

# Understanding inventory, configuration and IT asset management



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## Introduction

It's common knowledge that enterprise IT organizations face a deluge of efficiency, cost constraint and compliance issues every day. Sometimes it seems like dealing with these issues takes precedence over what IT is responsible for in the first place—delivering business services that directly support and empower the variety of automated processes that drive the core business.

If delivering business services is the core responsibility of an IT organization, doing so requires having the right building blocks in place—specifically, the IT assets that comprise those business services. Laptops, servers, routers, hubs, databases, applications... there are dozens of classes, hundreds of types and a seemingly endless variety of building blocks that comprise the corporate infrastructure. All are connected, all are related and all are responsible for supporting the people, processes and transactions that power a company's business.

So it seems like common sense that these IT assets should be managed, from the day they are requested and procured, to when they are deployed, throughout their entire lifecycle right through to retirement and disposal. And yet, more than 80 percent of corporate enterprises still do not have a centralized and automated way to manage the physical, operational and financial status of their IT assets, much less the relationships that those assets have to one another.

That's where inventory management, configuration management and IT asset management come into play. Together, these three IT disciplines form the cornerstone to a well-managed enterprise infrastructure. Together, they empower business service delivery and support.

This white paper explores the distinctions among inventory, configuration and IT asset management, what you should know about them, what processes define each of these disciplines, and how they each contribute to improved IT efficiencies, cost containment and mitigation of compliance risk.

## Defining inventory, configuration and IT asset management

First, a note on nomenclature. Although some analyst definitions might vary, the core processes described here are consistent with industry best practices. Let's look at how each of these disciplines is defined:

**Inventory management** is about capturing the basics—what assets are on hand, where they reside and who owns them. It's about maintaining an accurate, up-to-date view of owned hardware and software assets, so that at any time you can see an "actual state" of the components that comprise your infrastructure.

**Configuration management** adds a relationship dynamic, such that you can associate each item with other items in the inventory. In configuration management, classes and components, upstream and downstream, and parent/child relationships establish relationships between each CI (configuration item). Furthermore, it involves processes around planning and identifying CI structures, having a controlled environment for changing CIs and being able to report on the status of CIs.

**IT asset management (ITAM)** is a much broader discipline, adds several dimensions of management and involves a much broader base of stakeholders. First, it introduces the financial aspects of assets, including cost, value and contractual status. In a broader sense, ITAM also refers to

the full lifecycle management of IT assets, from point of acquisition or procurement through disposition, which together account for a comprehensive “expected state.” Taken together, ITAM is designed to manage the physical, contractual and financial aspects of those assets.

Inventory, configuration and IT asset management build upon one another. It’s best advised to undertake inventory management before undertaking configuration management or ITAM, although some processes in configuration management and ITAM can be implemented simultaneously, depending on the process and organizational maturity of your organization. But this is not to say that you shouldn’t consider all three when specifying requirements—on the contrary. Embarking on inventory, configuration and IT asset management requires planning and forethought. All three should undergo careful requirements planning to minimize overlap in functionality or data collection requirements as your processes broaden and mature.

Undertaken in an evolutionary approach, building a centralized inventory repository with configuration information forms the basis for a CMDB (configuration management database). A CMDB is a logical entity with key integration points, and it supports and enables processes in service delivery, service support, IT asset management and other IT disciplines. The CMDB should hold the relationship among all system components, including incidents, problems, known errors, changes and releases.

The CMDB also contains information about incidents, known errors and problems, and corporate data about employees, suppliers, locations and business units.<sup>1</sup>

The CMDB enables powerful insight into the current and ever-changing profile of the infrastructure. Tightly integrated with service management processes as advocated by ITIL (the IT Infrastructure Library), inventory, configuration and IT asset management can be powerful and highly leverageable activities that help IT organizations reduce costs, improve service and mitigate risk.

