



The project is co-funded by the European Union, Instrument for Pre-Accession Assistance.

Test Bed Specifications and Pilot Deployment

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Ploče, 30.5.2013



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1 Introduction

This report is describing in details the system requirements and steps needed to perform the PCS and APC pilot deployment for each pilot Port participating under the APC project. Within the report separate sections are used to further describe required hardware and software specification. Separate part of the report addresses the end user training and pilot deployment.

2 Overview of the pilot architecture

The integration modules delivered for the APC project are part of the Ploče Port Community System (PCS). PCS system was designed using a standard three tier architecture:

Presentation tier

The presentation tier is used to displays information in a user friendly way. It communicates with other tiers by outputting results to the browser/client tier and all other tiers in the network.

Application tier

It controls an application's functionality by performing detailed processing.

Data tier

This tier consists of database server. Here information is stored and retrieved. This tier keeps data neutral and independent from application servers or business logic. Giving data its own tier also improves scalability and performance.

In addition to these three tiers PCS has a communication tier which is responsible for the integrations with other systems and for the communication between the presentation tier and application tier.

The whole system was developed using Microsoft .NET technologies. For the presentation tier Microsoft Silverlight application Framework was used. Silverlight is a cross-browser plug-in for



delivering rich web experience for end users.

The application tier and data tier are written in C# code. For the data tier for the database communication the Entity Framework is used. Entity framework is an abstraction technique for working with relational tables as they were objects in memory. The main benefit is to hide away the complexity of the underlying tables and give a uniform way of working with data.

For the database server the MS SQL 2012 was used.

The PCS Ploče system consists of eight content modules of which only three modules are part of the IPA APC project.

The list of modules is presented below:

- Vessel Announcement
- General Cargo Module
- Liquid Bulk Module
- Containers Module
- Customs Module
- Gate IN/OUT module
- Railways Module
- Security Module

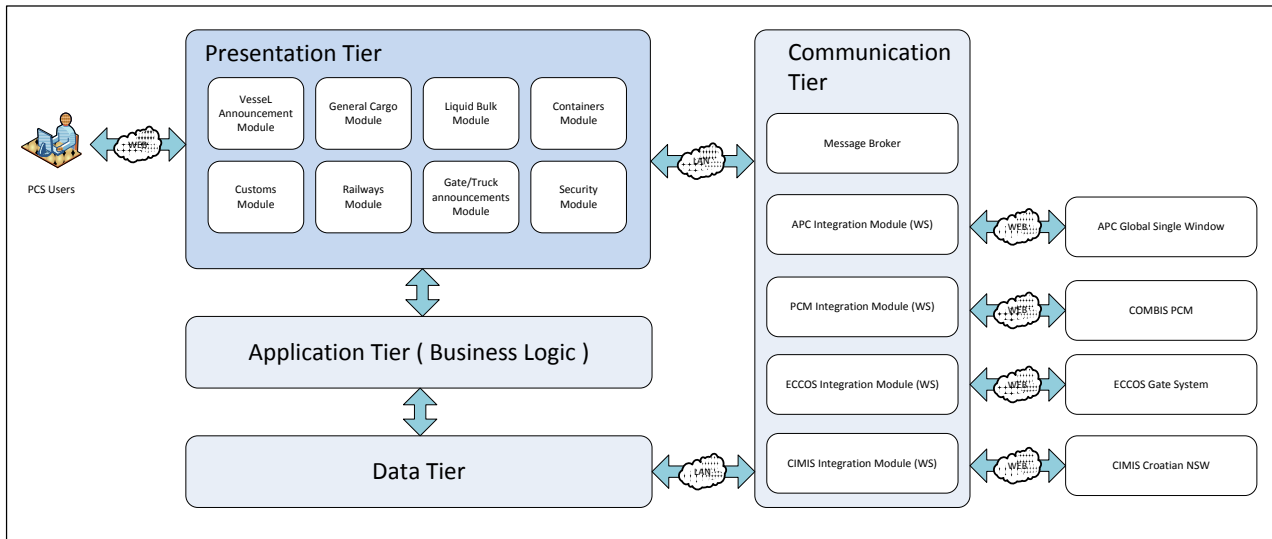
All the modules are logically connected together in order to support the business process.

