IBM

IBM Tivoli
Asset Management for IT
Portfolio Overview

Understand IT Asset Management basics

Position the portfolio of products

Learn from management scenarios

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Redbooks

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IBM Tivoli Asset Management for IT Portfolio Overview

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Note: Before using this information and the product it supports, read the information in "Notices" on page xiii.

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Preface

This IBM® Redbooks® publication provides an overview of the IBM Tivoli® Asset Management for IT portfolio. The portfolio is made up of the three primary products, IBM Tivoli Asset Management for IT, IBM Tivoli License Compliance Manager for z/OS®, and IBM Tivoli License Compliance Manager.

By using these products together, you can implement a comprehensive IT asset management solution. This book provides a functional overview of each of the products in the portfolio and also provides example scenarios of how they can be used to address IT asset management disciplines.

The IBM Tivoli Asset Management for IT product is a relatively new acquisition. It has its roots in enterprise asset management and has very rich function. This product will be enhanced and adapted to provide functions specific to IT asset management, such as facilities to handle contract management, full asset life-cycle management, integration with Enterprise Resource Planning (ERP) solutions and much more.

This book introduces the portfolio and describes its current capabilities. Our intention for the future is to provide additional materials for a deeper understanding of best practices for using the portfolio to implement a complete IT asset management solution.

The team that wrote this book

This Redbooks publication was produced by a team of specialists from around the world working at the International Technical Support Organization, Austin Center.

Figure 1 From left to right: Michael Beres Julio Zaima, Carmen Ces, Nick Ara, Bart Jacob, David Boggs

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Introduction to IT Asset Management

1

Introduction

IT asset management addresses issues related to two important initiatives that many businesses are addressing: Increasing the efficiency of the IT environment and enterprise asset management.

Enterprises are constantly looking for ways to operate more efficiently and cost effectively. The costs associated with information technology are under continuing scrutiny, and to stay competitive enterprises must discover ways to reduce costs and increase the value of the IT environment to their core business.

Enterprises are also looking to better control all of their corporate assets and ensure that they are managed in a fiscally responsible way. This not only makes good business sense, but because of government regulations, such as Sarbanes-Oxley, enterprises are having to be more aggressive in implementing asset management processes.

The assets of an IT organization need to be managed along with other assets of the enterprise. Applying the disciplines of enterprise asset management to the IT environment helps meet the dual objectives of managing all corporate assets and making the IT environment more cost-effective.

The IBM Tivoli Asset Management for IT product portfolio helps organizations manage their IT assets efficiently and effectively, lowering cost, mitigating license and regulatory compliance risks and better aligning IT with business goals.

IT Asset Management is part of the larger discipline of IT Service Management. In the next section, we provide a brief overview of IBM IT Service Management that will provide a context for IT Asset Management as discussed throughout the rest of this book.

1.1 IBM IT Service Management overview

What is needed today is a platform that will integrate the core process by which IT operates. These integrated processes will serve as the new platform for IT Service Management, reducing the labor cost associated with managing IT Services and increasing the effectiveness of IT operations.

To improve efficiency, IT organizations need to look at IT as a whole and build on top of resource management. IT Service Management is the optimal intersection of *people*, *process*, *information*, and *technology*. When these come together, it is easier to break down silos and make IT more efficient and effective.

Figure 1-1 depicts IT service Management and its various components.
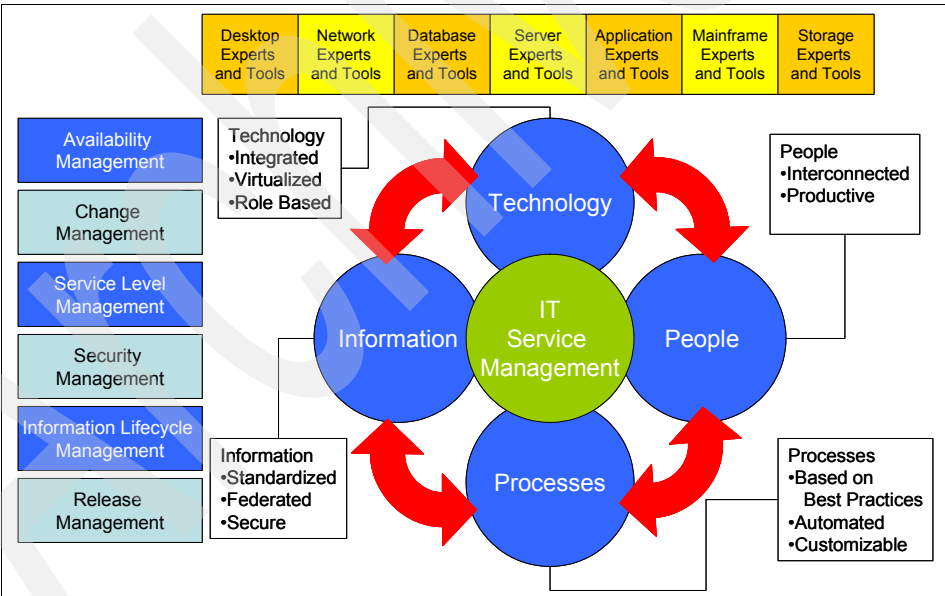
Figure 1-1   Optimal IBM IT Service Management Approach

IBM has taken a comprehensive approach to IT Service Management that spans from business models to technologies and products.

The IBM IT Service Management approach in terms of processes is based on the Information Technology Infrastructure Library (ITIL®).

ITIL is a set of documents that describes best practice approaches to delivering high quality information technology services. ITIL basically describes a set of management procedures for successful IT operations. ITIL is process oriented and therefore is product agnostic. IBM is focused on providing a set of management products that help its clients implement ITIL processes to support IT infrastructure, development, and operations.

ITIL Defined

Information Technology Infrastructure Library (ITIL)

A library of books describing best practices for IT Service Mgt

Describes goals, activities, inputs & outputs of processes

Not a "standard" – just best practices

Specific procedures vary from organization to organization

Worldwide de facto approach to IT management

OPEN approach – not tied to any particular vendor

Service Support

Service Delivery

ICT Infrastructure Management

Application Management

Security Management

Planning to Implement Service Management

Software Asset Management

ITIL

Figure 1-2   ITIL defined

However, ITIL addresses processes at a high level and does not provide a prescriptive approach to putting them in operation. IBM, with its approach, makes ITIL actionable by defining a process reference model and also defining a technology reference model.

This helps to understand these processes in the context of systems management tools, which can help automate tasks as well as high-level processes.

Figure 1-3 depicts the IBM approach to IT Service Management.
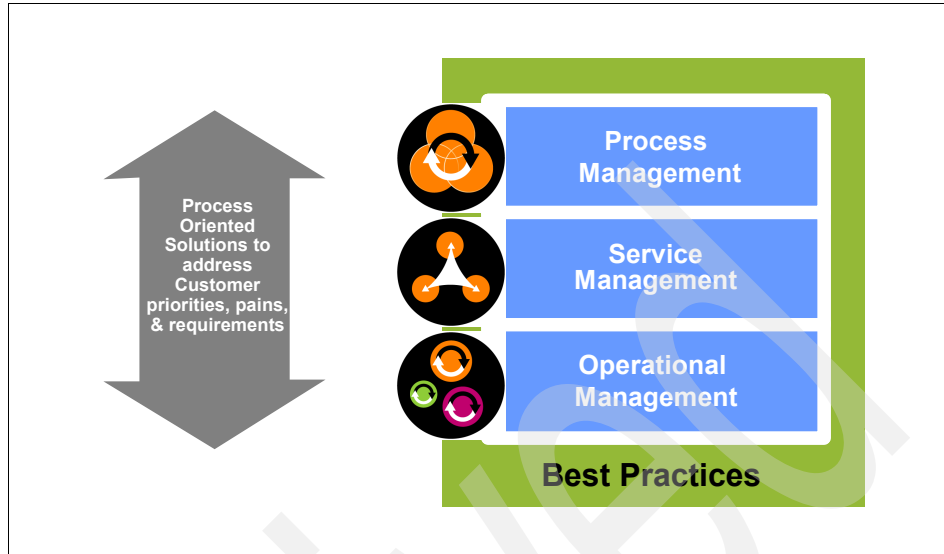
Figure 1-3   IBM IT Service Management overview

The IBM IT Service Management approach includes:

► ITIL-aligned Process Models and Workflows out-of-the-box that allow you to automate and integrate processes rapidly.

► Configuration Management via a Configuration Management Database (CMDB) and workflows that allow you to integrate, standardize, and share information across these tasks and tools.

► Automating specific tasks in a process through integration with IBM Tivoli Automation, Security, and Storage products.

Refer to the following Web site for details about IBM IT Service Management:

http://www.ibm.com/software/tivoli/features/it-serv-mgmt/index.html

Aside from traditional IT management disciplines that have focused heavily on availability management, IT asset management is an important piece of IT Service Management.

1.2 IT Asset Management

IT Asset Management is a subset of the larger discipline of IT Service Management as depicted in Figure 1-4.
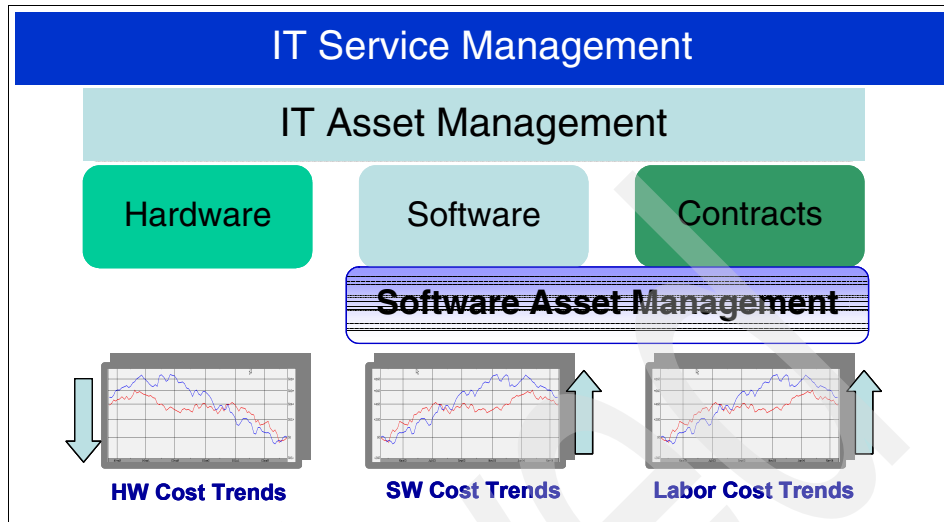
Figure 1-4   IT and software Asset Management as part of IT Service Management

IT Asset Management covers hardware and software, as well as related contracts. From the hardware perspective, enterprises may be somewhat further along in adopting an adequate set of policies and processes to manage the various IT equipment. The capital expenses involved and associated depreciation costs must be managed by any fiscally responsible organization.

Of course, this is not to say that IT hardware assets are fully under control. With the number of personal computers and various related accessories such as memory, hard disks and other options, organizations easily lose track of these IT resources. Costs for managing this environment are on the rise, and the sheer number of systems involved make this a daunting task.

Software Asset Management is a discipline that has historically had much less focus. However, due to a variety of factors including:

► Training and Support costs
► Risks associated with license compliance issues
► Government regulations
► Growing costs of software
► and so on

Software Asset Management is becoming a critical discipline that organizations must implement to stay competitive.

Some of the benefits of IT Asset Management include:

► Reliable asset inventory information facilitates decision making around IT spend and asset allocation.

► Optimize efficient IT asset utilization

► Effective IT asset management provides the cost and driver information to help better align IT with business requirements.

► Understanding your IT assets to better help regulatory compliance initiatives and to manage your IT risk (Sarbanes-Oxley, Basel II).

► Gaining an accurate view of the IT infrastructure, contracts and financial data enabling rapid recovery in the event of a disaster.

► Simplify the growing complexity of license compliance while mitigating risks and avoiding fines due to under-licensing of software.

► Reduced IT cost by avoiding over-licensing and redeploying underutilized assets.

The following graphic illustrates the "touch points" of IT Asset Management.
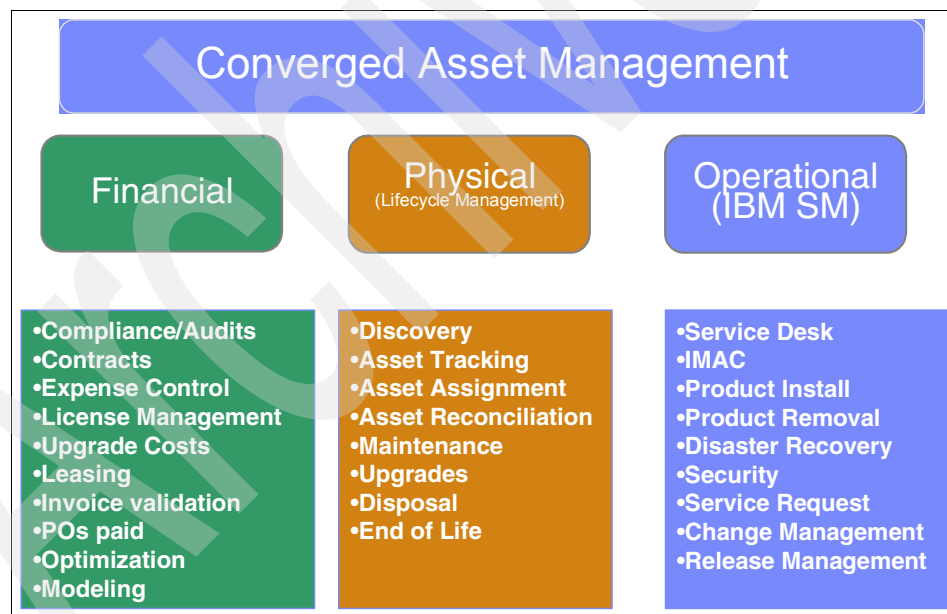
Figure 1-5   IT Asset Management categories

The key to effective IT asset management seems quite simple: "Know what you have." But there is a catch; to know what you have depends on the processes and tools that are used to manage IT assets. Software license compliance is

among the most evasive challenges facing organizations today. CxOs and IT managers are turning their attention to best practice frameworks to migrate ad hoc practices to comprehensive, process-driven IT asset management programs. An improved IT asset management approach can significantly reduce IT costs as well as mitigate the financial risks of improper software license management.

It is no secret that over the past decade the cost trends for hardware and software are clearly progressing in inverse proportion to each other. Hardware costs are becoming a small percentage of the overall IT budget, where software and personnel costs are increasing significantly.

1.2.1 Challenges Associated with IT Asset Management

Unfortunately, IT Asset Management is not without its challenges that include:

► Maverick Purchasing

Often, corporate IT policies and procedures are complicated and time consuming. In an effort to reduce red tape and improve agility, divisions are often allowed to conduct their daily operations with very little oversight from the corporate headquarters. As a result, these groups acquire IT assets, including software, as they see fit.

For large organizations, even a 5 to 15 percent reduction in maverick purchasing can lead to millions of dollars in savings, as every dollar saved has a direct impact on the organization's bottom line. Recognizing that maverick purchasing is occurring and implementing policies and procedures to control the spending is not a simple process. Senior level executives are asking why this is happening and the answers are not surprising:

– Poor initial analysis
– Inadequate control
– Inability to enforce a process

With that being said, one must ask the following question, "How does an organization go about eliminating maverick spending on IT products and what steps should be taken in order to realize the goal?"

An enterprise can significantly reduce IT costs if it has a centralized process, where possible, for asset acquisition. When there is centralized management of the purchasing process, companies can use scale to negotiate more favorable software agreements, redeploy and reuse licenses and reduce costs associated with over-licensing, and reduce the risk of fines and penalties due to under-licensing.

Another source of purchasing control problems is the inability of an enterprise to impose software standards. For example, policies such as the cross-organizational expensing of software make the enforcement of an

approved standard virtually impossible, resulting in maverick purchasing. Not only is unauthorized software unaccounted for, an increase in the unbudgeted costs of license management and infrastructure support occurs. Unauthorized software is frequently incompatible with the "approved" environment, causing conflicts, crashes and system failures, reducing productivity due to employee downtime, and increasing IT support costs.

It is important to set up IT Asset Management processes that control, identify, prohibit, and remove unauthorized software from the enterprise. These processes ensure employees are purchasing only approved software, and provide an equitable policy for software across all employees based on role or job function.

► Disconnected Processes

Financial, procurement, contract management, and IT groups are all involved in the software life cycle process. Often, these groups do not communicate or do not leverage the software asset repository when software is requested, purchased or distributed, resulting in poor control of software assets. For example, installed software is often not reconciled with procured software, resulting in a misrepresentation of deployed software. Also, software licenses are typically not reused when systems are retired or upgraded, resulting in excessive software license purchases. Finally, it is common to find enterprises that are not capturing application usage details, thus preventing the ability to renegotiate more advantageous contract terms.

► Technology Limitations and Evolution

The basis for any good IT Asset Management system is accurate and up-to-date information, along with the processes and technology to maintain accuracy. Many organizations, particularly in sensitive fields such as Government and Financial Services maintain strict controls over the IT assets for security purposes. These tight controls also help to keep the software repository or hardware warehouse more relevant because unapproved software and hardware is much more difficult to bring into the environment. However, IT Asset Management is still a challenge for these large organizations. Furthermore, in most industries it is less practical to "lock down" user environments to prevent unapproved software/hardware installation.

1.2.2 Software Asset Management

As a subset of IT Asset Management, Software Asset Management's ability to analyze actual software usage and manage related contracts makes it a fundamental part of IBM IT Service Management. As part of IBM IT Service Management, IT Asset Management allows a business to transform from a

siloed IT Asset Management approach to one aligned with overall business operations.

Figure 1-6 presents Software Asset Management (SAM) positioning in IBM IT Service Management.
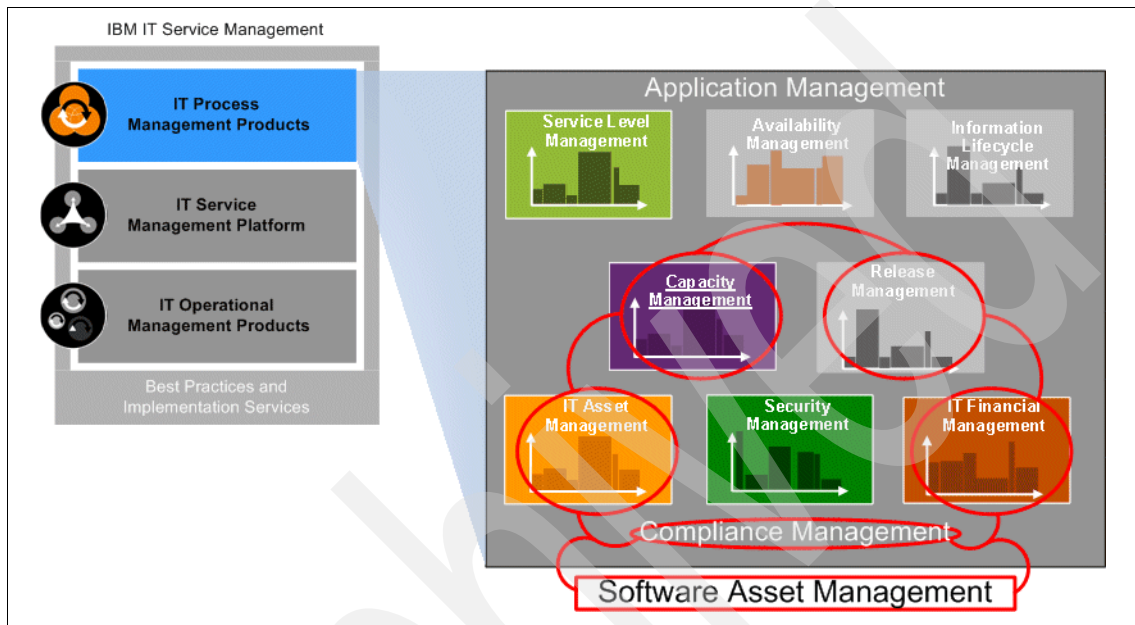
Figure 1-6   Software Asset Management in IBM IT Service Management

As depicted in Figure 1-6, Software Asset Management touches on several aspects of IBM IT Service Management, including:

► IT Asset Management

As already mentioned, Software Asset Management is a component of IT Asset Management. The ITIL definition of IT Asset Management is Software Asset Management and Hardware Asset Management together. For IBM, IT Asset Management is made up of three components: hardware, software, and contract management. Out of the three components, SAM is involved with software and contracts.

In general, hardware costs tend to remain fairly stable and have been declining over the years, as opposed to software and contracts, whose costs are on the rise and remain unstable. Software Asset Management is a big expense for a company, as well as difficult to manage.

- ► IT Financial Management

  IT Financial Management in IT Service Management deals with understanding the costs of IT assets including software. Software Asset Management therefore is a key component of the IT Financial Management process, as it allows clients to fully account for all IT software expenditures across the enterprise. With Software Asset Management in the IT Finance Management process, clients can control and manage their IT software budget while at the same time assisting them with software decisions and budgets. A secondary benefit is that a Software Asset Management solution enables the allocation of software costs to the users receiving them. It provides the framework for recording the costs of software, so that licenses can be allocated and costs recovered for the IT service to the user.

- ► Release Management

  Release Management in IBM IT Service Management is the process of performing a successful software or hardware change in an IT environment. Software Asset Management's involvement in this process is primarily in the front end, confirming that the software release is within the contract policy and does not have any interdependencies with other IT assets. The Software Asset Management piece of Release Management is critical for the planning and assessing portion of the software release cycle.

- ► Capacity Management

  Capacity Management is an area concerned with ensuring that IT processing meets the evolving needs of the business. A Software Asset Management solution allows you to understand where there is over-spending and under-spending on software licenses so that you can shift spending to align with the business needs. An IT Asset Management solution provides a current analysis of resource usage so that decisions can be made on actual usage rather than static contracts. In this way, an IT Asset Management solution ensures that the hardware and software license capacity of the company meets the current and future needs of the business.

- ► Compliance Management

  It is important that a Software Asset Management solution provides the ability to audit and account for IT assets, software, and expenditures, which forms the foundation to meeting the mandates of numerous regulations. It is the intention of IBM to fully integrate its Software Asset Management solution with other IBM compliance solutions to provide a common infrastructure helping companies with their compliance activities.

The IBM Tivoli Asset Management solution provides a process to automate, measure, and audit software and IT assets, helping you to manage your regulatory compliance requirements.

Benefits of Software Asset Management

As a subset of IT Asset Management, here is a simple example of the benefits related to Software Asset Management.

Let us look at a real-world example of the potential savings achievable through the implementation of minimal Software Asset Management practices. In Figure 1-7, all upgrade and maintenance costs are shown in blue, while software savings are shown in yellow. Notice that the initial savings will begin immediately after action is taken to eliminate unused (or under used) software, typically in the first year. Some estimates put this at 30% or more. The savings will continue annually at a smaller percentage, but still not insignificant. However, as software costs increase, that percentage will result in a higher dollar amount, thereby increasing the return on investment, or ROI.
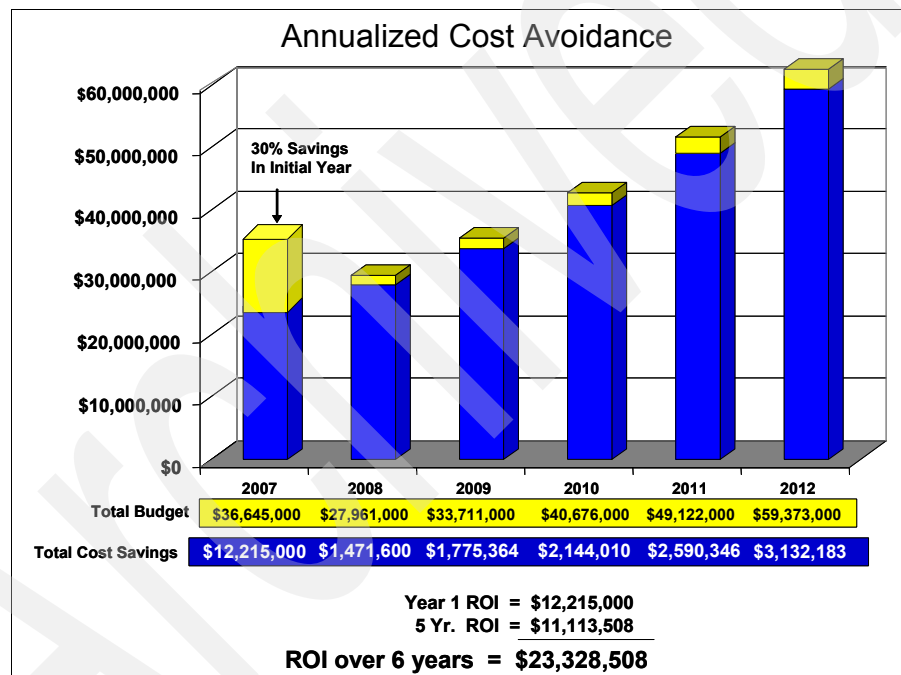
Figure 1-7   Annualized Cost Avoidance, 6 year Forecast

Continuing to carry under-utilized software year after year can have an accumulative effect. It becomes more difficult to come stay on budget as IT funding comes under greater scrutiny over time. The graph below presents a different perspective of software costs on a macro level. Without numeric values, one can see how easily a department's annual software budget can be exceeded.
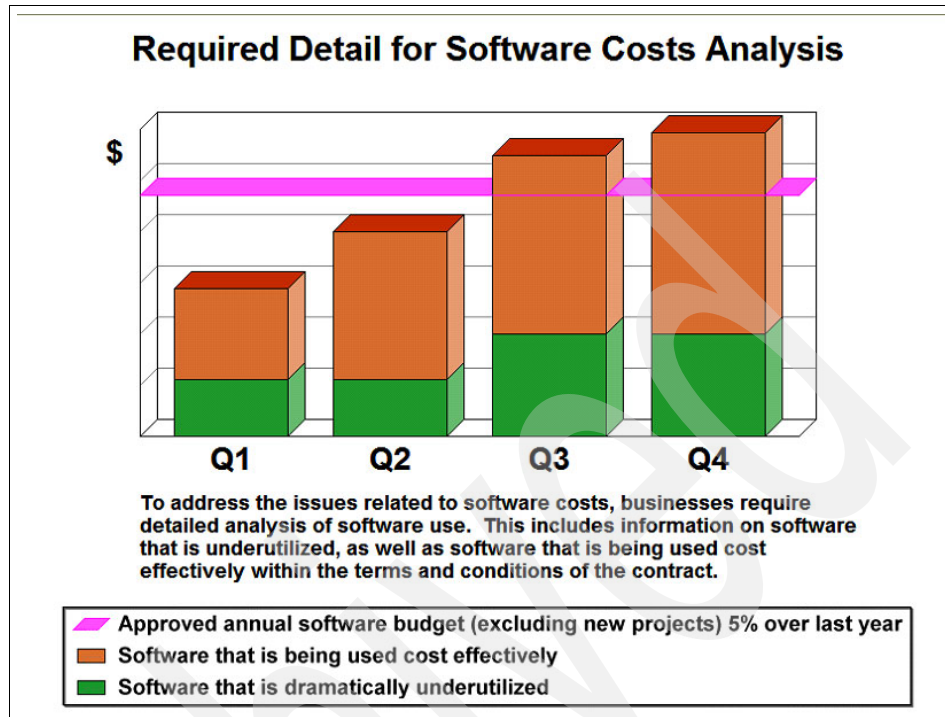
Figure 1-8   Required Detail for Software Cost Analysis

With effective license and Software Asset Management, a far different outcome can be expected. With little budget increase, and careful monitoring of software assets, additional funds are available for new projects.
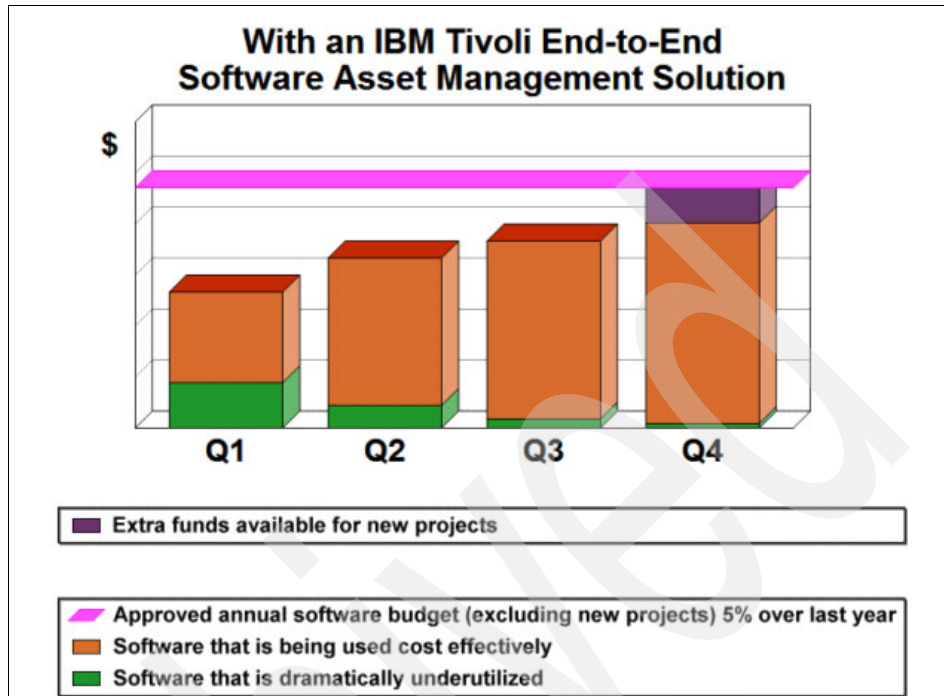
Figure 1-9   Extra Funds Available in Q4

Risk mitigation is another important consideration as software makers have increased their focus on license compliance, and the ability to audit is more common in software contracts. Software investments are a major component of any company's financial profile, and corporate reputations can be severely compromised in the event of a noncompliance scandal. For a company to be in full compliance with Sarbanes-Oxley, it must report all assets accurately. A solid SAM strategy helps firms maintain up-to-date inventories of their software, ensuring accurate financial and tax statements. Poor documentation and weak license control are at the root of software license compliance problems. Studies show that a large percentage of companies have inaccurate information on the number and configuration of their IT assets.

