



Rat Nests and Bird Wires

How Neglected Infrastructure Management Can Cost Money

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// Executive

The performance of a business's IT infrastructure is the strategic backbone for business operations today. The operational demand for today's 'always-on' network continues to climb. That can mean the financial implications in the event of an unplanned network outage can escalate.

As businesses continue to grow, the reliance on new computer and network technologies also expands. The need for proper network documentation is at an all-time high. Addressing network availability, downtime, and maintaining asset information provides multiple concerns for business executives. There may be an underestimation of the true business cost in the event of a network outage or misplacement of equipment. Instead, there has been more focus on business applications, business analytic programs, and OPEX/CAPEX spending reductions. Delaying essential Layer 1 (OSI Model) tracking software can be a costly event for a business.

For a business that places its equipment in a manned data center or has its own telecommunications closet, tracking, organizing equipment, and managing cables that are installed and removed does not need to be a stressful, time consuming chore. Thanks to the advancements in software technology and program flexibility, the organizing and tracking of both equipment and cable assets can be easily implemented. This white paper examines the reasons why implementing cable management software and maintaining documentation has increasingly become more important. The information provided shows the network and cost bearings of unplanned outages for both the engineer and the executive. By taking a pro-active approach and making the initial investment in an infrastructure management program, the potential weakness of a business's documentation can be identified and steps to optimize performance and tracking can be carried out.

// Contents

Introduction	3
Why the need?	5
Accuracy of Information and Challenges.....	5
Opportunities and Benefits	6
Workflow.....	6
Reporting.....	6
Capacity Planning.....	7
User Interface.....	7
Summary	7
Sponsor	8
References	9

// Introduction

As networks continue to grow and develop in to being more complex logically and physically, proper documentation is becoming increasingly important. Knowing what you have, where it's located, and what it's connected to can increase productivity and reduce costs. This growth has resulted in crowded enclosures and when enclosures become crowded, there is the worry about system downtime due to various faults. Human error often influences system uptime and part of this is due to cable management and documentation. If a technician opens a door to a crowded cabinet with lots of cables and no solid documentation to reference, a wrong cable can be pulled and many others jostled around

when performing system upgrades or equipment additions or removals.

Implementing cabinet level standards to control wire routing and labeling can have a positive impact on many things such as cabinet cooling and heating because air flow is less obstructed. Organized cables, properly labeled devices and cables will make maintenance much easier for the operator or employee to perform. Having an overall clean and labeled cabinet reflects organizations professionalism and can leave a positive impression on any client, executive, or investors that visit the site rather than a negative impression of a location full of rat nests and bird wires.

Traditionally, there are a number of ways to track and manage a company's network infrastructure. Some of these methods involve simple spread-sheet programs to very expensive asset tracking programs. Each style of infrastructure management has its own pros and cons.

Visual Organization

- Programs such as Visio and CAD
 - Pros: Can be cheap to implement and low overhead
 - Cons: Limited functionality and reporting features

Infrastructure Management Software

- Pros: Program can be tailored to individual company use
 - Many types of reporting features
- Cons: May have a high initial startup cost and maintenance depending on contract

Spreadsheets or In-House programs

- Spreadsheet programs like Excel or In-House developed programs
- Pros: Cheap to maintain off-the-shelf spreadsheet programs
 - Program development flexibility with In-House design
- Cons: Spreadsheet programs are static in design and has limited functionality
 - Maintaining In-House staff is expensive

The common tracking method is either typically by Excel spreadsheet, a static program that isn't very intuitive or was developed as a "one size fits all", or by an individual's memory resulting in "Tribal Knowledge". To prolong the life of a data or voice network, documenting network components and cable diagrams is vital. By implementing a Cable Management System (CMS), managing network adds, removals, and changes can reduce network downtime. Having quick access to well documented network information is a must in today's business culture.

