White paper

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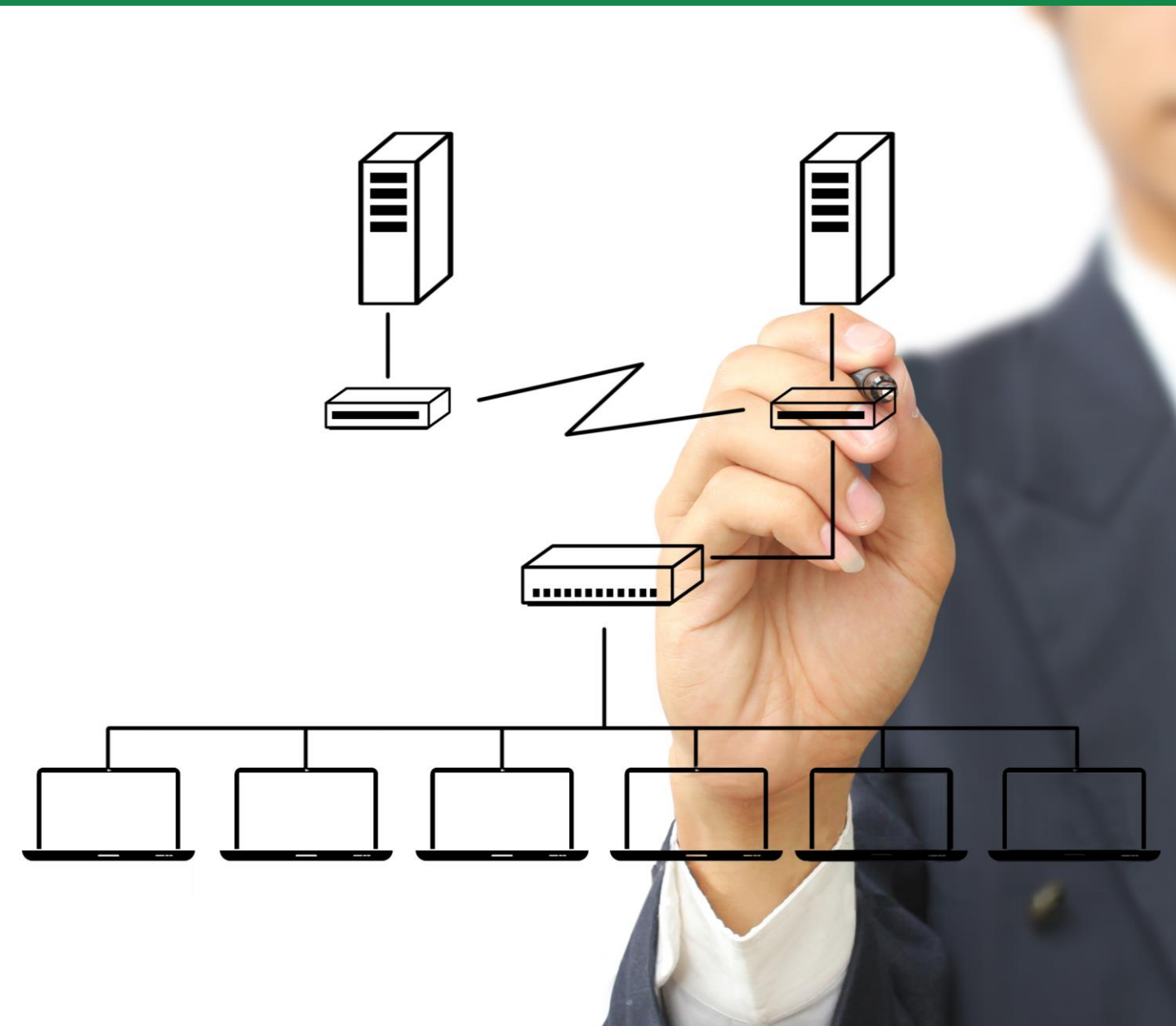
5 Steps Towards a More Functional and Efficient IT Infrastructure



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Summary:

1. Introduction

In recent years, the requirements in regards to IT systems have been significantly raised making high availability of certain services and disaster recovery systems (DR) two essential components of a healthy infrastructure. Therefore, companies need to adapt their IT infrastructures to be able to meet those requirements by maintaining the integrity and availability of their data.