## Primary success enablers

There are three primary enablers to success for implementing one or all of these disciplines:

**A single, centralized and relational repository:** If having a simple inventory list were your only objective, then a relatively simple database might suffice as a centralized repository. But, implicit in configuration and IT asset management are the relational attributes of assets to components, contracts, operational status, financial impact and upstream/downstream relationships. Because the data from all three build upon one another, starting with a repository that’s capable of managing complex relationships will save time and money in the long run.

**Organizational alignment and defined processes:** These three disciplines touch many organizations. Within IT, the applications delivery group, infrastructure, desktop support and network operations are just a few of the groups that will rely on inventory and configuration information. IT asset management extends tangible benefits to people in contracts, procurement and finance, thus alignment with cross-organizational people and processes makes sense. It behooves you to align requirements and understand all processes that will influence the initiatives, helping you to benefit from a coordinated implementation of tools, technologies and interdepartmental processes.

**Scalable technologies and infrastructure:** Significant leverage is gained from deploying inventory, configuration and ITAM on an enterprise-wide basis. Cost, benefits, service impact and risk

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<sup>1</sup> CCTA, Best Practices for Service Support, © 2000

mitigation benefits are highly leverageable. Therefore, planning and executing with enterprise-class scalable tools and technologies are the right things to do.

The value of inventory, configuration and IT asset management extends throughout the IT organization and by extension the customers that IT supports. Well conceived planning and implementation will improve quality of IT services to the business community, reduce costs of those services and mitigate financial, operational and risks associated with IT systems and the business processes they support. Structuring your goals, processes and tasks, and using a CMDB strategy as a fundamental success requirement, will pay dividends throughout your implementation.

## Inventory management

### Building the right foundation with an accurate inventory count

The goal of inventory management is to have a complete, up-to-date and accurate view of all network components, including PCs, servers, printers, hubs, routers, switches and software—everything that comprises the IT infrastructure. At a minimum, inventory management should tell you the device class and what's installed on the device. Thus, for any give time frame, inventory management provides the “actual” state of all infrastructure components. This means that you know what you have and where it's located—across the entire enterprise.

Implementing automated inventory management is foundational—and critical—to configuration management, IT asset management and all service management disciplines. By delivering a clear view into network assets, it delivers a host of direct (as well as indirect) benefits.

### Saving time while instilling process control

The most apparent benefit is the time and effort saved from doing physical inventories. In addition to recovering this time in the IT organization, automated inventory practices reduce the interruption to business users, otherwise caused by physical inventory, which can have a sizable impact on business unit productivity.

With a consolidated inventory, the service desk sees an immediate benefit simply by knowing the components of an asset related to a call or incident. In fact, analysts claim that the first nine minutes of a service call are spent trying to correctly identify the profile of the asset in questions—time that could be otherwise spent directly solving the problem.

Improving the utilization of existing assets is another benefit. Enterprise organizations typically have more hardware and software assets on hand than they really need. Inventory management lets you examine what you actually have so you can begin to make smarter choices about re-deploying existing assets before procuring new ones. Statistics show that enterprise companies have 12 percent more hardware assets than they actually believe they have. Systems that are idle or otherwise go unused can be re-purposed, which reduces spending on new asset acquisition. A solid, automated inventory practice can immediately curb the tendency to spend before re-using existing assets.

And, when it comes to compliance regulations such as Sarbanes-Oxley, having an accurate and demonstrable process in place for inventory satisfies control environment requirements and also supports other control processes. Importantly, with an accurate inventory you can be more confident that you're paying taxes appropriately; taxes are commonly overstated due to lack of asset visibility.

## Technology enablers

If the assets that comprise your network were static, inventory would be a painless one-time project. But of course that's not the case. Laptops are constantly on the move, servers get decommissioned, and software changes constantly. Inventory management has to keep up with the change, and that means you need an automated inventory management practice that accommodates frequent and regularly scheduled updates.

