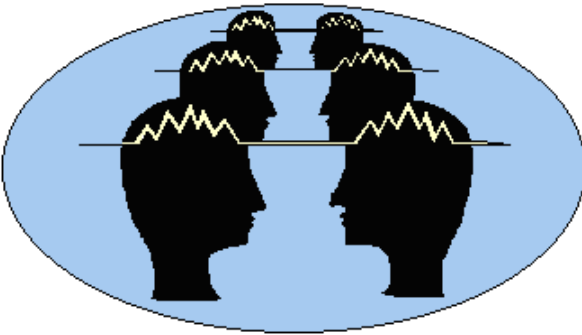


OBTAIN 24/7



Data Center Growth

Introduction

A customer once said: "You have to realize, nothing happens here until the pain reaches **critical intensity**". Pain is a great teacher and motivator, but planning and preparation are better business strategies.

The purpose of this white paper is to spotlight the common and often unexpected problems that most data centers encounter during growth. It is hoped that **insight** will lead to the adoption of appropriate tools and methodologies before the pain reaches critical intensity.

Most vendors offer steep discounts to small sites. Often, the cost of the tools is not the reason for delay. There is a hesitation to employ large site methods at smaller data centers. The effort required to re-engineer what appears to be a currently working process is viewed as unnecessary "at this time".

Being small offers the chance to cut corners and run fast and loose. In the short term, this has appeal for logical reasons: less overhead, fast results. It also offers personal advantages: individualism, self-expression, personal control. If the growth is slow, the pain level rises so slowly that it is lost in the

everyday tension... until **the event**.

"The event" arrives in several different formats: corporate acquisition or merger, purchase or launch of a new product line, loss of a key person, major equipment failure, data center consolidation, data center move, outsourcing, new connectivity technology, disaster recovery, security breach.

Regardless of its nature, the event will push a bad system past its operational limit into a painful state.

Non-linear complexity

The most common mistake made during growth is to assume that x percent of growth will require an additional x percent of resources using the same methods to manage the planning and change control. For a period of time the relationship can be linear. This leads to an expectation that the trend will continue. Every manager, like an investor with a rising stock, wants the trend to continue. But like all trends, it comes to an end for solid and often predictable reasons.

In operational research, the end of a trend is called an inflection

point. It is caused by one or more new, external factors. Here are some factors that will rain on your parade unless you compensate for their arrival either with increased resources or improved planning, change control, and documentation methods:

1. New use of or increased use of path switching technology (Ficon directors, SAN switches and zoning, network switches, etc)
2. New use of or increased use of logical partitioning.
3. Employment of a fiber infrastructure.
4. Sharing storage devices between different operating system types.
5. Offsite, real-time backup.

There are valid reasons why each factor is employed. Problems start when the funding for the new technology does not include the cost to improve the change control, planning and documentation tools that support it. Often the desire or intention to maintain adequate tools and methods is present. What is not present is a clearly defined reason for the tools or the re-engineering.

This happens for two reasons. In-house talent does not have direct experience in managing a new technology or an increased use of it.

Also, vendors of the technology have a keen interest in providing the lowest price bid for a solution and lack an incentive to investigate or even care if it will cause disruption to the buyer's change control methods.

Independent consultants are rarely better. The understanding of how a change in technology or an increase in its use will impact the hardware planning, change control or documentation process of a specific data center is not a widely available talent. A good manager wants a clear explanation as to how and why a new technology or growth will cause a non-linear change in his/her specific situation.

Key people are not static resources

A small data center relies on its key people more than a larger data center. Every manager hopes that key people will remain healthy, happy and dedicated to their current duties. Experience has proven otherwise. Health cannot be predicted; illness and accidents can suddenly throw a smooth operation into trouble. Also, your talent can be lured to another company with little warning.

Growth adds another dimension to the issue. An otherwise healthy and happy employee who has performed a vital set of tasks for several years is a prime candidate for a promotion or a change of duties. Sure, they are still available to help their replacement in an emergency. But they will have a new set of responsibilities and their enthusiasm and energy will be pulled toward that goal.

If you assume that the replacement worker will grow into the job and do just as well with time you may have a surprise coming.

Chances are the old pro has a self-tailored system that is just barely able to keep up with the current level of demand. He knows how to work his system to keep the wolves from the door and make it look easy to an outside observer. His replacement has a low probability of doing the same, especially if growth will increase the demand and complexity.

If the old pro continues to work for the same department, it is tempting to assume that he can multitask between his new responsibilities and spend part of his time each day taking care of old ones. This strategy runs into several problems. The old pro has probably been 'plugging holes in the dike' for several years. He has been looking forward to his well-deserved promotion. He is eager to tackle the new challenges and is expected to deliver on them. Sometimes people even view the struggles of their replacement as 'proof' that they are/were a key player.

Managers need to fund and monitor the implementation of a hardware planning and documentation system that standardizes the process. If all people involved in equipment/connectivity changes use the same tools and methods, they become a dynamic and collective resource that can be expanded or redirected more easily.