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2. Challenges Related to IT Infrastructures

a. Availability of Services

Although many companies need to have their systems up and running 99.99% of the time, a large portion of them are unable to offer such high availability of service to their users - both internal and external. The main reasons for this lack of availability are:

- Obsolete equipment
- Lack of compatibility between systems
- Difficult, time-consuming and expensive infrastructure management
- Undersized system when compared to actual use
- Delay in investments

Whatever the cause for this lack of availability, the impact on users is tremendous and the outcomes for the company are even greater.

Companies usually have a hard time estimating the costs of service down-time. However, having a global understanding of your non-availability costs will enable you to build a case for investing in infrastructures providing high-availability.

b. Disaster and Disaster Recovery

If you belong to a public company, you are already subject to legal regulations regarding data management. However, even in such companies, the existing solutions may not always coincide with the requirements.

More generally, the loss or corruption of data is a real concern for any company and the consequences can be very serious. Sadly, it is often the case that companies that have experienced major crises with their IT infrastructures are the ones that really understand the importance of establishing a recovery plan.

3. 5 Steps Towards a More Functional and Efficient IT Infrastructure

For your IT infrastructure to be more efficient at critical times, that is, mainly in the context of crisis situations, our 5 recommendations are:

a. Prioritize Services

Consider the company as a whole, and prioritize the importance of the different services, starting from the ones that are crucial to generate the company's income and rank them in order of importance.

Usually, there are three different hierarchy levels:

- **Essential services:** these services are necessary for the company as a means of generating income. They are usually used by internal and external clients (for example: ERP suite, CRM, management of financial transactions...)
- **Important services:** services that support first level services (for example: email management system, management console...)
- **Non-priority services:** those services are used less frequently and by a more limited number of users (for example: Reporting tools, dashboards, BI...)

This hierarchisation enables the company to know from the start on which services to work when a major incident occurs.

b. Quantify the Service Value

This step stems logically from the previous one. Once the services have been prioritized according to their "function", the next step is to determine the costs associated with their non-availability.

There is a direct correlation between the hierarchisation of services and the costs related to their disruption.

In order to determine the real cost of services non-availability, you need to include the following elements:

- **Sales losses per hour of non-availability: this applies to all e-commerce websites, transaction websites, but also to all companies processing transactions.**
- **Penalties for non-availability:** contractual clauses can include penalties for non-availability to be paid to clients in the event of a major incident; those clauses should therefore be considered in the cost estimate.
- **Service restoration costs:** individual hourly rates, overtime hours as well as concomitant costs should be included.
- **Indirect costs:** if the resources working to restore the services are usually dedicated to other projects, the cost of delivery delays, overtime hours to make up for project delays and possibly additional temporary resources should be determined.
- **Non-productivity costs:** the cost of time during which employees won't be able to access the service, and will thus be non-productive.

c. List the Direct and Indirect Inter-services Relationships

Even in the least complex IT infrastructures, certain services are interdependent, and a failure or incident will often trigger an unexpected chain reaction.

Therefore, having a mapping of all the elements involved in your infrastructure, as well as their direct and indirect inter-relationships is essential. This analysis should include:

- Servers
- Storage
- Networking, telecommunications links, inter-sites connections
- Client/user stations
- Data centers cooling and power supply units

d. Carry out a Capacity Study

Performing a capacity study will enable you to quantify and understand your environment, its points of contention, and limits.

The analysis is performed by installing tools that monitor and capture the metrics of the different IT systems. The monitoring tool will then provide an objective report of how your IT infrastructure performs.