Often, there is no central location for enterprise agreements; instead, licenses are scattered across business units. In addition, generally little or no accountability exists to deter employees from installing unauthorized software on their PCs. It is important to manage software across the entire enterprise, connecting key departments that interact with software assets, while ensuring license compliance. Software Asset Management enforces entitlement, assures software redeployment, and reduces the overall expense of software. With these

benefits, many organizations are starting to implement asset management programs.

Software Asset Management can be thought of as the combination of IT Service Management and asset life cycle management processes. To ensure that an organization is in complete control of the purchase, usage, distribution, and disposal of its valuable software assets, both business and technical process disciplines are required to co-exist and complement each other. SAM is not solely a technical issue; it requires investment in new business processes that underpin a corporate wide software usage policy in order to be successful. In other words, Software Asset Management is best achieved through an implementation that combines ITIL disciplines and best practice asset life cycle management.

Software Asset Management Maturity Model

In the final analysis, software management is a multi-disciplinary process. Static product functionality is not sufficient to ensure that software management policies are enforced. Processes need to be defined and documented to ensure software compliance policies and procedures are followed.

A strong workflow mechanism is required to "string" together all required activities to ensure that procedures are followed. A five-layer model, based on a capability maturity model, has been built to help measure and track the activities an enterprise will need to undertake to move forward.

SAM Maturity Levels

Level 5
Value Creation
Unbundling & Transforming **55%**

Level 4
Service
Extending & Innovating **45%**

Level 3
Proactive
Business Integration **25%**

Level 2
Reactive
Process Efficiency **15%**

Level 1
Initial: Chaos
Legacy Renovation **0%**

Reduced Risk

Time

Increased Cost Avoidance Percentage from Level 1

Source: Gartner, Isogon
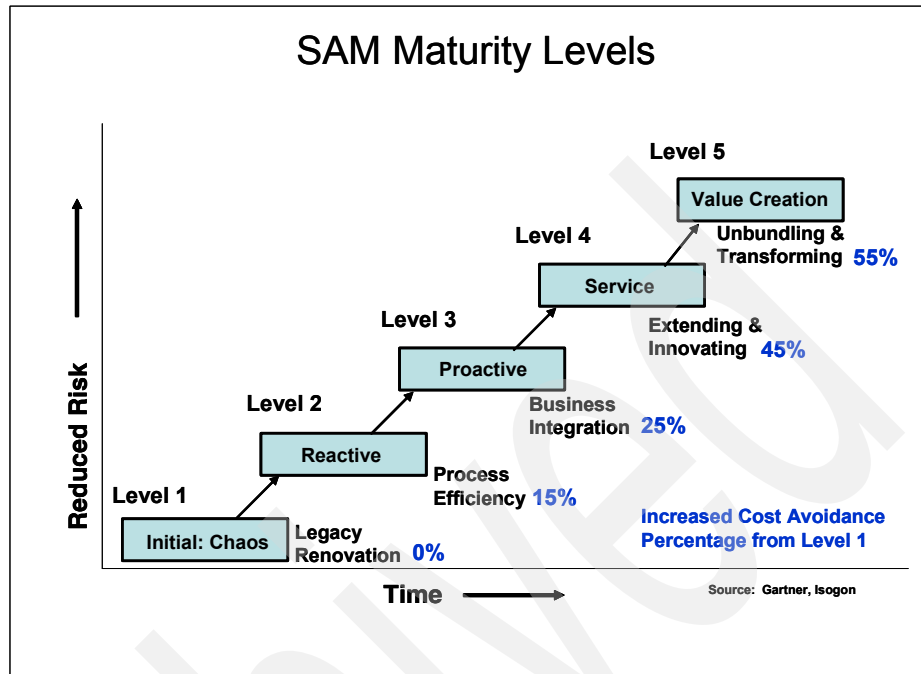
Figure 1-10   SAM Maturity Model

The SAM Maturity Model serves this purpose, with the layers defined as follows:

Level 1: Chaos - Legacy Renovation

The initial environment has ill-defined procedures, controls and a lack of adequate tools to track or manage software assets resulting in a chaotic environment. The organization generally does not know what it owns, where it is located and who is using it. Unused software assets are often kept with no control mechanisms or accountability by designated employees. Such enterprises often do not have a centralized purchasing or negotiation team. IT contracts are not tracked and are typically stored in folders in filing cabinets. There are no systems in place to track the intellectual capital and negotiation strategies associated with acquisition. Until the process is under statistical control, no orderly progress in process improvement is possible.

Level 2: Reactive - Process Efficiency

At Level 2, IT organizations create spreadsheets or a database to help track software assets. A SAM program is focused on counting the software assets and involves annual physical inventories to identify and catalog all software, and the process is now repeatable. The organization may use an auto-discovery tool to

supplement this data. However, installation, move, add, changes processes are not consistently followed reducing the accuracy of the data. Reports are basic and lack sufficient detail to identify and resolve problems. Linkage and sharing of data with purchasing are sporadic at best. Often have multiple overlapping tools without centralized oversight or governance.

Level 3: Proactive - Business Integration

In Level 3, the process is well characterized and reasonably well understood. The organization moves into proactive management by defining its process in terms of software engineering standards and methods, and by making a series of organizational, methodological and SAM software tool improvements. Inventory data can now be linked with financial and contractual data to create a centralized view of how assets are performing. The repository and auto-discovery tools are integrated to provide real-time inventory and faster problem resolution.

Level 4: Service - Extending and Innovating

In Level 4, the SAM process is not only understood but it is quantified, measured and reasonably well controlled. The organization has metrics in place to measure the program's value and service levels can be created to meet broader business goals. Opportunities for savings are identified and communicated to the business units on a regular basis. Process and tools are used increasingly to control and enable faster procurement time frames, more efficient order tracking and improved invoice reconciliation. Inventory levels are managed to prevent overbuying while maintaining low-cost inventory stock levels and retiring or disposal of under performing assets. The organization is learning to project expected costs and problems with reasonable accuracy. This is when the most significant quality improvements begin.

Level 5: Value Creation - Transformation

At Level 5, organizations have not only achieved a high degree of control over their process, they have implemented and integrated all three tools of an SAM program (repository, auto-discovery and software-usage) and have a major focus on improving and optimizing its operation. At this level, business units are charged back for computing services, TCO metrics are linked with SAM metrics, and data from management and business applications are used to audit the efficiency and effectiveness of established business practices across all software assets. IT cost recovery encompasses usage based pricing models. The data on the process are used interactively to improve the process and achieve optimum performance.

1.2.3 ISO/IEC 19770-1 - A New Software Asset Management Standard

Published in May 2006, ISO 19770-1 establishes the first baseline for an integrated set of Software Asset Management processes that will enable

organizations to benchmark their processes against internationally approved guidelines. ISO 19770-1 is closely aligned to the processes outlined in ISO 20000, the international standard for IT Operations. Both ISO 20000 and ISO 19770-1 rely heavily on the IT best practices outlined in the Information Technology Infrastructure Library (ITIL).

The ISO 19770-1 standard details the processes involved in Software Asset Management and groups them into six main segments:

► Control Environment: Covers the processes and procedures, policies, roles and responsibilities, statements of all requirements and communications as well as ongoing assessment for the SAM process.

► Planning and Implementation: Maps out the activities needed, resources required, reporting structure, measurement and verification plus a continual improvement process.

► Inventory: Defines the scope selection and confirmation of assets included in Software Asset Management and the auditable monitoring of the existence, access to, usage and storage of them.

► Verification and Compliance: Covers the process to identify and record assets and match inventory to licenses and associated processes like authorization and calculating effective license from underlying licenses (upgrades).

► Operations Management: Covers security policy and documentary evidence of implementation, the management of relationship with suppliers and the contracts that relate to them including customer (user) relationships and maintenance of SLA's for both the management and maintenance of contractual documents / budgets.

► Life Cycle: Covers the life cycle of software assets from change management and selection of assets, acquisition and development (including new releases) incident management, problem management through to retirement, transfer and disposals.

So far, ISO/IEC 19770-1 has been positively accepted by both the user and vendor communities. It is generally accepted that businesses that undertake 19770-1 certification programs show a higher level of compliance with software-related contractual obligations and therefore may reduce their legal and financial exposure. Software manufacturers supporting 19770-1 certification are viewed as proactive and audit-friendly.

ISO/IEC 19770-1 may sound like a standard for software licensing compliance, but it is not. Although software licensing compliance is included, this is just one element of overall SAM. The objective of SAM is to get full control of all aspects of software and related IT assets, and licensing is just one of them. ISO/IEC 19770-1 also gives an organization on-going control, not simply a point-in-time snapshot which is typical of many licensing compliance exercises.

1.3 Summary

The potential benefits of implementing an effective IT Asset Management policy and approach can be very significant. These benefits are not only realized financially but also through improvements to the robustness and resilience of the entire IT infrastructure.

The non-exhaustive list below highlights many of the key areas where benefits can be achieved.

► Maintain license compliance

  – Avoid audits, non-compliance fines, and associated negative publicity

  – Identify the level of corporate exposure due to pre-existing unapproved software usage

► Reduce software purchasing costs

  – Negotiate improved terms and conditions with software/hardware vendors at initial purchase and subsequent contract renewal

  – Deploy only that assets that are actually required

  – Downgrade casual software users to standard versions, freeware viewers, and/or open source applications

  – Redeploy installed, but unused software/hardware to users that need it

► Better purchasing decisions

  – Make informed IT purchases

  – Recycle previously purchased software/hardware internally

  – Streamline™ software license provisioning practices

  – Eliminate maverick buying

► Reduce software maintenance and support costs

  – Only pay maintenance on software that is actually in use

  – Fewer incidents support calls caused by unapproved software/hardware

  – Fewer software packages or hardware platforms means technicians need less training and can resolve problems quicker

  – Reduce/Mitigate the risks associated with implementing planned changes

2

Architecture

This short chapter provides an overall perspective on the logical components that need to be part of an IT Asset Management solution. The IBM products that implement these logical components are then introduced.

Note: Throughout this chapter and the rest of this book, you will see references to the IBM Tivoli Asset Management for IT portfolio and the IBM Tivoli Asset Management for IT product. The portfolio currently consists of three products including the product of the same name. Though it may cause some initial confusion, the products are being integrated in such a way (now and in the future) that you can think of them as modules of an overall IT Asset Management solution. We specify when we are talking specifically about the product versus the overall portfolio.

2.1 Solution components

The components of an IT Asset Management solution must cover a range of functions and capabilities. The basic questions that must be answered by an asset management solution include:

► What assets do I have?

► What assets are being used?

► In the case of assets requiring licenses (such as software), licenses can also be seen as assets, and therefore, what licenses are being used?

► Where are we over licensed (potential for savings, by eliminating unused/unneeded licenses)?

► Where are we under licensed (exposed to compliance risk)?

► What are the associated costs for our assets?

Figure 2-1 summarizes the preceding questions.
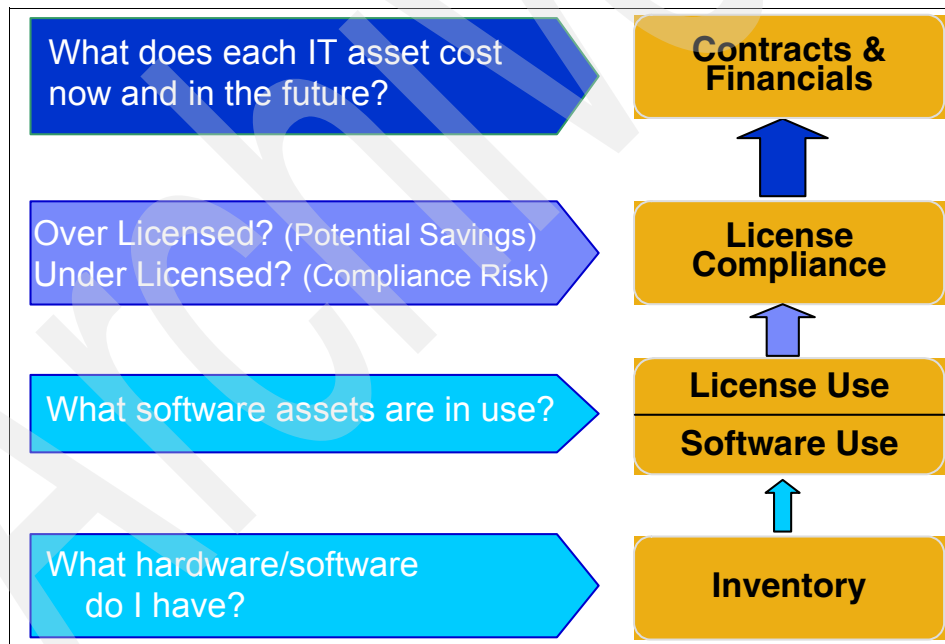
Figure 2-1   IT Asset Management summary

In practice, answering the above questions may be quite difficult. Some of the reasons for this difficulty include:

- Lack of centralized cross-platform data repository for:
  - Software inventory
  - Product use activity
  - Contractual and financial information
- Rapid business change causes unexpected software spending and inefficient software deployment.
- Complexities of license metrics, terms and conditions, and software deployment.
- Software Asset Lifecycle management within functional areas and departmental silos.
- No clear knowledge of what software is installed, how much it is being used and who is using it.
- Most Software Asset Management practices lack the maturity to drive maximum business value.

The Tivoli Asset Management for IT portfolio of products provides the end-to-end capabilities required for implementing an IT asset management solution that meets business goals. The various components of the portfolio and how they fit to meet the overall solution are shown in Figure 2-2.
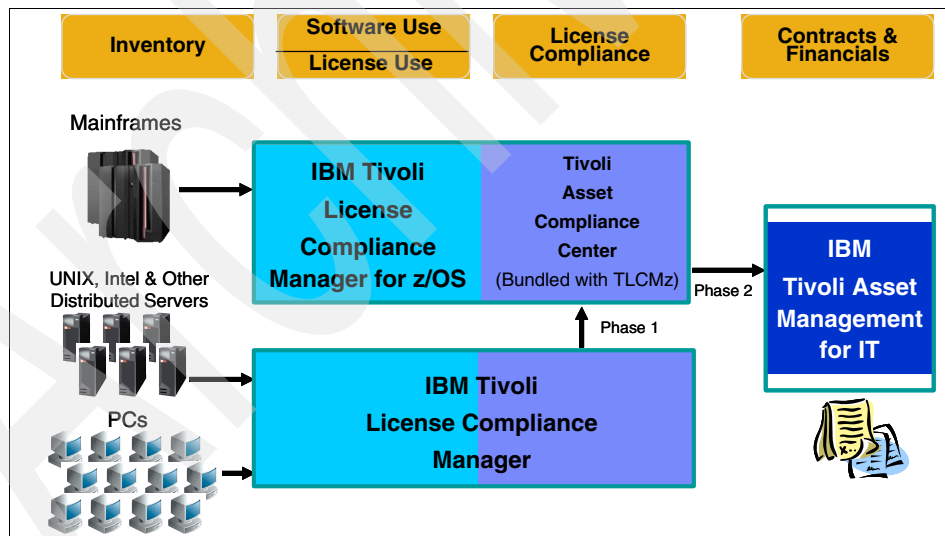
Figure 2-2   Product positioning within the solution portfolio

Note: The IBM Tivoli License Compliance Manager products not only provide software inventory, but also provide hardware inventory information.

Though product names and functions may shift overtime, the basic structure provides the solution architecture, aligned with the four basic questions (stated in Figure 2-1).

Working from left to right, it is important to first get an inventory of the assets within the enterprise. The IBM Tivoli License Compliance Manager for z/OS and IBM Tivoli License Compliance Manager products provide the ability to identify the software that is currently installed in the z/OS and distributed environments. The next phase is to look at usage information to see what software is actually being used and to map that to license information. License compliance can then be determined as well as identifying areas where you may be over licensed. Finally, all of this information must be reconciled with the contracts and other financial aspects of the business. The IBM Tivoli Asset Management for IT product provide a rich set of capabilities including:

► Procurement
► Financial Management
► Contract Management

More information on the capabilities of the Tivoli License Compliance Manager products and IBM Tivoli Asset Management for IT products will be provided in the next part of this book.

2.2 Tivoli Asset Management for IT product

In order to implement a Software Asset Management policy, the supporting tools must be flexible and comprehensive enough to model a wide variety of license contracts. This flexibility is critical to ensure compliance and provide the capabilities necessary to proactively manage the deployed software portfolio. Tivoli Asset Management for IT product is one of the most configurable, process-driven solutions on the market, with deep IT AM functionality including:

► Asset Management

– Including hardware and software contracts, terms and conditions, and financials
– Manage software licenses and associated financial information
– Identification of installed software and usage
– Identification of installed hardware

► License Optimization

– Identification of opportunities to consolidate or renegotiate licenses
– Cost reduction through elimination of unneeded software

- Compliance Management
  - Identification and elimination of compliance problems prior to a vendor audit
  - Identification of installed software that is unlicensed or unauthorized
- Planning for Upgrades
  - Analysis of software for a hardware upgrade
  - Determining additional license cost for increased capacity

Contract management

This includes tracking and management of contract-associated costs (including cost allocations to financial centers and so on) and terms and conditions of usage associated with the contract. Tivoli Asset Management for IT acts as the fundamental point of reference for all users of the system and defines the duration of the contract, the parties involved, and the ability to proactively manage the re-negotiation process. This capability gives the purchasing function the information they need to be able to negotiate the best possible commercial terms.

The contract management module underpins the entire system and is used to track and manage overriding contracts. The contracts module will proactively monitor contract usage and will automatically initiate workflow when contract thresholds are approached. The solution will also monitor contract expiration dates and ensure that the relevant purchasing personnel are notified in with enough lead time to be able to renegotiate terms when the contract is due for renewal.

Inventory management

A virtual storeroom for unused software licenses and automatic re-order levels enables the Tivoli Asset Management for IT user to handle complex software license transactions including upgrades, software bundles (productivity suites and such), exchanges and re-issues. Inventory management allows users to maintain a virtual stockroom of uninstalled software licenses. This better practice approach creates what are called software pools and allows for the management of all deployed (installed) and not deployed software licenses. Procedures for booking items in and out of the store are included within the solution, and these could be integrated with software distribution tools if required. Furthermore, the inventory management module allows for financial management of software licenses as well. When a software license is "issued", a GL transaction record (credit/debit) is created. In this fashion, charge backs and internal billing can be managed to ensure proper cost allocations are assigned to business units, regional offices, departments, or users.

Cost tracking/cross-charges/charge backs

The primary driver for the majority of Software Asset Management initiatives is financial. Because of this, Tivoli Asset Management for IT is designed to track and allocate costs accurately in accordance with the organizations financial system and policies.

Request management and self service

An investment in a central software asset repository will not deliver the level of returns expected unless it is being continuously used and updated. Tivoli Asset Management for IT's request management functionality enables employees to request software, and provides the ability to review requests, approve and manage them in a consistent and efficient manner.

Procurement/Purchasing

The Procurement capabilities of Tivoli Asset Management for IT enable the full procurement process: purchase requisition, purchase order, receipt inspection, and final receipt/asset registration, to be managed and controlled. As a result, all purchasing steps required to fulfill a change management event (purchase of a new software license) can also be monitored and reported on. User definable purchasing permissions can be configured to ensure that corporate policies regarding approval are enforced automatically, minimizing the amount of manual intervention necessary to move requests through the system. Furthermore, Tivoli Asset Management for IT can be integrated with ERP purchasing modules and/or external e-commerce marketplaces for automated ordering.

2.3 Tivoli products implementing solution

Today, more than ever before, an enterprise must have an integrated IT asset management solution focused on the total asset management practice. Several products exist to serve the IT asset management professional. They are described briefly in the following sections.

2.3.1 Tivoli License Compliance Manager (TLCM)

Often, software products do not provide technical support for License

Management activities, leaving product License Compliance Management completely in the hands of the organizations buying those products.

The Tivoli License Compliance Manager provides software inventory, use metering, and license allocation services on Windows®, UNIX®, and OS/400® platforms. As an IBM solution for collecting data on distributed platforms, it can

be scaled to meet the needs of large and small organizations, and support the management of multiple organizations. Information about installed software and software use is collected from monitored computers by an agent that can be deployed on a range of Windows and UNIX platforms and is reconciled with license and contract information that you define. Information is stored in a central IBM DB2® database and can be accessed using a Web user interface.

2.3.2 Tivoli License Compliance Manager for z/OS (TLCMz)

In similar fashion to TLCM for the distributed platform, Tivoli License Compliance Manager for z/OS (TLCMz) identifies software inventory, measures use activity, and automatically links license entitlements to help manage software costs and license compliance in the mainframe environment. This Software Asset Management solution enables IT to align software spending with business priorities. With the information provided, organizations can reduce unnecessary software costs and compliance risk to allocate additional resources to priority projects.

The linked software inventory, use activity, and license entitlement information provided by Tivoli License Compliance Manager for z/OS enables IT to:

► Proactively manage and verify license compliance

► Identify software inventory with no or low use activity to reduce unnecessary license fees

► Monitor software use trends to plan financially optimal capacity upgrades and server consolidations

► Report on the MIPS capacity of each LPAR under which software is running

► Effectively prepare for contract negations and audits with key information

► Plan the migration off old version and duplicate function software

► Enhance the charge-back process by allocating the expensive low use software to the appropriate department

► Improve Disaster Recovery planning with software use activity information

Tivoli License Compliance Manager for z/OS solves three major information challenges needed for effective mainframe Software Asset Management:

► Identifies software inventory

► Measures product use activity by LPAR

► Automatically Links license entitlements to installed inventory and use activity

2.3.3 Tivoli Asset Compliance Center (TACC)

The Tivoli Asset Compliance Center component of IBM Tivoli License Compliance Manager for z/OS provides a comprehensive user interface to work with the output of TLCMz. This interface features a convenient, easily customizable layout of panes that display information for you to use the product effectively. It provides fields in which you can enter information, search for data, and perform other tasks. The GUI offers two views:

1. Asset Compliance perspective, which helps you efficiently view and manage licenses, discovered hardware, and discovered software. The Asset Compliance perspective gives you one place to go to manage all of your IT assets. You can track hardware, software, and licenses across your environment. You can also find opportunities for underused software, ensuring that your organization is obtaining the maximum benefit from existing software licenses.

2. Administration perspective, which enables an administrator to establish and control user access to licenses, software inventories, and other business objects. With the Administration perspective, you can easily define domains, roles, groups, and users, efficiently ensuring that the right people have access to the data they need.

2.3.4 Integration with the Tivoli Asset Management for IT product

An integration plan has been established that integrates all of the above mentioned components into a single GUI. By the time you read this book, it is likely that these plans will have been accomplished.

This phased approach will integrate TLCM v 2.3 into the Tivoli Asset Compliance Center (TACC). Since inventory and license information is already contained within the TACC, this will provide Software Asset Managers with an end-to-end view of mainframe and distributed platforms for inventory and license compliance.

The second phase will be to automatically import License information from TACC into the Tivoli Asset Manager for IT, thus enabling those licenses to be associated to contracts. Software Asset Managers may now use the Web-based Tivoli AM for IT GUI and the TACC GUI hand in hand to drill down to software and license use information for specific contracts and licenses. Additionally, mainframe hardware inventory data will be imported into Tivoli AM for IT via the TACC to perform hardware asset management and invoice validation.

The final phase of the Tivoli IT AM integration strategy will provide the following key functionality in a single GUI:

► Contract Management

- ► License Management
- ► Procurement
- ► Hardware Asset Management
- ► License Compliance
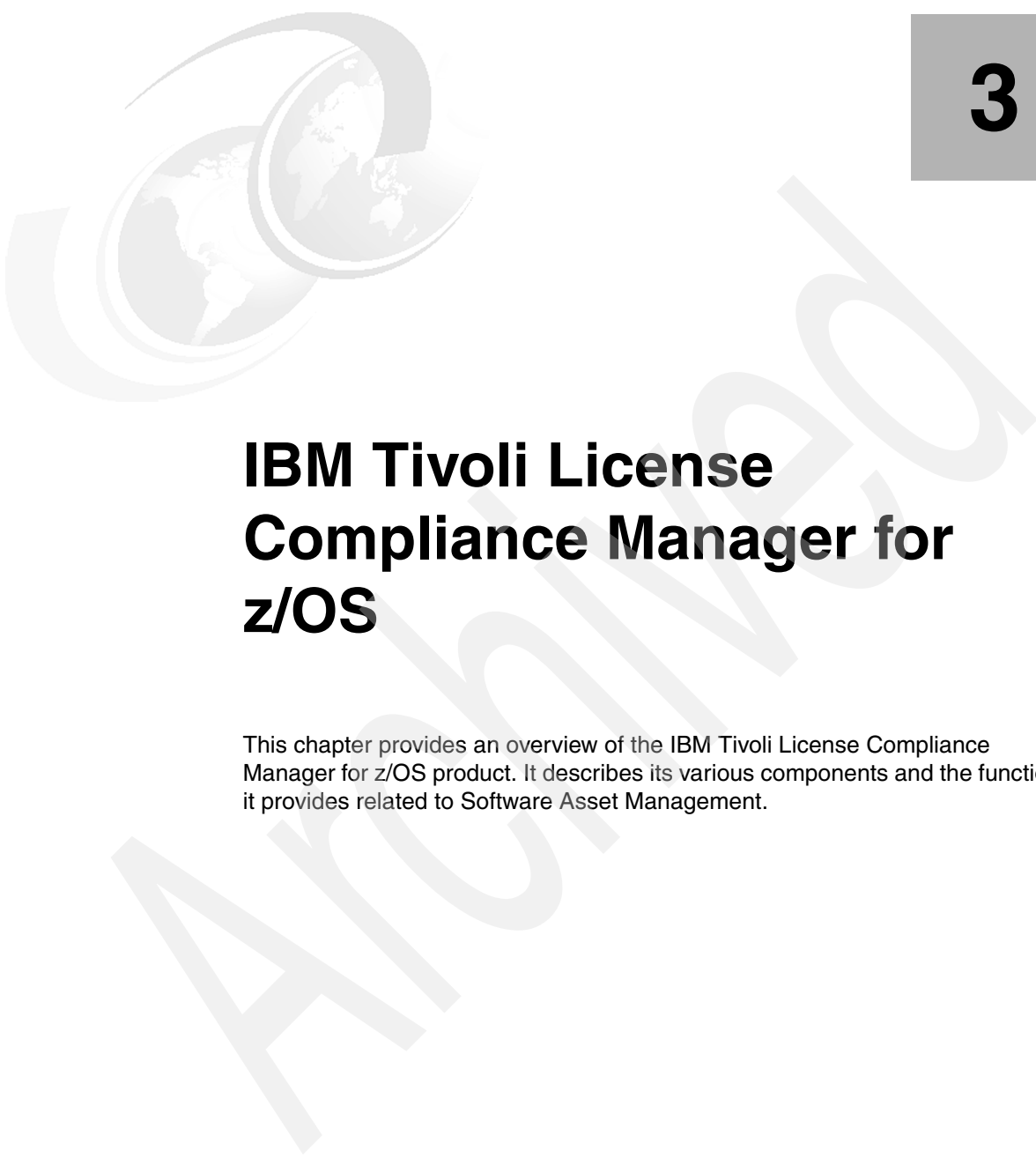
IBM Tivoli Asset Management for IT Portfolio products

3

IBM Tivoli License Compliance Manager for z/OS

This chapter provides an overview of the IBM Tivoli License Compliance Manager for z/OS product. It describes its various components and the functions it provides related to Software Asset Management.

33

3.1 Introduction

IBM Tivoli License Compliance Manager for z/OS is a product that allows the storage, search, retrieval, and manipulation of software and license information, as well as basic hardware inventory, software inventory, product information, and license usage information. IBM Tivoli License Compliance Manager for z/OS also can import hardware, software, and license usage data from other sources. When license, inventory, and usage information is available, you can perform software compliance and cost optimization functions.