Taking inventory is the first step in establishing visibility into the infrastructure and provides the basis for populating a CMDB (configuration management database). Although often initiated with a physical inventory, using automated tools to discover all components on your network saves enormous time and effort and provides an immediate view into the actual state of your infrastructure.

Determining the right level of asset detail you will need requires planning and forethought. Large ITOs (IT organizations) might want to see hardware inventory details, such as memory, disk and BIOS information. For network devices, they might track network equipment, such as hub, routers and switches, down to the operating system level.

Determining the level of software specificity is very important, because it is this data that will be used to determine if you're meeting software license compliance obligations. At a minimum, an inventory product should collect all registry and non-registry files and be able to recognize version, release and patch levels. This provides a baseline to enable more sophisticated software asset management capabilities that can reconcile files against titles as well as against licensable applications.

## Best practices

Here's a short list of best practices to consider in starting an inventory management initiative:

**Get organizational buy-in:** Although inventory may not involve the variety of stakeholders that configuration and ITAM do, starting early in the process always helps. Ensure processes are well defined so that inventory accuracy is maintained. Set policies on frequency of discovery scans and inventory processes. Make sure stakeholders from all departments see reports on a regular basis so that they continually buy into a centralized inventory process and configuration management practices.

**Set up a centralized, relational CMDB-based repository:** Ensure that there's a centralized repository—one that's capable of serving as a CMDB—to hold inventory items and eventually financial and lifecycle aspects of those assets with ITAM processes. It's all too common to see different divisions, branches or business units taking their own inventory and storing it in their own way. As we look deeper into the value propositions associated with inventory, configuration and ITAM, having a single, centralized repository will pay very large dividends.

**Establish a baseline:** Good inventory practices start with an accurate baseline. An accurate inventory of installed hardware and software forms the foundation of a solid ITAM program. This baseline identifies in ITAM which assets need to be redeployed, reused or retired.<sup>2</sup> Doing a physical baseline is a necessary step to make sure you have all connected and non-connected IT assets in your repository.

**Go deep, then go wide:** A winning strategy for companies is the start of an inventory practice around one asset class, such as servers. This way, you can put processes in place to capture and

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<sup>2</sup> Patricia Adams, Gartner, 2004 – "Management Update: Conduct a Baseline Inventory to Better Manage Your IT Assets"

reconcile the detail you need and test the processes through regularly scheduled updates to ensure they are thorough and yield the right results. Once successful, the same processes can be implemented for PCs, network equipment and detailed software inventory.

**Have a process owner:** Inventory management needs a single process owner who can consider the needs and requirements from all stakeholders and assure accountability throughout the entire process.

## Configuration management

### Showing depth and relationship among assets

Configuration management takes inventory management to the next level by introducing the notion of relationships among the assets. Adding additional levels of asset detail depth to the CMDB, configuration management describes relationship detail for each CI, delivering a more robust informational basis for incident, problem, change and release management.

As described within the ITIL framework, configuration management provides a logical model of the infrastructure or a service by identifying, controlling, maintaining and verifying the versions of CIs in existence.<sup>3</sup>

The goals of configuration management are to account for all IT assets and configurations, provide accurate and up-to-date information on CIs to support service management and IT asset management processes, and to provide a sound basis for incident, problem, change and release management.

In effect, the configuration management discipline aims to fully support efficient delivery and support of business services. Thus, configuration management practices result in a complete, up-to-date and accurate account of the status of every CI and reflect this directly in the CMDB. The CMDB, in turn, becomes the master source of the state of the infrastructure upon which actionable reports, analysis and decisions models can be built to address compliance, performance and cost containment measures.

### Reconciliation: the heart of configuration management

A key configuration management dynamic is reconciling what is found with what you believe you have on hand—the reconciliation of the “actual” versus the “expected state.” This is accomplished by having your discovery data compared with your current repository of data and by having any unexpected discrepancies become immediately apparent.