For the report to reflect your business reality, the capture should be performed during a relevant time period based on the company's activity. Thus, it should occur during periods of high use of the systems. We recommend a capture period of at least 2 weeks to understand the cycles in infrastructure use, and in some cases it might take several weeks.

e. Have Experts Design your Solution

When you work in a given ecosystem, it can be very difficult to take a step back and have a broader vision of the potential for improvement. On the other hand, the IT infrastructure being critical for the company – given the losses that could result from incidents -- it is highly recommended to involve external experts who can look at the systems with a fresh eye and suggest a broad range of solutions.

We are also seeing businesses transfer the responsibility of IT infrastructure availability to external experts to take this load off IT's shoulders so they can concentrate on adding more value to the business, with mobility for example. Read our ebook: 10 Reasons Your Business Needs Mobile Capabilities TODAY to learn more.

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4. IT Infrastructure Optimisation Solutions

IT infrastructure optimisation solutions fall into three categories: software-based replication solutions, hardware solutions and cloud solutions.

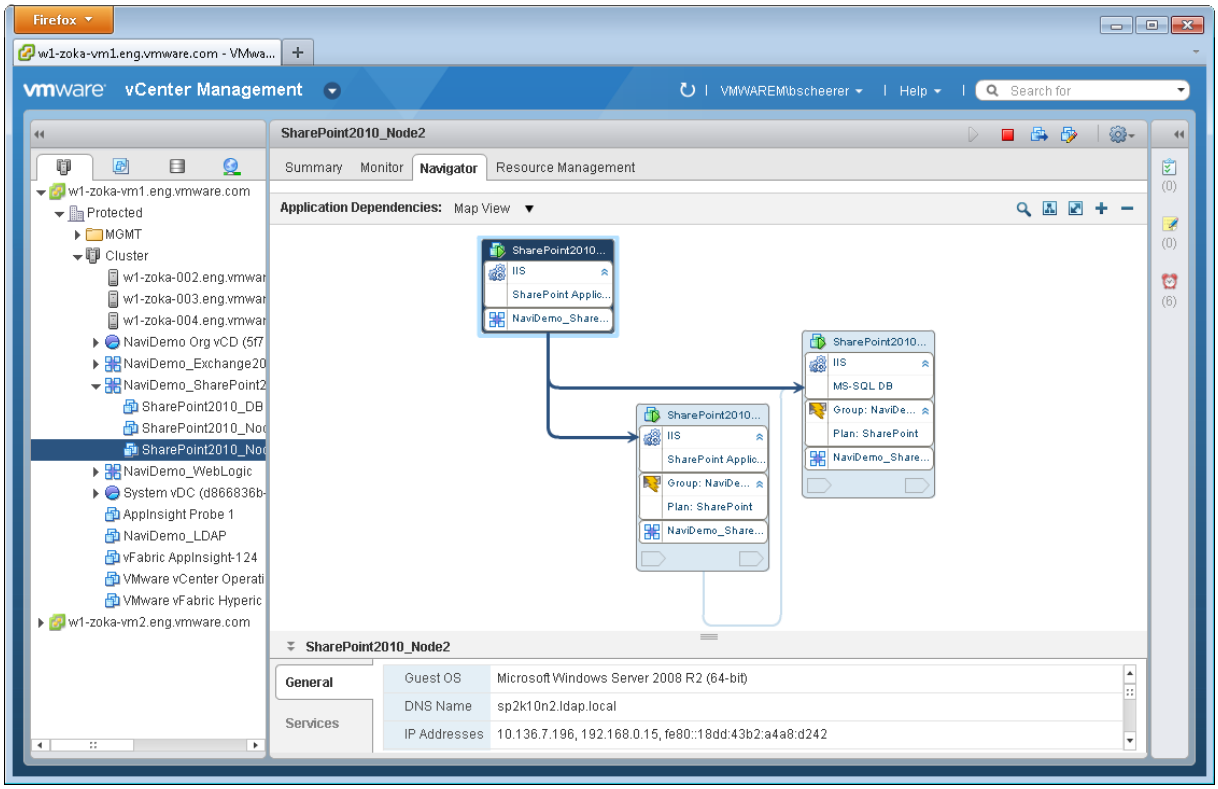
a. Hardware Replication

Hardware replication consists of having dual data storage equipment in separate locations in order to duplicate information very fast. In many cases, this type of replication can guaranty perfect sync of the production site and backup site.