For the purpose of the APC project several updates were made on the Vessel Announcement Module, Containers Module, Gate IN/OUT module in order to meet the project requirements.

The above-mentioned modules have been enhanced with the integration with external systems in order to provide data for the APC GSW exchange.

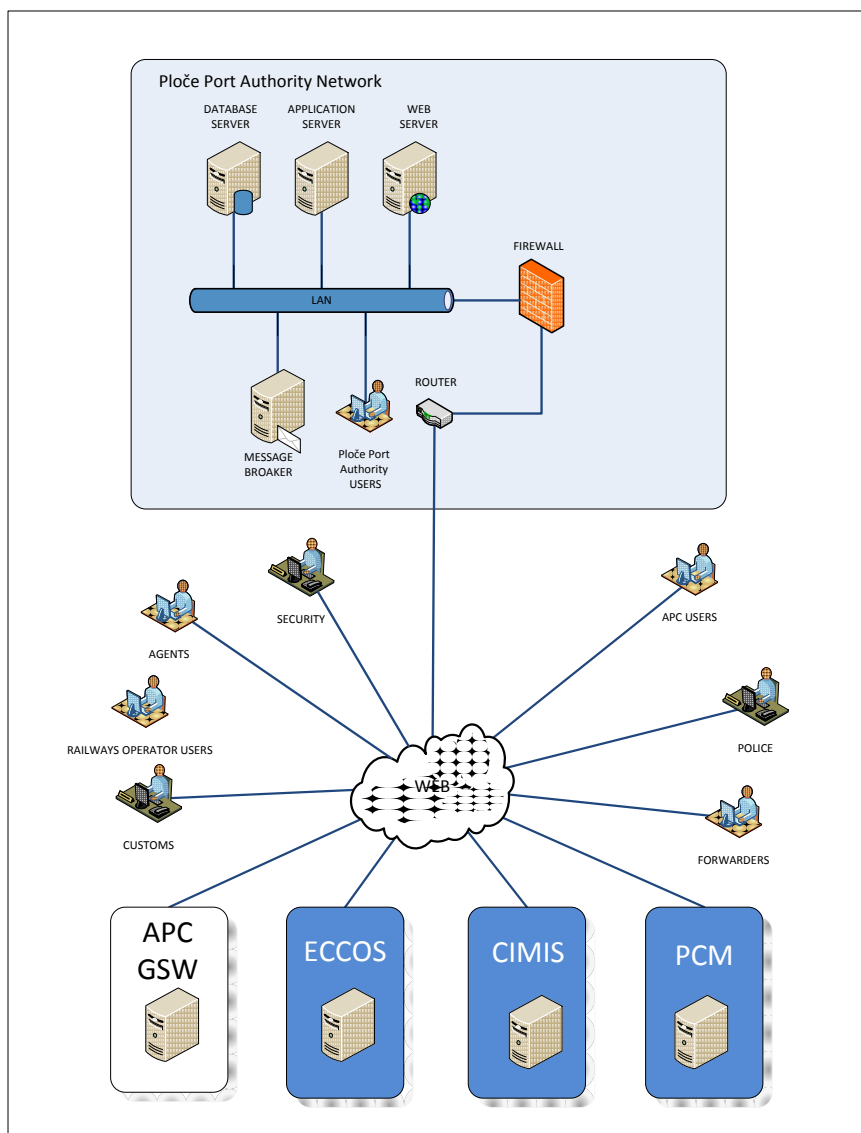
The integration was made using Web Services which enable flexible and dynamic and flexible interoperation of autonomous information systems.

The logical system architecture is presented in the figure below:



3 Physical Architecture - Used infrastructure

The figure below presents the physical architecture of the system.