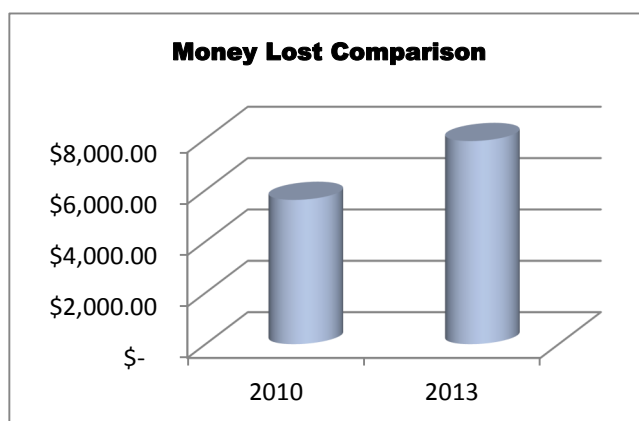
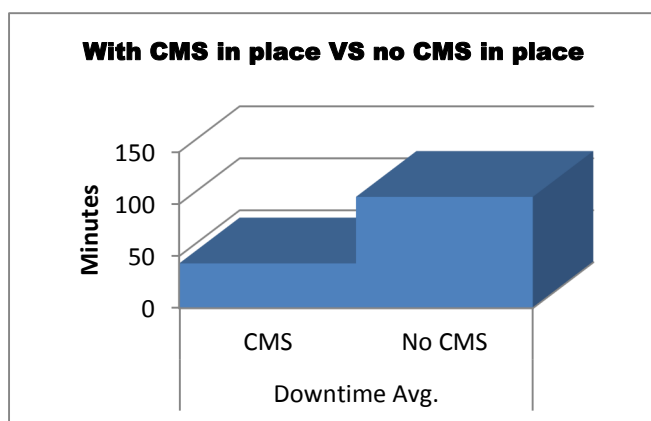
A properly implemented CMS system can answer many questions about a company's network build such as the following:

- ◆ *Do I have sufficient space and power?*
- ◆ *Do I have enough copper or fiber ports available?*
- ◆ *Where are my assets located?*
- ◆ *Where is the best place to install a new server, switch, or router?*
- ◆ *If I am using a certain nomenclature scheme for the cables, do I have any numbers or letters left?*
- ◆ *How much capacity is remaining in my data center or select racks?*
- ◆ *Where is that server, router, or switch located?*
- ◆ *How many equipment platforms of a particular model are deployed?*
- ◆ *What was that site ID and address where that device is located?*

Without a system in place, these questions become harder to answer. When evaluating a product, it is very important to create a detailed list of requirements. The requirements should have the information needed to manage the network.

// Why the need?

In 2013, Emerson Network Power performed a joint study with the Ponemon Institute to find the cost of data center outages and what the root and common causes were. ⁽¹⁾ The data used was collected between the years 2010 to 2013 from 450 data center professionals. The report numbers show there is a loss of \$7,908 per minute compared to \$5,617 in 2010. In the report, those that have some sort of CMS management program in place had an average of 43 minutes of downtime compared to 107 minutes for those that did not have a CMS program in place.

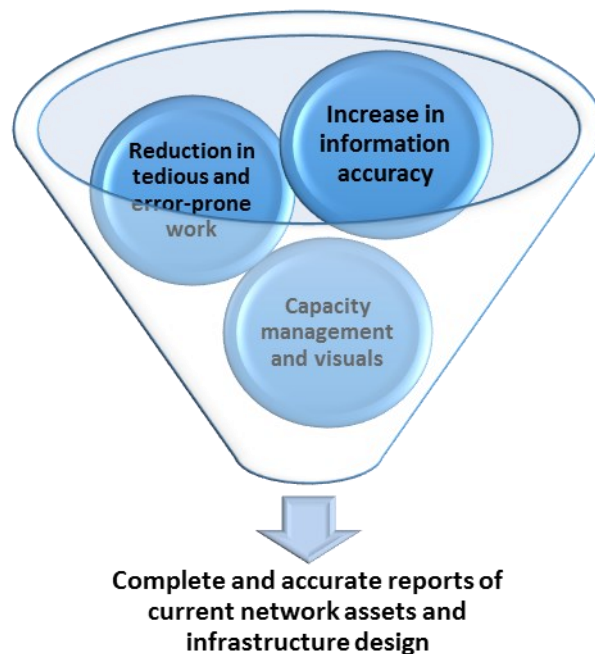


/ Accuracy of Information and Challenges /

There are plenty of challenges today with shrinking IT budgets: A greater demand on asset control, reduction in resources resulting in increased pressure and expectations from management, to compile asset reports for financial reasons and to remain in compliance with certain laws. With laws such as HIPA and Sarbanes-Oxley, audit reports can be requested several times a year for a company to remain compliant with the laws. The cost of an audit can vary on the size of the network and in some cases, the cost of a manual audit could exceed initial deployment costs of a management system.

According to the resource The Visible Ops Handbook: Implementing ITIL in 4 Practical and Auditable Steps, ⁽²⁾ major IT organizations can identify by just looking at a resource and change management schedule of a particular device and identify a problem that occurred if an issue arises 80% of the time. When an issue is detected, it can be remedied in one try 90% of the time. Tracking change management with an infrastructure program is a key item to have when troubleshooting network events. The authors of the book write how managers can become alarmed by the amount of “unscheduled changes” and how many network changes occur out of process when conducting a physical audit against both on-site audits and comparing to the management program.