Documentation is rarely accurate and complete

In most data centers, documentation is the last part of the change process. Consequently, it competes with

the demands of the next change that is often immediately pressing for quick attention. The result is incomplete, inaccurate and nonstandard documentation. The cost of this documentation failure is large and insidious.

Everything from problem resolution to planning future changes is enhanced by reliable documentation. The single most important process change that a data center can implement to achieve reliable documentation is to:

Use tools and methods that create complete and consistent documentation during the planning process. The planning documents should automatically evolve into the change documents and the operational documentation.

It seems like a simple idea but there are managerial supports that are vital to implementing it. First, the process is 180 degrees different than the current process. Employees almost always want to shoehorn a new tool or method into their current system. Their current system doesn't worry about documentation in the early stages of the process. Their process leaves documentation till the end. Give them a new tool and with out monitoring and they will use it in the same way.

Every change should be subject to formal review and audit

One of the corners easily cut during a change is the review process. In a smaller data center the person charged with making the change happen usually knows more about the change and its effects than anyone else. Formal review of the change plan is considered a waste of time. This leads to a stream of sloppy, inconsistent, undocumented changes...until the unexpected

and preventable failure that bites badly.

Suddenly, people wonder how it happened. Why didn't someone think of it during the planning phase? The second mistake is to discount it as a simple human failure that can be avoided by trying harder or paying closer attention.

Increased complexity has just knocked on your door. You can avoid dealing with it for a while but it will keep knocking ever more insistently.

Formal review does not have to be an expensive, time consuming process. We all know that the more people you gather into a room, the more time is used for unrelated and inefficient activity. This activity can be minimized. Newly available tools enable the review to be performed by several different experts asynchronously. Each expert can contribute to the review when it is most efficient for them to do so and without a physical gathering.

Equipment and connectivity changes are commonly made without an audit trail at many sites. If the number of people actually making equipment or connectivity changes is small, it is assumed that it shouldn't take long to find out who did something and when. Surprisingly, even at small sites, there are times when no one can remember if change A happened before B or after it. Often, lost in the stream of changes are the reasons for each change and a clear memory of how things looked at a key point in time.

A good set of change control tools and methods with auditing capabilities should be able to quickly answer all question regarding when a change was made, by whom, for what purpose, approval person and peer review contacts.

Standardization efficiencies

Ad hoc change control and documentation leads to multiple copies of equipment, connectivity, power and financial/warranty data. Each copy is maintained in a unique style that fits the needs and preference of a single user. The inefficiency of this approach is obvious in some respects:

- Duplicate data entry,
- Inconsistent data takes time to resolve which copy is more accurate and current,
- Increased communication between team members to enact a change or get access to set of configuration data.

There are other efficiencies that are not as apparent to the 'owners' of multi-copy data. Vendors are often relied on to help in special situations such as troubleshooting, large installations, equipment moves and disaster recovery planning/execution. Managers may not have a daily requirement for equipment and connectivity data. However, budget and planning are enhanced when a complete picture of the current situation can be presented in a standard format across all equipment types and locations.

Some data centers have found that maintaining an in-house staff of experts for situations that arise infrequently is very expensive. Complete outsourcing of the data center may not be desirable for financial or security reasons. A third option, hiring specialized consultants as required for large or complex projects, requires careful management to avoid the interface overheads that drive the cost up quickly.

yields

Standardized documentation and methods with recognized tools helps to cut the interface cost between the many different workers in a data center. As bandwidth increases, tools that enable a data center to leverage the value of on-site workers with specialists who can quickly and securely apply their expertise will outperform other strategies

Conclusion

Every data center should have their change process and documentation reviewed professionally at periodic intervals. Growth can turn a once viable system into an inefficient and unreliable process. Local participants bond to a method and set of tools. Objective evaluation with an eye to future growth is essential. Newer tools and methods used at larger data centers can be cost effective at smaller sites.

Knowledge Flow Corp. and its business partners offer a thorough and formal review as a one-day service. All aspects of a site's documentation, change process and tools are analyzed. A written report with specific examples from the site is prepared and presented to management. To schedule a review at your site, please contact one of the business partners in your area.

OBTAIN 24/7 is created by:

Knowledge Flow Corp.

U.S. and Canada

Contact: Anand Purohit

800-361-7431

anand@obtain.com

Authorized OBTAIN Resellers:

IBM Corporation

U.S.

Contact: Mark Lewis

866-793-2211

MELewis@us.ibm.com

ViON Corporation

U.S.

Contact: Al Dopkins

321-951-9424

al.dopkins@vion.com

Connectivity Technologies Ltd.

U.S. Northeast

Contact: Pat Grippo

888-446-9175

pgrippo@contech1.com

Optica Technologies Inc.

U.S.

Contact: Paul Schlueter

480-776-4993

paul.schlueter@OpticaTech.com

Other U.S.

Contact: Tyler Miller

888-446-9175

tmiller@contech1.com

CSS - Computer Services & Solutions Nordic AB

Scandinavia

Contact: Bengt Leksell

[46] 8 622 64 95

bengt@cssnordic.se

Hitachi Data Systems

United Kingdom

Contact: Sam Hempton

[44] 121-717-4000

sam.hempton@hds.com