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Projektovanje Računarskih Sistema

Prva Kolokvijumska nedelja

Projekat: Case Study Harper-Collins

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Table of Contents

The Client The Client -Company Background Company Background Company Background

Harper-Collins is a family-owned company that has grown over the last 50 years to be a major publishing house for primary and secondary school books in the UK. Until now, it has been able to manage its business with an in-house developed **Prime printing application** installed on servers in London headquarters offices and the switched network between campus network. However, the Prime system can no longer keep up with the demands of the business since the number of client terminals in manufacturing plants is increasing and servers are not able to process requests efficiently enough.

Since the business is going well, management of the company decided to invest in the redesign of the current network infrastructure and deployment of the new Information system since they plan to increase the number of employees (at least 30%) in the next three years. They also plan to launch a new e commerce platform for private customer for on-line shopping in order to reach new customers.

For the above reasons management of the company decided to convert to client/server technology using Oracle-based software and to introduce new network solutions. **The new network infrastructure** must be built in order to support new applications since the existing system is outdated.

However, due to complex economy/political situation in the UK, company failed to attract external

investment for this project so the Management board decided to run the project with company assets and to deal with the all involved risks. The capital for this conversion has been budgeted and the time line has been established as a three-month project, after which the new business system will operate in parallel with the Prime until all applications are fully converted and verified. Management set as a target that the new system must reduce the current processing time by half.

Client Systems and Applications Client Systems and Applications

The headquarters campus consists of the **Administrative building**, the main **Warehouse** building (300 meters from the main building), and the central **Production plant** (200 meters from the main building).

The **Warehouse** building and **Production plant** building are connected with the **Administrative office** building using wireless point-to-point links with 1Mbps capacity.

Both in the **Warehouse** and **Production plant** one L2 switch and one Access Point are installed in order to connect them with **Administrative building**.

Network and Organization Network and Organization

The administrative building organization is presented in **Table 1**.

Company is connected to the Internet and remote offices via one internet gateway router located in the Server room.

Access switches are currently installed on each floor and connected to the main switch with 100Mbps links. Servers are connected also to the central switch. Main switch is connected with Internet gateway

router which is used both to connect company to Internet and to terminate VPN connections (employees working from home). Only one Internet connection is used and currently company uses PAT as a way to translate addresses to public domain. Access points used to connect **Warehouse** and **Production plant** are connected to the main switch as well all company servers.

Table 1. Company Organization

Department	Number of Devices (PCs)	Role
Warehouse		
Ground Floor	35	Operations & Logistic
Production Plant		
Ground Floor	2	Production Manager

Ground Floor	18	Administration
Administration Building		
Second Floor	10	Managers
Second Floor	35	Accounting& Finance
Second Floor	30	Administration
First Floor	40	Marketing
First Floor	100	Sales
Ground Floor	20	IT Support & Server Room
Ground Floor	50	Logistic
Ground Floor	45	Call Center employees

Server Systems and Applications Server Systems and Applications

The new business software is Oracle-based and will run on new HP servers (5 Servers). Besides, the company already has a server platform with 12 servers that hosts systems such as Mail, Web, FTP, DNS and DHCP.

A new collaboration tool should be suggested in order to improve collaboration with remote offices and increase system efficiency.

Besides, the management of the company also wants to install a new centralized client/server application for inventory called HINT (Harper-Collins INvenTory), with a server located in an **Administrative office** building. Application is currently in the development phase (in-house development so all specific needs

of the company could be covered) and should be deployed along with the new system. In this way employees in **Warehouse** could enter information in the system and correct and updated information about product stock will be available.

Goals for the New Network Goals for the New Network

Management wants pattern designs to be available over secure Internet connection for evaluation and sales presentations in the remote offices and company visits as well. It also wants final pattern designs to be transmitted from servers to **Production plant** over the LAN directly without packet loss and delay.

These files are approximately 10 Mbps size; 20 to 25 patterns will be sent for processing each evening in

the last three hours of the day, 3 p.m. to 6 p.m. Also, 5 to10 patterns will be transmitted to sales offices each day.

Also, management wants to introduce new Wi-Fi systems in all three buildings that will be used for guests (conference room), employees in the **Administrative building, Warehouse building** and **Production plant**.

IP Video surveillance solution that should include 5 IP cameras per floor in **Administrative building,** 10 in **Warehouse building,** 10 in **Production plant.**

You should use 10.0.0.0 range of private addresses. Also, company got the public range of 20.20.20.0/26 addresses from service provider for future use.

Harper-Collins would like a proposal for a turnkey network solution that will be brought online in parallel with the Prime system until all conversions have been made. Hence, you have a freedom to re-design existing network i.e. build new network infrastructure and introduce new connections, module, servers farm organization, Internet connections etc. in order to meet customer requirements and deliver future proof solution.

TaskList

Use the information contained in this section to help you characterize the network at **Harper-Collins** and suggest a design of the new system that will resolve all described issues.

The result should be prepared in the form of the **Design Summary Document** that should provide an answer on the following questions and present your design.

Your document should include the following points.

1. System Design System Design

Document the customer's applications and their importance (non-critical, critical, and essential) in the form of the table.

Document the customer's business constraints and requirements.

Document the customer's technical constraints and requirements.

Document the application requirements and comment.

Based on the customer inputs create a **high-level diagram of the current** system. Based on the customer inputs and your analysis create a high-level design of the new system including:

- Design of new Enterprise campus network (VLAN setup, IP address plan, routing and switching options, new modules, internet connection among others)
- Design of WiFi network for all three buildings
- Design of IP Video surveillance solution

Description of the solution along with short explanation (in which way proposed design corresponds with customer requirements) must be part of the final document.

New system should improve:

- The switching speed between floors
- The commutation efficiency between buildings
- Network scalability
- System availability
- System redundancy
- System security

In the **Design Summary Document** you have to explain (briefly) how your design fulfills each point. You can do it in the table form or descriptive.

2. System Deployment System Deployment

Based on the first point and system description, create a **Project implementation plan** (one section/chapter in **Design Summary Document)** in which you will define and describe **Methodology and Steps** for the design and deployment of the new system.

For **each defined step** describe the set of actions that will be/should be performed.