Components on z/OS mainframes

The z/OS components include the Surveyor, Identifier, Exporter, and the Reporter. These z/OS components are traditional batch application programs, which run as needed by submitting batch jobs manually or by using a job scheduling facility.

In addition to the preceding z/OS programs that run as needed, the Monitor program normally runs all the time. The Monitor program collects detailed information about the use of various application modules. This detailed use data is stored, and periodically combined with data from the Identifier program. The data can then be processed by the Reporter program or the Exporter program to create printed inventory and use reports, or to create data files that can then be processed by unique, customer-created programs.

Typically within a data center, multiple independent or connected mainframes each run several instances of z/OS using hardware partitioning and virtualization techniques. Within each such instance of z/OS, the Monitor usually runs and the various IBM Tivoli License Compliance Manager for z/OS programs run as batch jobs within each z/OS instance.

The z/OS programs do not have any graphical user interfaces. The administrators submit the batch jobs to the z/OS operating system and the programs interact only with the data that the programs produce and report on. To provide the administrators with a consolidated view of the software inventory and use, the data from the various z/OS instances must be collected and brought together into one repository. Figure 3-2 on page 37 represents the major components of the product. Throughout this chapter we describe these components and the functions they provide.

The software product inventory data produced by the Identifier and the use data produced by the Monitor is used by the Distiller® component to produce an XML output file for the Data Aggregation server on the Tivoli License Compliance Manager for zOS distributed component.

Distiller files include Software Inventory and Use - a daily summary of the product use.

Components on distributed systems

While the software inventory and use information provides considerable value on its own, the real value comes when the use information is combined with software license information. This combined data allows the administrator to not only understand what software is being used, but also whether the software use is within the terms and conditions of its governing license agreement.

The Asset Management server, Data Aggregation server, and the Tivoli Asset Compliance Center are distributed components of IBM Tivoli License Compliance Manager for z/OS and run on Windows or Linux® operating systems.

The distributed component of the IBM Tivoli License Compliance Manager for z/OS provides a view of use information and software license information using the Asset Management server component and the IBM Tivoli Asset Compliance Center component, which has a graphical user interface and acts as the client.In addition, the Data Aggregation server component provides the vital function of aggregating data from multiple z/OS systems into one consolidated set of data. When this data is combined with the license information contained within the Asset Management server, the administrator has the full picture of software inventory and use, combined with software license information, and information about possible unlicensed software use.

Data Aggregation server

The Data Aggregation server is a WebSphere®-based server application that receives all Distiller XML files, aggregates the data, and calculates license use data (based on the software inventory and use data from the Distiller files and output from the Sub-Capacity Reporting Tool [SCRT]), combined with license and topology data obtained from the Asset Management server. The output of the Data Aggregation server is transferred to the Asset Management server for storage and for use in license compliance calculations.

There is one Data Aggregation Server; however the Asset Management Server and the Data Aggregation Server can also be stored together on a single machine.

Asset Management server

A WebSphere-based server application that manages software and hardware inventory and use data, together with license inventory and use. It also performs license compliance calculations. The data is stored in a DB2 database.

There is one Asset Management Server; however the Asset Management server and the Data Aggregation Server can also be stored together on a single machine.

Tivoli Asset Compliance Center

The Tivoli Asset Compliance Center is a graphical user interface (GUI)-based component that provides support for viewing of hardware and software inventory, software use, and license use information. This component enables you to create and update licensing and inventory data through a graphical interface. It interacts with the Asset Management server, and it replaces Spotlight+, which was included in earlier versions of IBM Tivoli License Compliance Manager for z/OS.
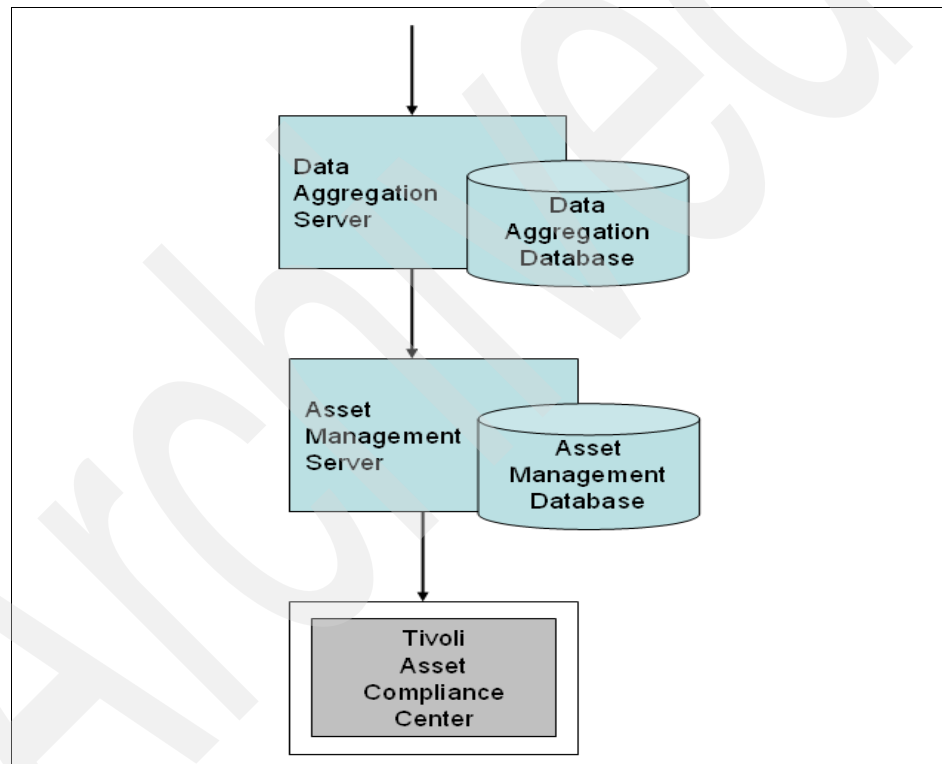
Figure 3-1   Components of TLCM for zOS on distributed systems

The distributed server components include servlets, business and data layers, import service, reporting, and databases. The installation for the distributed server offers the following components:

► Asset Management server
► Asset Management database

- Data Aggregation server
- Data Aggregation database

The installation for the distributed client offers the following components:

- Tivoli Asset Compliance Center (Asset Compliance perspective) - The main user interface for the client.
- Administration Console (Administration perspective of the Tivoli Asset Compliance Center). A console to manage security, administer users, and configure the application.
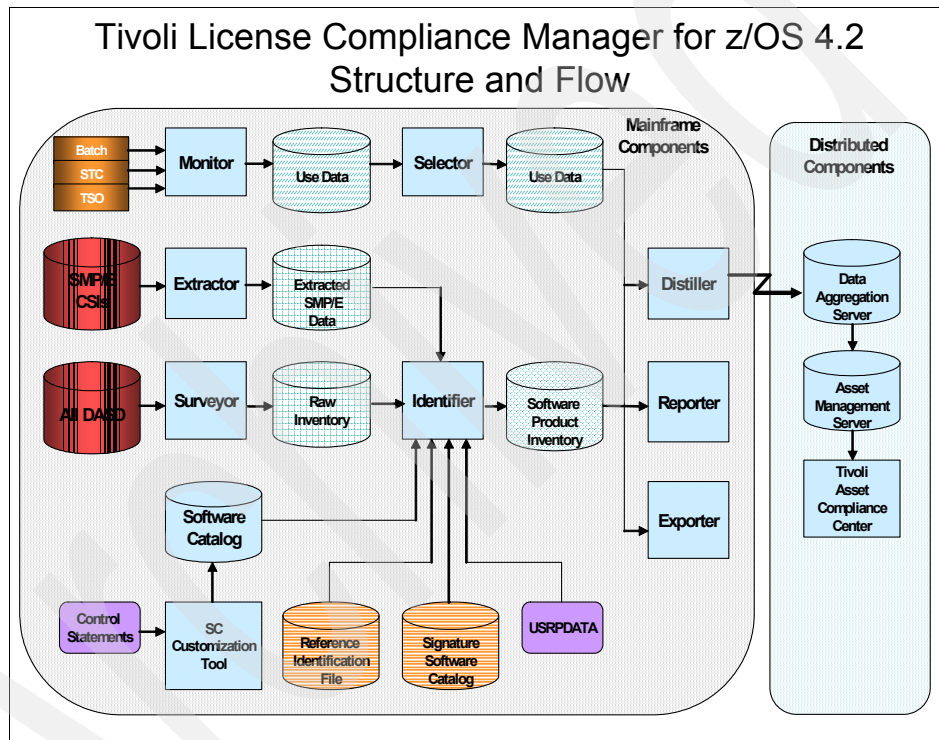
Figure 3-2   Structure and flow of Tivoli License Compliance Manager for z/OS

3.2 Collecting raw data

The two types of data that the product provides for Software Asset Management are software product data and software use data. The relationship between the software product data and the software use data is binary. That is, each type of data is of little or no value without the other. Having an inventory of software products without the use data for those products is of limited value to a Software

Asset Manager. It is illogical to have use data without matching it to a software product.

3.2.1 Taking an inventory of software data

First, we discuss collecting software inventory data. In the z/OS environment the raw software inventory data is stored in load libraries. The z/OS UNIX data is stored in UNIX directories. Additional inventory data for z/OS and z/OS UNIX software is stored in SMP/E consolidated software inventory (CSI) data sets.
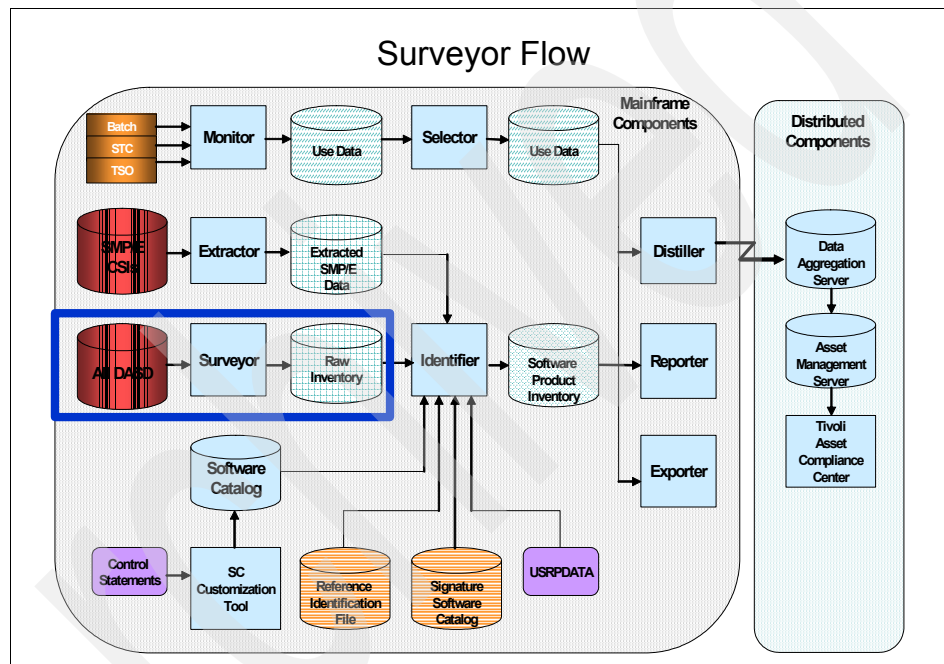
Figure 3-3   Surveyor flow

z/OS load libraries

Generally speaking, each load library on a given z/OS LPAR is defined with a unique load library name. Each load library contains load modules that provide the functions of a given software product or products. A load library can contain the set of load modules for one software product or sets of load modules for many software products.

The Surveyor component is used to gather data from the z/OS load libraries by scanning and storing data from the z/OS load libraries. The Surveyor collects the information that is required to create a software product inventory. The data that

is collected from the z/OS load libraries will be used in a downstream component of the product.

z/OS UNIX directories

The Surveyor is also used to collect data from the z/OS UNIX directories. In the z/OS UNIX environment the raw software inventory data is stored in a directory structure. A discussion of the technical differences between z/OS load libraries and z/OS UNIX directories is beyond the scope of this material. The resultant data that the Surveyor collects from z/OS UNIX directories will be used in a downstream component of Tivoli License Compliance Manager for z/OS.

SMP/E

Another form of software inventory data for z/OS and z/OS UNIX products is stored in SMP/E data sets. The software inventory data that is stored in SMP/E data sets includes product names, product versions, load module names that are attributable to a given product.
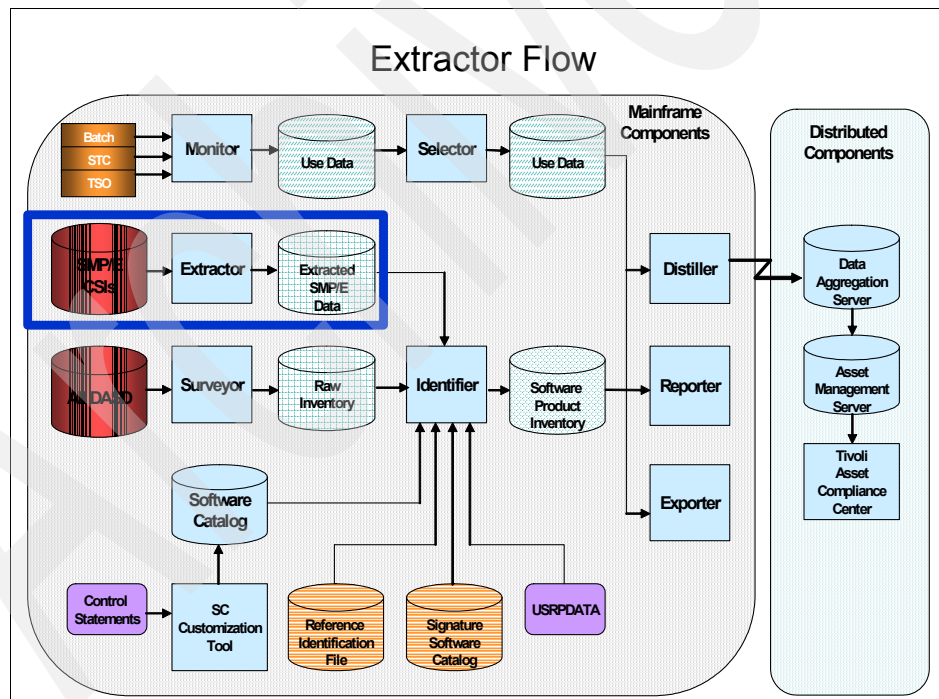
Figure 3-4   Extractor flow

The Extractor component is used to gather data from the SMP/E consolidated software inventory (CSI) data sets, by extracting and storing data from the z/OS

load libraries. The Extractor collects the information that is required to create a software product inventory. The data that is collected from the SMP/E CSIs will be used in a downstream component of the product.

3.3 Creating a software product inventory

After you have collected raw software inventory data for z/OS and z/OS UNIX using the Surveyor and Extractor components, you are ready to generate an inventory of software products.

3.3.1 Identifying products

The Identifier component is used to generate a software product inventory. The Identifier uses three sets of data as input to generate a software product inventory:

► The raw software data collected by the Surveyor
► The CSI data collected by the Extractor
► The Software Catalog
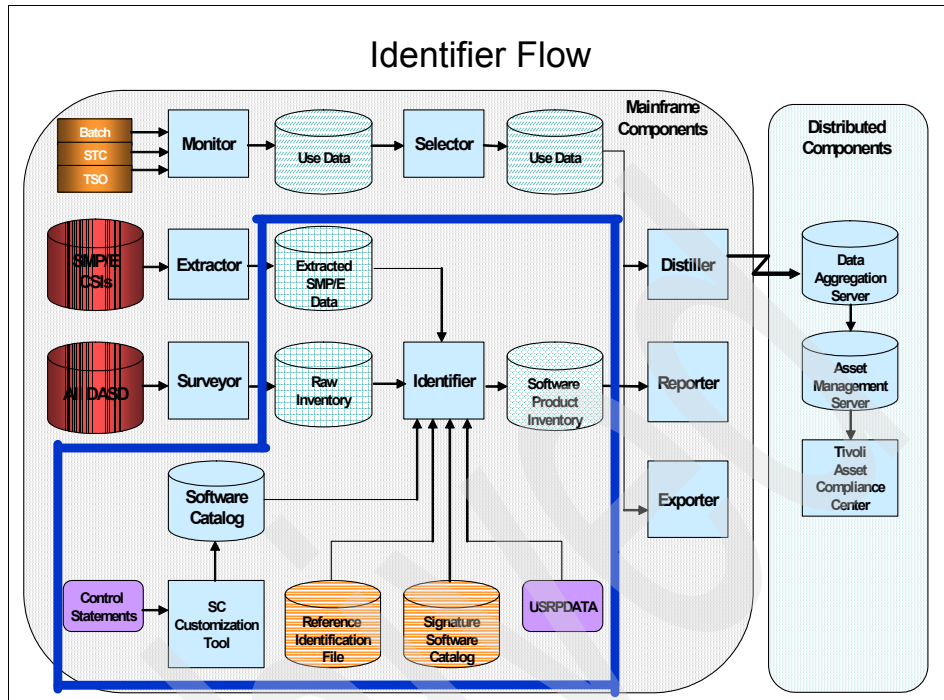
Figure 3-5   Identifier flow

Software catalog

The Software Catalog (called the Knowledge Base in the previous version of the IBM Tivoli License Compliance Manager for z/OS) is a proprietary database containing information used to associate objects discovered by the Surveyor with software products. Contents of the Software Catalog include:

- ▶ Vendor information (Vendor Name, Vendor ID, and so on)

- ▶ Product information (Product Name, Product ID, Vendor ID)

- ▶ FMID to Product ID mapping table (for use with data extracted from SMP/E)

IBM Software Catalog is constantly updated with new and changed products and vendors, and is released quarterly to customers.

The Identifier uses a set of algorithms to compare the raw software data to the contents of the Software Catalog to produce a software product inventory. This raw software data is used to generate a file of installed software products that includes the vendor name, the fully qualified product name, and the version of the product.

The Identifier produces a data set and a report that contains all of the installed software products. The data set contains names of the z/OS load libraries and z/OS UNIX directories where the product was discovered.

New editions of the Software Catalog are made available four times a year. The product definitions that are contained in the Software Catalog represent the profiles of software products at a point in time. That is, various elements contained in the Software Catalog will become superseded or replaced. This is because software products are not static. For example, product names change, new versions of products become available, vendors acquire and divest software products, and new load module names attributed to a software product.

There are four optional data sets that you can include in an Identifier run to further adjust, enhance, and influence product identification to achieve your goals:

► User product data (USRPDATA)
► Software customization tool (SCCUT)
► Reference identification file (RIF)
► Signature Software Catalog

User product data (USRPDATA)

Since new editions of the Software Catalog are made available approximately every calendar quarter, there may be instances when you need to adjust various elements that define the individual software products that are not yet contained in your edition of Software Catalog. You may want to modify various elements of the software products contained in the Software Catalog to conform to your local tracking and licensing of software products. The Software Catalog contains definitions of commercially available software products. You may have the need to have the License Compliance Manager for z/OS track internally developed applications and utilities.

The user product data (USRPDATA) statements provide you with the mechanism to make adjustments to product identification. The USRPDATA statements enable you adjust and influence software product identification to fit your enterprise requirements. Some of the adjustments that you can make to product identification include:

► Define new products not contained in the Software Catalog
► Change the external name of software products
► Attribute a software product to a different vendor
► Define locally developed applications and utilities

To use the facility to influence product identification, you include the appropriate USRPDATA statements that you develop in the particular run of the Identifier.

There are some things to consider when using USRPDATA statements to influence product identification:

► The USRPDATA statements do not alter the contents of the Software Catalog.

► The changes that you make using USRPDATA statements are contained only in the output from the Identifier - the Identifier data set and the Identifier report.

► You run as many iterations of the Identifier using the USRPDATA statements as necessary to achieve your product identification goal.

Software Customization Tool (SCCUT)

Another option that is available to you to adjust and influence software product identification, is the Software Customization Tool (SCCUT). SCCUT enables you to change product identification in much the same way as USRPDATA with one major difference - SCCUT applies your changes to the Software Catalog. The input statements to SCCUT are similar in format and content to USRPDATA statements. The SCCUT component provides you with a safeguard by generating a copy of the Software Catalog. The end result of an SCCUT run is a Software Catalog that contains your changes defined by the SCCUT statements, a copy of the Software Catalog without your changes, and a report detailing your changes. The theory for and reasons why to use USRPDATA and SCCUT are the same, the difference is that SCCUT applies permanent changes to a copy of the Software Catalog.

Reference identification file (RIF)

Many enterprises choose to centrally install software on a base system and then roll out or clone the base system to deploy the software on subordinate systems. This process results in effectively replicating the same set of base system software on all of the subordinate systems. When the Identifier has identified a set of modules in one library as belonging to a particular product-version-release, that identification is available for reference in the identification of the same set of modules in other libraries. Use of the reference identification file (RIF) will help ensure consistent software product identification across the enterprise.

Signature Software Catalog

The Software Catalog contains several releases/versions of products with their modules and module signatures. It is used to perform version identification.

3.4 Capturing software use data

The capturing and reporting of the use of software is critical to the discipline of Software Asset Management. The collection of software use data must be comprehensive. It must include the use of product in the batch environment, the interactive (TSO) environment, and the many system tasks that are used to manage and control subsystems. The collection of software use data must also be vendor neutral. That is, software use data must be captured irrespective of the vendor of the software.
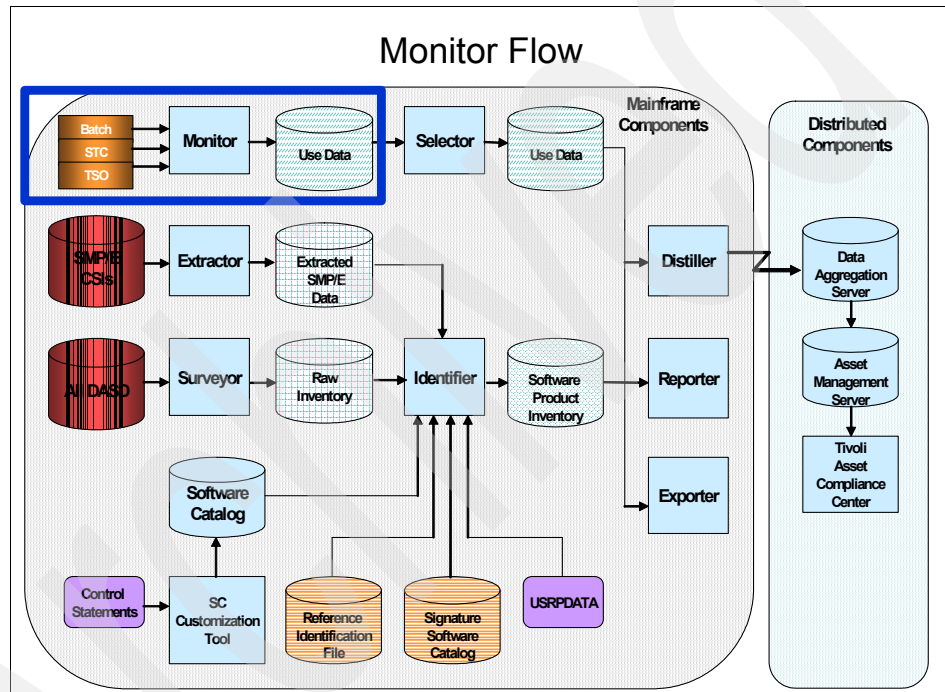

Figure 3-6   Monitor flow

The Monitor collects software use activity data within the z/OS logical partition (LPAR) in which it is running. The Monitor must run as a started task in each LPAR where use activity must be captured. It captures information about each of the three types of z/OS work.

► Batch jobs (JOB)
► TSO sessions (TSO)
► Started tasks (STC)

Software use recording of z/OS work is activated when the following z/OS supervisor calls (SVCs) are detected within the LPAR where the Monitor is running.

- ► Load
- ► Link
- ► Attach
- ► Transfer control

The Monitor captures a comprehensive set of data points including the name of the load library that was used by the work unit - JOB, TSO, or STC.

The Monitor data is recorded in a log data set and the management of the Monitor logs is similar to the techniques used to manage system management facility (SMF) data.

Periodically, the use data that is collected by the Monitor is moved into a Monitor log accumulation data set. This data set represents a continuous log of use data and it can reside on a device type appropriate to your environment - DASD, tape, virtual tape.

The Monitor simply records software use data as z/OS work is initiated and processed in the LPAR. The task of identifying software products would add significant overhead to the Monitor. Identifying software products and building the software product inventory is done by the Identifier component. The accumulated use data set does not contain product or vendor specific information. You will combine the accumulated use data with the software product inventory that you generated using the Identifier.

3.5 Generating reports

The following sections describe the components and process for generating reports based on use data and software product inventory data.

3.5.1 Generating data for the distributed component of the License Compliance for z/OS

We have generated software product inventory and we have collected software use data. We now need to combine the software product inventory data with the software use activity data. At this point we have two files of unrelated data:

- ► The software product inventory produced by the Identifier.
- ► The software use activity data that is collected by the Monitor.

We use the Distiller to combine these two files into a software use file. The Distiller can combine the two files using the z/OS load library name. The Distiller uses the z/OS load library name that is contained in the software product inventory data and use activity data, as the linkage. The output of the Distiller is a file in extended markup language (XML) format. We now have a file that contains the use information for specific products that are contained in the software product inventory file.
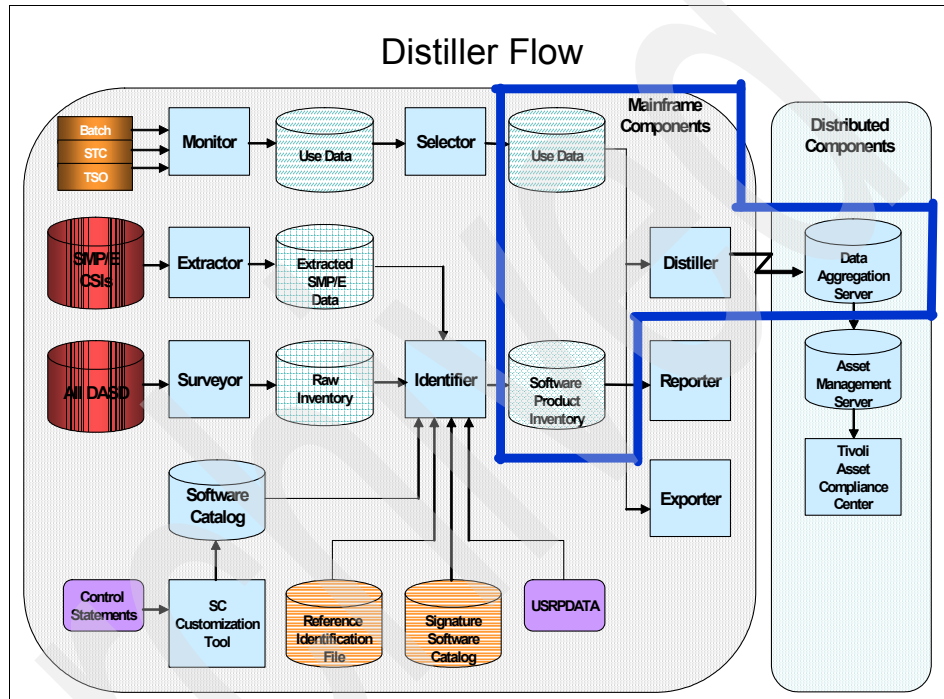
Figure 3-7   Distiller flow

We will then import the XML output of the Distiller into the Tivoli Asset Compliance Center.

3.5.2 Mainframe server based reports

You use the Reporter component of the product to produce mainframe-based reports about software product inventory and software use.
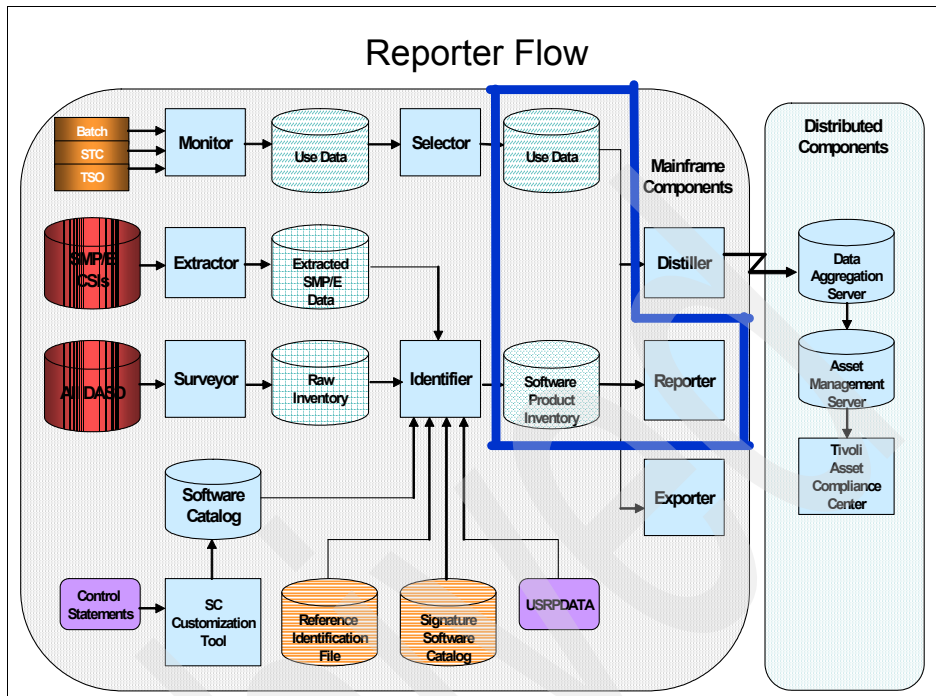
Figure 3-8   Reporter flow

The Reporter uses the software product inventory data produced by the Identifier and the software use data that is collected by the Monitor to produce reports. The Reporter provides a number of reports on software product inventory only and software produce use. All of the available reports are parameter-driven.

