



Universal Imaging Utility
The power of one.

Building a Solid IT Foundation in any Economy

Windows PC Imaging - The ONE Fundamental of Systems Management

» White Paper Series «



Table of Contents

Table of Contents

Executive Summary	3
Introduction	
IT Affected by Current Economic Climate	3
Economic Inspired Analysis	4
Windows PC Imaging and Product Lifecycle Management	
History and Schematic breakdown of PLM	4-5
Acquisition and Procurement	
Product Lifecycle Management Steps 1-5	5
Operating Systems Configuration and Deployment	6
Operations and Maintenance	
Product Lifecycle Management Steps 6-8	6
User Downtime and Business Continuity	7
End-of-Lifecycle Management	
Product Lifecycle Management Step 9	7
Summary	
Foundation Issues at Each Point in Product Lifecycle Management	8
The Solution	8-9
The Universal Imaging Utility	9



EXECUTIVE SUMMARY

“Do more with less” is the mantra being touted across the IT realm. Labor and costs are being cut and spending on new hardware and software is being frozen. Department managers and CIOs are forced to justify the cost of operation and ROI for a department that is typically a cost center. This economic cutback is not limited to one sector. Government, Education, Healthcare, Finance and Corporate; all are restructuring or implementing cost saving measures. It isn’t just the small public school or the mid-size private corporation, or even the Healthcare conglomerate that are taking steps to analyze every step of their IT foundations to determine areas of improvement, but all the way to the top of the government. In October 2008, Clay Johnson III, Deputy Director of Management and Budget for the President of the United States, put Agency CIOs and Department Heads across the country to task requiring them to review the current status of their IT systems development lifecycle management, projects and policy, and return a framework with their proposed methods of compliance.¹

A closer look at the fundamentals of IT infrastructure is being carried out across the globe, but are there still cracks in the foundation? If the inspection isn’t comprehensive, problems with cost management and efficiency will persist and prohibit growth. Everything breaks down to the fundamentals; not only is the foundation itself critical, but the means by which the foundation is laid, maintained and supported are equally as significant.

What is the foundation of any Windows-based environment? The maintenance and deployment of a quality Windows PC image. Even though the means of creating an efficient system of Windows Image maintenance and deployment can be difficult, there is a solution.

Introduction

You don’t need to be told that the current economic climate has caused IT departments to struggle with decreased budgets and adjustments to their existing environments. And you don’t need to be told that attention previously given to growth, development, and new technology is, out of necessity, being reverted to the core systems essential for day to day operation to maximize cost-effectiveness. Interestingly enough though, for every article or blog addressing IT departmental efficiency, cost-savings/cutting approaches or capital purchasing strategies, countless more are still touting the latest and greatest in new technology. Whether Cloud Computing, Virtualization, Enterprise Solutions or the latest mobile applications, the majority of tech news, blogs and forums distract IT departments from focusing on streamlining the efficiency of their existing environments. Regardless of the media focus, the current economic situation is forcing companies to take a step back to analyze the foundation and fundamentals of their existing technology and systems management. Infrastructure analysis is not essential merely for the sake of quantifying cost-cutting, rather, it is crucial for qualifying the cost effectiveness and ROI of your

¹ “Information Technology Management Structure and Governance Framework”, *Memorandum for the Heads of Executive Departments and Agencies*, Executive Office of the President of the United States - Office of Management and Budget, 10/21/08



INTRODUCTION (cont'd)

departmental initiatives. Successfully managing your environment with a reduced budget is only possible if proper organization and restructuring of your systems management is efficient and effective. If your environment isn't operating as effectively as possible, how is it going to weather the current economic storm, let alone be able to support such elaborate and complex systems/programs as cloud computing and virtualization in the future? It is a back to the basics approach that will be the marker of the successful IT department in the future. It is the fundamentals and a solid foundation in that will allow growth in challenging economic times.

