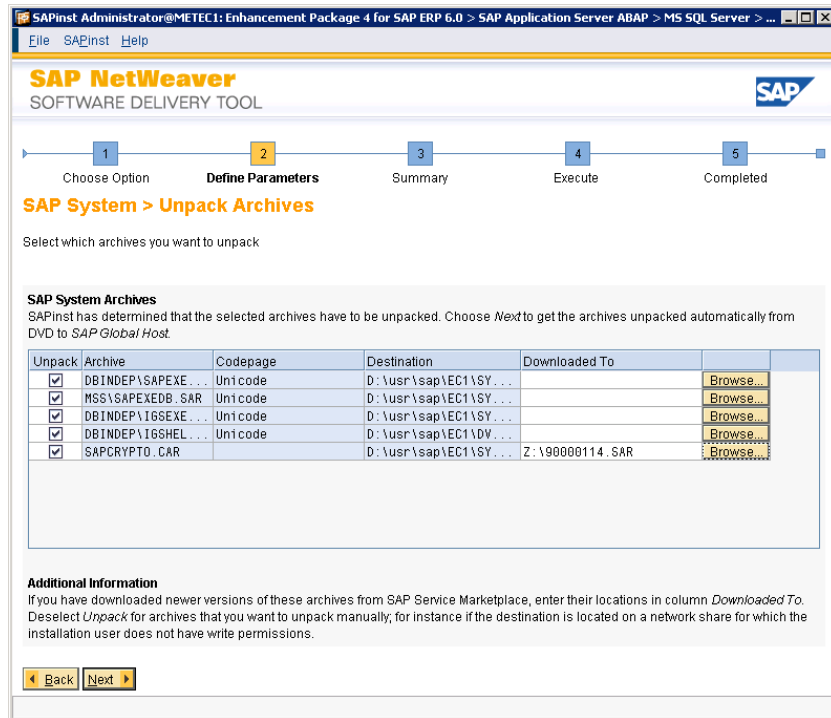
19. ABAP Message Server Port is 3600.

Internal ABAP Message Server Port is 3900.

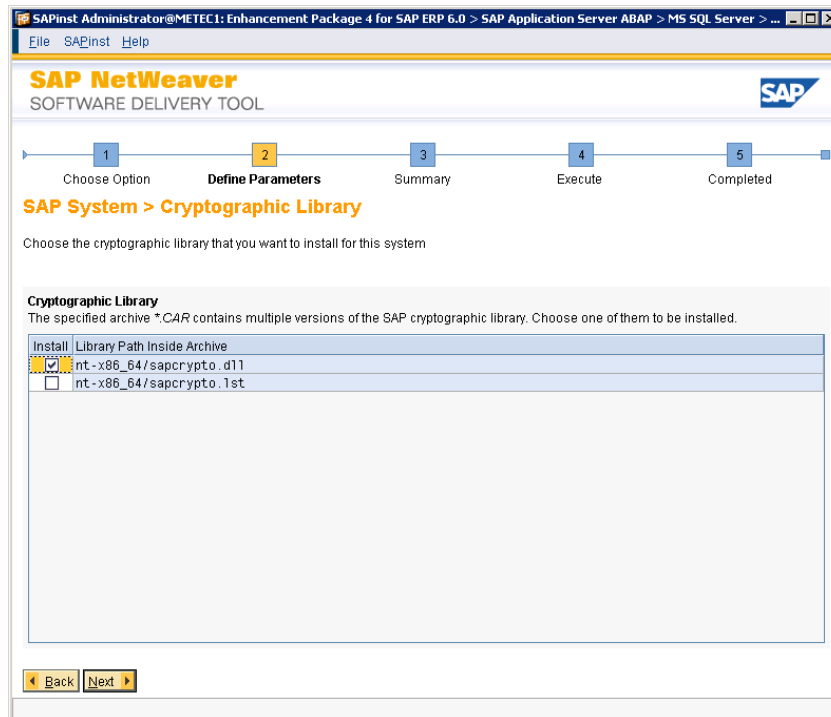
Host with Transport Directory is the Server name. In this case *METEC1*.



