HDSE/BDSE - IT Systems & Networks

Project Planning

Project Scenario

You are a Junior Network Administrator at Swift & Bacon Publishers (SBP) Ltd, a medium sized company that deals with the publication of books and journals for the scientific and technical community. Books are published both as physical and electronic copies.

SBP Ltd is currently situated in two office buildings and contains four Publishing Teams that deal with subject-specific material: a team for Computer Science and Engineering, a team for Maths and Physics, a team for Biological and Chemical sciences and a team for the Biomedical Sciences.

Each Publishing Team has a Publishing Team Leader (PTL), and up to 20 Publishing Editors (PE). Each team has their own secured area on the network. Each PE has access to their own content only, as well as any shared team documentation, but they do not have access to any other documentation.

The PTL can access all material for that team. There is an area for SBP company documentation that anyone can view.

SBP receives manuscripts securely from their authors into an encrypted Public Repository Server (PRS) located on the premises. The manuscripts are then extracted from this repository by one of the four PTLs, who then assigns the manuscript to the PE.

Project Scenario

All documentation and office software are located on a company file server.

Once a manuscript has been reviewed, it is uploaded to the Secure Publishing Server (SPS) where the content is either sent electronically to an external printing company or is available for download by paying customers.

SBP also maintains a team of three Network Administrators who have full admin access to the entire network.

There is also a Senior Publishing Manager and CEO who have access to all company documentation.

Since the 2020 pandemic, the company has realised that a hybrid working model is now most effective for their employees. SBP is planning to close one office building completely to allow staff to work from home if they choose.

Project Scenario

SBP wants to set up their remaining building in the following physical configuration.

- The PRS and SPS servers are in a data centre on the top floor
- The middle floor is a suite of five public meeting rooms with full wired and wireless access
- The Network Server Room containing the company network and email servers is on the middle floor
- The network administrators are also located on the middle floor
- One network administrator must be present in the building each day. The on-site network administrator uses a desktop machine for server administration
- The ground floor is to be a collection of 20 open-plan ‘hot desks’ where employees who choose to come into work can go to any desk, plug their laptop into the cabled network and begin working.

Project Scenario

To facilitate working from home the company wants the following.

- Each employee is to be issued with a company laptop
- The laptop will contain a software firewall, as well as VPN client
- Employees will store company data on the company fileservers
- A high-throughput VPN server will need to be installed and configured to allow secure connectivity for all remote working employees
- The security model of all company data must be preserved
- All office software must be accessed using a cloud-based delivery model, e.g. Google Docs, Office 365
- Each employee is to be based in mainland UK.

SBP also wants to explore moving the company data located on the fileserver to a cloud-based offering such as SharePoint or Google Workspace, but they are also happy to maintain a fileserver within the data centre if necessary.

Project Scenario

The SBP network requirements are that:

- the data centre can handle high-volume traffic of data from inside and outside the organisation
- the ground and middle floors have a mixture of wired and wireless connectivity
- all Publishing Teams are isolated from each other
- there is proper consideration given to network security to minimise a data breach
- a firewall will need to be installed and configured to allow inbound and outbound traffic
- there is no lag of data traffic between floors and no connectivity ‘dead spots’
- any data sent to a cloud server or stored on the RPS server is encrypted
- there are robust backup facilities in place for the SBP data in case of a data loss or security breach
- the current network security model for teams and employees is preserved even though employees are working from home.

The SBP CEO and Senior Network Administrator has asked you to design and build a virtual network solution that will fulfill the company requirements. This will help SBP to identify any potential issues in the requirements before spending money on closing a building and reorganising the remaining building layout and employee requirements.

In addition, SPB wants you to create a presentation for them, showing the range of available networking topologies, protocols, hardware and software, to demonstrate that you have the breadth of knowledge available to you before you begin the design task.

Project Activity 2

Document to be produced: Implementation Plan (report)

Content:
You are required to design a networked solution for the requirements specified by SBP Ltd. You should make use of whichever design tools and techniques are most appropriate for your network and for the nature of the networked solution. You should produce your evidence as an implementation plan.

Your implementation plan should include the following:

- The design of the network, including any networking hardware, software, network addresses and devices and users, including any network sub domains as well as the physical location of these devices within the organisation (*)
  Create network design using Cisco Packet Tracer which include the following devices and users identified from scenario:
  - Hardware (servers, laptop etc.)
  - Software
  - Devices
  - Users (Network Administrators etc.)

Refer to IU5 – Network Services (Lab - DHCP Server Configuration Using Cisco Packet Tracer)

Project Activity 2

Document to be produced: Implementation Plan (report)

Content:

Your implementation plan should include the following:

- Any device configuration and security considerations should be included
  - What are the configuration of devices (mentioned in the previous question) that need to be included?
  - What are the security considerations (hardware, software) that need to be included?

- The design of a maintenance schedule to support the networked system (*)
  Based on the networked system you created, create a maintenance schedule.

No.	Equipment Description	Condition	Maintenance Frequency (days)	Description of Maintenance Activity	Assignee	Last Maintenance Date	Next Maintenance Date
1	File Server	Good/Fair/Bad		Inspection			
2							
3							

Project Activity 2

Document to be produced: Implementation Plan (report)

Content:

Your implementation plan should include the following:

- A test plan covering all areas of the networked system requirements, indicating the test action, test data and expected results (*)

Test Item (Area of networked system requirements)	Test Action	Test Data	Expected Results
Topology	Test if the topology is up and running	Routing tables Ping test outputs	All networking devices are connected.

- Feedback from a range of users on the effectiveness of the solution design (*)
  Get feedback from at least 3 users (via Interview, questionnaire etc.)

Project Activity 2

Document to be produced: Implementation Plan (report)

Content:

Your implementation plan should include the following:

- An analysis of the user feedback with the aim of optimising the design and improving the efficiency of the networked solution
  Summary of the feedback gathered and analyse how the networked system could be improved in terms of efficiency.

- A clear explanation of how the network designs have been optimised and improved
  What are the implementations of the analysis above?

- An explanation of the range of network server types available required by the SBP scenario and a recommended selection (*)
  Identify the types of server from the scenario and recommend the selection (server model, specification, cost)

- A justification of the recommended server selection, with specific focus on cost and performance optimisation.
  Justify the reason why the server selection above are recommended.

Thank you

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