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5 Hardware and Software Specifications

5.1 Servers

Web Server

- Processor : 2 x Intel® Xeon® E5-2620 (6 core)
- Cache Memory: 15 MB L3 Cache.
- Memory : 16GB
- Storage Controller: 1GB FBWC Controller Raid(0/1/1+0/5/5+0)
- Hard Drive: 5 × 300GB SAS 10k
- Power Supply: redundant
- Networking: 4 x 1Gb Ethernet Ports
- Optical Drive: DVD-RW
- Form Factor: Rack (2U)
- Warranty: 12 month
- Remote server management (graphical remote console with multi-user collaboration, video record/playback).

Database Server

- Processor : 2 x Intel® Xeon® E5-2620 (6 core)
- Cache Memory: 15 MB L3 Cache.



- Memory : 64GB
- Storage Controller: 1GB FBWC Controller Raid(0/1/1+0/5/5+0)
- Hard Drive: 5 × 300GB SAS 10k
- Power Supply: redundant
- Networking: 4 x 1Gb Ethernet Ports
- Optical Drive: DVD-RW
- Form Factor: Rack (2U)
- Warranty: 12 month
- Remote server management (graphical remote console with multi-user collaboration, video record/playback).

Application Server

- Processor : 1 x Intel® Xeon® E5-2620 (6 core)
- Cache Memory: 15 MB L3 Cache.
- Memory : 32 GB
- Storage Controller: 1GB FBWC Controller Raid(0/1/1+0/5/5+0)
- Hard Drive: 2 × 300GB SAS 10k
- Power Supply: redundant
- Networking: 4 x 1Gb Ethernet Ports
- Optical Drive: DVD-RW
- Form Factor: Rack (2U)
- Warranty: 12 month
- Remote server management (graphical remote console with multi-user collaboration, video record/playback).Inter-VM traffic inspection
- Enforce security for dynamic virtualized environments



- Full virtualized security gateway
- Plug-and-Play security for virtual machines
- Single management for physical and virtualized environments

Message broker Server

- Processor : 1 x Intel® Xeon® E5-2620 (6 core)
- Cache Memory: 15 MB L3 Cache.
- Memory : 32 GB
- Storage Controller: 1GB FBWC Controller Raid(0/1/1+0/5/5+0)
- Hard Drive: 2 × 300GB SAS 10k
- Power Supply: redundant
- Networking: 4 x 1Gb Ethernet Ports
- Optical Drive: DVD-RW
- Form Factor: Rack (2U)
- Warranty: 12 month
- Remote server management (graphical remote console with multi-user collaboration, video record/playback).
- Inter-VM traffic inspection
- Enforce security for dynamic virtualized environments
- Full virtualized security gateway
- Plug-and-Play security for virtual machines
- Single management for physical and virtualized environments



5.2 Work Stations (Personal Computers)

The required hardware specification for working stations (6x) is as follows:

- Processor: Intel Pentium 2.90 GHz (2 core)
- Cache Memory: 3 MB cache
- memory: 4GB
- Hard Drive: 500GB SATA
- Optical drive: DVD+/-RW
- Monitor: 20"
- Warranty: 12 month

5.3 Software Requirements

The required software for the underlying infrastructure can be found in the list below:

5.3.1 Operating Systems

- Windows 8 Pro 64bit; 6 Licenses
- Microsoft Windows Server Standard 2012: 4 Licenses

5.3.2 Database Management System

- Microsoft SQL Server Standard 2012 ; 1 License

6 Training

The purpose of the training was to transfer knowledge to the final users to get familiar with the software which was designed to meet their business needs. Training activities included theoretical and practical training sessions using the PCS APC modules, aimed at different users.

In the next paragraphs the training details are presented:

6.1 Levels and types of training

To get the users accustomed to the PCS APC we acknowledged the following levels and types of training:

Knowledge transfer: during this process our consultants explained to the management how our systems can be deployed in conjunction with procedures. Institutional strengthening and efficiency issues were outlined and translated into advises or alternate choices. All this is based on one rule: the customer decides.

Basic skills training: where required, this training included very basic skills such as use of the keyboard, Windows conventions, using peripheral equipment like printers, etc.