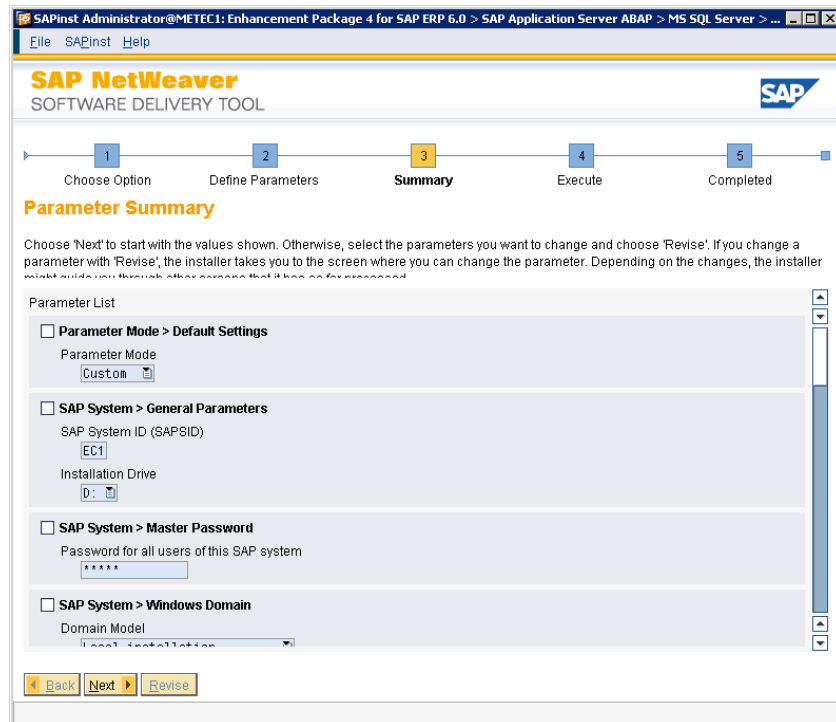
20. Enter the location of the *UC Kernel Net Weaver 7.01* software package. It can be located from the directory tree by clicking *Browse*. Click *Next*.



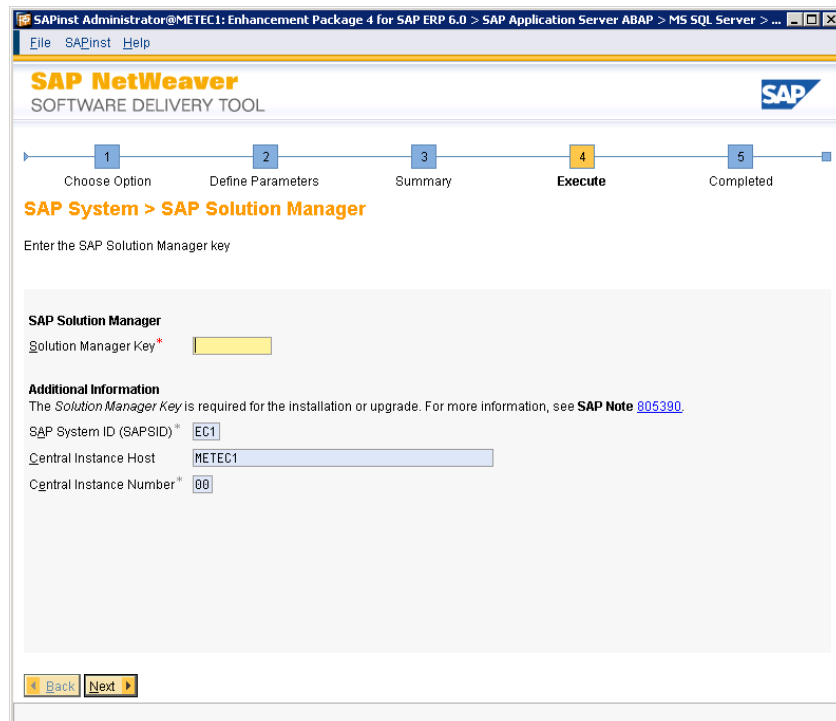
21. Make sure that all *SAP System Archive* files have mark on *Unpack* tab. Enter the location of the *SAPCRYPTO.CAR* file. It can be located from the directory tree by clicking *Browse*. Click *Next*.