There are two potential causes of reconciliation discrepancies: either an asset enters the infrastructure without going through a change process (e.g. rogue software is installed), or a change process was not properly closed, resulting in an actual asset status that’s different from the expected state.

This, in fact, is where the practical value of configuration management lies, because by managing the actual versus expected state of your assets, you’ll get immediate and specific detail on any new hardware or software assets that may have unexpectedly entered in the environment. You can take corrective actions immediately, enabling quick remediation for potential security or compliance breaches.

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<sup>3</sup> CCTA, Best Practices for Service Support, © 2000

If discovering and remediating individual CIs weren't enough, you also have to consider the upstream/downstream effect of disruptions caused by discrepancies or unexpected activity.

Configuration management holds this upstream/downstream relationship of CIs so the ITO can better understand the true impact of change, service costs, service delivery and unforeseen service disruptions. Because service disruptions can happen at any point in a chain of hardware and software dependencies, implementing configuration management practices is really the only way to proactively manage the data required to quickly resolve an outage. System availability issues can get quite complex with distributed applications, so the impact of one change to one element of a service can have a domino effect on CIs that are down the line. And, as the scope, frequency and number of changes increase, automating the configuration of systems enables IT organizations to improve the success of repeatable tasks that are often subject to human error.

Thus, establishing and documenting configuration management processes is a critical component to a successful managed infrastructure. Ultimately it keeps the CMDB intact so that dependent processes are as efficient as possible in support of business services.

## Configuration management for proactive IT management

From a strategic view, configuration management plays a pivotal role in supporting all other service support and service delivery processes as well as asset management processes. At its core, configuration management is about enabling proactive and service-oriented processes by actively recognizing and reconciling actual and expected states, taking action to rectify the situation or fulfill a requirement, and updating the CMDB to reflect the true status of the infrastructure.

A host of benefits result. First, you can reduce software overspending to a considerable degree by having a software use monitoring process in place. Usage reports tell you which applications can be uninstalled from one machine and re-used on another. And, importantly, configuration management manages and reports on this process to maintain software compliance controls.

Through software distribution and patch management processes, you can control the distribution and installation of applications in a managed environment. Coordinated with change and release management, software distribution provides staff efficiencies and mitigates risks associated with manual software distribution.

Having CI relationships exposed through network topology mapping and application mapping lets you see, understand and take action, based on upstream/downstream and parent/child asset relationships.

For example, knowing that there are 100 business users on a payroll system that depends on a particular router and hub, which is dependent on a particular server, allows better management decisions around planned changes. Moreover, this visibility allows the service desk to achieve better response times for unplanned outages. Mitigating this risk is critical both for productivity purposes as well as for process control required for compliance and governance practices.

Configuration management also facilitates trend and impact analysis for change and problem management, key ITIL processes that contribute to lower service interruptions and greater system availability.

In fact, business continuity and disaster recovery strategies are fully reliant on the degree to which your current infrastructure state is documented. Configuration management processes and the CMDB play a big role in having documented network status right at hand.

## Technology enablers

A variety of technologies can be used to enable configuration management processes. Building on the foundation of discovery and inventory applications and processes, a reconciliation engine is the cornerstone of configuration management. As requests for change cycle through the IT organization, the reconciliation engine allows you to constantly monitor the actual state of each CI to the expected state based on the change management process. The extent to which you catch discrepancies associated with change management processes, as well as rogue hardware and software entering the network, determines the level of risk you impose on IT infrastructure management.

Relationship mapping of business service components is central to configuration management. Thus, network topology and software mapping capabilities become crucial components of configuration management. Through these technologies you can build and maintain a relevant picture of how all assets are related. These are strategic in nature, because they allow you to see the forest through the trees, or said differently, the “network through the assets.” With a relational repository in place, both agent and agentless technology can be used to populate the CMDB with asset location, dependencies and relationships and characterize assets in the context of business services.