Windows PC Imaging and Product Lifecycle Management

The fundamentals of a solid IT department are most often represented by what is referred to as Product Lifecycle Management (PLM). Although discussed heavily in academic circles since the early 1960's², this qualification methodology was originally constructed and applied by Dassault Systèmes in the early 1980's for the American Motors Corporation as a manufacturing development process.³ Because a large part of the original focus involved computer-aided design software and the systems involved, PLM quite naturally became synonymous with computers and IT departments. The schematic for this lifecycle is commonly laid out chronologically in nine individual steps:



1. Capital purchase
2. Base OS Configuration (Enterprise Standards w/ or w/out GPOL)
3. OS deployment Methodology (Imaging and GPOL)
4. Application deployment methodology (Local or Policy based)
5. Hardware deployment Strategy (Physical)
6. Tiered Support Infrastructure (Call centers and technician responses)
7. Software correction methodology (Software fixes and upgrades including OS)
8. Hardware correction methodology (Hardware repair or replacement)
9. End-of lifecycle strategy (Reallocate hardware-continue scheduled capital cycle purchasing)

2 Levitt, T. (1965) "Exploit the product life cycle". *Harvard Business Review*, vol 43, November-December 1965, pp 81-94

3 Hill Jr., Sidney (2003) *How To Be A Trendsetter: Dassault and IBM PLM Customers Swap Tales From The PLM Front*. Retrieved December 12, 2008, from <http://www.coe.org/coldfusion/newsnet/may03/technology.cfm>



Windows PC Imaging and Product Lifecycle Management (cont'd)

The above illustration of the product lifecycle is analogous in the majority of IT departments as a guide to help determine necessary systems management and cost analysis of the equipment within their environment. Even when the majority, if not all, of these criteria are part of existing management structure, the fundamentals of each must be addressed to maximize efficiency. Each step is basic and, in itself, not only self-explanatory, but well established in the understanding of basic IT management requirements. However, the natural extension, processes and procedures of each step constitute an extrapolation of fundamentals that often cause larger issues within the lifecycle.

The nine individual steps are often consolidated into three larger segments; Acquisition and Procurement represents steps one through five, Operations and Maintenance is made up of steps six through eight, and the final segment, step nine, is End-of-Life Management.

1. Acquisition and Procurement (PLM Steps 1-5)

The inherent difficulty with the first portion of the lifecycle is that it requires careful planning and budgeting every time the cycle flips over (depreciation in 3-5 years is common for desktops and 2-3 years for laptops). To plan for product turnover and acquisition of new hardware, budget projections must be made well in advance. This often presents problems with budgetary fluidity since a fixed amount of dollars are already tied up in future purchases. Gartner research estimates that up to 75% of most IT budgets are static. Barbara Gomolski, managing vice-president at Gartner stated, "...Organizations need to be more responsive to changing market conditions. The traditional acquisition model of buying hardware and software, and depreciating it over time, does not allow organizations to quickly shift its IT investments, or cut costs rapidly."⁴ Reallocation of the budgeted funds for new contracts and hardware is difficult unless a large enough portion of the budget is variable. Often, budgets change after the initial purchase and existing operating systems and corporate policies dictate the incoming hardware. Regardless of specific budgetary issues, traditionally, the more uniform the hardware, the easier and more efficient the support process. One hardware manufacturer with similar components will naturally reduce a certain amount of support issues and provide greater ease of hardware support.

However, if the cyclical purchase of hardware was not dependent on equanimity of platform, you would be free to obtain multiple quotes from a variety of manufacturers securing the best price. Also, if hardware manufacturer selection was no longer a factor for support and maintenance considerations, you would be free to purchase the hardware most appropriate for your environment at any given point in the cycle turnover.

⁴ Gartner Research (October 14, 2008). "Gartner says Changing the Cost Structure of IT will Become a Business Imperative for Most CIOs". Press Release. Retrieved on 4 December 2008.



1. Acquisition and Procurement (PLM Steps 1-5) (cont'd)

Operating System Configuration and Deployment

Once the hardware procurement and OS licensing is completed, configuration of each machine for your environment presents imaging difficulties. The difficulties and labor costs associated with OS configuration set up and deployment are numerous (joining domain, naming conventions, Sysprep configuration, license keys, etc.) and often not considered on the same level of cost as the physical hardware or software costs. The portion of PLM budget required is not as easily quantifiable as in the Capital Purchase portion of the cycle. Instead, its cost measurements are not only in labor hours expended on the setup and deployment of new systems, but in the time and energy no longer available for development, innovation and other support issues.

For example, an installment of 100 machines is purchased for a newly created department within your organization, 20 of them laptops. The PC Image must be updated to meet with existing Enterprise standards and Group Policies. However, even if the new machines are from the same manufacturer, more than likely they will contain newer technology. Image deployment invariably requires a substantial amount of time and effort to manage the numerous different device drivers for both old and new systems. Typically a PC will need to be maintained for each type of hardware platform; Laptops seldom play well with desktops. Also, a unique PC Image is required to address the disparity in hardware and manufacturer for each OEM, and within each OEM, model, to compensate for the multitude of hardware differences. Even with capable cloning applications such as Symantec Ghost™, Altiris® or Acronis®, the difference in hardware devices, drivers, and plug and play IDs continues to require substantial amounts of time for imaging and hinders those IT departments from being proactive in their environments.