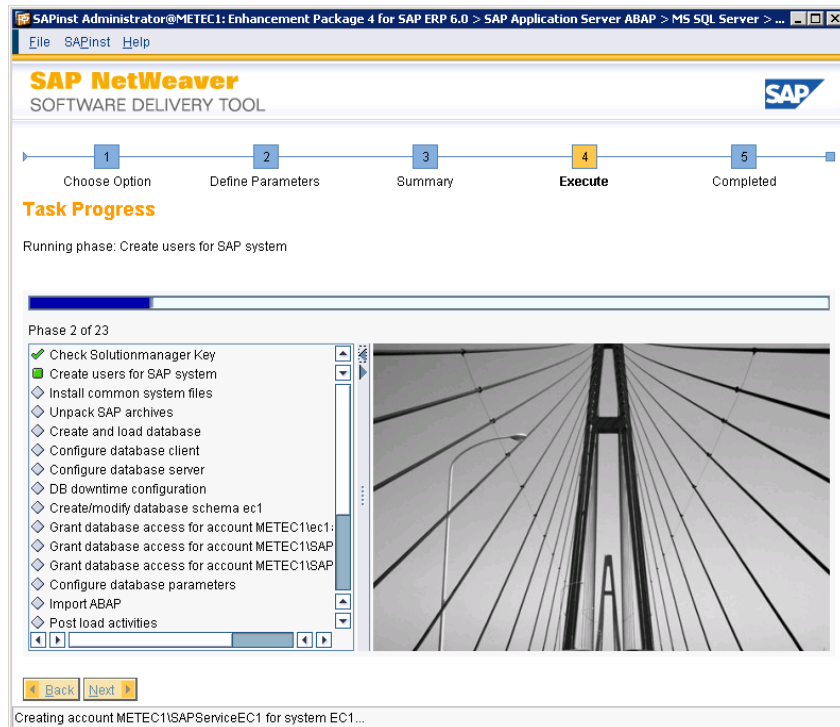
22. Make sure that there is a mark on section *nt-x86_64/sapcrypto.dll* only. Click *Next*.



23. Here is the summary of the choices. If you want to change the selections, put mark on the parameter/parameters and click *Revise*. Otherwise click *Next*.

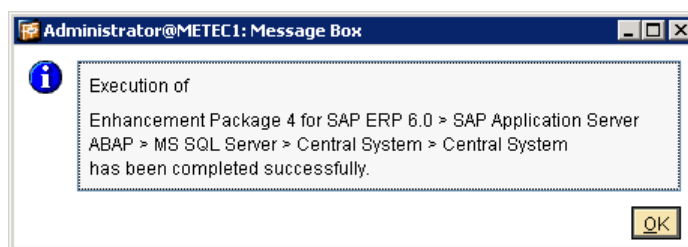


24. Now enter the *SAP Solution Manager Key* that is generated for the installed system. Click *Next*.



25. The installation starts. If there appear errors, read the log file. This helps to locate the error. Also see the *Troubleshoot* section in this documentation.

If the installation files are not located in the hard drive of the server, there can appear problems during the installation process. There are created 3 users in the installation phase. You may have to grant administration rights to the users.



26. When the installation is ready, there appears a message box that notifies successful completion of the installation.

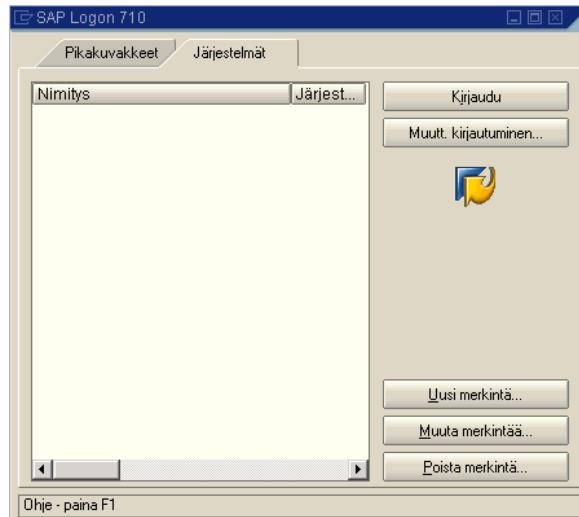
27. Restart Windows Server.