3.5.3 Exporting data to other tools and programs

The Exporter is used to export the software product inventory and software use data.
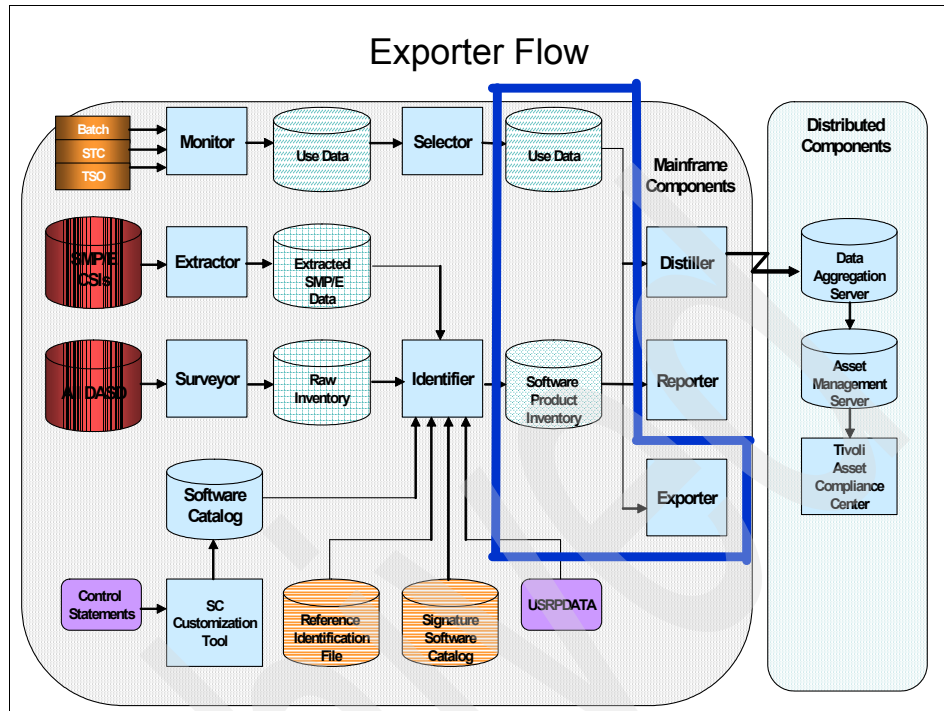
Figure 3-9   Exporter flow

The Exporter uses the software product inventory data produced by the Identifier and the software use data that is collected by the Monitor to produce sequential data sets that you can use with analysis tools and reporting programs. You can use the Exporter to produce sequential data sets or data sets in system management facility (SMF) format. You can process the sequential data sets that are produced by the Exporter within the mainframe environment or convert them to files that are suitable for processing in your distributed environment.

3.5.4 Managing software use data from the Monitor

You use the Selector to manage use data after it is collected by the Monitor. Since the Monitor sees every unit of work that is executed in each LPAR, the volume of the use data can quickly accumulate.
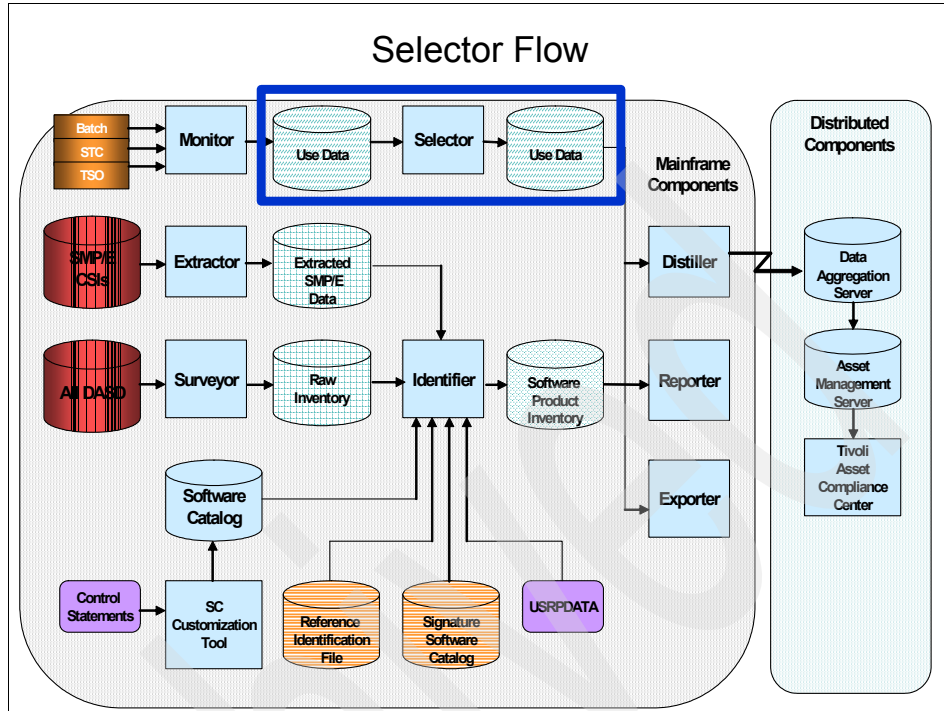
Figure 3-10   Selector flow

For example, an enterprise may have the Monitor running in 30 LPARs, for 24 hours, seven days a week. Many of those LPARs have significant batch loads, while other have a large number of TSO user sessions that start and stop during the Monitor collection period. The Selector is used in this example to reduce the volume of software use data by filtering out unneeded or unwanted software use records.

You will also use the Selector to filter out unwanted software data from the Distiller process so that extraneous data does not appear in the distributed component of the IBM Tivoli License Compliance Manager for z/OS.

3.6 Sub-Capacity Reporting Tool

The Sub-capacity Reporting Tool (SCRT) is a no-charge IBM tool that reports required license capacity for sub-capacity eligible products that run on z/OS, z/OS.e or z/TPF. The Sub-capacity Reporting Tool is not required to use the License Compliance Manager for z/OS product. However, if you are using the

Sub-capacity Reporting Tool, you can import the data that it generates into the distributed component of the LIcense Compliance Manager for z/OS product.

3.7 Tivoli Asset Compliance Center
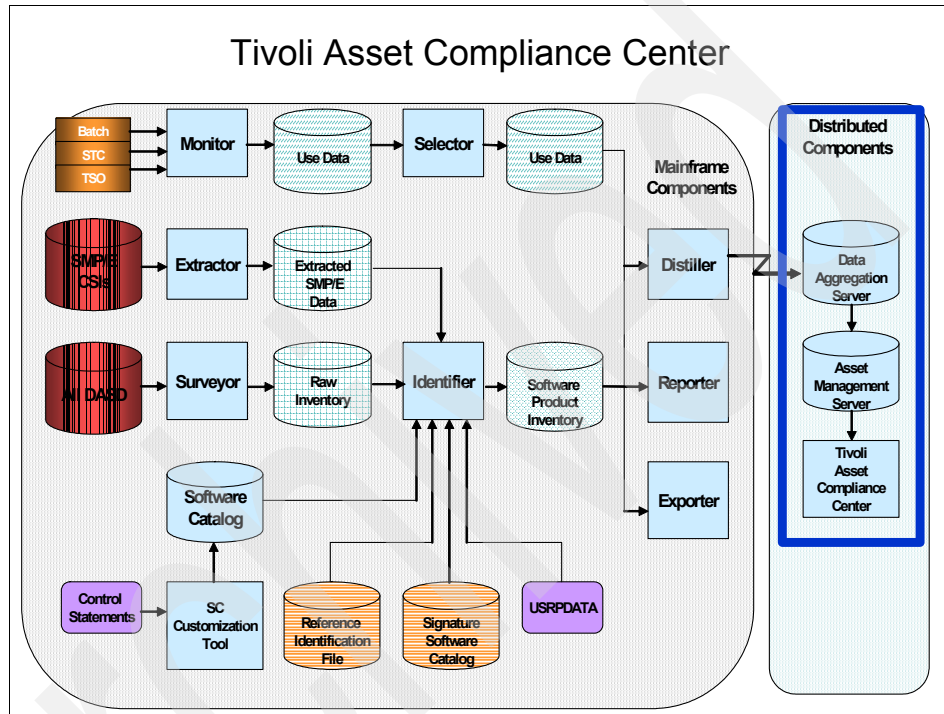
Figure 3-11   Tivoli Asset Compliance Center flow

The Data Aggregation server accepts Distiller files and data generated by the Sub-Capacity Reporting Tool (SCRT), containing software usage information for applications licensed under sub-capacity-based pricing terms. This data, too, is combined with license information, and is made part of what is presented to the client.

Once the data (whether Distiller XML data or SCRT data) is available on the Data Aggregation server machine, it must be imported into the Data Aggregation server itself.

The Data Aggregation server will process the imported data files on an ongoing basis. Periodically, processed data must be extracted from the Data Aggregation server and made available to the asset management server.

For most data, the flow is as described: from the Distiller to the Data Aggregation server; from the Data Aggregation server to the Asset Management server. However, before the Data Aggregation server performs its periodic compliance processing it first connects to the Asset Management server to obtain the current set of license information together with some topology information (installed machines, for example). This data transfer is automatic, once the communication parameters have been configured (this is usually done as part of the server installation processes).

3.7.1 Administering and using the Tivoli Asset Compliance Center

The Administration perspective provides the administrator with the functions to define and manage:

- Users
- Groups
- Roles
- Domains
- Locations
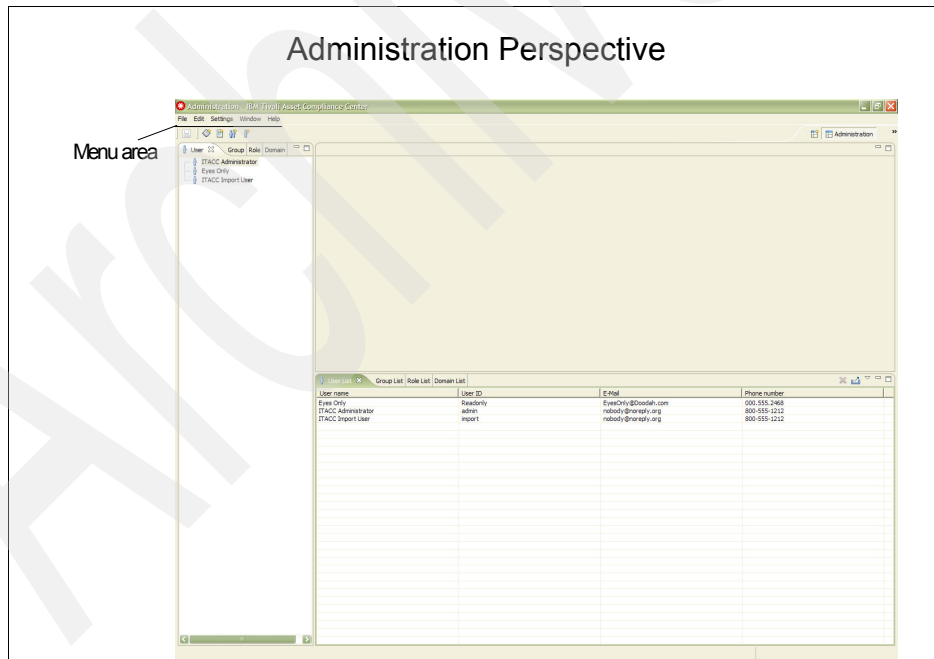
Figure 3-12   Administrative perspective

The administration perspective is used to import:

- ► Distiller files
- ► SCRT files

3.7.2 Using Tivoli Asset Compliance Center to manage software assets

The asset compliance perspective provides the Software Asset Manager administrator with the functions to:

- ► Create and manage business objects
- ► Work with activities
- ► Work with software licenses
- ► Search for and filter data
- ► Run reports
- ► Export information

3.8 Summary

The Tivoli License Compliance Manager for z/OS product is composed of the mainframe components and the distributed components.

The mainframe components of the product provide:

- ► The Surveyor and Extractor programs to take the raw physical data that represents your installed software.

- ► The Identifier to produce an inventory of installed software products using the raw physical data.

- ► The Monitor to collect software use data in the LPARs in which you are interested.

- ► The Distiller component that enables you to generate files that can be imported into the distributed component of the product.

- ► The Reporter, Exporter, and the Selector components produce mainframe reports, export data, and manage software use data.

The distributed components of the product provide:

The graphical user interface (GUI) view of your z/OS software product inventory.

- ► Import data generated by Distiller component.
- ► Optionally import data generated by SCRT.
- ► Manage licenses compliance for those products.

- Produce reports and export information.
- The activities perform the other tasks of Software Asset Management.

IBM Tivoli License Compliance Manager

This chapter provides an overview of ITLCM including its architecture.

4.1 ITLCM overview

IBM Tivoli License Compliance Manager provides the basis for implementing infrastructure and processes required for effective management, control and protection of the software assets within an organization throughout the software assets' life cycles.

IBM Tivoli License Compliance Manager (ITLCM) provides mechanisms to collect, monitor and report Software inventory and usage information to allow companies to keep compliance with regulations and governance, eliminating compliance risks on business operations and allows management and optimization of software costs.

IBM Tivoli License Compliance Manager is intended to be used to enforce implementation of corporate and regional policies through Inventory (discovery), monitoring, measuring and reporting of software installation and usage according to many distinct licensing models and policies.

IBM Tivoli License Compliance Manager provides flexible reporting capabilities to ease tracking of authorized versus installed or in-use software, supporting business decision making and optimization of software costs.

Software cost optimization is achieved by:

► Identifying under-utilized software - Contracts should be renegotiated with providers

► Unused software - Immediate Cost avoidance by removing unused software products

► Over-utilized software (out-of-compliance) - software usage exceeding the contracted, terms and usage conditions may require acquisition of additional licenses or reduction of level of usage

Often, software products do not provide technical support for license management activities, leaving product license management completely in the hands of the organizations buying those products.

IBM Tivoli License Compliance Manager provides software inventory, use metering, and license allocation services on Windows, UNIX, Linux and i5/OS® platforms. It can be scaled to meet the needs of large and small organizations, and supports the management of multiple organizations.

Software inventory and software usage information are collected from monitored computers by a software component (agent) and are reconciled with license terms information stored in a central IBM DB2 repository. These data and pre-configured reports can be accessed through a browser-based user interface.

IBM Tivoli License Compliance Manager provides the following main functions:

► Detection of installed software

The detection and collection of installed software is performed using the Common Inventory Technology (CIT) module. This software component is also used by other IBM Tivoli products for software recognition. The use of CIT enables scan results to be shared between Tivoli products, reducing the impact of multiple Tivoli applications running on the same system.

IBM Tivoli License Compliance Manager's capability to recognize software is mainly based on a catalog of software signatures. IBM provides such a catalog, which includes product information for a wide range of IBM and non-IBM native and Java™ applications. While IBM provides regular updates to this catalog to ensure that the most well-known software in the software marketplace is available, you could extend this catalog to include your own information for detecting in-house software, for example, or you can customize your own software catalog to meet your business needs.

► Software usage monitoring and metering

The IBM Tivoli License Compliance Manager agent is able to detect the starting and stopping of software installed on the system.

IBM Tivoli License Compliance Manager allows the administrator to identify the level, number of users or processors, and duration of use of a product. It is important to notice that the metering unit used depends on the type of license you define for the products you want to monitor.

► Control of license agreement terms information

In order to reconcile software usage and installation with the license agreements of your software. IBM Tivoli License Compliance Manager also supports use of electronic entitlement files.

IBM Tivoli License Compliance Manager offers the ability to define and record and manage licenses and terms or use information.

This includes information about the procurement of the license, and includes the license type and the license quantity. The license type identifies a set of rules that determine how the use of the license is counted, for example, by number of instances of the product installed, by number of concurrent user sessions, or by the number of processors in use.

IBM Tivoli License Compliance Manager offers the ability to manage products that share components with other applications, that is, part of a bundle, or when its licensing model depends on how and where it is used, for example, sometimes the same product has different license agreement if used as a stand-alone product or as a prerequisite software for another application.

IBM Tivoli License Compliance Manager also offers the ability to assign a license model to a different group of targets depending on whether, for example, the licenses are assigned to a single user or a group of machines.

► Reporting

IBM Tivoli License Compliance Manager includes a set of pre-configured reports for the analysis of collected installed software and software use information and its reconciliation with the licenses that have been defined for products.

4.1.1 Integrity and confidentiality of data

Tivoli License Compliance Manager provides a configurable security infrastructure that guarantees the integrity and confidentiality of data that is transmitted between the Tivoli License Compliance Manager components. It includes the following features:

► The Secure Sockets Layer (SSL) protocol

Tivoli License Compliance Manager can be configured so that communication between its components is conducted using the SSL protocol. SSL creates a secure connection from a client to a server over which any amount of data can be transmitted in a manner that guarantees the confidentiality and reliable delivery of the data.

► Server and client authentication

Integrity and confidentiality of data is further ensured by requiring the identity of the SSL server and client to be authenticated before data is transmitted. Server authentication prevents the interception of data by a bogus server, while client authentication prevents bogus clients from transmitting false data to the server and destroying the integrity of data held there.

► Encryption

Tivoli License Compliance Manager integrates cryptographic modules that are compliant with the Federal Information Processing Standard FIPS-140-2. Passwords used internally by Tivoli License Compliance Manager are encrypted using FIPS-approved cryptography algorithms. FIPS-approved modules can optionally be used for the transmission of data.

> **Note:** Federal Information Processing Standards (FIPS) are standards and guidelines issued by the National Institute of Standards and Technology (NIST) for federal government computer systems. FIPS are developed when there are compelling federal government requirements for standards, such as for security and interoperability, but when acceptable industry standards or solutions do not exist. Government agencies and financial institutions use these standards to ensure that the products conform to specified security requirements. For more information on these standards, see the National Institute of Standards and Technology Web site, at this link: http://csrc.nist.gov/publications/fips/

4.2 Objectives

IBM Tivoli License Compliance Manager (ITLCM) provides mechanisms to collect, monitor and report Software inventory and usage information to allow companies to keep compliance with regulations and governance, eliminating compliance risks on businesses operations and allows management and optimization of software costs.

IBM Tivoli License Compliance Manager is intended to be used to enforce implementation of corporate and regional policies through Inventory (discovery), monitoring, measuring and reporting of software installation and usage according to licensing models and policies.

4.3 Architecture

IBM Tivoli Asset Management for IT product and Tivoli License Compliance products correlates and provide support for Software Asset Management activities as depicted in the high level architecture shown below.
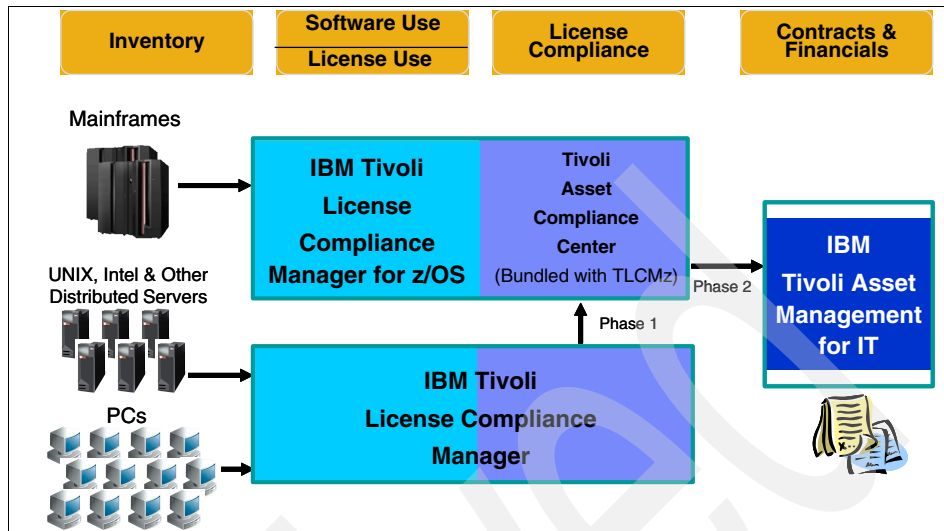
Figure 4-1   IBM Tivoli Software Asset Management

ITLCM provides inventory and use monitoring of software products within distributed systems domain and extends its capabilities on both client and server computing devices.

Tasks covered by ITLCM include:

► Controlling license allocation

► License usage metering using ITLCM agent

► Use of Tivoli Common Inventory Technology (CIT[1]) that integrates with Tivoli Configuration Manager[2] to gather inventory information of managed devices

► Monitoring and metering software usage on managed devices

► Providing reports on Installed versus used and procured licenses and also software usage trends

► Providing configurable alerting capabilities for software usage thresholds monitoring

► Management of pools of licenses by user or by machines

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[1] Tivoli Common Inventory Technology (CIT) is a technology used to collect hardware, software, file system and registry information from computing systems. CIT is intended to uniting all IBM products under a single scanning technology and is currently used by IBM Tivoli License Compliance Manager (ITLCM), IBM Tivoli Configuration Manager (ITCM), IBM Tivoli Provisioning Manager (ITPM), and IBM Tivoli Security Compliance Manager (ITSCM).

[2] Requires IBM Tivoli License Compliance Manager 2.3 and IBM Tivoli Configuration Manager 4.2.3 with Fix Pack 2 (minimum).

► Capability to manage complex products and support for logical partitioning and virtualization (Node / shared pool / LPAR / virtual machines).

IBM Tivoli License Compliance Manager V2.3 relies on IBM middleware software and uses the following software components:

► IBM DB2 Universal Database™

► IBM WebSphere Application Server

► HTTP Server (IBM HTTP Server is bundled with IBM WebSphere Application Server.)

► HTTP Server plug-in (A plug-in for IBM HTTP Server is bundled with IBM WebSphere Application Server.)

Refer to *IBM Tivoli License Compliance Manager Planning, Installation, and Configuration*, for a detailed list of software requirements for an IBM Tivoli License Compliance Manager V2.3 implementation.

4.3.1 ITLCM Infrastructure - Monitoring Components

IBM Tivoli License Compliance Manager V2.3 leverages a three-tiered architecture as shown in Figure 4-2.
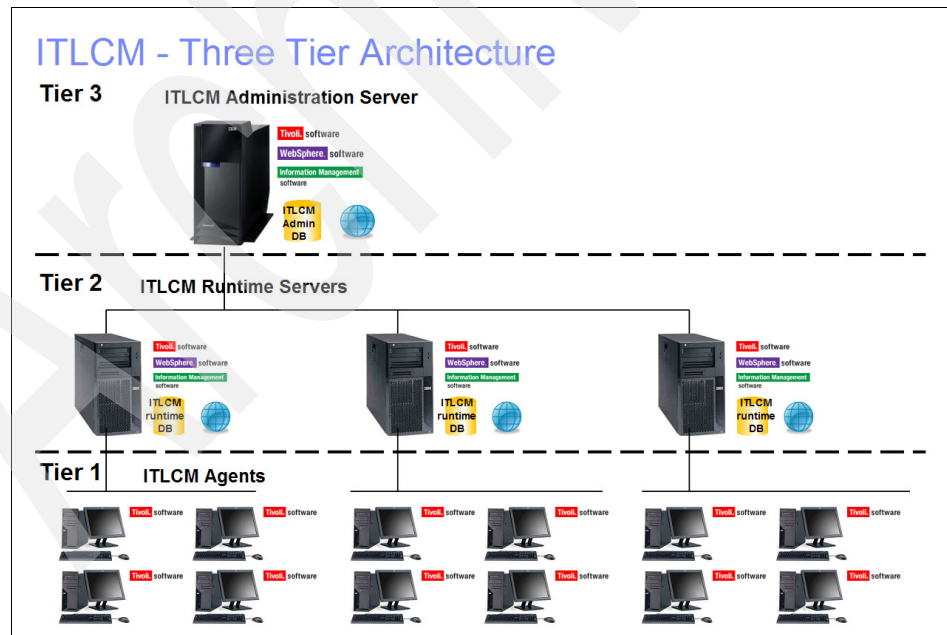

Figure 4-2   IBM Tivoli License Compliance Manager three-tier architecture

Tier 3 - **Administration Server** is an application server that contains the business logic and stores the core data for the ITLCM installation. Each Tivoli License Compliance Manager installation has a single administration server that runs on WebSphere Application Server and provides the following facilities:

► A DB2 repository of product, license agreement, license use, installed software, and organization information.

► A Web user interface from which registered users can perform license management and administration tasks and to produce historical reports of license use and inventory information over time.

► A command-line interface that you can use to import electronic entitlements, manage complex products, import data, and perform system management and problem determination tasks.

► Generation of e-mails to notify administrators about relevant events that have occurred. Users of the Web user interface have the option to receive notifications about events that are relevant to their roles.

► The capability to reconcile license information defined on the Web user interface to the software use information received from agents.Tivoli License Compliance Manager provides a flexible structure that can be adapted for large and small installations.

Tier 2 - **Runtime server** provides services for the clients. Each Tivoli License Compliance Manager installation must have at least one runtime server. The runtime server runs on WebSphere Application Server. Each runtime server provides the following facilities:

► A DB2 repository that stores information downloaded from the administration server to support agent monitoring tasks and information about products uploaded from agents. Information about products to be monitored and schedules for installed software scans is obtained from the administration server and sent to the agents at regular, configurable intervals. Information collected by agents about software installed and in use on monitored systems is uploaded from agents and sent to the administration server at regular, configurable intervals.

► Generation of e-mails to notify administrators about relevant events that have occurred on the server or its agents.

► A command-line interface that you can use to perform system management and problem determination tasks.

► A Web page from which you can deploy the agents to computers that are to be monitored.

Tier 1 - **Agents** that runs on the end-user server or workstation and performs the following functions:

- ► Performs an inventory of the software installed on the computer and forwards this information to the runtime server.

- ► Identifies software products that are active to build up information about the use of monitored software products on the monitored computer. The agent stores this information in its cache and uploads it to the runtime server at regular, configurable intervals.

- ► Collects information about software that is running on the monitored computer that is not included in the catalog of software products and adds it to a list of potential signatures. Using the catalog manager, you can process the potential signatures and link them to new or existing products.

Note: Agent functions differ on i5/OS computers. Only IBM products that have been instrumented for license tracking and J2EE™ applications can be monitored. No scan is needed to identify which products need to be monitored.
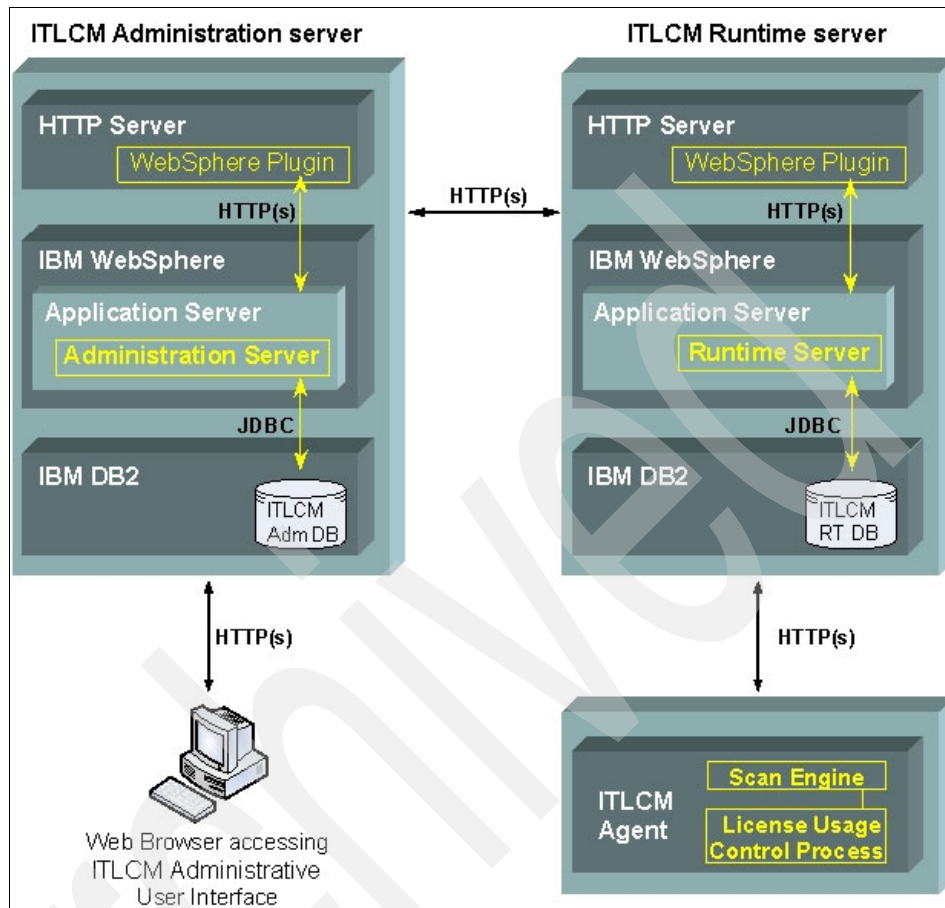
Figure 4-3   ITLCM Software Components

4.3.2 ITLCM Logical Components

This section describes the logical components of ITLCM as depicted in
Figure 4-4.

