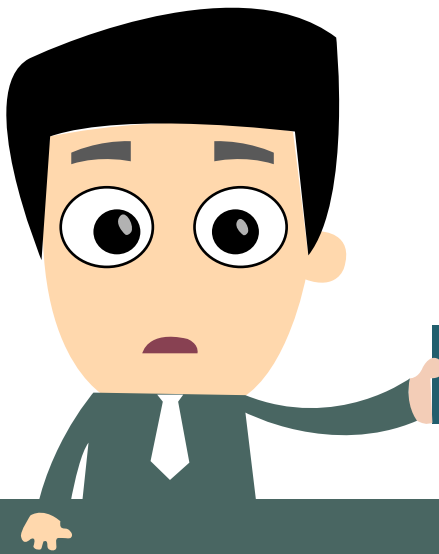# Site24x7:
Key Mistakes in Data Center Operations

Introduction

In today's connected society, the demands placed on data center professionals is at an all-time high due to the need for modern devices to always have connectivity. While investing in quality equipment is one way to avoid downtime, you can greatly improve the performance of your datacenter by working to minimize common inefficiencies within your company.

Whether you are a C-Level executive or employee directly handling the operations of the data center, the knowledge discussed in this paper is critical to making your job more manageable. Running a datacenter can be demanding at times, but by focusing on a few key tweaks to your workflow, you can ensure you can meet even the toughest demands. Mistakes are part of human nature however in a datacenter setting, the costs can be astronomical.

According to recent research, in 2013 the average partial datacenter shutdown lasted 59 minutes and cost $350,413 while a total shutdown lasted 119 minutes and cost $901,560[1]. The average per minute cost of an unplanned partial outage was $5,617 while a total outage cost $7,908.

The most common mistakes related to datacenter operations include improper training, choosing the wrong technologies and not enough awareness1. When managing a mission critical environment, any downtime is unacceptable to clients which is why knowing how to avoid trouble before it occurs is critical to your success.

By following the advice mentioned in this guide, you should be able to improve current operations with existing resources, plus you should be able to update your future data center plans to be more efficient as they are implemented.

Ponemon Institute. "2013 Cost of Datacenter Outages." December 2013. Emerson Network Power. November 15, 2014

Failing to **Properly Train Talent**

Most capacity planning and performance management skills within IT infrastructure teams are not able to meet the needs of businesses in today's rapidly evolving society. By 2016 this talent gap is estimated to be a major constraint to approximately 80 percent of major organizations2.

Humans are a primary source of errors within data centers, which is why career development programs are vital to helping to ensure you stay ahead of your competitors. Continuous training can help reduce overhead associated with system upgrades, plus it also makes it easier for staff to perform their jobs.

Aside from reducing operational costs, career development programs also can reduce turnover heling you to retain top talent in a competitive industry.

While implementing employee training programs can be a daunting task, you can implement training programs right now by following the steps below:

- **Ensure employees are aware of the unique aspects of your facilities:**

    Every datacenter has unique components and configurations. While general certifications can help staff with the general concepts of business operations, training tailored to your datacenter can greatly reduce mistakes and improve efficiency.

- **Routinely perform emergency drills for common issues:**

    The IT world is no stranger to Murphy's Law which states, "Anything that can go wrong will go wrong." You should never assume your safeguards will prevent issues from occurring. Failing to perform drills can lead to excessive amounts of downtime and decreased customer satisfaction.

- **Keep datacenter complexity in check:**

    Versatility and functionality does not have to equal complexity when it comes to your data center. Steps you can take to minimize complexity while maximizing operational efficiency within your facility include:

Gartner Says 80 Percent of Businesses Will Find Growth Constrained From a Lack of New Data Center Skills by 2016. (2014, September 24). Retrieved November 15, 2014, from http://www.gartner.com/newsroom/id/2853917

○ Using appliances to simplify backup and recovery operations: By using a dedicated device to handle backup and recovery, staff can easily troubleshoot any issues with your backup systems. Worrying about system compatibility also becomes less of an issue.

○ Understand resource utilization within your facility: By knowing who and what is using resources within your datacenter, you can ensure staff are held accountable for their actions.

○ Implement deduplication where applicable to help cope with increasing amounts of data: The rise of connected devices in today's society has been putting an unprecedented strain on data centers which is only going to get worse in the future. Without deduplication, you will be forced into constantly purchasing new hardware while battling limited capacity.