28. After restart, start SAP from the SAP Management Console.

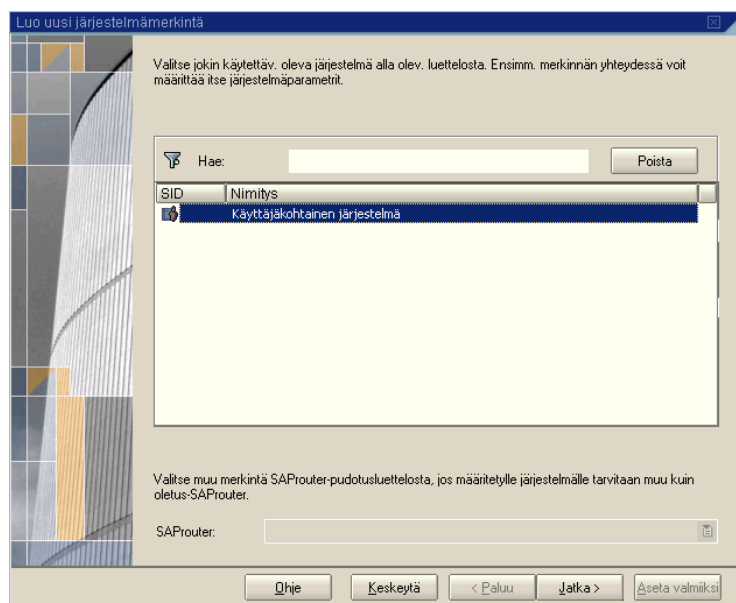
5 POST-INSTALLATION SETTINGS

This section guides through the settings after the installation phase.

5.1 Configuring SAP Front End Log on



1. Open SAP Logon pad by double-clicking SAP Gui in the desktop.
Click *New entry...*



2. Click *Continue*.

3. Enter following parameters:

Description: Name of the system connection (in this case *SAP ECC 6.0*)

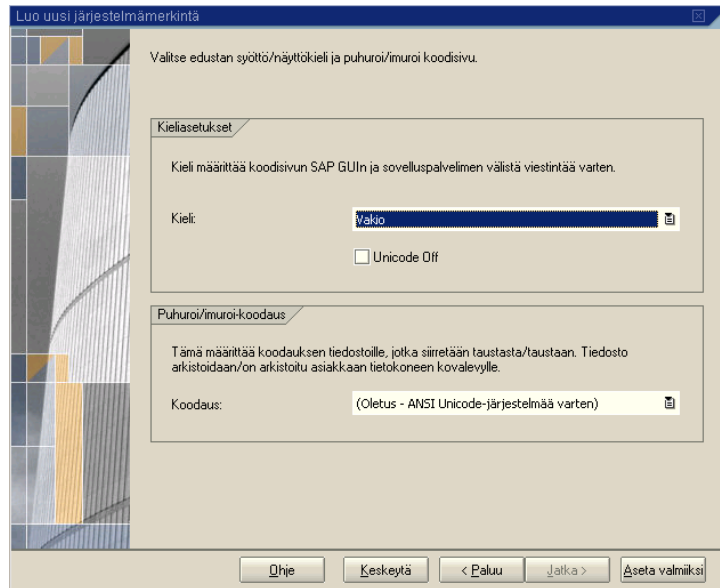
Application Server: Name of the application server (in this case *METEC1*)

System Number: System number which is *00*

System ID: System ID which is *800*

Click *Continue*.

