Jarrett Phillips – Cyber Capstone: Final Report

**PROJECT INTENT**

The objective of this project is to design, implement, and demonstrate a backup server solution using Windows Server in a virtualized environment. The project will show the critical role of backups in disaster recovery by simulating a data loss scenario on a client machine and demonstrating the restoration of critical files from the backup server.

1. Set up a Windows Server to act as a dedicated backup server for a client machine running Windows 10/Enterprise.
2. Demonstrate how critical business files can be securely backed up and restored in case of accidental deletion or other disasters.
3. Simulate a disaster scenario where critical files are lost and subsequently restored using the backup server.

D.) The demonstration will fit within a 3 to 4-minute presentation window while communicating the importance of disaster recovery planning.

**TIMELINE**

Week 1:

Environment Setup:

A.) Set up and configure the virtual machines in VirtualBox.

B.) Install Windows Server on the backup server VM and Windows 10/Enterprise on the client machine VM.

C.) Establish network communication between the two VMs.

Week 2:

Backup Server Configuration:

A.) Install and configure the Windows Server Backup feature.

B.) Set up and schedule backups for critical files on the client machine.

C.) Perform initial manual and automated backups to ensure everything is working as expected.

Week 3:

Disaster Simulation and Recovery:

A.) Develop a disaster scenario by deleting critical files from the client machine.

B.) Execute the disaster scenario and document the process.

C.) Restore the deleted files from the backup server using the Windows Server Backup utility and validate the restoration.

Week 4:

Final Testing and Documentation:

A.) Conduct final testing of the backup and restoration process to ensure reliability.

B.) Put together a detailed documentation, including setup steps, backup configurations, disaster simulation, and recovery outcomes.

C.) Prepare the 3 to 4-minute demonstration, focusing on key points.

Week 5:

Presentation Preparation:

A.) Finalize the presentation slides and visual aids.

B.) Practice the demonstration to ensure clarity and timing.

C.) Submit all documentation and reports for review.

**PROJECT PROCESS**

The project followed a structured, step-by-step approach, beginning with the setup of a virtualized environment and concluding with a disaster recovery demonstration.

Virtual Environment Setup:

1. Using VirtualBox, I created two virtual machines: one running Windows Server, configured as the backup server, and another running Windows 10/Enterprise, acting as the client machine.
2. Network communication was established between the two VMs to facilitate file sharing and backup operations.

Backup Server Configuration:

1. The Windows Server Backup feature was installed and configured on the backup server VM.
2. A backup schedule was created for the critical files on the client machine, ensuring both manual and automated backups were functioning properly.

Disaster Simulation:

1. I simulated a disaster scenario by intentionally deleting critical files from the client machine.
2. These files were successfully restored from the backup server using Windows Server Backup, demonstrating the recovery process.

Testing and Documentation:

1. Final testing was conducted to ensure the reliability of the backup and restoration process.
2. I documented all steps of the project, including the configuration, disaster simulation, and recovery procedures which is what is within this final outline.

Demonstration Preparation:

1. The presentation slides were created, and the demonstration was practiced to ensure that it fits within the allotted time and clearly communicates the project's importance.
2. Thanks to the help of the instructor, I was able to polish the demonstration, shorten the length of the video, and go over the key takeaways. This took a few attempts to get corrected.

PROJECT TAKEAWAYS

Importance of Backups:

1. The project emphasized the critical role that proper backup and recovery strategies play in safeguarding against data loss. In business environments, reliable backups can prevent significant downtime and financial loss. Had there been more time to demonstrate this would have been a more detailed project, with an actual cyber-attack in play and event viewer displayed.
2. Demonstrating the quick restoration of critical files highlighted how a well-planned disaster recovery solution can minimize the impact of data loss and ensure business continuity.

Challenges:

1. One of the challenges encountered was configuring network sharing between virtual machines, which required careful setup of permissions and network settings. This emphasized the importance of testing all components of a disaster recovery plan. This also led to believing that there must be an easier way to go about Window Server Backups, because setting up a file share seemed to be the only solution I could find after hours of research, but that seems time consuming for big companies to have to do.
2. The project also proved the importance of securing backup data and ensuring that only authorized users have access to sensitive information.

Recommendations:

1. Businesses should regularly test their backup and recovery procedures to ensure they are effective and can handle real-world disaster scenarios.
2. Automating the backup process and monitoring for failures is key to ensuring the reliability of the disaster recovery solution.

**DELIVERABLES FOR DEMO**

Demonstration Video:

1. A 3 to 4-minute demonstration showing the backup and recovery process, including the configuration of the backup server, the simulation of a disaster, and the successful restoration of files.

Presentation Slides:

1. Slides outlining the project’s objectives, the importance of backups for security, the disaster recovery process, and the key takeaways.

Final Project Report:

1. A detailed project report documenting the entire process, including environment setup, backup configurations, disaster simulation, recovery steps, and lessons learned.

**ADDITIONAL RESOURCES**

1. Microsoft. (n.d.). Windows Server Backup Overview. Microsoft Docs. <https://learn.microsoft.com/en-us/previous-versions/windows/it-pro/windows-server-2012-R2-and-2012/jj614621(v=ws.11)>
2. Oracle. (n.d.). VirtualBox Shared Folders Documentation. Oracle VirtualBox User Manual. <https://www.virtualbox.org/manual/ch04.html>
3. Oracle. (n.d.). VirtualBox Networking and Shared Folders. Oracle VirtualBox User Manual. <https://www.virtualbox.org/manual/ch06.html>
4. EaseUS. (n.d.). How to back up Windows Server 2019 files: Full guide. EaseUS. <https://www.easeus.com/todo-backup-guide/backup-windows-server-2019-files.html>
5. Kirbtech. (n.d.). The importance of data backup for business. Kirbtech. <https://kirbtech.com/importance-of-data-backup-for-business/>

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