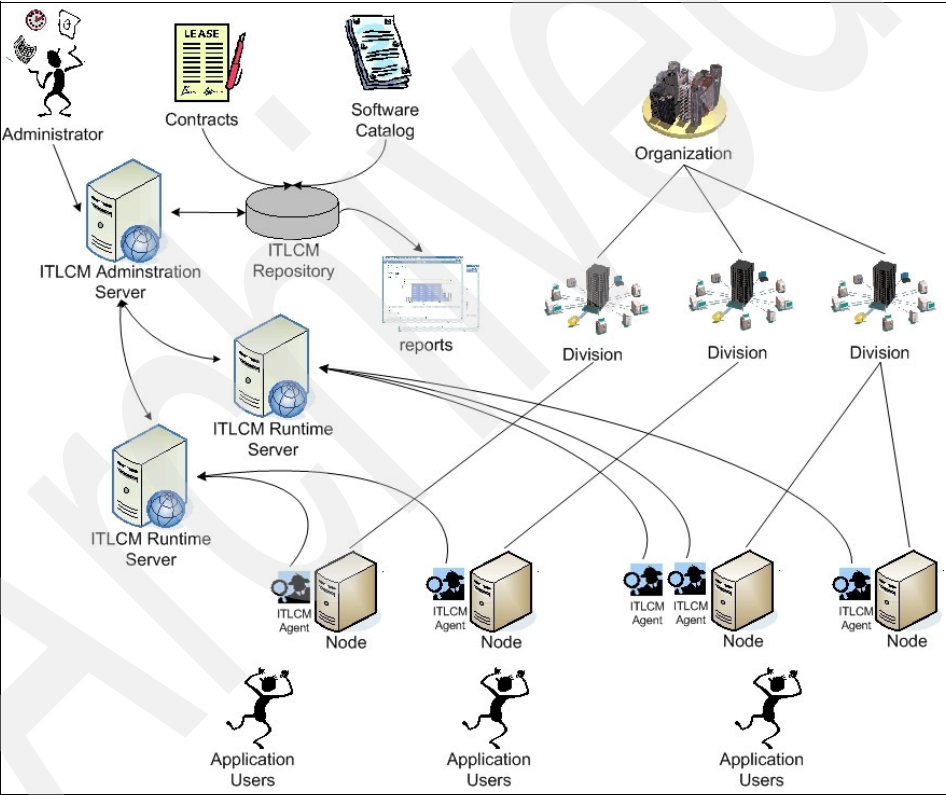| ADMIN. SERVER	ITLCM Administration Server											
ORGANIZATION	ACME_ENERGY						ACME_ENTERPRISE					
RUNTIME SERVER	RT_SRV1						RT_SRV2	RT_SRV3			RT_SRV4	
DIVISION	D001_ACC	D002_BIL	D003_SAL				D004_RES	D005_ACC	D006_BIL	D007_SAL	D008_MAN	D009_IT
NODES	NODE	NODE	NODE	NODE	NODE	NODE	NODE	NODE	NODE	NODE	NODE	NODE
AGENTS	AGENT	AGENT	AGENT	AGENT	AGENT	AGENT	AGENT	AGENT	AGENT	AGENT	AGENT	AGENT AGENT

Figure 4-4   Hierarchy of Logical components

Figure 4-5   Logical Components

Organization

An organization is the highest level in the logical design and can be served by
only one administration server. However, one administration server can serve

more than one organization. The IBM Tivoli License Compliance Management logical structure may consist of a single or multiple organizations.

Each organization owns its logical components, contracts, licenses, software usage and inventory data, reports including its physical elements: ITLCM Runtime servers, and ITLCM Agents and these components cannot be shared across organizations.

When IBM Tivoli License Compliance Manager environment is configured for management of multiple organizations, it is possible to aggregate information of those organizations using SQL queries on the administration server database. Though data of different organizations resides on the same server, the aggregated information is not made available on the pre-built reports on the administration server Web interface. For tracking of software use levels across the enterprise, only one organization should be defined, so that peak use information relates to the entire enterprise.

► Country or region- If required, the License administrator can assign a country or region identification for each Managed Organization.

Division

A division is a logical grouping of agents that may refer to an existing department, division or cost center, and this identifier should be as short and meaningful as possible. Divisions should usually reflect the organizational structure of the enterprise, respecting license management policies and requirements, taking into account geographical location, the quantity of nodes to be managed and also, consider Network topology.

At least one division must be defined per organization and each agent will subscribe to only one division.

For example: Accounting, Branches_LATAM, Branches_EMEA, Branches_US, Billing and so on.

Node

A node is a logical representation of any existing physical asset (computer workstation or server) within the organization, with or without one or more deployed agents. A list of nodes can be imported from any existing Asset Management tool or Inventory solution by using the IBM Tivoli License Compliance Manager XML import utility.

When new nodes are manually created or imported into ITLCM, the ITLCM agent is NOT installed automatically on the node.

When a new agent is installed on a machine, it is assigned a node. If the node does not already exist, a new node definition is automatically created.

Example: My_server is a physical asset and has a unique serial number and Model. It holds two VMWARE virtual servers named Innerserver1 and Innerserver2. The node should be Myserver and there should be three agents: Myserver, Innerserver1 and Innerserver2 assigned to that node.
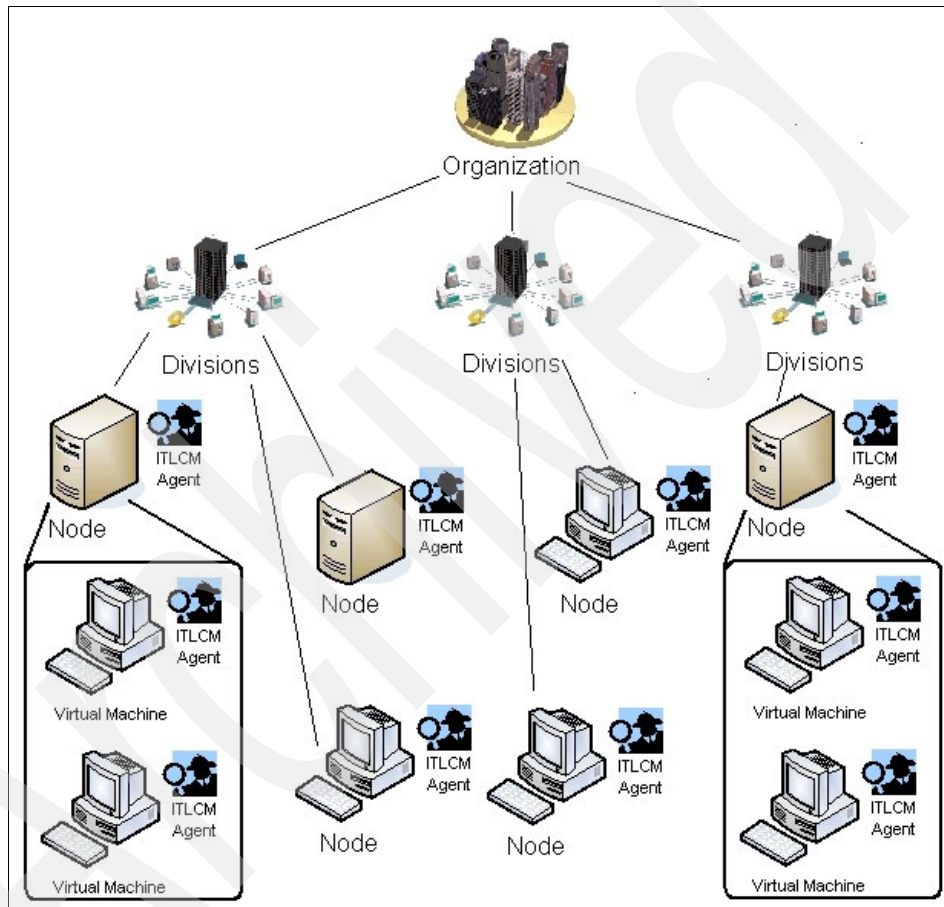

Figure 4-6   ITLCM Agents and Virtualization and partitioning support.

Virtualization and partitioning

Logical Partitioning (LPAR) capable nodes may host multiple ITLCM Agents. ITLCM allows management of software licenses on subsets of the total number of processors of the node by using the ITLCM virtualization and partitioning support.

Each VM Layer represents a software layer that allows running instances of operating systems.

The following VM layers represent the types of partitioning and virtualization elements:

Node - Represents a Physical Machine.

Shared Pool - Represents a group of processors shared among LPARs.

LPAR - Stands for an autonomous operating portion of the Node.

VM - Represents the operating system emulation layer.

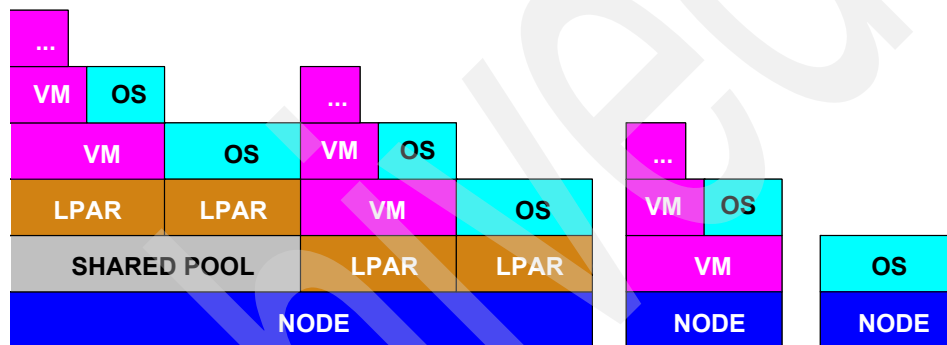OS - Operating system running on a machine or partition.

Figure 4-7   Virtualization and patitioning layers

Application Users

Application users represent actual users that can start software applications on Nodes. Details of application users are defined and maintained in the ITLCM Administration server database to allow licenses to be restricted to specific users. Application users for the managed organization should be associated to applications that are being monitored by the ITLCM.

Application user definitions can be imported from existing user or identity management systems (Active Directory®, LDAP, and so on) using CSV or XML formatted files. A unique identifier for the application user must be provided.

When LDAP authentication is used, ITLCM allows defining the mapping between a user role and an LDAP group.

Procured licenses and contracts

Procured licenses are defined based on procurement information of the licenses according to the terms and conditions of the license contract.

Contracts are created and associated with a license definition. The contract number must be defined in a way that the association to the license definition can be easily identified. The recommendation is to adopt the naming convention defined by the procurement management team if any.

Reporting

IBM Tivoli License Compliance Manager includes a set of preconfigured reports for the analysis of collected installed software and software use information and its reconciliation with the licenses that have been defined for products.

Using tasks on the Web user interface, administrators can request the reports and supply parameters that restrict reporting to a specified set of products or licenses and a specified set of computers or partitions where the agents are installed.

Reports can be viewed immediately online or report requests can be added to a queue for batch processing. If you choose the batch processing option, an ITLCM online task allows monitoring the status of report requests. When a batch report is ready, it can be downloaded as an XML file.

The following reports are available:

Installed software snapshot - Provides a view of the products installed on monitored computers at a specified date and time.

Product use level analysis - Provides a view of the level of use of products during a specified period. The report can be restricted to products with use above a specified level or to products with use below a specified level.

Product use trend analysis - Provides a graphical view of the trend in the use of a single selected product over time.

License use trend analysis - Provides a graphical view of the trend in the use of a single selected license over time.

License compliance - Provides a view of the license use situation at a specified time. The report shows the quantity available and percentage used for each license at the specified time. It also provides a high water mark value, indicating the highest level of use during a selected period leading up to the specified time. You can identify out of compliance situations and under-use of licenses.

Unlicensed use - Provides a view of the products that were used at a specified time for which no valid license was available.

All reports can be produced online or in batch mode.

ITLCM Product Catalog

The ITLCM Product Catalog is a central repository of software product information that describes software components, related files and identifiers that can be used for its monitoring by IBM Tivoli License Compliance Manager.

The ITLCM Master Catalog resides in the ITLCM Administration server database and a subset of it is periodically downloaded to each ITLCM Runtime server and each registered ITLCM Agent.

This subset of the ITLCM Master Catalog, only includes those entries from the ITLCM Master Catalog that relate to products that have been discovered running on nodes by ITLCM Agents that are assigned to the ITLCM Runtime server.

IBM provides regular updates for software catalog. These updates may be updated and included in the Tivoli License Compliance Manager to reflect the software catalog to be managed. ITLCM also allows the administrator to include custom added software definitions, this is useful for identifying "in-house" software products.

Procured licenses and contracts

Procured Licenses are defined based on procurement information of the license according to the terms and conditions of the license contract.

Contracts are created and associated with a license definition. Naming conventions for contracts refers to the contract number. The contract number must be defined in a way that the association to the license definition can be easily identified. The recommendation is to adopt the naming convention defined by the procurement management team if any.

4.3.3 ITLCM Catalog Manager

The ITLCM Catalog Manager is a Java based graphical interface tool used to maintain the ITLCM Master Catalog of products that need to be monitored that can be installed in a computer that should be used by the master catalog admin-istrator. The ITLCM Catalog Manager runs independently of the license adminis-tration interface and accesses the database server through a JDBC™ connection.
The ITLCM Catalog Manager allows the execution of the following tasks:

► Update the ITLCM Master Catalog database with updates provided regularly by IBM.

► Extension of the ITLCM Master Catalog with custom defined products using an hierarchical structure: Product, Version, Release, Component, and Signature.

- ► Create additional Software product entries to the ITLCM Master Catalog from unknown (potential) software signatures that have been detected by ITLCM Agents for which no corresponding entry exists in the ITLCM Master Catalog.

- ► Manage signatures by defining custom signatures and assigning or removing them to/from components definitions.
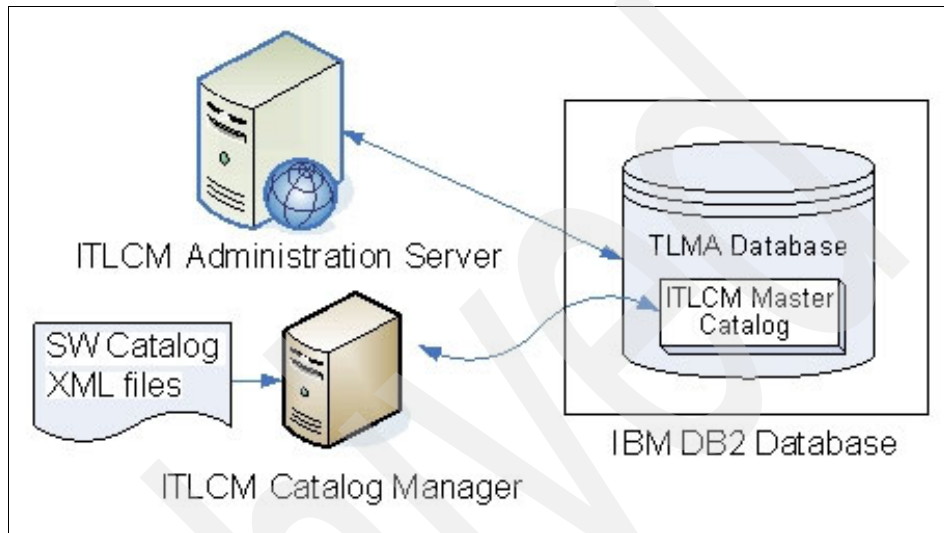

Figure 4-8   ITLCM Catalog Manager

Managing Software Catalog

Catalog management tasks is of vital importance to the overall IBM Tivoli License Compliance Manager solution, as procurement management and software usage monitoring activities are dependent on software signatures defined and maintained as entries in the ITLCM Master Catalog.

- ► In procurement management terms, licenses must be assigned to a software product signature in order to be valid and usable upon distribution.

- ► From a usage monitoring perspective, Catalog information is used for enabling software usage monitoring that is:

  - – Automatically enabled for software products with a valid license assigned to them, and

  - – Manually defined by the IBM Tivoli License Compliance Manager administrator for software products that may not have a license defined to them. In this case, the IBM Tivoli License Compliance Manager administrator first selects a valid software signature for the product and then enables software usage monitoring based on the software signature of the software product.

4.3.4 Roles and Privacy Policies

Defining profiles for *IBM Tivoli License Compliance Manager* Administrator represents the definition of an association of the IBM Tivoli License Compliance Manager Administrator to a role and a privacy policy within a particular IBM Tivoli License Compliance Manager Organization.
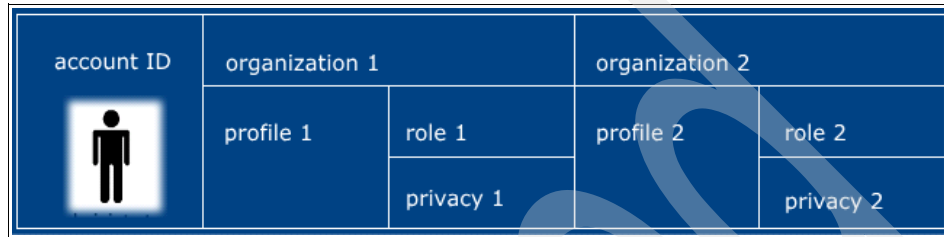

Figure 4-9   IBM Tivoli License Compliance Manager Administrator account structure

Administrative Accounts

Administrative accounts define who can log on to the Web interface and perform the tasks of the portfolio. Each Administrative Account should be assigned an e-mail for notification to be sent to.

Administrative Profiles

A profile is comprised of a list of administered organizations, a set of roles, and a set of privacy policies. Each user is allowed to work for a list of organizations. The operations a user can perform for an organization depend on the type of role, or roles, that the user has for that organization. The data a user is allowed to view in reports is defined by the privacy policy. A different privacy policy can be defined for each of the organizations with which the user is allowed to work.

Roles

Roles must be associated to IBM Tivoli License Compliance Manager Administrators based on the responsibilities of individuals in the enterprise and their mission and objectives regarding the License Management solution.

The following are IBM Tivoli License Compliance Manager Administrator roles available with IBM Tivoli License Compliance Manager 2.3.

▶ Super Administrator

   The super administrator role is entitled to run any task for any IBM Tivoli License Compliance Manager Organization. There can be only one account with this role in any IBM Tivoli License Compliance Manager deployment. This account is created during the IBM Tivoli License Compliance Manager installation and cannot be deleted or have its profile modified.

The tlmroot account is the only account allowed to manage IBM Tivoli License Compliance Manager Organizations and other IBM Tivoli License Compliance Manager administrator accounts.

► Procurement Manager

Procurement Manager is a role that has the financial responsibility for all contracts and negotiations. Procurement managers hold decision making ownership about the procurement of software within the IBM Tivoli License Compliance Manager Organization. Therefore, this role is allowed to manage contracts, procure licenses, and view reports.

► License Administrators

They are the primary users of the License Management solution. They configure software entitlements according to contracts and distribute licenses to users and machines. They also generate reports on software usage.

► Procurement and Licensing Managers

They manage software licensing from contract management through license distribution and hold responsibility for both the proper contract information, and storing and applying the necessary software use restrictions entailed by them. They need an accurate understanding of the terms and conditions and how to translate them into the technical licensing scope. This role combines the roles of the Procurement Managers and License Administrators.

► Software Resources Managers

They usually require information to support technology decisions and funding requests. Therefore, this role is responsible for reporting on software use.

► System Resources Managers

The IBM Tivoli License Compliance Manager Administrator with System Resources Manager role is responsible for creating and managing the infrastructure in which IBM Tivoli License Compliance Manager will operate for a particular IBM Tivoli License Compliance Manager Organization. They are responsible for defining Divisions, Nodes, application users, and ensuring that ITLCM Runtime servers and ITLCM Agents are deployed, as well as defining the mapping of complex products.

► Administrators

They are assigned the rights of all the other available roles, except for the Super Administrator. Therefore, they are allowed to run any task except to manage IBM Tivoli License Compliance Manager Organizations and IBM Tivoli License Compliance Manager Administrators.

Figure 4-10   Administration Hierarchy

Table 4-1 provides a summary of the activities an IBM Tivoli License Compliance Manager Administrator can perform using the IBM Tivoli License Compliance Manager administrative Web Interface based on its assigned role.

Table 4-1 IBM Tivoli License Compliance Manager administrator roles and tasks

IBM Tivoli License Compliance Manager Administrator Roles and activities	Procurement Managers	License Administrators	Procurement and Licensing Managers	Software Resources Managers	System Resources Managers	Administrators	Super Administrator (tlmroot)
Produce Reports	X	X	X	X		X	X
Manage Batch Reports	X	X	X	X		X	X
Manage Procurement	X		X			X	X
Assign Licenses		X	X			X	X
Define Product Properties		X	X			X	X
Schedule Software Scans					X	X	X
Manage Resources					X	X	X
Manage Complex Products					X	X	X
Manage Infrastructure					X	X	X
Manage Organizations							X
Manage Access							X
Define Custom Fields	X		X			X	X
Export IBM Use		X	X		X	X	X

Privacy policies

Appropriate privacy policies must be given for the administrators who are authorized to work with each organization. The privacy policy of an administrator is part of the profile that is defined for each administrator who is authorized to use the Web interfaces. The default profile implements a privacy policy that allows the computer information for installed software to be reported.

Privacy policies for each administrator can be customized to disable reporting of these details. If you disable the reporting of computer information, the installed software and software use reports relate the product information to the agent that has provided the information.

4.3.5 Support for Procurement Management

This functionality involves recording definitions of contracts, licenses terms and their relationships into ITLCM.

IBM Tivoli License Compliance Manager provides the following features that allow support for procurement management:

- ► Recording Software Licenses definitions
- ► Recording Software Contracts definitions
- ► Associating licenses definitions to a contract
- ► Assigning software products (from Products catalog) to a license definition
- ► Generating and analyzing license compliance reports
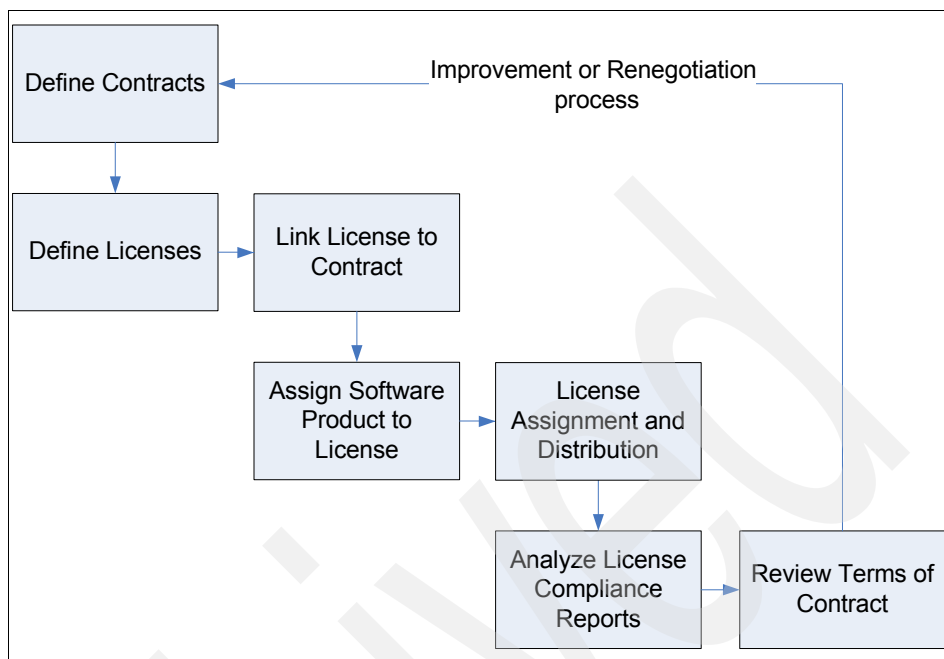
Figure 4-11   Sample procurement support flow

Figure 4-11 represents the general process flow for procurement. We cover this in more detail in this book.

4.3.6 Use licenses

These are licenses with which licenses of software application are measured by software usage. IBM Tivoli License Compliance Manager V2.3 defines the following types of use licenses, including those based on the International Program License Agreement (IPLA).

Usage Concurrent Session licenses

This license type counts multiple instances of the software application running concurrently on the same ITLCM Agent by the same application user as one used license.

Usage Concurrent Nodelock licenses

This license type counts multiple instances of the software application running concurrently on the same ITLCM Agent as one used license, and does not take application users into account.

IPLA Full Capacity licenses

This license type is applied to IBM software using the IBM capping rule following the full capacity counting rule. The full capacity counting rule states that the processor quantity used by an IBM software running on a Node is the total number of processors on that Node.

IPLA Sub-Capacity licenses

This license type is applied to IBM software using the IBM capping rule following the sub-capacity counting rule. The sub-capacity counting rule states that the processor quantity used by an IBM software running on a logical partition (LPAR) is the number of processors available to the LPAR.

IPLA Value Unit Full Capacity licenses

This license type is applied to IBM software using the IBM capping rule following the full capacity counting rule. The full capacity counting rule states that the processor value-unit quantity used by an IBM software running on a Node is the total number of processor Value-units on that Node.

IPLA Value Unit Sub-Capacity licenses

This license type is applied to IBM software using the IBM capping rule following the sub-capacity counting rule. The sub-capacity counting rule states that the processors quantity used by an IBM software running on a logical partition (LPAR) is the number of processor value-units assigned to the LPAR.

4.3.7 Install licenses

These are licenses with which licenses of software application are measured by software installation. IBM Tivoli License Compliance Manager V2.3 defines the following types of install licenses, including those based on the International Program License Agreement (IPLA).

Install Instance licenses

This license type counts multiple installation instances of the software application on the same ITLCM Agent as one used license.

Install IPLA Full Capacity licenses

This license type is applied to installed IBM software using the IBM capping rule following the full capacity counting rule. The full capacity counting rule states that the processor quantity used by an IBM software installed on a Node is the total number of processors on that Node.

Install IPLA Sub-Capacity licenses

This license type is applied to installed IBM software using the IBM capping rule following the sub-capacity counting rule. The sub-capacity counting rule states that the processor quantity used by an IBM software installed on a logical partition (LPAR) is the number of processors available to the LPAR.

Install IPLA Value-Unit Full Capacity licenses

This license type is applied to installed IBM software using the IBM capping rule following the Value-Unit full-capacity counting rule and refers to the Number of available processor value-units on the computer where the product is installed.

Install IPLA Value-Unit Sub-Capacity licenses

This license type is applied to installed IBM software using the IBM capping rule following the Value-Unit sub-capacity counting rule and refers to the Number of processor value-units assigned to the partition where the licensed product is installed.

Note that IBM provides regularly updated table with value-units for each processor type.

4.3.8 Event logging and e-mail notification

The ITLCM Administration server and ITLCM Runtime server maintain logs of significant licensing and system administration events. They can optionally be configured to generate e-mail notifications of logged events.

Configuration settings control the sending of notifications, as follows:

> **Note:** If the administration and runtime servers are installed on the same computer the system.properties file exists in both locations. You must define settings in both files to enable both types of notification. For details of the types of notification that can be generated on the administration and runtime servers, see Chapter 8, "Event logging and notification" in *IBM Tivoli License Compliance Manager: Problem Determination*.

4.3.9 Periodic software license audit

Besides the monitoring, logging and notification capabilities, ITLCM also provides mechanisms for administrators to perform periodic license compliance audits in order do identify and resolve out-of-compliance conditions, providing means to verify accuracy, completeness and correctness of captured data by comparing the installed software view with available licenses.

5

IBM Tivoli Asset Management for IT product

IBM Tivoli Asset Management for IT product is a product adapted from the popular MRO Maximo Asset Management product. The MRO product is a very rich enterprise asset management product that provides capabilities to manage all enterprise assets. Since acquiring MRO, IBM has adapted their technology to create a product specifically targeted at the management of IT assets. This chapter provides a high level view of the Tivoli Asset Management for IT product.

As more corporate assets are touched by technology, companies are looking to consolidate how they operate and manage them. They are realizing that there are synergistic advantages in combining the management of operational assets with IT assets, especially the IT infrastructure that supports the management and control of the operational assets. Deploying and operating multiple software solutions to manage different types of assets, including production, facility and IT assets, is cost-prohibitive and impedes business process innovation.