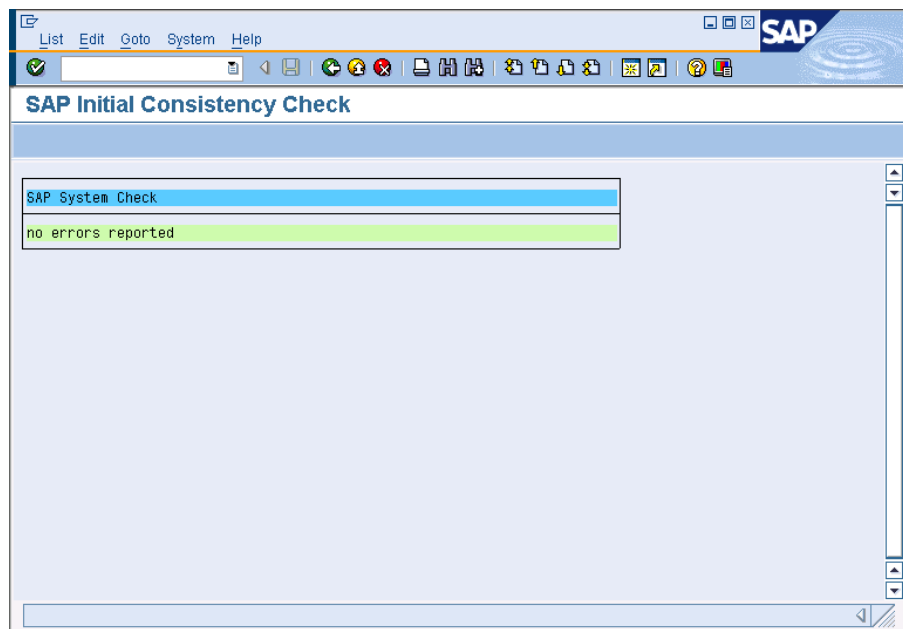
4. Make sure that there is **NO** mark on *Activate Secure Network Communication*. Click *Continue*.



5. Leave the selections on default. Click *Assign ready*.

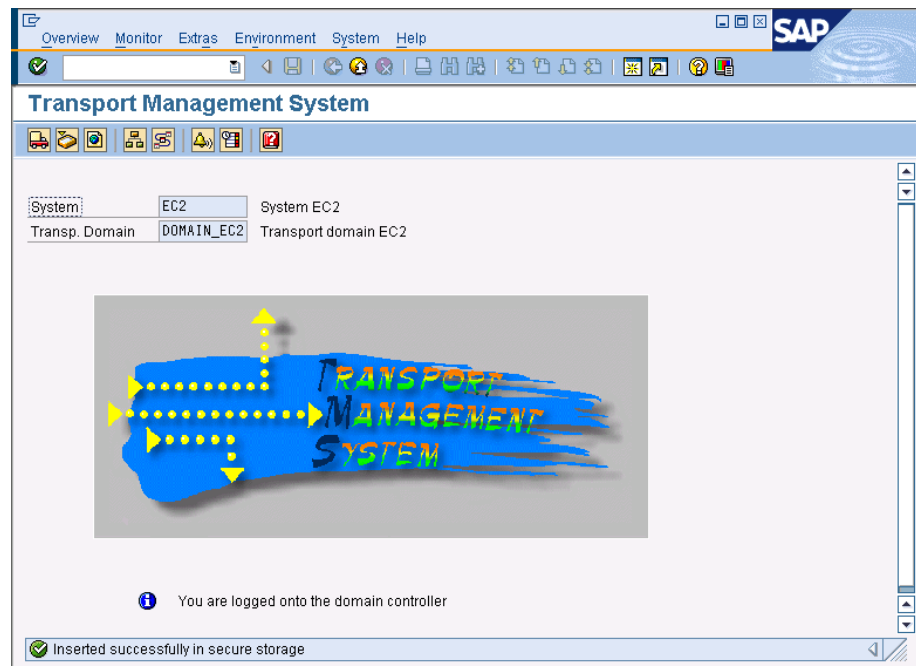
5.2 Performing SAP Consistency Check and SAP Transport Management System

1. Log on to SAP ECC.
2. Sign in to Client *800*.
3. Enter transaction code *SICK*.



4. The screen informs that the check is successful and no errors reported.
5. Sign in to Client *000*.

6. Enter transaction code *STMS*.



7. The screen informs that the check is successful.

5.3 Installing the SAP License

You must install a permanent SAP license. When you install your SAP system, a temporary license is automatically installed. This temporary license allows the use of the system for only 4 weeks from the date of installation.