What if your IT department had hundreds of hours of time each year, normally relegated to image maintenance, now available for creating innovative new protocols and developing more efficient systems?

2. Operations and Maintenance (PLM Steps 6-8)

Operations and Maintenance is easily the most high-profile segment of PLM. Every day IT must support the entire end-user population within the organization while being evaluated for performance and justifying their costs as a department. Support calls and logs, system crashes, hardware and software maintenance and updates, security issues, user resets and disaster recovery all fall under this section. Granted many of the issues are user-based, but the support and maintenance structure in place needs to address the user issues just as efficiently as the operational issues. The primary foundational concern is maintenance of security and updates. Ideally most end-user security updates are automatic and sent down from a server. However, security updates should also be current on any PC image. Unfortunately, with the majority of support demands dominated by support calls, new equipment rollouts and any other manner of day-to-day requirements, minimal time is allotted to update existing PC images.



2. Operations and Maintenance (PLM Steps 6-8) (cont'd)

The problem again arises with the maintenance of the high quantity of PC images due to different types of hardware in each environment. With each new Service Pack, anti-virus, or "Patch Tuesday" update from Microsoft, countless items are necessary for best practices and policy compliance.

User Downtime and Business Continuity

When hardware becomes inoperable it must be replaced. Installing new hard drives requires considerable time and effort as each new hard drive must be given the appropriate PC image. Depending on the other hardware present in the machine, updated drivers will need to be obtained for each unique component. Downtime for each workstation can be considerable, which adds to the cost of IT support and decreases productivity.

As an illustration of several examples of user downtime, consider the situation in which the CIO's PC becomes inoperable on the day of a merger. On a slightly larger scale, a sprinkler gets set off on the accounting floor ruining 35 workstations completely shutting down the department. And on a grand scale, an entire building is wiped out due to a flood.

Certain areas of the country are plagued by various natural disasters with enough frequency that disaster recovery programs are built in to their systems management. Hurricanes in Louisiana and Texas, and fires in California are responsible for millions of dollars in damages. But disaster is not limited to the natural; the east-coast power outage in 2003⁵ and September 11th, 2001 impacted the operations of countless businesses and government agencies. What happens if your entire environment is wiped out and you have to replace everything? How much money is lost for the days or weeks those workstations remain inoperable? Few have the financial resources to have a hot site prepared and ready to function. Fewer still have arrangements with data centers or co-location sites to transfer operations for a short period of time. Most must rely on relationships with business partners or are forced to replace their equipment. Regardless of the scenario, the survival of a business and its ability to produce revenue depends entirely on how quickly the new equipment is set up according to business needs. The simplest fundamental in this scenario is being able to get each workstation installed with the compliant operating system as quickly as possible. If PC images of the new equipment do not exist, they must be created, updated and deployed to each individual machine. If those images were hastily created, the potential for error and inconsistencies rises sharply increasing future PLM costs. However, if a proper Master Image (the image created with all OEM, driver and security updates with the ability contain all necessary drivers and handle hardware differences) has been created and maintained, then regardless of laptop or desktop, or manufacturer, downtime would be significantly reduced.

Proper Master Image maintenance presents solutions to the illustration above. The CIO can quickly use an available laptop that has been re-imaged. The accounting department can set up newly imaged machines on an alternate floor while their offices dry out. And, in a remote location, new machines containing all necessary re-imaged functionality can be quickly set up so that business may be resumed as soon as possible after a flood.

⁵ "Interim Report on the August 14, 2003 Blackout". New York Independent System Operator, 1/8/2003



3. End-of-life management (PLM Step 9)

End-of-Life management involves more than just disposing of old hardware. This phase also entails selling or reallocating equipment, re-imaging PCs and providing follow-on support for a different employee.⁶ If an existing PC is going to be reallocated, it must be completely scrubbed and re-imaged as it re-enters the beginning of another cycle. At this stage, End-of-Life management mirrors Acquisition and Procurement in many ways. The outgoing hardware will often differ significantly. If not a physical OEM difference, then a component difference, all requiring a different PC image. All the disparities in hardware (Plug and Play IDs) require different drivers, invariably re-creating the same situation for IT that had been present at the Acquisition and Procurement phase.