To improve manageability, many operational assets are taking on IT attributes such as microprocessors, operating systems and IP addresses. IT-embedded generators, power meters and instrumentation are increasingly being networked and managed with IT software. Since they behave like IT assets, there is an opportunity to leverage IT business processes, such as software distribution and patch management, onto the shop floor to provide better overall asset management. IBM acquisition of MRO Software will address this need by

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providing customers with a more consistent and comprehensive set of asset management solutions.

This acquisition leverages the strengths of both companies to bring together the best of operational asset management, IT asset management, and service management. IBM and MRO Software deliver business processes to support all asset classes, including production, IT, facilities, and transportation. For IBM, a holistic approach to managing this diverse collection of assets is the key to a successful enterprise asset management (EAM) strategy.

Figure 5-1 shows an enterprise view of asset management.
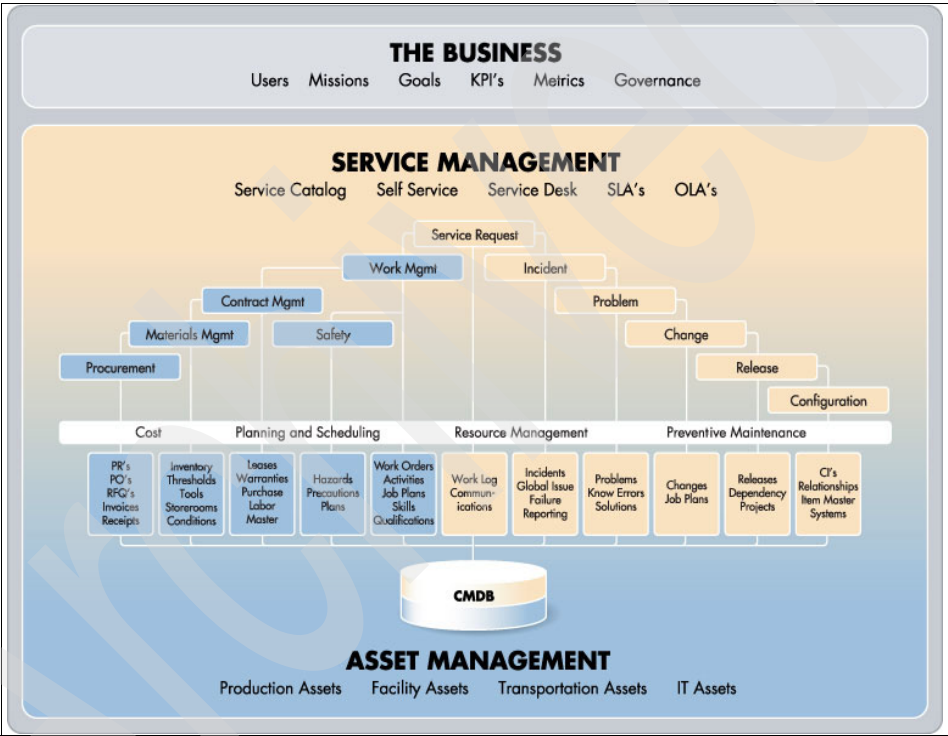
Figure 5-1   IT Asset Terminology and Maximo

5.1 Overview

From desktops, laptops and servers to software, contracts and maintenance agreements, managing the thousands of IT assets spread across your organization can be a difficult task. Just when you least expect it, another obstacle occurs - a server crash, a system-wide virus, a compliance violation.

Manually tracking and managing inventory data is costly, time-consuming and error-prone. That's why IT asset managers need a solution that enables them to manage software, hardware and related information across the infrastructure - throughout the asset life cycle - and to manage the financial impact of IT assets and costs related to procurement, overprovisioning, budgeting and compliance.

IBM Tivoli Asset Management for IT is a complete IT asset management application that combines inventory, financial, maintenance and contract assets management. This application helps you automatically track and efficiently manage the complete life cycle of IT assets. As a result, Tivoli Asset Management for IT can help you:

► Control costs of procurement, licensing and maintenance agreements

► More accurately forecast for future IT needs

► Minimize maverick software and hardware purchases

► Maintain - and document - internal, contractual and regulatory compliance efforts for software licenses and hardware leases

► Negotiate more effectively for volume discounts

The functions and features of Tivoli Asset Management for IT help you quickly and efficiently manage your IT investments and better control costs related to compliance, over-provisioning, budgeting and forecasting. It manages data regarding a multitude of assets, including, but not limited to, the following:

► Desktops
► Laptops
► Servers
► Mainframes
► Routers
► Hubs
► PBXs
► Switches
► Mobile devices
► Software licenses
► Contracts
► Maintenance agreements

5.2 Component overview

Tivoli Asset Management for IT is based on a Web architecture and consists of several component servers. Users interface with the Asset Management for IT product using a Web browser.

Key technology components include:

► An embedded, robust process automation system that helps you to create dynamic, customizable workflows.

► A comprehensive escalation and notification engine that sends automatic alerts regarding incidents and problems.

► A thorough database that stores and tracks IT-related asset information.

► Screen designing tools, including an application designer that enables you to configure the product to better meet your business objectives.

► A standards-based approach that makes integrations with key physical, financial and HR systems far simpler than other solutions.

The Asset Management for IT product is based on three servers that, depending on the size of your implementation, can be installed on the same or separate physical machines. The three servers are:

► Database Server
► Application Server
► Report Server

Logically, these servers are positioned as in Figure 5-2.
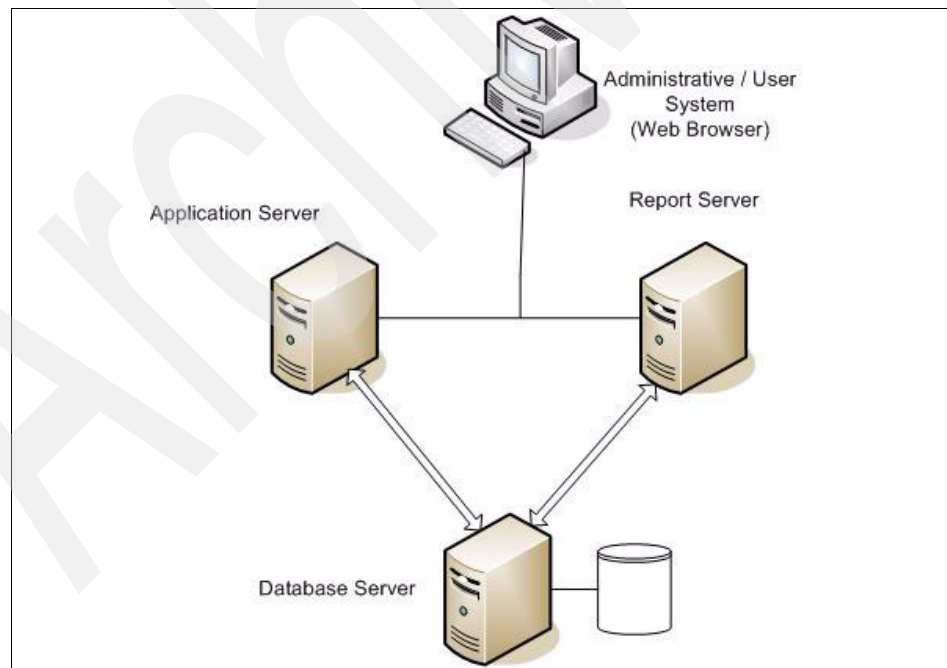
Figure 5-2   Logical relationship of Asset Management for IT servers

The following sections provide a brief description of each of these servers.

Application Server

The application server is a J2EE Web application server. This server could a BEA WebLogic server or an IBM WebSphere server.

The application server drives the primary user interface for Asset Management for IT. The application(s) driving the user interface utilize XML (stored in the database server) to control the look of the interface and its controls. Therefore, the look and feel of the user interface can be customized to meet the needs of the enterprise.

Report Server

The report server provides the ability to create, manage and deliver reports about the managed assets and related information.

It can generate report data in multiple formats including DHTML, PDF and XLS.

Database Server

The database server is used to control the data associated with the managed assets as well as the information used by the application server and report server to drive the user interface and the various reports.

5.3 Functional overview

The following summarizes the features and capabilities provided by the IBM Tivoli Asset Management for IT product.

Software Asset Management

► Track and manage software license terms and conditions, enabling better planning for future requirements.

► Electronically procure software based on corporate standards, minimizing the number of supported applications to enhance service and reduce costs.

► Regularly monitor usage of software throughout the organization to maintain up-to-date information on software usage to enhance budget planning.

► Periodically audit authorized licenses against actual installations, to quickly identify license violations or the opportunity for cost savings if purchased licenses exceed requirements.

Contract Management

► Quickly research vendor prices, service rates, and terms to identify cost savings through vendor and contract options.

► View enterprise asset requirements for bulk purchases to help consolidate purchases to benefit from volume discounts.

► Automatically generate a contract from a purchase order and associate supplemental and subsequent contracts to assets allowing you to minimize contract preparation effort and ensure accurate contract data.

► Monitor vendors for quality products/service and efficient delivery, enabling you to exclude unreliable vendors and low-quality products.

► Easily check warranty/maintenance terms to lower support and service costs and improve user service levels.

► Receive automatic notification of lease ends, to ensure you terminate lease payments instantly and meet vendor terms at lease expiration to avoid penalties.

► Compare invoices with specified contracts to monitor vendors and avoid overpayments.

Procurement

► Select items to buy from preferred supplier online catalogs allowing you to consolidate with select vendors to gain volume discounts.

► Enable end-users to create, forward, and check on the status of requisitions, improving user service levels and employee productivity.

► Electronically create and route a purchase order for approval to streamline the procurement process.

► Register new assets in an enterprise database to help manage assets from receipt throughout the life cycle.

► Set up online payment audits and payment schedules to ensure payments are on time and match contract terms.

► Integrate purchasing with accounting, financial, and other enterprise systems to manage information to provide decision support.

Work Management

► Provides work planning and scheduling to optimize resources for more cost-effective implementation.

► Assignment manager optimizes work schedules and increases productivity, ensuring the right person with the right skills is assigned to the task.

5.4 Tivoli Asset Management for IT modules

IBM Tivoli Asset Management for IT product encompasses a large number of modules and applications that can be used depending on the client's requirements. The applications are contained in modules that represent like functionality typically tied to a role individuals are performing within the organization. For example, a contract manager would typically have access to the various contracting applications, all of the applications would show up in one module titled Contracts. The primary modules provided by Asset Management for IT are described in the following sections.

> **Note:** References to Maximo in the descriptions below, refer to the Maximo Enterprise Asset Management® product and modules in general and as they have been adapted and specialized to become the IBM Tivoli Asset Management for IT product.

5.4.1 Administration Module

- ► Organizations - Used to setup the organizations and sites to be used within the asset management applications.
- ► Classifications - Used to create classifications and establish an overall classification hierarchy.
- ► Bulletin Board - Used to create, post and view messages as well as to broadcast information to users of the system.
- ► Communication Templates - Used to create and manage generic communication templates that users can leverage to standardize frequently used e-mail communications (also known as notifications).
- ► Calendars - Used to indicate working time for equipment, craft and labor records for an organization and its associated sites.
- ► Sets - Used to create a framework for sharing item and company (vendor) data across multiple organizations.
- ► Work View - Used to make queries available for display in the Result Set portlet of a user's Start Center.

5.4.2 Assets Module

- ► Assets - Used to store asset numbers and corresponding information such as parent, location, vendor, up/down status, and maintenance costs for each asset.

- ► Locations - Used to enter and track locations for assets and organize these locations into logical hierarchical systems or network systems.

- ► Meters - Used to add or modify meter definitions. Meter definitions include names for the meters as well as sets of attributes that describe the meters.

- ► Meter Groups - Used to define a logical grouping of meters that will exist in a meter group. Meter groups represent a collection of meters that will be used together multiple times.

- ► Condition Monitoring - Used to define unlimited measurement points for assets, and to specify alarm limits and associated work to be performed after reaching those limits.

- ► Failure Codes - Used to build and display failure hierarchies, which help you construct accurate histories of the failures that affect your assets and operating locations.

5.4.3 Configuration Module

- ► Domains - Used to maintain lists of defined values that appear in drop-down lists (sometimes referred to as value lists).

- ► Database Configuration - Used to create or modify the objects and attributes used by Maximo applications.

- ► Application Designer - Used to create new applications (clones and custom applications) or to tailor the pages of an existing Maximo application.

- ► Cron Task Setup - Used to manage cron tasks. Cron tasks are behind-the-scene jobs set to run automatically and on a fixed schedule.

- ► Workflow

  - – Workflow Designer - Graphical application that is used to create a series of paths for records to flow through, called a workflow process.

  - – Roles - Used to manage roles within Maximo.

  - – Workflow Administration - used to view and modify assignments within Workflow, Escalation and SLA processes.

  - – Actions - Used to manage the administrative functions of creating actions and action groups within Workflow, Escalation, and Service Level Agreement (SLA) processes. Actions are scheduled events that occur when a record leaves a Workflow node.

- ► E-Mail Listener Configuration - Used to receive and process incoming e-mail messages.

- ► Escalations - Used to automatically monitor critical processes across your enterprise. The primary goal of Escalation Management is to ensure that critical tasks are completed on time, such as those defined in SLAs.

5.4.4 Contracts Module

- ► Purchase Contracts - Used to create, modify, and view contracts with outside vendors.

- ► Lease/Rental Contracts - Used to define the overall terms and conditions of the agreement between a vendor and a customer regarding one or more rotating assets.

- ► Labor Rate Contracts - Used to define multiple labor rates for specific crafts and skills, and optionally labor records. Within the Labor Rate Contract application you can manage outside labor and the corresponding rates.

- ► Master Contracts - Used to associate many contract types for a particular vendor. A Master Contract defines the relationship with a vendor and contains terms and conditions that apply to the contracts created and listed under it.

- ► Warranty Contracts - Used to maintain one or more assets for an outside service provider for a fixed fee, or regularly scheduled payment over a time period; or to track warranty information for multiple assets or locations by time or meter.

- ► Terms and Conditions - Used to maintain a library of terms and conditions that can be added to a purchasing document or contract. These terms can contain information such as liability concerns, shipping and handling details, or delivery time expectations.

5.4.5 Financial Module

- ► Chart of Accounts - Used to establish general ledger (GL) account fields in Maximo with definitions equivalent to those used with the rest of your financial data processing system.

- ► Currency Codes - Used to define currency codes and to specify which codes can be used in Maximo.

- ► Exchange Rates - Used to set up exchange rates used for converting currencies in Maximo.

- ► Cost Management - Used to generate project cost information to track the financial resources required to complete a project and manage budgets more effectively.

5.4.6 Inventory Module

► Item Master - Used to define items that will be stocked in your storerooms. You group these items in an item set, which can then be shared by the organizations using that item set.

► Service Items - Used to define and manage purchased services.

► Tools - Used to manage information about the tools used to perform work. Tools are typically nonconsumable items for which you charge an hourly rate for their use.

► Stocked Tools - Used to manage existing tools in storerooms.

► Inventory - Used to enter, display and update information on each inventory item.

► Issues and Transfers - Used to issue or transfer items from storerooms, or to return items to storerooms.

► Condition Codes - Used to create and maintain a master list of condition codes for a particular item set.

► Storerooms - Used to add and maintain information about storeroom locations, as well as view the items stocked within a storeroom.

5.4.7 Planning Module

► Job Plans - Used to create a detailed description of how a job is to be performed.

► Routes - Used to list related work assets that are considered "stops" along an inspection or maintenance route.

5.4.8 Purchasing Module

► Purchase Requisitions - Used to ask the purchasing department to order materials or services.

► Purchase Orders - Used to purchase materials or services from an internal supplier or an external vendor.

► Receiving - Used to receive materials into inventory and record the receipt of services.

► Invoices - Used to record invoices and match against purchase orders and receipts for approval.

► Request for Quotations - Used to request and manage vendor quotations.

► Companies - Used to manage data on manufacturers, vendors, and other companies that do business with you.

- ► Company Master - Used to create company master records that belong to a particular company set.

- ► Terms and Conditions - Used to maintain a library of terms and conditions that can be added to a purchasing document or contract. These terms can contain information such as liability concerns, shipping and handling details, or delivery time expectations.

5.4.9 Reporting Module

- ► KPI Manager - Used to create Key Performance Indicators (KPIs) to track critical performance variables over time.

- ► Report Administration - Used to create reports, generate and preview request pages, add parameters, display reports as toolbar icons, e-mail reports, or specify a schedule for running a reports.

5.4.10 Resources Module

- ► People - Used to maintain records of people.

- ► Person Groups - Used to maintain person groups. A person group consists of people, who may or may not be workers.

- ► Crafts - Used to maintain craft records.

- ► Labor - Used to maintain labor group records.

- ► Qualifications - Used to create qualifications and certification requirements for qualifications.

5.4.11 Work Orders Module

- ► Work Order Tracking - Used to plan, review, and approve work orders for assets and locations. Primarily an EAM application, but used to record downtime against and asset.

- ► Labor Reporting - Used to report the type and total number of hours of work that was performed by external contractors or internal employees.

- ► Quick Reporting - Used to report work on open work orders or small jobs.

- ► Assignment Manager - Used to dispatch urgent work and schedule future work requirements.

- ► Service Requests - Used to create, view, and resolve service requests from customers.

5.4.12 Self-Service Module

► Service Requests:
  – Create Service Request - Used by self-service users to create new service requests.
  – View Service Requests - Used by self-service users to view existing service requests.
  – Search Solutions- Used by self-service users to search and view solutions to known problems.
► Desktop Requisitions:
  – Create Requisition - Used to create a new desktop purchase requisition.
  – View Requisitions - Used to view existing purchase requisitions.
  – View Templates - Used to view a requisition that was previously saved as a template.
  – View Drafts - Used to view a requisition that was previously saved as a draft during the create requisition process.

5.4.13 Security Module

► Security Groups - Used to grant access to sites, applications and menu options. A user is assigned to one or more groups to gain access to the system.
► Users - Used to add and manage Maximo users.

5.4.14 Service Desk Module

► Incidents - Used to create and modify incident records and capture information about an event that deviates from standard service or an event that might disrupt the quality of that service.
► Problems - Used to create and modify problem records in order to capture an unknown, underlying cause of one or more incidents.
► Solutions - Used to create and manage solution records within a Service Desk environment.
► Changes - Used to plan, review, and report actuals for implementing changes or deploying new, standard configurations to existing assets.
► Releases - Used to plan, review, and prepare for large batches of changes to assets.

- Activities - Used to manage individual work, normally tasks that have been assigned either from the Incident or Problem teams to individuals or resolution groups. Further, the Service Desk may create activities when a request for service comes is such as a password reset or processing of a new employee.

- Ticket Templates - Used to generate activities for recurring service request, incidents and problems.

5.4.15 Service Management Module

- Service Level Agreements - Used to create and manage service level agreements.

- Service Catalog - Used to define all services that are provided or procured.

5.4.16 IBM MEA Adapters

- IBM Maximo ERP Adapter (Oracle® or SAP®) Used to integrate Maximo to Oracle or SAP systems.

We can think of the IT world as being divided into two parts, the first part is the authorized world and the second part is the physical world. The physical world is being monitored through any number of tools that are tracking hardware and software configurations throughout the enterprise. Integration Composer (Fusion) is the application that moves this data into the deployed asset applications through the use of adapters. The authorized side of the world is managed through the Service Management processes to ensure that only authorized items are purchased, deployed, maintained, and disposed.

5.5 Summary

IBM Tivoli Asset Management for IT delivers an end-to-end IT asset management solution available to you from any Web interface through a single, unified platform. Use Tivoli Asset Management for IT to help:

- Reduce costs related to IT asset procurement, management, forecasting and contractual/ regulatory compliance.

- Enhance service levels and response times by delivering more accurate asset and configuration information to your help desk.

- Improve first-call response rates by standardizing configurations.

- Boost employee productivity through more effective management of provisioning requests.

Tivoli Asset Management for IT integrates with products like IBM Maximo Discovery and IBM Tivoli Configuration Manager, to help you discover IT inventory. It is unified on the same platform with Tivoli Service Desk, to enable service desk agents to use your asset data to help speed problem resolution and increase customer satisfaction. Together, these products support the IBM Service Management strategy to help align your IT functions with your business objectives.

Part 3

Asset Management scenarios

6

Managing the Asset Management Lifecycle

The ability to track and manage software license instances through the purchase requisition phase, procurement, stock item, deployment/installation, usage, return to inventory, redeployment, upgrade, and retirement, is imperative. In essence, the process is a "cradle-to-grave" approach to managing corporate software assets. Tivoli Asset Management for IT is capable of keeping an audit trail for each deployed item of software (where required by the business) in order to demonstrate compliance and good corporate governance.

This includes managing hardware and software assets through the Tivoli IT Asset Management Lifecycle from planning through retirement. Managing the life cycle with the Tivoli Asset Management for IT portfolio results in aligning IT with your company's strategy, cost savings, improved business processes, helps ensure compliance and delivers an effective ROI.

Note: In this chapter, much of the function we describe is part of the Tivoli Asset Management for IT product. This product is largely based on the Maximo product that has been recently acquired by IBM and integrated into the IBM Tivoli product line. In some cases, certain components or functional descriptions still retain the Maximo label. Over time, this seemingly confusing naming discrepancy will go away as the integration of these product lines is completed.

6.1 Life cycle phase overview

The Asset Management for IT life cycle is an endless loop. As illustrated in the diagram below, once an asset is retired, the planning phase begins to determine how to replace the asset, if required.
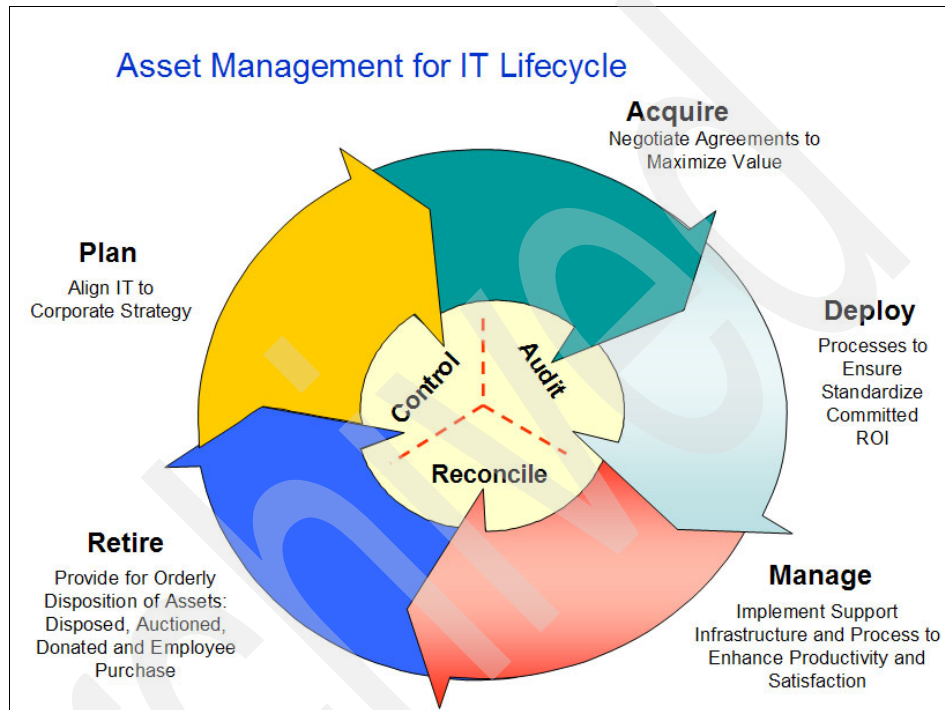
Figure 6-1   Asset Management for IT Life Cycle

These phases are briefly described here, with more detail in the following sections.

► Plan

   The Plan Phase is where a company formulates a budget and an associated schedule for hardware and software acquisitions. The technology refresh cycle indicates when existing assets will need to be replaced based on company policy. Stock rooms are used to keep spares and check inventory before a purchase is made.

► Acquire

   The Acquire Phase is where the asset gets purchased and created in the application. A Purchase Order (PO) approval process should be in place to

expedite and control purchasing. Assets can be created from a PO, receipt of an asset into inventory or directly from a vendor.

▶ Deploy

The Deploy Phase is where assets are assigned either to an employee, project or business unit. Employee information including location is received from HR feeds. The status of the asset is tracked as moves throughout the IT AM life cycle. Communication with the user allows for a smother deployment. Integration with Tivoli Service Desk can generate service tickets for the technician.

▶ Manage

The Manage Phase is where asset reconciliation between what is discovered versus what has been purchased occurs. Installs, Moves, Adds and Changes (IMAC) need to be recorded. Integration with Change Manager allows for more robust change management processes such as Request for Change (RFC) to be implemented. During the Manage phase assets costs are managed through software license compliance, monitoring stock rooms and viewing software use.

▶ Retire

The Retire Phase is where an asset has reached its end of life. The asset can be disposed, auctioned, donated, sold to an employee, returned to a leasing company or purchased.

6.2 Plan phase

During this phase the organization is translating the strategic objectives into action. These plans may include the introduction of new services into the organization, that is, a new financial system, HR system, and/or technology refresh of servers, mobile computers or laptops, or other software and hardware assets. Funding for these actions was allocated and prioritized during the planning process, what is left is the execution phase. Tivoli Asset Management for IT facilitates the planning process, for example during the planning process management would need to know the current configuration of assets within the organization and when the lease is terminating for assets. Tivoli Asset Management for IT provides that capability through the use of numerous applications.

▶ **Terms and Conditions**: The Terms and Conditions application provides numerous capabilities for various roles in Tivoli Asset Management for IT, so it becomes a library for these roles to select. For example, when sending out an RFQ the buyer may apply those terms and conditions the vendor must abide by in order to be awarded the contract, which may be they have to

provide a one year warranty on all parts and labor. Payment terms can also be addressed and well as any legal requirements. If there are certain service levels that must be maintained each of these should also be listed in the terms and conditions application. These service levels are then translated through the Service Level Agreements application, the KPI Manager, and Escalations to ensure the appropriate service level is applied, maintained and measured. Contracts also used the terms and conditions application so the Contract Managers can ascertain what the legal requirements are for both the Vendor and the Organization.

► **Request for Quotation (RFQ):** The organization is making a purchase and are going to have vendors compete for the business. The organization could generate a RFQ and send that RFQ to various vendors. Once the vendor responds their price is entered into the RFQ by someone in the purchasing role. Once all bids are in the purchasing agent can award the purchasing contract to the vendor who provided the best price.

► **Purchase and/or Lease Contract:** These contract types are established in order to make purchases or lease assets where the organization is going to stagger payments, make payments on a reoccurring basis, and acquire assets on a schedule. For example, the organization is upgrading to blade servers and payment terms of 20% of the overall purchase price will be paid at Purchase Order approval, 70% will be paid upon receipt of the assets, and the remaining 10% will be paid 60 days after receipt. A Purchase contract can be created with a specific execution date, that is, Start Date, through the use of an Escalation that checks the Start Date to ascertain if that date has been reached and an Action that changes the Status of the Purchase Contract to Approved and sends out a notification to the Contract and Procurement Manager to place the order for the items, and then this would start the Acquisition Phase.

► **Companies and Company Master -** These applications contain a list of all vendors, manufacturers and couriers that the organization does business. The Company Master is a library of these entities which enable procurement to centrally control the vendor list. When a new vendor, manufacturer, or courier is required, the organization may have a formal process for getting them on the list. For example, the U.S. Government has certain requirements the vendor must meet before being placed in the GSA Catalog. As part of the planning cycle this list could be updated by procurement. The update may include disqualifying vendors as they have not performed to the contract or purchase order terms and conditions. Tivoli Asset Management for IT provides the capability to perform vendor analysis through the Inventory Module, or at the time of Purchase. If the vendor is not performing to expectations the procurement manager would disqualify the company from the Company Master Application which could then propagate down to all organizations that share the Company Set and use the vendor.

6.3 Acquire phase

The Procurement team would generate a Purchase Order (PO) referencing the Contract. The PO may be placed into a workflow that would perform certain checks, based on the defined business process, to ensure the appropriate levels of approval are accomplished prior to the PO being sent to the Vendor for action. The vendor would take action on the PO and send the items to the shipping address specified on the PO. Once the items arrive at the shipping address they made need to be inspected and given an asset number. Once the asset number is assigned through the receiving process, the organization now has an instance of that asset. For example, the organization create a PO to lease ten IBM T60P's. The PO would reference T60P's as the Item Number and order a quantity of 10. Upon completing the receipt process they would have 10 T60P asset all referencing that one T60P Item Number. As part of the acquisition process the organization would desire to monitor stock levels of certain Assets. For example, the organization has an Enterprise Wide Agreement with Microsoft® covering Vista and Office products. The agreement for the first year was for 1000 licenses. The organization has a view options on how to account for these licenses. They could treat the licenses as spare parts and be able to track the amount of licenses issued up to four years. The inventory application will provide a list of all assets that have Vista or Office installed. Further, Tivoli Asset Management for IT, through the automatic re-ordering process will monitor the re-order point established for the license. If the re-order point is reached Tivoli Asset Management for IT will either generate an Approved or Unapproved Purchase Requisition or an Approved or Unapproved Purchase Order depending on the type of Default Vendor, that is, Internal or External. Tivoli Asset Management for IT can automatically place any PR or PO, generated from the re-order process, in a workflow to ensure the defined acquisition cycle is followed. Tivoli Asset Management for IT will allow inventory balances to drop below zero but this is an organizational level option and applies to *all* items in inventory.