To acquire license, go to <http://service.sap.com>.

Navigate to Support portal → Keys & Requests → License keys

Fulfill the requested information. The license key is sent to the e-mail address that is given when the installation package is purchased.

To install the license key, you log on to SAP ECC Client 000. Enter the transaction code *SLICENSE*. Figure 2 displays the view of installing the SAP license.

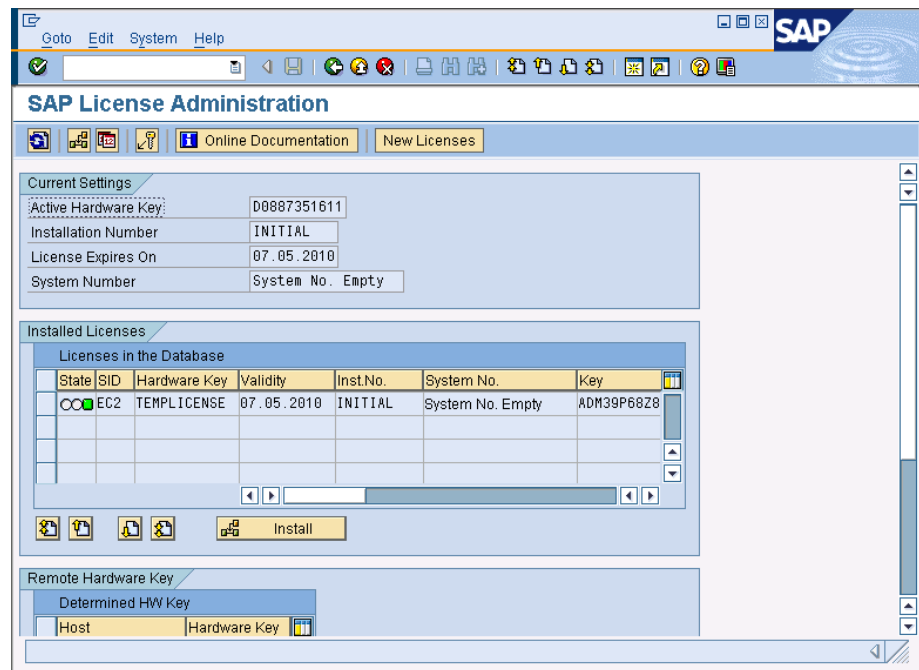


Figure 2: Installing the SAP license

The license key can be in two formats: regular license key code or license key file. If you have the code, click *Install* and enter the code as requested. If you have the license key file, click *New Licenses* and enter the directory root of the file.

6 TROUBLESHOOT

This section displays some hints and advice for problem solving during the installation.

6.1 Log Files

If the SAPinst installation phase notifies errors during the installation phase, you can see the log files created that SAPinst composes. The log files appoint the event in which the installation has failed. Log files **sapinst** and **sapinst_dev** are located in:

C:\Program Files\sapinst_instdir\ERPEhP4\AS-ABAP\MSS\CENTRAL\

Log file **log** is located in:

D:\usr\sap\EC1\DVEBMGS00\

6.2 SAP Management Console and Windows Services

In SAP Management Console you can see the status of the SAP solution. If the installation aborts e.g. in *start instance* phase, you may need to start the solution manually in the Sap Management Console. Figure 3 displays SAP Management Console.