● Understand the implications of IT systems: By understanding the business functionality your systems are providing to clients, you can get a better idea of what needs to be done to address their needs.

● Build an information responsible culture: By creating a culture of responsibility within your company, staff in all departments can capture more synergies across the organization and improve operations.

# Choosing the Wrong Technologies for Datacenter
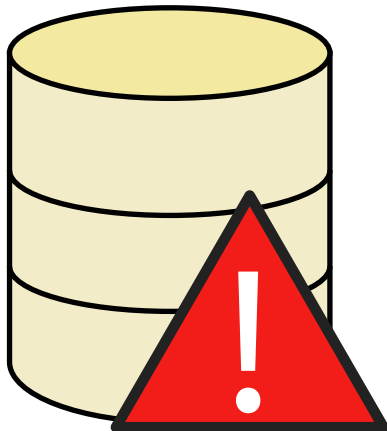
With a wide array of technologies in the IT space, choosing the right technologies for your systems can be overwhelming. In particular while it's tempting to use new technology because it's the hottest thing in the industry, before implementing any platform you need to consider whether the system actually addresses your needs.

Below are some of the most common challenges faced when choosing technologies for your datacenter and how they can be addressed:
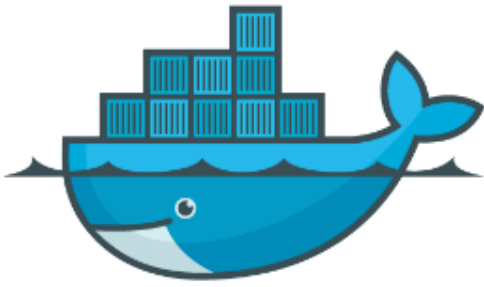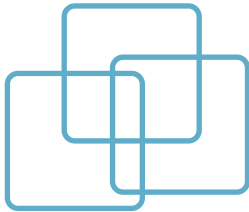
Docker vs. Traditional Virtualization

Choosing between container and virtualization is one of the biggest sources of error within the datacenter because of the similarities between the two. Although both systems are able to boost the performance of data centers, they each have strengths and weaknesses which make them ideal for different use cases. Although the exact mechanics can't be completely discussed here due to space limitations, below is a brief overview of when containers and traditional systems should be used:

- When you are looking to maximize capacity on your servers, using a container solution such as Docker is ideal because it allows containers to share core program files.

- If you are running a project where rapid recovery times are critical to the project, virtualization has an advantage because it allows administrators to switch to fallback systems on the fly to keep downtime to a minimum.

- Since Docker containers share core application files, they don't provide the same level of security as traditional virtual machines. Although the risk of a process breakout is small, it still can happen3.

Not Considering Long Term Needs

It can be tempting to choose systems and technologies based on the sticker price, however this common mistake can have devastating consequences. What initially seems like a bargain can cost you in the long run. Hidden costs such as: energy usage, hardware replacement and training costs are some of the biggest issues you can face by choosing the wrong hardware.

Some questions you should ask before purchasing hardware include:

- What equipment will the device be interacting with? You should make sure that the hardware you choose is compatible with products from other vendors used in your datacenter.

- How energy efficient is the equipment? By focusing on using equipment which runs cooler and consumes less energy you can save on utility costs in the long run.

Docker. (2014, November 15). Security - Docker Documentation. Retrieved from https://docs.docker.com/articles/security/

What operating systems will the hardware run on? Although predicting the exact hardware specifications of future operating systems is impossible, in general Linux optimized systems shouldn't run Windows and vice versa.

Does the equipment support virtualized workloads? Virtualization is one of the most cost effective ways to improve your datacenter capacity while still keeping overhead at manageable levels. With the rise of cloud computing, virtualization support is almost a must for any datacenter.

In addition to the previously mentioned aspects, capacity is another topic to consider. Although it's impossible to precisely predict future capacity needs, you can streamline your planning analysis process by implementing a data center infrastructure management (DCIM) solution for your facility. Regardless of the stage of your project, a DCIM solution can help you to maximize your profit per square foot whether you're building a new facility or are streamlining an existing structure.

Choosing Products without Considering Integration Capabilities

Vendor lock in is the worst enemy of virtually every information technology professional because in today's rapidly changing world, it is impossible for one solution to address every challenge a data center professional faces. Customers also are increasingly demanding flexible systems because on their end, they need the ability to interface remote systems with on premise solutions and vice versa.

