

Best Configurations & Practices for Creating an Efficient Enterprise Server, Regarding Speed, Reliability, Scalability, and Security

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1. Introduction

Servers play a significant role in how organisations perform many of their day-to-day responsibilities. Servers store the majority, if not all of an organisation’s data, and allow users of the network to interact with this data, as well as store or edit data. Data is invaluable to organisations, and if the server were to go down, this can severely hinder the operations of the organisation. Due to the importance a server carries, it is key that a network engineer properly configures the server to ensure performance is optimised, according to the following: Speed, Reliability, Scalability, and Security.

2. Aim & Objectives

Aim:

To investigate what configurations and practices are best for an enterprise server, in terms of speed, reliability, scalability, and security. Research and testing will be performed where suitable to aid the investigation and determine what configurations should be implemented.

Objectives:

- To conduct research into the subject area to gain an understanding of what configurations should be considered when configuring an efficient server.
- To further discuss and evaluate this research, to better understand what factors should be considered for the enterprise server.
- To design/implement and configure a server within a small virtual network, further demonstrating how to configure a server.
- To test and analyse different RAID configurations, to determine which configuration will give the server the best performance possible.
- To evaluate and summarise these test findings and use them alongside prior research to draft a final server plan.

3. Research (Literature Review)

From findings in the Literature Review, and testing completed later on in the project, the following configurations were deemed appropriate for improving the efficiency of an enterprise server (Alongside related Sources):

Speed Configurations

- Use of RAID 10 (Determined to be the fastest storage configuration through testing). [1] [2]

Reliability Configurations

- Use of a UPS - To keep the server running in the event of a power cut to avoid possible data corruption.
- Failover Clustering. [3]
- Data Redundancy – Use of Offsite Backups (With routine backups via the GFS scheme) and RAID Level 10 (Mirrored data means a complete backup is stored in the array).
- Use of an offsite backup and GFS backup scheme, as a final failsafe if all other reliability configurations fail and result in data loss.

Scalability Configurations

- Failover Clustering.

Security Configurations

- Use of GPOs (Group Policy Objects) [4]
- Use of a business-grade antivirus software and Firewalls

4. Implementation + Testing

To demonstrate the configurations discussed within the literature review, Oracle VM VirtualBox was used, which is a software that facilitates the creation of Virtual Machines. This meant that a virtual machine running Windows Server 2019 could be created and documented, to show readers how the configurations were installed and their benefits.

For Testing, RAID 5 and 10 were tested, alongside a baseline configurations using a standard storage drive. To test these configurations, a combination of CrystalDiskMark [5] (Figure 1) and ATTO Disk Benchmark [6] were used, to measure the Read/Write speeds of each configuration within different scenarios. Testing found that RAID 10 was the best configuration choice, as it had the best read/write speeds (illustrated in figure 1) of all the configurations tested. It also had the best data redundancy/fault tolerance.

5. Conclusion

From research, implementation, and testing done throughout the project, the project highlighted key areas/configurations for improving the efficiency of an enterprise server. These configurations were implemented, and where applicable tested, alongside research to detail why each configuration was crucial for an enterprise server, in terms of speed, reliability, scalability, and security. The project also illustrated and documented how each configuration was configured, to allow readers to configure the server identically, and to show how testing was completed, so it can be replicated by anyone to arrive at the same results. As explained previously, testing showed that RAID 10 was the best configuration choice for data storage, as it boasted the highest Read/write speeds measured.

6. References

[1] T. Montgomery, *CompTIA Cloud+ Study Guide: Exam CVO-001*, 2nd., California: Sybex, 2016, ch.3, pp.58.

[2] D. Lowe, *Networking All-in-One For Dummies*, 7th ed., Hoboken: Wiley, 2018, ch.5, pp.263-264.

[3] S. Lynn, *Windows Server 2012: Up and Running*, California: O'Reilly Media, Inc., 2012, ch.6, pp.119.

[4] J. Krause, *Mastering Windows Group Policy Control and Secure Your Active Directory Environment with Group Policy*, Birmingham: Packt, 2018, ch.1, pp.7-8.

[5] CrystalDiskMark, "About CrystalDiskMark", *CrystalDiskMark*, [Online] Available: <https://crystallmark.info/en/software/crystaldiskmark/>

[6] ATTO Disk Benchmark, "Industry Standard Application for Analyzing Storage Performance", *ATTO*, [Online] Available: <https://www.atto.com/disk-benchmark/>

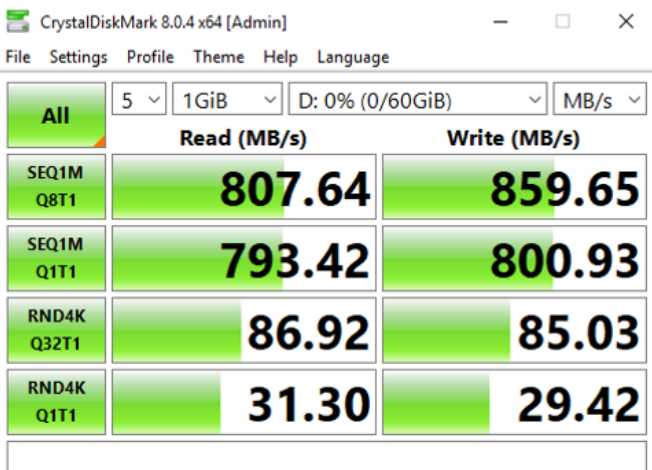


Fig. 1