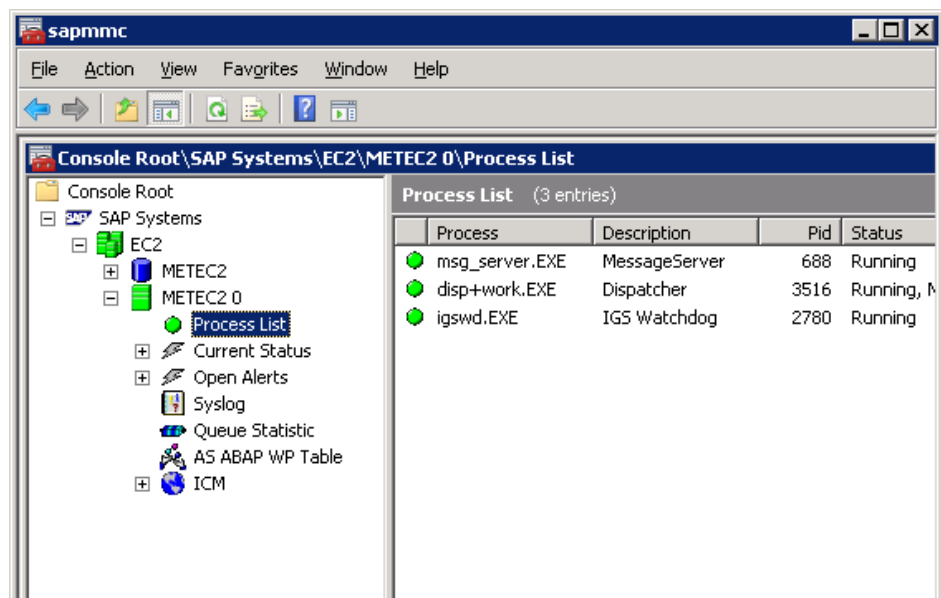


Figure 3: SAP Management Console

Check from the *Process List* whether the status of the processes is *Running*. If not, right-click the *System ID* (e.g. EC1, EC2 etc.) and click *Start*.

Check also the Windows Services. Choose *Start* → *Run* → Enter *services.msc*

Windows Services can be seen in Figure 4.

SAP ECC installation -related services are:

- Distributed Transaction Coordinator
- SAPEC1_00 (depends on the System ID name)
- SAPOsCol
- SAPService Automatic Workstation Updates
- SQL Server (MSSQLSERVER)
- SQL Server Agent (MSSQLSERVER)
- SQL Server FullText Search (MSSQLSERVER)
- SQL Server VSS Writer

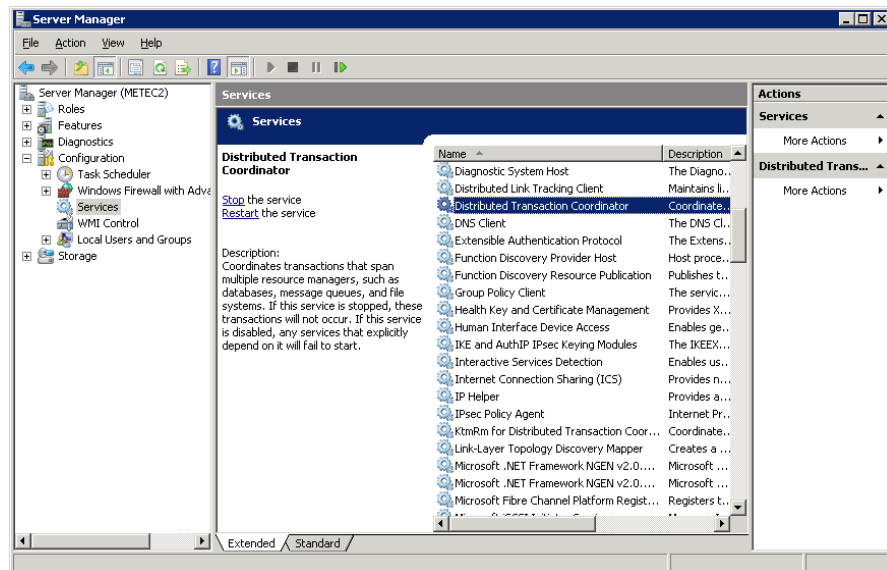


Figure 4: Windows Services

In case of error during the installation, you can stop all the services on the list above and start them again.

6.3 Directory Roots of the Installation Files

The directory roots of the installation files should be as short as possible. Avoid any spaces and special characters in the directory names.

7 SUMMARY

This documentation displays how SAP ERP Central Component is installed in the SAP laboratory of Metropolia University of Applied Sciences. This documentation can be used as a source of information in maintaining the system.