Software distribution and patch management are central to configuration management, because they enable consistent deployment of applications and software components. With automated discovery tools, version and patch levels are identified for proactive management of the current software state. The value of this becomes quite apparent in the heat of the battle when a virus strikes: understanding which machines are vulnerable based on their application profile makes all the difference. Automating the entire software distribution patch management process puts you in a highly proactive stature. The combination of a centralized configuration management process with software distribution and patch management makes it possible for IT to define and manage a Definitive Software Library or DSL, which in turn increases the stability and predictability of what gets installed and updated within the infrastructure.

Intrinsically tied to incident, problem, change and release management, establishing integration points to these and other service management processes drives more value. An integrated solution is essential. Although configuration management processes can be called out as distinct, in practice they are intricately tied to so many processes that they should be considered foundational to any service and asset management solution.

## Best practices

**Gain consensus around a federated CMDB strategy:** All CI details should be in a single, federated CMDB, a robust and relational repository that can easily integrate with other systems. This single point of data access simplifies how people find and use the information for various processes, and it’s more efficient to administrate.

**Define an appropriate level of CI detail:** Gathering and documenting the right level of detail is an important task. Start with defining those associated with critical business servers first, then add definition to secondary services. Many companies set the definition of a CI to be recorded at a level of detail justified by business needs—typically to the level of “independent change.”

**Define how the CMDB data is maintained:** Clearly document the process flows to reconcile between the CMDB’s expected state with inventory management’s actual state. Additionally, document the service support processes that modify the operational state of a CI and define the criteria necessary to commit operational state back to expected state.

# IT asset management

## Lifecycle management

IT asset management is often characterized as the discipline that covers the financial aspects of inventory management. Whereas the financial aspect is a distinguishing element of IT asset management, it is much broader in its scope, benefits and deliverables. IT asset management disciplines include contract management and entitlements, costs and depreciation values, asset leasing, maintenance and ownership status associated with each asset. IT asset management also covers vendor management, service standardization and catalog and request management. IT asset management has also become a pivotal discipline for meeting compliance requirements, as it enables fiscal transparency, process control and documentation, and software license management.

Taking another, more operational view, IT asset management extends inventory and configuration management by layering in processes that manage each asset throughout its complete lifecycle. For each asset, there is a beginning (procurement), a middle (moves, adds, changes) and an end (retirement). Managing this lifecycle requires a full appreciation of each process associated with the stages of the asset lifecycle. These processes can be automated through an integrated system that leverages inventory and configuration management systems.

## IT asset management for process automation and IT efficiencies

The goals of IT asset management are:

- To establish processes that optimize the cost and the utilization of each asset
- To ensure that the supply meets the demands of the business and that IT assets directly support specific business productivity requirements in the most efficient and reliable way possible
- To mitigate risks associated with governance practices, compliance requirements and business continuity

These objectives can be met through core IT asset management processes:

**Request management:** A standardized order and approval process gives business users the ability to order assets and to have those assets be approved through a workflow that reflects controlled management criteria for asset acquisition.

**Stock/inventory management:** Stock and inventory management can fully expose existing available asset inventory. Having a centralized capability to check stock across multiple physical locations helps reduce the cost of unwarranted purchases by re-purposing existing stock.

**Procurement:** Integrated with request and stock management, procurement support allows requests that cannot be fulfilled through existing inventory to be included in bulk purchase orders. Upon asset delivery and acceptance, the purchase order and the individual request detail can be checked to ensure that only requested (and approved) items are received. Alternatively, issuing the asset request in a standardized, electronic way to corporate purchasing groups or employees—such as through an ERP system—helps ensure that delivered assets are associated with the requester and associated cost center.

**IMACs:** Installs, moves, adds and changes comprise the bulk of day-to-day work in an IT operations organization. Standardizing and automating these processes provide tremendous efficiencies.

Recognizing the costs, productivity levels and cycle times associated with various IMAC types can help establish baselines for workload distribution and can also be used for chargeback systems. For example, IT can show exactly how many IMACs per department were conducted with specific detail on each one, illustrating the exact resource used by any given business unit.