Basic Application training: use of standard keys and functions, generic conventions for application use.

Application manager training: Training of the persons that will control, further set-up and authorize the use of the systems in great detail. The purpose is to ensure that those persons understand the concepts of the systems, and how to tune the systems to the specific requirements. The application managers are trained to the level that they can answer functional questions from users. A training manual and an implementation manual support this training.

User training: per system, group of systems, and (group of) modules a tailored training is given to the users. The contents and scope of this training are defined during the pre-



implementation phase.

Application and system manager training

Training of the users who will in great detail control, further set-up and authorize the use of the PCS and coordination application e.g. administrators, super users etc. The purpose is to ensure that those persons understand the concepts of the systems, and how to tune the systems to the specific requirements. The application managers are trained to the level that they can answer functional questions from users. A training manual and an implementation manual support this training.

User training

Per target group a tailored training is given to the users. The contents and scope of this training are defined during the pre-implementation phase

6.2 Training Objectives

General objective of the training activities was providing the participants with:

1. Good understanding on the general framework of the PCS APC Modules: the port logistics context; users, actual and modified processes; advantages; future developments;
2. A solid understanding of the PCS APC system and the role they can play in PPA community.
3. Sufficient skills to execute their specific tasks using the PCS APC: standard flow of information and how to handle exceptions;
4. Awareness on the effects of user's decisions to other chain parties when using the PCS APC.
5. An abstract knowledge of the technology that is made available to the PCS APC: systems, modules, functions, conventions and concepts.
6. Specific and detailed knowledge as to how to use the PSC APC modules in full and to execute procedures efficiently.



The measure of success of the training and knowledge transfer program was, in a single word, independence. The user organization must be capable of sustaining the processes with the use of the technology made available, without regular intervening of the support group.

6.3 Target groups

Based on the variety of PCS APC users there can be defined four major groups to which training activities are aimed.

Different groups of participant are:

1. **Group:** Application managers: responsible for releases, patches, requests for modification;
2. **Group:** System managers: responsible for authorization, operating system, database system, back-up requirements, restoring data from back-ups; logs and use of the system;
3. **Group:** Helpdesk employees: responsible for adequate problem solving and information to users, quality reporting to application / system managers;
4. **Group:** Users: the final users of (parts of) the PCS APC; tasks and authorization can vary per employee.

Target groups were defined in a way that will include everybody from stakeholders list involved in the execution of the specific PCS APC processes

Management level is not included in target groups since the training is concentrating towards employees who really manage and operates the PCS APC.

In order to satisfy all expectations groups will be composed with participants from all involved companies and institutions using the same application, in order to stimulate the transport chain awareness within all involved parties.

6.4 Group size

The maximum number of participants per training group was approx. 15 participants, in order to ensure sufficient interactivity during training sessions and sufficient personal attention during practical exercises.

The following table indicates the different PCS APC subjects for whom training sessions should be organized, as well as the estimated numbers of participants.

Training session:	USERS	PPA/PCC: Luka Ploče	HMO/Port Captain	Border Police	Customs	Forwarders	Agents	Luka Ploče	Liquid Terminals	Terminal Security	Total	Training groups
Vessel announcements		4	2		6	10	25	10	10		61	4
Container procedures					6	20	15	15			56	4
Gate in Gate Out procedures				8	6					32	32	3
Application and System Management		4									4	1
Total sessions												13

6.5

6.6 Participant level

Participants should have sufficient proficiency in computer operation, as well as basic knowledge and some working experience in their specific task, to be sufficiently familiar with terms and abbreviations used in the PCS screens.

6.7 Methodology

It is important that participants are not only trained in their specific job, but that also awareness and understanding are created concerning functions of other involved parties. Secondly, participants must be able to address their specific questions and problems during the training sessions.