// Opportunities and Benefits



Manually tracking network infrastructure changes by either spreadsheet or pen and paper is a time consuming action and can be prone to a high amount of errors. By implementing an asset and infrastructure management program, greater results can be achieved in the control of inventory, change management, and increased efficiency in workflow.

/ Workflow /

Many businesses have deployed some level of workflow process when it comes to the installation, removal, and change process for a network. For example, the installation or removal of a switch will have several steps which may depend upon several groups to complete the work.

By implementing a CMS system, the program can track the workflow process from the time the switch was identified for removal, install, or a cable change, and track its progress from person-to-person, group-to-group, from start to finish. The workflow function could coordinate the installation steps and compile the needed information so it can then be handed off to the install technicians, therefore streamlining the workflow process.

If the workflow functionality in the CMS program is used, this should be carefully examined

during the interview and trial of the program to see how well it fits into the organization and its process.

/ Reporting /

Reports and the analytics that come with it are an important capability to consider. Depending on the size of the organization, there could be a couple hundred or thousands of devices and cables that will need some type of data analyst performed. The amount of data that could be generated may be overwhelming, so the CMS should be capable of processing it efficiently and in a timely manner. The CMS program should be able to display the data in historical graphs, raw data that can be exported into Excel or another spreadsheet program for analysis, show data in a Dashboard style format, and be available to create custom reports so the program user can create and generate their own reports.

/ Capacity Planning /

To make sure space and power is being utilized to the best of its capacity, the CMS reporting features should have some sort of capacity planning feature and report generation. Rack space reports on cabinet capacity and where the most space is available at should be available and how much power is available at a given rack. The CMS tool should be able to provide percentages of what is available at a location so the engineers planning equipment install or removals know how much space and power there is. Organizations use this data to plan for capacity augments, asset cleanup, and power capacity planning. Not only does this reported information help the engineers planning the work, it can help assist in executive level cost planning.

/ User Interface /

The user interface should be intuitive and be able to effectively display the information the user searches for. The users should be able to quickly look up information and also search for it. The program should be easy to navigate and supply a level of user generated views and have the ability to create templates and reports.

Part of the user experience should allow the ability to navigate to individual racks, to the equipment in that rack, down to the network ports of that device and see where that network port connects to. The user should be able to have the ability to label all aspects of that circuit from the port name, the cable name, any asset and identification numbers associated with it, and be able to upload and maintain a database of equipment templates. Configuration to suit the user should be important. Be sure to have a trial of the product to test the interface and its capabilities before settling on a system.

// Summary

No single infrastructure management program is capable of capturing 100% accuracy of network assets and connections. Multiple technologies and solid processes need to be implemented and integrated in to the current business practices to achieve as close to 100% as possible. By implementing a comprehensive management program that can track the space, power, and cooling at the rack level, the following can be provided:

- ◆ Monitor rack environmental conditions
- ◆ Track authorized and unauthorized changes
- ◆ Maintain a high level of data accuracy
- ◆ Quickly collect asset information
- ◆ Review the current status of the network build
- ◆ Inexpensive way to accurately collect IT asset information

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INFRASTRUCTURE MANAGEMENT SOFTWARE

Written by: Daniel Jones

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/Product Video: <http://www.youtube.com/watch?v=g8cYV6Wqqqc>

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// References

- (1) Ponemon, Larry, Dr., Ph.D. (2013) *The Lowdown on Data Center Downtime: Frequency, Root Causes and Costs*. Retrieved from: http://www.emersonnetworkpower.com/en-US/Solutions/ByApplication/DataCenterNetworking/Data-Center-Insights/Pages/Causes_of_Downtime_Study.aspx
- (2) Kim, Gene. Spafford, George. & Behr, Kevin. (2005) *The Visible Ops Handbook: Implementing ITIL in 4 Practical and Auditable Steps*. IT Process Institute
- (3) Patch Manager Asset and Cable Management System: <http://patchmanager.com/en/about-us/>
- (4) Watson, Tomas. & Fulton, John. (2012, October) *Striving to Achieve 100% Data Accuracy: The Challenge for Next Generation Asset Management*. Retrieved from: http://www.amitracks.com/wp-content/uploads/2012/05/AMI_100DataAccuracy.pdf
- (5) Emerson Network Power. (2010) *Addressing the Leading Root Causes of Downtime: Technology Investments and Best Practices for Assuring Data Center Availability*. Retrieved from: http://www.emersonnetworkpower.com/documentation/en-us/brands/liebert/documents/white%20papers/data-center-best-practice_24656-r10-10.pdf

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