These advanced backup copy tools often use snapshot features.

Naturally, replicating at the hardware level also offers the advantage of not consuming host servers' processor cycles. However, the overwhelming majority of hardware replication solutions cannot always ensure data integrity without integration with the operating system and/or applications.

There are also significant drawbacks to this approach: the advanced copy services of the storage units are expensive and they are attached to the units. Therefore, when the disk drive is replaced, the advanced copy services, the replication and all that it entails disappears.



Dashboard for a material replication infrastructure

b. Software-based Replication

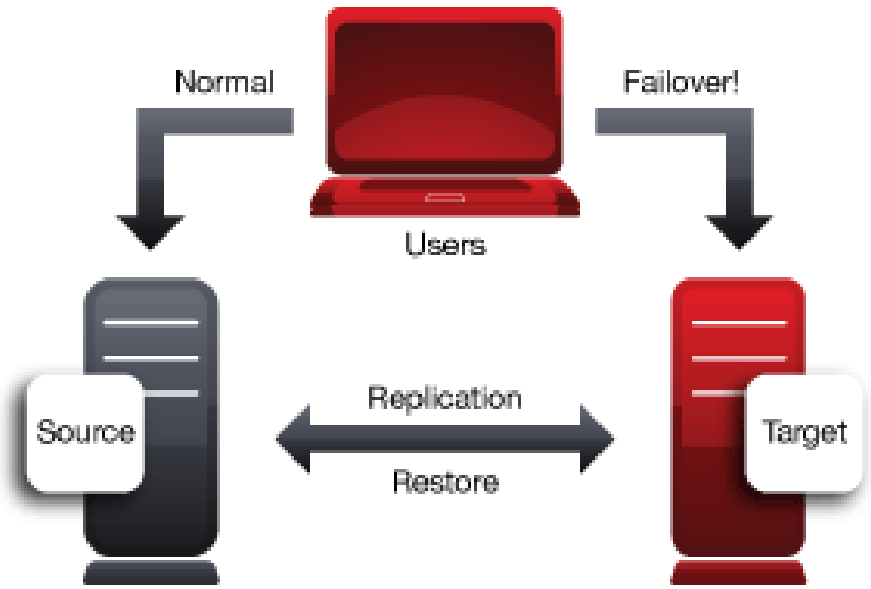
This type of replication, which directly integrates the software in the servers and operating system, allows replicating the data in a second site without having an identical storage unit.

In such cases, data integrity is guaranteed since there is direct integration with the operating system. This also offers the advantage of providing a high degree of flexibility for data transfers since the replication can be performed following various protocols.

However, there are also some downsides to this approach. The main drawback is linked to synchronicity, notably because the degree of synchronicity varies with the exchange protocol used.

It is also important to note that the replication being software-based, it will consume servers' processors cycles. This element must be taken into account when implementing this type of solution for your systems.