**Software asset management:** Software license contracting and utilization is a complex subject and requires specific, defined processes to manage it effectively. Typical issues around software asset management include overspending for the sake of meeting compliance requirements, underutilizing license grants and entitlements, and having a lack of standardization for software titles, which causes unnecessary support.

**Contract management:** Lease and maintenance contract management present considerable opportunities to save money and increase efficiencies. Automating the cycle of lease returns results in reduced fines and the ability to actually locate and return assets on time and in the requisite physical state. With maintenance contracts, systems can ensure that contracts cover only those assets that are actually in production. In- and out-of-contract repairs can be better reconciled with contract terms, saving time and money associated with unwarranted costs.

**Financial management:** Key elements of IT asset financial management include cost center budgeting, service and product pricing, and chargebacks.

## Technology enablers

Effectively managing the physical, contractual and financial aspects of assets results in better cost containment, improved services and improved risk management. The single most important enabler to accomplishing these benefits is implementing a robust, relational repository. Of course, having the repository in place when you build inventory management and configuration management disciplines is the perfect set-up, lending a much faster implementation cycle for IT asset management processes.

Even more so than inventory and configuration management, IT asset management requires powerful relational capabilities because of the inherent need to relate physical, contractual and financial status of assets throughout their lifecycle. Fundamentally, every physical change to an asset affects its contractual and financial status. For example, if a PC changes ownership, the cost center charge is affected.

When a new application is installed on a PC, a software license contract needs to be related to the installation. If a server crashes, the financial status may change so that it's written off the books, and operational records need to show that it's no longer in service, and the associated maintenance contract is updated.

The relationship among an asset, its owner, location, software licenses, physical status and financial value is not difficult to track, but if a system does not automatically make adjustments to the various attributes upon a change, records quickly become old and irrelevant.

## Best practices

The biggest challenge of IT asset management—centralizing and controlling the lifecycle of each asset—is also the biggest opportunity. Once an inventory is established and configuration information is available, common best practices can result in significant cost-saving opportunities as well as service improvements.

**Ensure stakeholder alignment:** Going beyond central stakeholders in IT operations, IT asset management has stakeholders in contracts, procurement, finance and compliance. Because each department is involved in discrete parts of the IT asset management lifecycle, defining cross-departmental processes upfront helps meet multiple goals.

**Establish IT asset management project milestones:** Implementing IT asset management requires careful coordination between IT and process owners. Best practices call for setting project milestones for process definition, software implementation, integrations, training, testing and rollout.

**Set specific operational and financial goals:** Most ITOs initiate IT asset management projects to gain specific, measurable results in three areas: cost control, risk mitigation and service level improvement. Specific operational and financial goals can be set to show incremental progress against each of these, using metrics around IT budget impact assessments, service quality levels and decreased risk of compliance irregularities.

**Standardize on hardware configurations and software license titles:** Instituting standardized practices means selecting fewer hardware configurations and software titles, which enables significant volume purchase leverage and also reduces the burden on the service desk.

**Establish periodic reviews of software usage:** Set standards for how long an application remains unused before recalling it for re-deployment on another system. There may be different thresholds for different types of applications or different job types. For example, you might set a three-month usage threshold for Visio or a four-week threshold for a CRM client application.

**Conduct internal audits:** Regularly review asset management practices to ensure cross-functional processes are supported by automation as much as possible. Document these processes so that you can show proactive resource control in the face of an audit.

## Evolve your IT operational practices with HP OpenView solutions

HP OpenView solutions provide enterprise customers a consolidated view into assets from a physical, financial and contractual perspective. Assets are managed throughout their entire lifecycle, maximizing investments, improving service quality and mitigating risks associated with corporate and regulatory compliance issues. Contact HP for more information about its complete line of IT management solutions.

For more information

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