In principle different methodologies could be applied. Since well-known method such as do-it-yourself training, Classroom teaching or One-on-one training are too rigid or not sufficiently interactive to realize the purposes or they are too expensive. Therefore the following methodology is recommended:

Per target group a practical workshop of 1 day-part, composed of a theoretical and a practical section, aimed at intensive participation by max. 10 participants;



Interactive presentation and demonstration of the PCS and its background by experts, having wide experience in training on port logistics and modern ICT applications in this field, applying modern training equipment such as power point presentations, beamer etc.;

Practical exercises, focusing on real- life situations in the port of Ploče and aimed at the creation of chain awareness amongst the participants (what are the effects of own decisions and actions on the other parties in the chain);

6.8 Duration

Per target group at least one session of 5 hours is recommended,

6.9 Location and facilities

The training location should provide following facilities and equipment:

- Tables and chairs for 10 participants;
- Presentation equipment such as beamer, whiteboard, flip-over;
- Sufficient computers with internet access, appropriate data capacity, operating system, screen resolution etc.;
- During the practical exercises the following facilities should be available:
- The PCS application should be available on a specific test- / or training environment, accessible via internet;
- User names and passwords to access the application;
- A helpdesk function via telephone to cope with emergencies.

6.10 Contents

The contents of training vary per specific target group.

6.11

6.12 Course materials

Participants received a hand-out for further home study and reference concerning the addressed topics, including the used screens, data entry actions etc.

For training we used:

1. A separate training facility where the trainees can meet without intervention from their work, phone calls, etc.
2. Facilities for showing the applications: beamer, or connected screens.
3. One workstation running the applications per trainee.
4. Training database (environment) on the system.
5. White board or flip over for making notes.

In addition to the above we hand over the following:

1. Training manuals.
2. Implementation manuals.
3. Procedure description.

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7 Pilot Time Plan

In the following table the pilot time plan is presented.

Task	Activities	feb.13	mar.13	apr.13	may 13
Deployment	HW specification and procurement	█			
	HW Installation and Configuration			█	
Training	Training Plan preparation		█		
	Manuals preparation		█		
	Training Execution			█	
Pilot/Testing	Test Cases Creation		█		
	Pilot - Testing			█	

The pilot phase was divided into three phases:

- deployment
- training
- testing

7.1 Deployment

During the deployment phase the hardware and system software was specified and procured. After the procurement the PCS APC system was installed and configured on that hardware in order to start the pilot testing.

7.2 Training time plan

Training phase involved Ploče Port Authority users and other stakeholders. In order to ensure a successful training we prepared a training plan and training manuals. According to the plan training was carried out for different users based on their role in the business processes. Because some seminars included many users we conducted several training sessions.

The training sessions and involved users are presented in the table below:

Description – Seminar Title	Involved /Stakeholders	Departments	mar.13	apr.13	May 2013
Vessel Module	Announcements	PPA Users		✘	
		Harbor's master		✘	
		Customs			✘
		Shipping Agents	✘	✘	
		Forwarders	✘	✘	
		Luka Ploče Terminal Operator	✘	✘	
		LPT & NTF Terminal Operators		✘	
		PPA IT and Help Desk		✘	
Container Procedures	Customs			✘	
	Forwarders		✘	✘	
	Shipping Agents		✘	✘	

	PPA IT and Help Desk		x	
Gate IN/OUT Procedures	Customs		x	
	Terminal Security	x	x	
	Police	x		
	PPA IT and Help Desk		x	
Application and System Management	PPA IT and Help Desk	x	x	

7.3 Testing

In order to ensure that the developed software meets the agreed requirements a pilot end user testing was performed (user acceptance testing). The bases for testing were test cases which were prepared in collaboration with final users. In addition to standard usability testing end users included business test cases in order to check if the application supports their business needs.

Testing took place over two months (April, May) with the following results:

- test report
- defect list



8 Conclusions

The report illustrates the comprehensive guidelines for pilot phase of the APC integration with PCS for Port of Ploče Authority. It offers an overall description and provides all the necessary steps for execution of the pilot and activities described throughout the report including training. The time plane and schedule addresses both time necessary to execute deployments within Port of Ploče Authority and broader project community.