6.4 Deploy phase

The deployment of an asset can be initiated from various means. For example, the request may come in through the Service Management disciplines, that is, it may come from the end-user through Self Service requesting a new asset be installed or replacement of an existing asset. It may come through external sources that are integrated with Tivoli Asset Management for IT through the use of the Maximo Enterprise Adapter. For example, an external purchasing system request generates a Service Request for a new asset in Tivoli Asset Management for IT.

It could be triggered though the Incident, Problem and Change management processes. For example, a network card on a server has repeatedly failed and Problem Management has identified the issue. The problem team may raise a Change Request for the replace of the Network card. The Change Request identifies the asset and potential services that could be impacted as well as the backout plans and risks associated with making the change. The Change Manager identified all of the tasks, labor, material, services and tools required to accomplish the change. During the planning phase of the deployment the Asset Manager would check the Storeroom(s) for the quantity of the type of item(s) they are going to utilize to fulfill the request. Once they have identified the item they can view the availability of the item and look across all of the site's storerooms where that item has been authorized. They can also view Purchase Requisition, Purchase Orders and Contracts that have been generated for the item. For example, the re-order may have been generated to replenish the storerooms stock. If the item is available the asset manager would select the Storeroom from which the laborer doing the work would be issued the item. When all of the planning was accomplished the Asset manager would approve the Change. The approval of the change causes the Available Balance of the item in the storerooms inventory to decrease by the quantity identified on the Change Request. If the Available Balance is going to result in a negative balance to occur Tivoli Asset Management for IT will not allow the Asset Manager to approve the Change Request. This is an organizational level option and can be changed to allow negative balances to occur.

They would then schedule that change to occur through the use of assignment manager, the forward schedule of changes, that is, a calendar that is associated to each asset, to ensure the work does not interfere with normal service delivery hours. Further the deployment of the asset may involve numerous moves of the asset, that is, removed from the storeroom to a staging location, from staging to a configuration, configuration to deployment, and deployment to the user. Once at the user location the asset is accounted for through numerous applications, primary the Asset application which would hold the current configuration. The Inventory application provides a list of assets that are associated with the Item Number, if the Item is considered a rotating Item, or it lists the Asset where the Item is used as spare part, when it is considered a spare part.   If the Asset is considered a leased asset the lease contract will hold all of the asset details to include warranty start and end dates, and if an Activity, Change, Release or Work order is generated against the Asset, Tivoli Asset Management for IT will notify the role creating those entities that the asset is under Warranty.

6.5 Manage phase

The Service Management processes of Service Request, Incident, Problem, Change, and Release generally provide the capabilities to maintain the asset. Anyone of these applications may generate and IMAC (Install, Move, Add, or Change) to the current configuration of the Asset. For example, a user cannot connect to the e-mail service; there could be numerous causes for that, that is, the e-mail server may be down, in which case the Service Desk would be receiving numerous Service Requests regarding the outage. The Service Desk would generate a global incident record against the e-mail server (asset) providing that service and associate all Service Requests to that global incident ticket. Further, they could post a Bulletin to all users that the service was down and the expected time the service is to be available. As mentioned a record of the Asset is maintained in the Asset table and this table has numerous other relationships to other tables to maintain the configuration information, contract information and procurement information. These tables form the Authorized view of the Asset. There are a set of tables that start with "DPAM" that hold the Physical view, that is, what is actual software and hardware configuration as detected by the network discovery tool, such as SMS, Altris, Radia and Tivoli. These tables are populated by using the Integration Composer (AKA Fusion). Integration Composer at it simplest form is simply a mapping tool, it enables user to map data schemas and do data-type conversions, which would require users to know the data structure of both data sources, plus know how to write Java expressions.   However, the client has an option to purchase what is known as Adapters, these are pre-built adapters based on the base schema of the source and target product. At the time of writing, the following adapters are available:

► Altiris Inventory Solution

► Centennial Discovery

► Hewlett Packard (HP) Configuration Management (CM) Inventory Manager (formerly HP Inventory Manager using Radia)

► IBM Tivoli Configuration Manager

► Maximo Deployed Assets

► Maximo Discovery

► Microsoft SMS

► Maximo MainControl i.collect

In order to port the data the user needs to identify to database connection strings, one for the source database and one for the target database. The target database will be Maximo Deployed Assets, for example MAXPROD1, for the Maximo Production database. The source database may be IBM Tivoli Configuration Manager (TCM). Once the connection strings are established the

databases can be browsed either by data or by structure. The major difference is browsing by data provides a view of the first ten records found in the data structure, whereas browsing by structure does not return any data. The connection string information as well as mapping information is stored in the Tivoli Asset Management for IT database, any table starting with FSN is a Fusion related table.

Once the data source and target are identified they are used to create a *mapping*. Once the mapping is created the *adapter* is imported based on the source data structure. Any errors in the mapping will be highlighted in red, and further there is a Show Errors option that can used to detect errors as well. If there are no errors or adjustments to be made the mapping is saved. When run, it will pull the data from the source and place it into the target. Integration Composer can be scheduled to run via a batch file that is scheduled through any scheduling tool, such as Microsoft Task Manager or the mapping can also be run via a manual process.
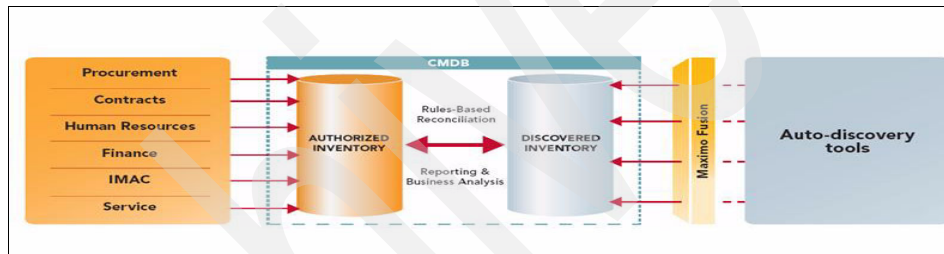
Figure 6-2   Tivoli Asset Management

Depending on the organization the discovered data may become the baseline authorized inventory. Tivoli Asset Management for IT does provide an add-on solution titled Asset-Initialization. The solution uses Integration Composer to map deployed assets to the Asset table and related tables. There are however prerequisites to accomplishing this:

1. The Organization and Site structure must be defined in Tivoli Asset Management for IT. This will enable mapping of the Deployed Assets to the correct organizational and site within that organization.

2. If the deployed asset location is captured by the discovery tool and the organization desires to map that location structure within Tivoli Asset Management for IT, a system called Deployed_Asset should be created and the entire location structure must be created. The Tivoli Asset Management for IT Data Loader can create this structure by using a CSV export from the Discovery tool.

3. Set UNSPEC codes or other classification in Tivoli Asset Management for IT. The Quick start or Accelerator will provide a baseline classification to start.

4. Set up item records for each type of discovered asset. For example, the organization has T40 and T60P Thinkpad laptops (that is, mobile computers), and each of these would be an item number and have the IT classification structure applied.

5. Set up the standard software naming conversions in the Software Conversion Application or use the Maximo Enterprise Adapter, or Maximo Data Loader to populate these objects. Note: When the Integration Composer mapping is run, these tables plus five other conversion tables are populated with data, these are Processor, Adapter, Manufacturer, Software Suite, and Software Usage.

6. Depending on your discovery tool you will need to redeploy your agents to capture the organization, site, and location data that Tivoli Asset Management for IT will need, or somehow segment that data and adjust the adapter to pick up the correct organization, site, and location. For example, Maximo Discovery can be deployed out on a per site and staged basis if the organization wanted to limit the amount of Discovery Consoles. As the agents report in they are associated to the site they are located. Discovery will store the site information in the Discovery table called Organization. The Discovery adapter will pickup the primary key value for each organization. The Discovery Adapter will need to be adjusted to reflect the organization and site to which the asset belongs. The Organization field would be hard coded, for example 'ORG1' would be entered to reflect that all assets being ported belong to that organization. The next field to be mapped would be the SITEID field, here and expression will need to be written to correctly map the Organization table in Discovery to the Sites in Maximo. The Expression® would look similar to this:

```
{
switch('Client.OrganizationId')
  {
   case 1:
   {
      return ("SITE1");
   }
   case 2:
   {
      return ("SITE2");
   }
   default:
    {
      return ("UNKNOWN");
    }
  }
}
```

7. Configure Integration Composer to utilize the Mapping and adjust maximoasset.properties if necessary.

8. Run the mapping.

9. Review the Conversion tables and adjust the variants as necessary.

10. One of the concerns for using the Asset Initialization to form the baseline is proving software compliance issues. For example, if audited could they produce documentation detailing how many licenses where purchased. If the baseline data is bad then the organization could be in for an expensive licensing upgrade. If it is assumed to be good or a reasonable guess the organization will achieve success and can at least prove they are taking proactive measures to ensure they are compliant with the software vendor licensing requirements.

The reconciliation process is then used to compare the Asset to the Deployed Asset. At the simplest level the organization can compare Assets to Deployed Asset using a Link Rule. A link Rule establishes a common link between the two tables, for example the Asset table has a column for the Serial Number of the Asset. The Deployed Asset table also has a Serial Number field. Since serial numbers are somewhat unique they are a good candidate for a link rule.

The Link Rule is referenced on a Reconciliation Task. The Reconciliation Task is then associated to an instance of the Reconciliation Crontask located in the Crontask Setup Application. A Crontask is simply a schedule of when the Reconciliation Task should be run. The results of the Reconciliation Task are written to the Reconciliation Results and the Link Results Application. The Reconciliation Results, when using a Link Rule, will provide inform the Asset Manager that A deployed asset was found that had no matching Asset, or an Asset Record was found that had no matching deployed asset. In the example below an Asset was found that had no matching deployed Asset record.

Figure 6-3   Reconciliation results - No matching deployed asset

Also depicted in the Reconciliation Results list is a comparison rule that was used to locate unauthorized software. Setting up this rule required the use of five applications, Software Suite Conversion, Comparison Rules, Reconciliation Task, and the Crontask to schedule the task, and the Reconciliation Results to view the results. Software Suite Conversion was utilized to identify the components that make up the suite as well as whether the software was authorized or unauthorized.

Figure 6-4   Reconciliation - Software suite

The comparison rules was utilized to filter the result to only those deployed assets that had, in this case MSOFFICE installed on them.
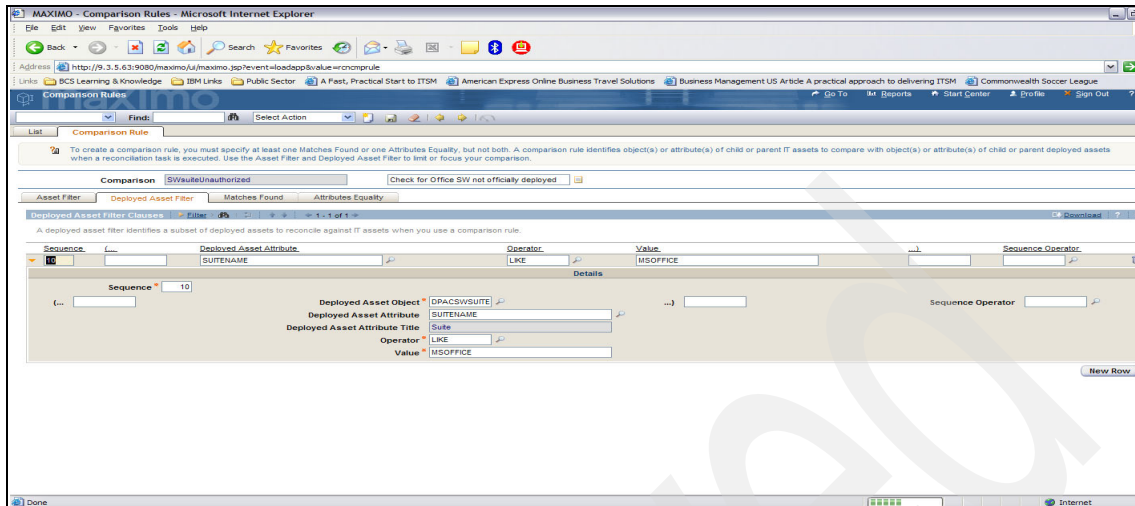
Figure 6-5   Software suite example

In exampling the interface we can see that filtering can be accomplished either from the Asset (authorized side) or deployed asset (physical side). The next two tabs determine whether to use a Matches Found or Attributes Equality Rule. Comparison Rules allow the user to specify which asset attributes they are interested in comparing and the degree of variance that they want to detect. Matches Found defines the range of acceptable relationships between IT assets and deployed assets in a comparison rule. It specifies whether an IT asset or assets can be related to one or more deployed assets. If you specify Matches Found, you must have either an Asset Filter or a Deployed Asset Filter, or both. Attributes Equality identifies specific attribute(s) of a child or parent asset in authorized IT assets to compare with specific attribute(s) of child or parent deployed assets. There must be at least one Matches Found or one Attributes Equality, but not both.

6.6 Dispose phase

All good things must come to an end, whether it is replace of defective parts on the computer, returning lease assets, or accomplishing a technology refresh Tivoli Asset Management for IT can support a large majority of those requirements without customization.   For example, by using Escalations IT Asset Management for IT can send out notifications via e-mail to the Asset and Contract Manager that a Lease Contract is expiring in so many days, allowing for each role to start planning for the replacement item as well as the return of those items. For those Asset's not leased IT Asset Management for IT provides an

Installation Date field on which a report could be generated and sent to the Asset Manager listing those assets that are reaching the organizations refresh policy. For the department managers who fund the technology refresh they can be provided a KPI on their *Startcenter* detailing how many systems that have that will need to be refreshed. In order to accurately track the asset from cradle to grave certain status could be added to the Asset. For example, the organization has an Employee Purchase Plan, a status title 'EPP' would be created referencing IT Asset Management for IT's internal DECOMMISSIONED status, this is known as a Synonym Domain. Any Assets associated with the EPP status would behave based on the DECOMMISSIONED behavior, that is, decommissioned assets will not appear in the Drilldown. A location would also need to be created in order to track the Asset to how it was disposed, that is, EPP, a Donation, and Scraped are just a few examples. For those assets being returned to the vendor a status titled RETURNED referencing the DECOMMISSIONED status as would be a location for each vendor in order to track those assets returned to the vendor.

6.7 Reporting of Results

Tivoli Asset Management for IT powerful reporting engine allows administrators to schedule large batch reports, which can be automatically e-mailed to multiple recipients. Reports can be produced in multiple formats such as PDF, DHTML, and XML, and revisions of past report output are archived. Also included is e-Spreadsheet functionality which customers can use to create and generate on-the-fly reports and queries, that may then be exported to multiple formats.

Building on Tivoli Asset Management for IT's powerful reporting tools, the user can now have the ability to define and display Key Performance Indicators or KPIs which are active monitoring measurements that explain what is happening in the business environment. KPIs greatly enhance the user's ability to see at a glance the status of their business. IT asset managers, for example, can easily monitor software counts and know when approaching software limits, or see when a service commitment to a business unit (for example, e-mail service availability of 98%) is about to drop below acceptable levels due to a hardware failure or software conflict. KPIs are available on Tivoli start centers, so users can quickly see how their day-to-day activities affect KPI performance. KPIs can be displayed graphically, and are color-coded according to customizable, targeted values or benchmarks.

Contract Management

This chapter describes some Contract Management scenarios, including the steps used to accomplish the tasks in IBM Maximo AM. Also workflow will be used to demonstrate alert and escalation capability.

7.1 Maximo contract-related applications

Maximo provides the capability to Manage Contracts through the following Maximo applications:

Labor Rate Contracts - You use the Labor Rate Contracts application to define labor rates for crafts, skills, and optionally, labor records. With the Labor Rate Contracts application, you can manage outside labor and their rates. When you reference craft or skill records on a labor rate contract, you reference records created and maintained in the Crafts application, but you can apply individual rates in a labor rate contract. You also can associate individual labor records with a labor rate contract. There is a person, labor, user relationship in Maximo. Anyone who is going to be a user and/or custodian of an asset or location must have a person record. Further, from a service desk perspective, the person record should exist in order for the service desk to create a service request where the person is either the individual reporting the request to the service desk or they are the person being affected by the service. In order to access Maximo a user record must exist, if the administrator attempts to create a user record without first entering the person record, Maximo will allow them to create a person record based on the User ID entered. In order to record any labor hours, that is, work against any ticket or workorder application, a labor record must be created. The labor record is also associated to one or more crafts, one craft must be the primary, each craft will have numerous skill levels, and each skill level could have different craft rates. So in order to establish Labor Rate contracts either based on craft or labor these applications will need to be populated first. What all of this means is that when establishing Labor Rate contracts these areas must be created first.

Purchase contracts -You use the Purchase contracts application to create, view, and modify purchase contracts with outside vendors. On the contract, you can specify items or services provided, their costs, shipping and handling, expected delivery times, financial terms, and vendor information. When you use a standard purchase contract, Maximo requires a purchase order, but does not specify a maximum amount that you can spend. Before you can approve a purchase contract you must have at least one authorized site. Purchase contracts have the following contract types:

► **Price contracts** - A price contract is a type of purchase contract. You use a price contract to specify that items or services purchased from this vendor over a period of time will be provided at an agreed-upon price. Maximo refers to the contract when you enter items or service items on a request for quotation (RFQ), purchase requisition (PR), or purchase order (PO) line.

► **Blanket (volume) contract**s - A blanket, or volume, contract is an agreement to spend a pre-determined amount with a specified vendor over a period of

time. This type of contract can also list items or services that the vendor will provide. You can create release-type purchase orders (POs) from blanket contracts and track committed costs for all purchases you make. You also can create release POs from purchase requisitions (PRs) for items or catalog services that reference a blanket contract. When you approve a release PO, Maximo verifies that sufficient funds remain to cover the total cost of the PO.

► **Software license contracts** - The Purchase contracts application, you create software license contracts. You can apply them to previous software acquisitions or reference them on purchase records for new licenses. If you create a software license contract for a previous purchase, be sure to set the contract dates and status so that the contract is not referenced on future purchase requisitions or orders. A purchase record that references a software license contract associates the receipt of licenses with the contract. The business rules for each software license type in Maximo are suggestions for setting up line level information for each license type. You can change these values. The values you supply become read-only after the license contract is approved. A software license contract supports seven software licensing models:

- **Concurrent**—A concurrent software license is an instance-based monitoring system. With this software license, Maximo monitors how many users are using the license at the same time. This license contract allows open distribution, but limits it to a set number of concurrent, or simultaneous, license instances.

- **Enterprise**—An enterprise license contract allows open distribution with unlimited use throughout an organization.

- **Named User**—A named user license refers to a list of users who are allowed or denied access to the software. This license allows access by a named set of users. You cannot transfer the license to users not on the access list.

- **OEM**—An Original Equipment Manufacturer (OEM) license supports software that is bundled with computers. This type of license limits your use of the software to the computer on which the software was supplied and is not intended for use elsewhere.

- **Retail**—A retail software license is either a single user or a limited multi-user license. Maximo monitors retail software licenses on an instance basis.

- **Select**—A select software license uses points as an order unit. You establish a volume (of points) agreement to use within your organization. Software suites use a points measure to allow or deny software distribution to end users. Each software package in the suite has a number of points associated with it. As users log on to the software, Maximo calculates the number of points in use. When you reach the

maximum number of points for your license, you cannot log any more users onto the software.

- **Subscription**—Subscription-based license contracts monitor use of a licensed program based on login information for authorized users. The order units on a subscription-based license are time intervals.

Lease/Rental Contracts - You use the Lease/Rental Contracts application to define the overall terms and conditions of an agreement between a vendor and a customer regarding one or more rotating assets. A rotating asset is an asset that is interchangeable, such as a motor, pump or mobile computer (laptop). Rotating assets have both an asset number and an inventory item number. Having an asset number as well as an inventory item number lets you track the asset as it moves from an operating location to a storeroom and back to an operating location. Maximo does not provide the details of the individual costs per asset until the assets are received by the customer. Payment schedule details are generally consolidated and provided on a monthly or quarterly basis. The details could include the total payment amount, total number of payments, lease rate factor and periodic payment amount. There also may be detailed information about the costs associated with each individual asset that was delivered during the specified time period. When you receive a new payment schedule, you can either create a new lease contract under the master agreement, add a new payment to an existing lease contract, or create a new lease contract under the existing master with one line of payment schedule details.

Warranty/Maintenance - You use the Warranty Contracts application to create warranty contracts. A warranty contract defines the agreement to maintain one or more assets with an outside service provider for a fee or scheduled set of payments and tracks warranty information for assets and locations by time or meter. You also use a warranty contract to create a service contract. A service contract indicates that an outside service provider maintains one or more assets. Payment for service can be made with a single fee or with a scheduled set of payments.

Master - You use the Master Contracts application to associate many types of contracts for the same vendor. A master contract defines the relationship with a vendor that applies to the contracts associated with it. You can provide detailed information about a contract's terms and contact information. They can be used in one of two ways:

► You have a major project that is going to do staged buys throughout the year and you know the total cost was negotiated up front. For example, you are going to purchase a specific portion of the item over the next 3 months, Maximo could be used as an example. You know the total cost, well until scope creep starts happening, you have 100,000 budgeted for Professional Services, 50000 to purchase the IBM Blade Servers, 250,000 for software

license, and a maintenance agreement based on the Bronze level of support for $100,000. We could create a master contract for the Maximo Purchase and Installation, and on this master create two Purchase Contracts one would be the software type, the other a Purchase. We would have a Warranty covering the Software and Service Contract for the implementation of Maximo. We could also treat the Professional Services (PS) as a labor rate, or even a blanket for the purchase of services.

► The second usage is simply for the master contract to list all contracts generated for a specific vendor, that is, if you had 100 contracts with IBM and all of those contracts were generated from the Master, you have one center source to go to and then drill into the contract you want to view, The use of Master Contracts should not be an after thought as you cannot associate contracts created in the individual contracting applications to the master. in other words all contracts that need to be associated to the master must be created from the master.

7.2 Escalations and workflow

Escalations and workflows are two very powerful tools in Maximo. The following provides examples of how they can be used within the context of contract management.

To create an escalation that checks the contract End Date on leased assets we would use the Escalations Application. In this example we will create an Escalation that checks the Lease (Leaseview Object) every 24 hours for leases that will be expiring in 30 days. If the escalation finds a lease that meets the criteria it will send out a notification (email) and place the Contract into the organization workflow process for handling lease and rental contracts. We will need to create the workflow process before the escalation, since the escalation will start the workflow process through the use of an Action. The example workflow is going to very simple, it will place a task for the contract manager in their Inbox informing them that a lease contract is about to expire and they need to start the bid process.

7.2.1 Workflow Creation

1. Open Workflow Designer.
2. Create a new Workflow Process. Title the process LEASECONT and reference the LEASEVIEW Object. Maximo will automatically add a Start and Stop node. A workflow can have only one Start Node but it can have numerous Stop Nodes.
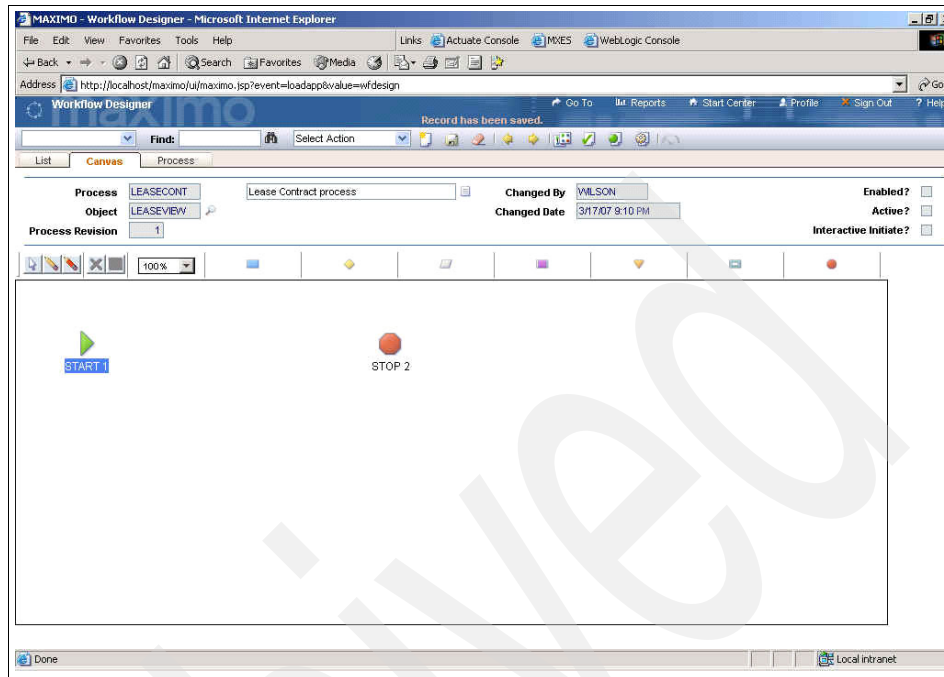
Figure 7-1   Create new workflow process

3. Save the workflow process.

4. Place your cursor on the Task Node, Blue Rectangle and drag it to the work area.
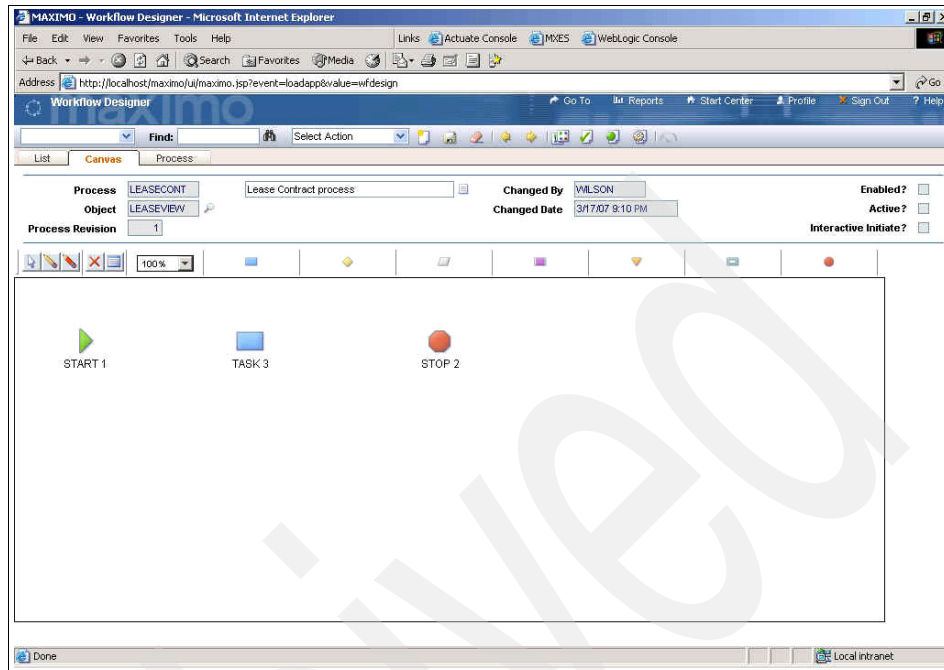
Figure 7-2   Adding a task

5. Double-click the Task node and this will open up the properties dialog window. Here we give the task a name, description and assign the role; a role in Maximo is only used to assign work or send out notifications.
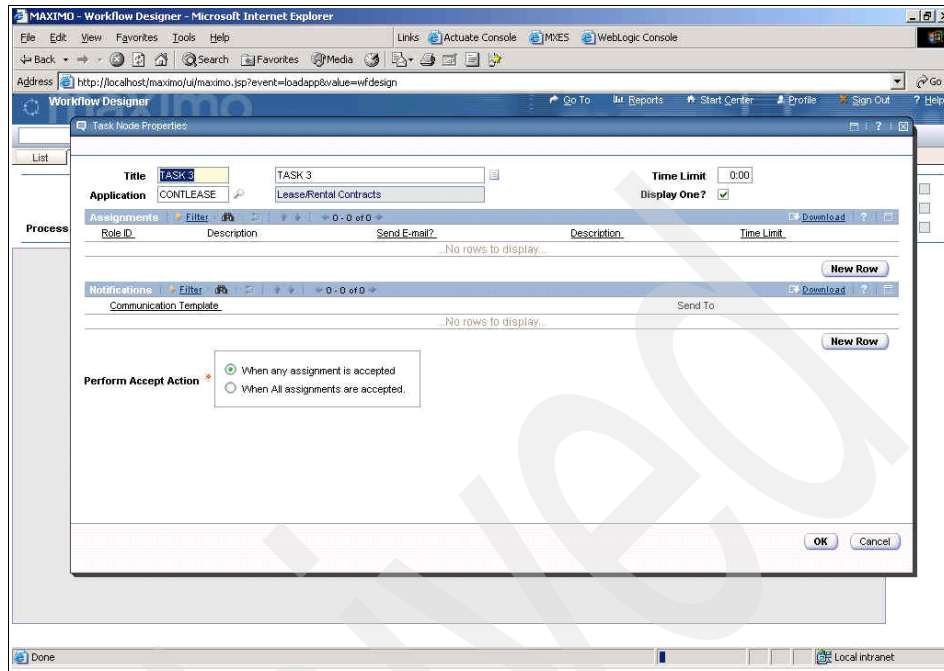
Figure 7-3   Task properties