Summary

There is a clear and concurrent theme when assessing the foundation of each phase of Product Lifecycle Management; the quality, maintenance, and deployment of PC images. During the first phase of Acquisition and Procurement, PC imaging difficulties can make purchasing new hardware frustrating, often creating a dependence on one manufacturer and concerns about the difficulty of future purchase and maintenance. Most importantly, setup and deployment of PC images causes countless hours of IT labor to address individual hardware and platform needs.

Operations and Maintenance presents support call and software/hardware upgrade issues often requiring re-imaging. Disaster Recovery is also a consideration within this phase. The requirement of new PC images, and how quickly and effectively they are deployed, determines how quickly an environment can be set up to allow expedited continuity of business.

Finally, End-of-Life management requires that old machines be sanitized or re-imaged for reallocation which mirrors Acquisition and Procurement in many ways. If PC Imaging was not properly done in the beginning of the PLM, the same problems will need to be addressed at the conclusion of the lifecycle.

Now, there are many steps of each particular section of Product Lifecycle Management that have not been addressed, and there are many extraneous facets of each section required for the successful implementation and execution within an environment. But the basis of each fundamental step, and the foundation of any successful environment, is the quality, maintenance and deployment of a PC Image.

The function of a Windows PC image defines its importance-Operating System. If the foundation of the system on which you operate is not maximally efficient, then every individual step along your environment's Product Lifecycle will suffer. It may even, as illustrated previously, lead your IT department to expend countless hours fixing the same problem at multiple points along the way instead of addressing more proactive business initiatives.

⁶ "Total Cost of Ownership". Federal Electronics Challenge, U.S. Office of Federal Environmental Executive, 9/26/07



Summary

Solution

There exists a solution to the problems previously listed; the maintenance of one Master Universal Image is the function of the Universal Imaging Utility (UIU). The UIU makes the foundation of your environment rock-solid, allowing you to save countless hours of IT support in the most important aspects of PLM. You may now secure multiple quotes to purchase hardware from the manufacturer that most appropriately suits your current needs and budget. Purchasing machines from one manufacturer for the sake of imaging issues need no longer be a consideration. Upgrading hardware and software is a simple process with the UIU. All the individual business-class drivers are handled by the UIU allowing you to upgrade your workstations at any time. The same holds true for security and compliance. Maintaining only one Universal Image allows you to have the most effective image ready to go whenever necessary, complete with all service packs, security, Anti-virus and business application updates from Microsoft. Enterprise and Corporate Policy, as well as industry or government (FDCC, ISO, HIPAA, etc.) compliance are easy to stay on top of with only one Universal Image. Even Disaster Recovery is expedited with the UIU. You are able to have a fully functioning, Universal Image that can be easily deployed to your new or temporary environment, allowing you to maintain business continuity and reduce downtime. And finally, managing End-of-Lifecycle offers the same ease of reallocation as the initial Acquisition and Procurement.



Universal Imaging Utility The power of one.

The Universal Imaging Utility is the only software that allows you to create one hardware-independent Universal hard drive Image that can be easily deployed to any desktop or laptop machine in your environment. Used in conjunction with your existing cloning software (Symantec Ghost™, Altiris®, Acronis®), the UIU also automatically helps build the Microsoft® Sysprep answer file for you, and launches Sysprep to keep you compliant with Microsoft® disk imaging requirements. The UIU detects and installs the appropriate HAL after image deployment eliminating the problems associated with the differences between ACPI, UniProcessor and MultiProcessor PCs. New to version 4.6 of the UIU is an advanced Discovery Tool allowing you to fully assess the individual components of your environment prior to image creation and deployment. In addition, the UIU contains a driver and plug and play ID catalogue of over 32,000 different components allowing automatic deployment regardless of machine or hardware type. With a newly designed user interface, the UIU is even easier to use than ever.

The UIU is designed for one reason, to help IT departments around the world create solid, efficient foundations on which their companies can operate.

The proverbial phrase, "Time is Money" has never been more poignant than in the current economic climate. The Universal Imaging Utility is the only product of its kind to allow you to create, maintain and deploy one hardware-independent Universal Image to any machine across your entire environment. The UIU will save you time-the UIU will save you money, creating a fundamentally founded and efficient environment.