Two site disaster recovery



Replication Solutions Comparative Table

	Advantages	Drawbacks	Service cost
Hardware Replication	- Speed - High-bandwidth and low-latency communication between the units is required in order for the replication to be synchronous - Snapshots for analysis, backup copies and other uses	- Low level of integration with the operating system - Potential lack of data integrity - Replication features are directly embedded in the equipment - Usually uses a single protocol for replication which is less diversified than software-based replication	- Investment in equipment - Advanced copy services costs included in the equipment price (very high price) - Flat rate (not based on volume of data)
Software-based Replication	- Data integrity is ensured due to the integration with the operating system - Flexible connectivity via various protocols - Usually allows having an integrated management console with the application, including dashboards for a fast analysis of information.	- Synchronicity is less frequent and depends on the distance - Uses processors and servers cycles	- Lower investment - Services are invoiced at a granular level based on actual use

c. Cloud-based Solutions

Although cloud-based solutions to access and store information help solve a certain number of challenges linked to IT infrastructures, they should not be considered as the sole solution. Depending on a company's needs and constraints, cloud-based solutions can offer a high level of flexibility for disaster recovery plans (DR).

We strongly advise companies to manage IT infrastructures from within and not to rely solely on cloud-based solutions.

d. Factors to be Considered in Your Choice of a Solution

The most important factors to be considered in your choice of a solution are:

- **Integrity of your data:** data integrity is a critical factor for companies and it is important to choose a solution able to guarantee the integrity of your data at all times.
- **Speed and ease of recovery:** the fastest you can bring back the systems into operation, the less significant the impact on company's activities will be.
- **Ease of use and system management tools (dashboards):** speed of access to information and ease of data interpretation should be the main criteria to consider, so that the team can actually have in hand a useful tool rather than a burden.

e. Recommendations

We recommend the use of replication at the operating system, application, or hypervisor level, that is to say a software-based replication which will enable you to meet the above listed criteria.

Such solutions ensure data integrity and also allow the recovery of operations to be automated at the backup site. This layer manages the replication of data according to the required service levels, and in case of failure, major disaster or scheduled maintenance shutdown, the system will perform a complete failover of the secure servers in order to restart the services and restore user access.

All the replication processes and service levels are monitored through an integrated and easy-to-use management console.

By using proven software-based solutions from established companies with a proven track record of heavy investments, frequent improvements and excellent support, you will be able to implement a solution that evolves along with your needs. With such scalable solutions, you can prevent losing control of your IT infrastructure costs.

To control your investment, we also recommend consulting external experts such as Present. In fact, the comprehensive approach that experts have, allows them to suggest several options in order to address your specific needs based on your disaster recovery goals, your risk-tolerance and your budget.

5. Conclusion

Today, there is a wide variety of IT infrastructure solutions and the main difficulties companies face are related to the integration of high-availability systems to their existing architectures.

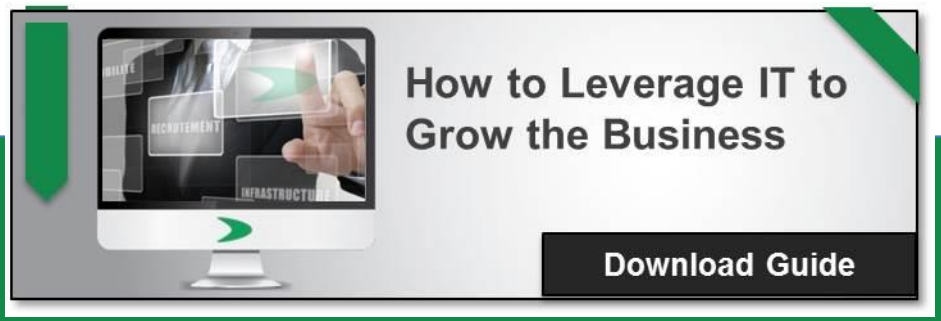
More precisely, you need to carry out a comprehensive audit of your IT infrastructure before you start looking for a solution, as there is no ready-made solution able to encompass all the specific characteristics of your environment.

Take the next step

Optimizing your IT infrastructure so it enables your growth is a challenge in itself. We created the guide « How to leverage IT to grow the business » to help you:

- Understand how IT infrastructure solutions can help solve tough business problems
- See how Present intervenes with IT executives to optimize their investment and maximize system performance

Download the guide by clicking on the image below



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