In order to ensure that your data center is embracing open principles, you should keep the following principles in mind before purchasing equipment:

Data center infrastructure needs to be modular: By breaking down deployment tasks into manageable pieces by following lean principles, system administrators can make changes rapidly while keeping complexity in check.

Infrastructure is typically built around open APIs: With APIs, instead of limiting permissions to selected accounts, applications are able to have the permissions they need for the jobs at hand.

Use of open and public protocols: By using open standards such as OpenFlow for communications between equipment, you can ensure that your network will function efficiently regardless of the device vendor. Just make sure that the equipment you purchase supports open standards.

Not Enough Communication
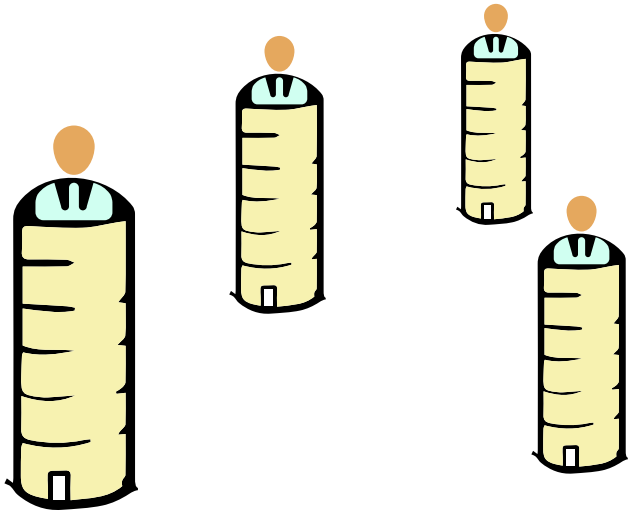
Since data centers are the backbone of most client projects, keeping customers informed of potential issues is crucial to the success of any company.

While it's impossible to provide 100% uptime to clients, you can minimize it with effective communication.

The three biggest areas pertaining to improving awareness within the data center include:

- Providing alerts to internal and external stakeholders about maintinance which can trigger an outage

- Implementing monitoring systems across the datacenter so that staff can spot trouble before it occurs. When downtime occurs, the monitoring systems also can be used to pinpoint the source(s) of the problem.

- Providing staff with easy to use software so they can rapidly act on intelligence

Aside from implementing monitoring systems within your facility, using a data center infrastructure management (DCIM) solution also can improve efficiency by providing staff with additional information to improve operations.

From capacity management to clarifying the relationship between devices on your network and allowing staff to access critical metrics form a central system, a DCIM greatly improve performance while helping to keep costs down.

General Best Practices for Datacenter Professionals
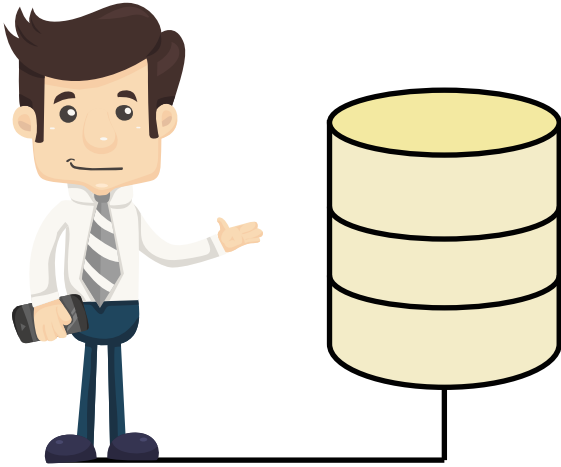
Although the previously mentioned mistakes can be intimidating, by taking proactive actions to improve your data center operations, you can minimize downtime while also improving your management abilities.

One of the best ways to avoid mistakes is to ensure staff feel free to admit when they make one, rather than having to trudge along. By accepting mistakes as they are made, they can be corrected immediately.

Once staff are comfortable with addressing mistakes as soon as they arise, documenting the steps leading up to and after the mistake is crucial to preventing issues down the road. By compiling a "lessons learned" file, staff can avoid making the same errors later on.

About Site24X7

Site24x7 offers unified cloud monitoring for DevOps and IT operations. Monitor the experience of real users accessing websites and applications from desktop and mobile devices. In-depth monitoring capabilities enable DevOps teams to monitor and troubleshoot applications, servers and network infrastructure including private and public clouds. End user experience monitoring is done from 50+ locations across the world and various wireless carriers.

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