6. Title the task CONTMGR and in the description field enter Lease Ending.
    Then select the New Row button under the assignments section. This is used
    to identify which Role(s) that are supposed to accomplish this task. Select the
    Detail menu button next to the Role ID field and select the menu option 'Go
    To Roles. We will need to create a new role for this task.
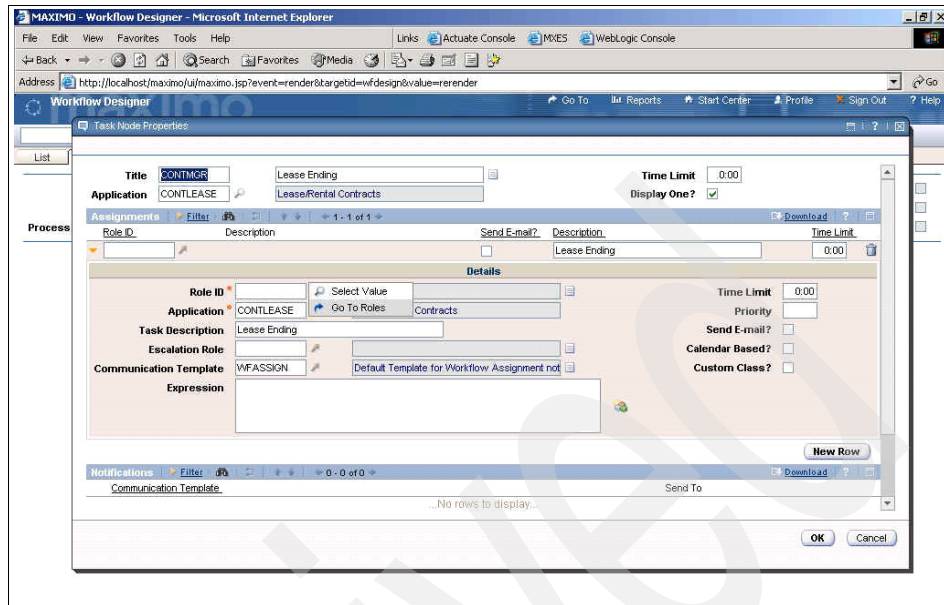
Figure 7-4   Roles for task

7. Select the CRTBUYERLE which is associated to the LEASEVIEW object.
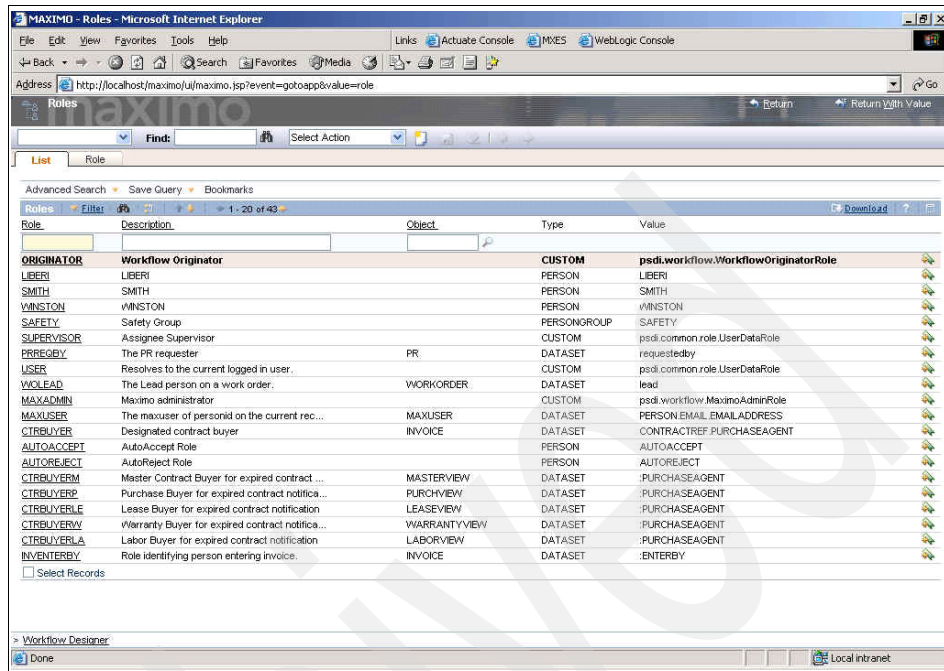
Figure 7-5   Selecting roles

8. This Role is considered a dynamic role as each Contract will have a specific Buyer. When the value needs to be determined when the process is started the Role Type would be set to a Dataset. We can tell Maximo which field (attribute) to use, in this case the field is PURSCHASEAGENT. Notice the colon in front of the field value. The colon is the syntax for a substitution value, so if the Buyer field (PURSCHASEAGENT) had WILSON identified as the Buyer, Maximo will send the work to WILSON. There are other roles. However, an in-depth discussion on workflow, escalations, and roles is beyond the scope of this text.
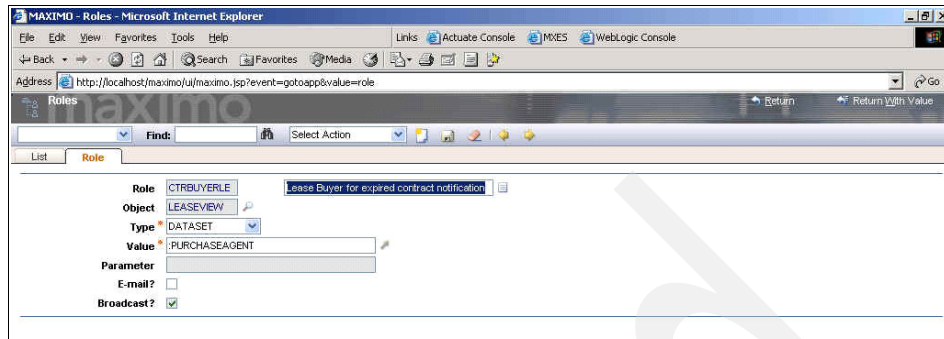
Figure 7-6 Role details

9. Select Return with Value and this will take you back to the Task Node properties dialog window and populate the Role ID field with our selected value. In the Task Description field enter the following:

```
Contract:CONTRACTNUM ending in 30 days
```

This will be the description the Buyer will see in the Workflow Inbox, the substitution value will provide the Buyer with the contract number that is expiring.
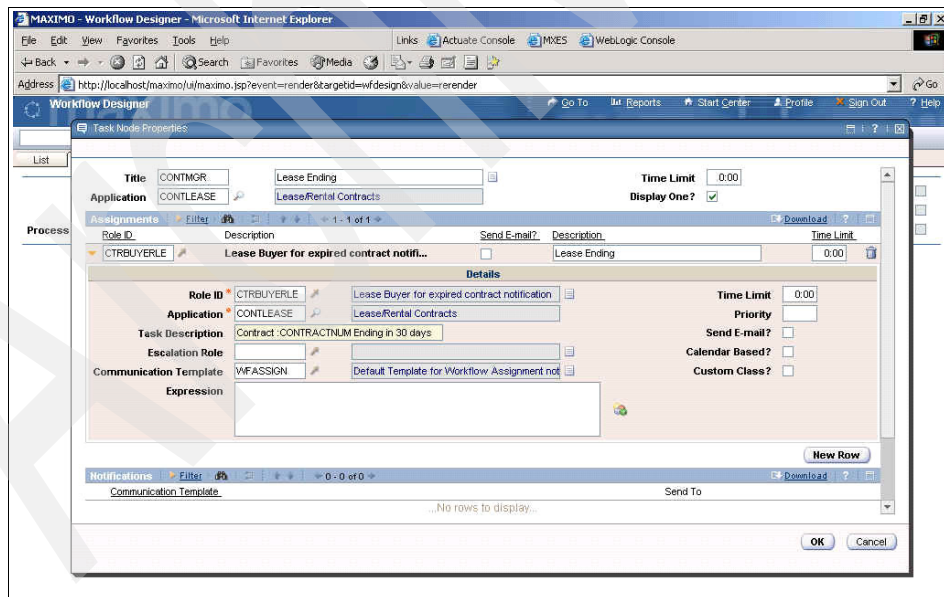
Figure 7-7 Returning to task properties

10. Click OK, and this will take you to the Workflow Canvas. Add in two positive actions (Yellow Pencil) connecting the Start Node to the Task Node, and the Task Node to the Stop Node.
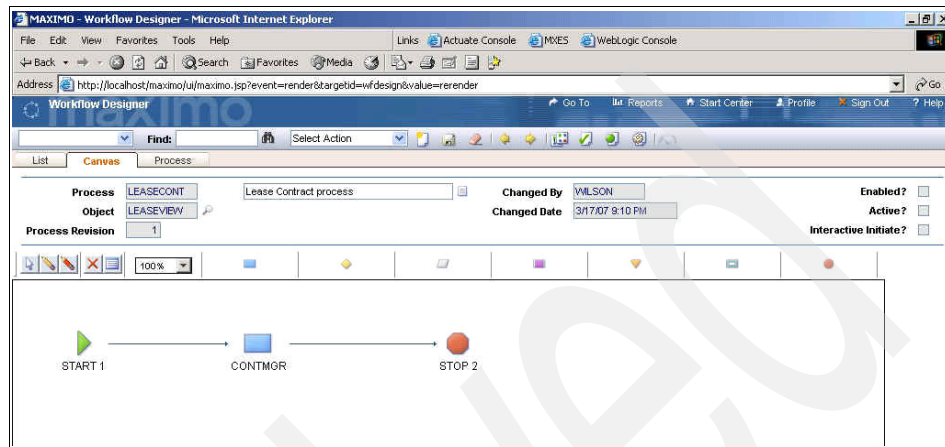
Figure 7-8   Updated workflow

11. The next step is to Enable the process. Maximo will validate the process to ensure that all nodes are connected correctly. It does not validate expressions. That would need to be done using the expression builder. The process must be enabled before it can be Activated. By enabling and activating records can now be placed into the process. A workflow can be enabled but not active, this is likely a result of a workflow revision. If the workflow process has active records Maximo will not allow the process to be disabled until either the records clear the process or someone stops the workflow process.
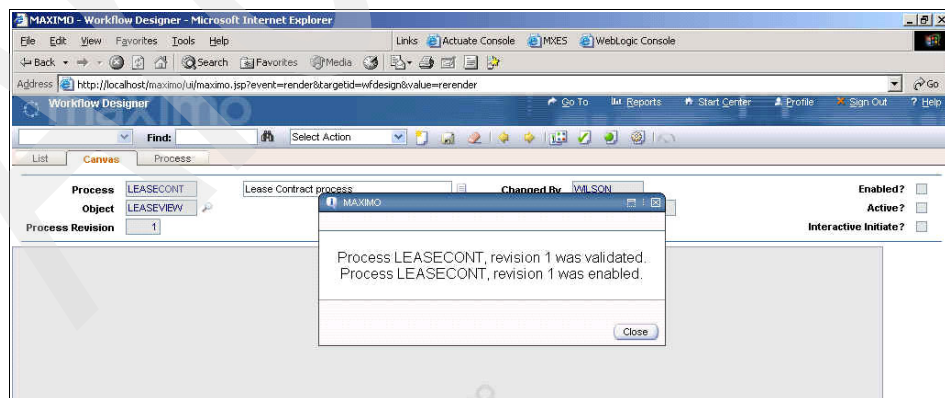
Figure 7-9   Enabling the workflow process

12. When you activate the process, Maximo may prompt you to add workflow support to the Object the workflow process is based. This will enable the menu options in the Select Action drop-down box.
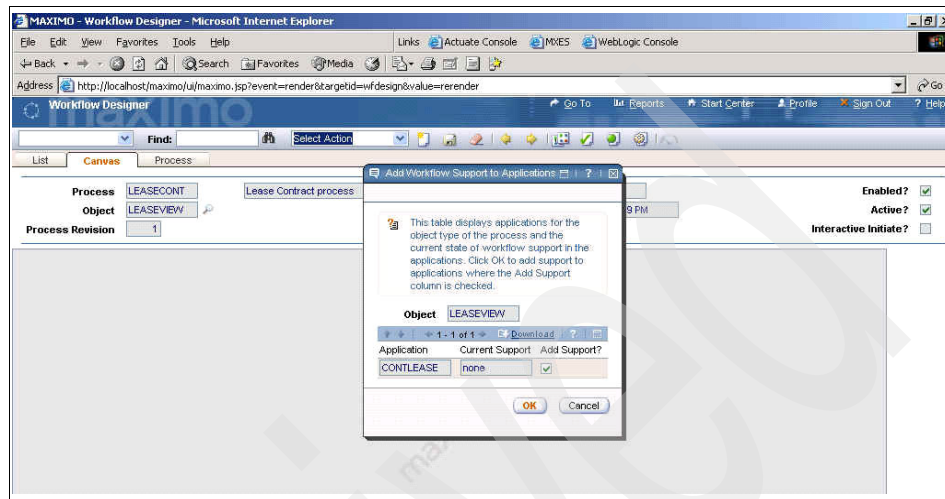
Figure 7-10   Adding workflow support to object

Again this was a very simple workflow, ideally we would have built the process to include other tasks based on the business process that is in place. For example create an RFQ, notify Asset Manager, and so on.

7.2.2 Escalation example

1. Open the escalations application and create a new escalation.

Figure 7-11   New escalation

2. Use the following information:

```
Escalation - LEASE30Day
Applies To – LEASEVIEW
Condition - STATUS='APPR'
Schedule - set for 2 minutes using Scheduler
```

In the Escalation Points section, we establish the criteria we want to escalate when the condition point is met. Here we want to escalate when the contract ENDATE is within 30 days of ending. The elapsed time attribute is limited to date fields on the object, however the escalation point condition can be used to define other attributes.

```
Elapsed Time Attribute - ENDDATE
Elapsed Time Interval – -30
Interval Unit of Measure – days
```

On the Actions tab we are going to create a new action that will initiate the workflow process that we created earlier.

3. Select New row and then go to the Actions application.

4. Insert a new action, accept the autonumber and enter the following:

```
Description - Lease End
Object — LEASEVIEW
TYPE- Application
Value — WFINITIATE
Parameter/Attribute - LEASECONT
```


Figure 7-12   Entering Action information

5. Save the Action and Return with Value; your screen should like Figure 7-13.

Figure 7-13   Escalation with Action

6. Select the Notification Tab, next to the Action Tab, add a new row and go to the Communication Templates Application.
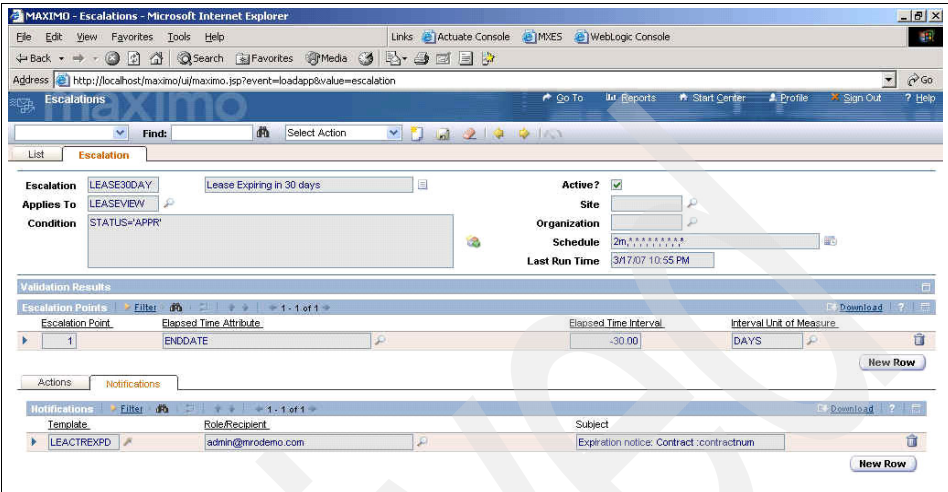
Figure 7-14   Communication templates application

7. Select the LEACTREXPD communication template and make the following change in the e-mail body section.
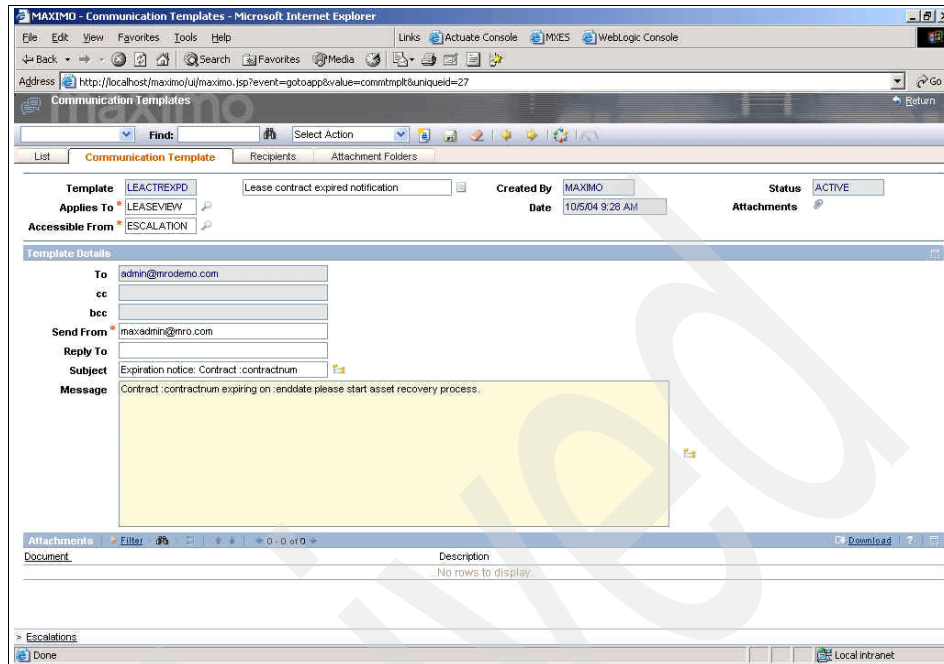
Figure 7-15   Information for e-mail in escalation

8. Select the Recipients tab. We are going to use admin@mrodemo.com as the recipient to illustrate the process.

9. Remove any Roles. Note the sections are collapsed by default.

10. In the e-mail section, enter `admin@mrodemo.com` and check mark the `To` check box.
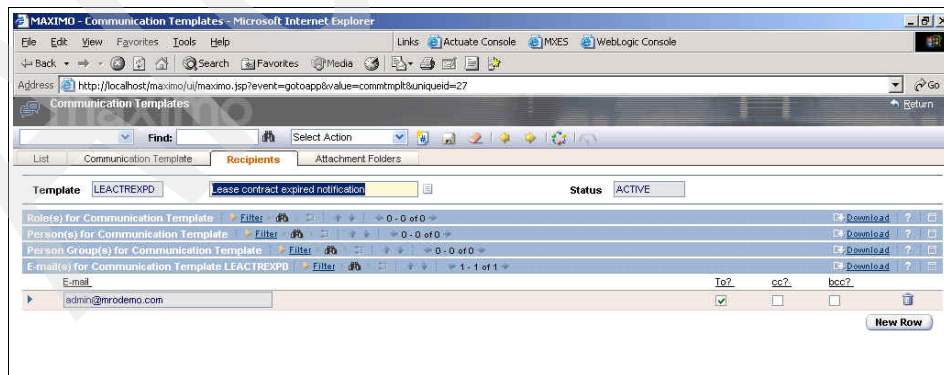
Figure 7-16   Completed e-mail information panel

11. Select Return

12. Activate the Escalation

After the escalation executes, records will be visible in the recipients Inbox/Assignments window with the Description contact that is expiring. By selecting the record, Maximo will open the correct contract for viewing.
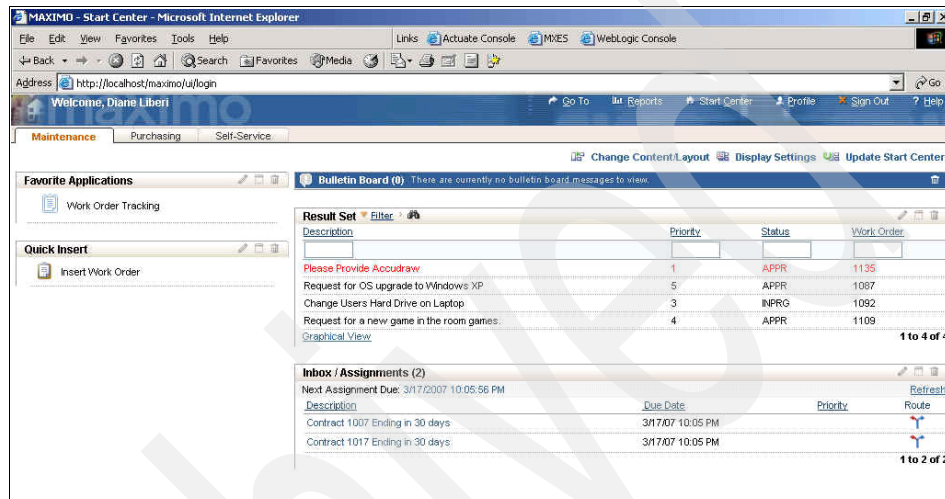
Figure 7-17   User receiving escalation notification for expiring contract

7.3 Summary

This chapter has provided brief and simple examples of how workflows and escalations can be used within Maximo to perform contract management.

8

License Management and Compliance

This chapter contains License Management and Compliance scenarios including steps for using the Tivoli Asset Compliance Center for mainframe platforms and Tivoli License Compliance Manager GUI for distributed platforms, to accomplish the tasks. These scenarios will utilize inventory and usage information from TLCMz and TLCM.

8.1 Business challenges of License Management

While business organizations are focused to improve and optimize their Information Technology (IT) or Information and Communications Technologies (ICT) infrastructure to better align it to their business and decrease associated costs, software is recognized as one of its most critical elements.

Software, whether internally developed or externally procured, is one of the most important and costly parts of the IT budget, and therefore requires special attention from business executives. This attention should not be limited to cost control, but should also be extended to compliance monitoring as well. As most governance requirements, such as Sarbanes-Oxley in US, Turnbull in UK, and Basel-II business executives must also ensure that their enterprise is not exposed to legal actions, financial penalties, or reputation loss.

The three main factors driving the need for a comprehensive license management solution are:

► Compliance with regulations and governance
► Management of risks on the business operations
► Management and optimization of software costs

To help you better understand these factors and their impact on your enterprise, you could ask yourself the following questions:

► Does my enterprise have enough licenses, meaning that my enterprise could not be compliant with the regulations and agreed terms and conditions of license contracts?

► Does my enterprise have too many licenses, meaning that my enterprise is paying for unused software?

► Do the end users of my enterprise run the software *only* on authorized systems?

► Do the end users of my enterprise *only* use the software they are authorized to, meaning they are not using any pirated or illegal software?

► Do the end users of my enterprise use the software licenses they are entitled to, no more (in order to avoid exposure) no less (to optimize the cost)?

The scenarios in this chapter show how you might answer some of these questions using the Tivoli License Compliance products.

8.2 Software Asset Management and License Management

Software assets are a key component in the IT equation. Maintaining those software products in a large infrastructure, that can include thousands of servers and desktops, and mainframe systems, is no trivial task. There is no universal, correct solution to manage software assets but implementing governance and processes based on an industry standard like ITIL will help your enterprise to face this challenge.

Understanding and controlling the broader context in which a License Management project is executed is the key success factor.

8.2.1 License Management

Software Asset Management is how you manage the software assets within your enterprise. An important aspect of SAM is License Management. Software licenses are rights to use software, with certain terms and conditions attached.

The rights to use software are totally separate from the legal rights to the software itself, which are normally kept by the software manufacturer or other third party. Licenses may be bought, or may be free, but always subject to special terms and conditions. Even open source software normally has a license agreement attached to it, even though payment may not be required.

Licenses are normally required whenever externally sourced software is used. The term, used in this context, is typically defined as software either being installed on a machine, or being executed on a machine, even if installed elsewhere (for example, a server). They may also be defined in enterprise terms, such as number of workstations or employees, in which case a license is required for each qualifying unit or individual regardless of actual usage.

Even with commercial software, there are several situations where paid licenses may not be required, depending on specific contractual conditions. Often, these situations are not understood and, as a result, organizations may purchase licenses they do not need. These situations include workstations used for dedicated training purposes (with limits on numbers), copies used for evaluation purposes (with conditions on how they are used, and for how long) and copies used for distribution purposes. Likewise, there can be runtime versions of some software, which do not require separate paid licenses. (It may be difficult to distinguish between runtime and non-runtime versions of such software.)

Software licensing is complex. Compliance with all of its terms and conditions requires in-depth knowledge. Typically, an organization will need to assign the

responsibility for understanding licensing to specific individuals, and then ensure that they have the necessary training (initial and ongoing) to master the area.

8.3 License Management Tools

In this section we introduce the IBM Tivoli products, Tivoli License Compliance Manager for z/OS and Tivoli License Compliance Manager (on the distributed systems) as tools for managing software licenses and compliance.

8.3.1 IBM products for License Management

For distributed systems, IBM Tivoli License Compliance Manager provides software inventory, use metering, and license allocation services on Windows, UNIX, and OS/400 platforms. It can be scaled to meet the needs of large and small organizations, and supports the management of multiple organizations.

For mainframe systems, IBM Tivoli License Compliance Manager for z/OS identifies software inventory, measures use activity, and automatically links license entitlements to help manage software costs and license compliance in the mainframe environment.

The IBM Tivoli License Compliance Manager for z/OS GUI known as Tivoli Asset Compliance Center (TACC), is a task oriented GUI that enables the user to define their software license metrics, such as full capacity or sub-capacity. And it then automatically links these license entitlements to discovered software inventory and use activity information enabling the user to proactively manage license compliance and reduce unnecessary software costs.

In the future, it is expected that a single GUI will be used for both z/OS-based and distributed license information, enabling the user to see the complete end-to-end picture of their software assets cross-platform, and manage their licenses and compliance.

8.3.2 Defining license models to determine compliance

One of the reasons why Software Asset Management is so hard is due to the complexity of license metrics and license types. This complexity can sometimes result in breaches unknowingly.

So, any help in this area is always well received for a Software Asset Manager and stakeholders. To have a good compliance strategy and a clear understanding is required of the different license types, license metrics, and the rules that apply to create the different license models.

The following sections describe the type of licenses for which the license metric values can be discovered in order to determine compliance, using Tivoli License Compliance Manager for z/OS. You may also find it useful to refer to Appendix A of the *IBM Tivoli License Compliance Manager for z/OS: User Guide for Distributed Components*, SC32-2027. For further details on all the parameters regarding the licenses refer to the appendix A of the guide mentioned above.

Required parameters in a license definition

The *license scope* and the *capacity unit* in terms of the license agreement are part of the definition of the license metrics.

Each license contains a licensed capacity value, expressed in a particular metric, capacity unit: MSUs (millions of service units), Seat/Installed Instances, Installed Instances, Concurrent Users, Value Units, Processors.

License scope

Scope is an integral part of a license agreement. Scope defines the breadth of the license in terms of enterprise, site, machine, user, or LPAR. If discovered software is found within the scope of a license, it is assigned to the license. Otherwise, discovered software is unlicensed software.

Table 8-1   Business rules for each scope type

License scope	Business rule
Enterprise	The location for each discovered machine must be within the enterprise specified in the license.
Site	The location for each discovered machine must be within the location specified in the license.
Machine	The discovered machine serial number must be equal to a specified serial number in the license.
LPAR	LPAR scope requires that a machine serial number is also specified. This scope limits where the licensed product may be executed. The discovered LPAR identifiers must be equal to the specified LPAR identifiers in the license and the discovered machine serial number of the machine containing the LPAR must be equal to a specified serial number in the license.

Within IBM Tivoli License Compliance Manager for z/OS this license scope value is defined in the License Details section of the License Business Object.

License term definitions

Each scope in a license is covered under a license term that determines if the discovered software is counted against the license entitlement.

Table 8-2   License term values and definitions

License term	Definitions
Installed	If the software is installed within the scope, it is counted against the entitlement
Executed	If the software is installed and executed within the scope of the license, it is counted against the entitlement.
Licensed	This term is used with mainframe licenses. If the software is licensed to a machine or LPAR, it is counted against the license entitlement.

Within IBM Tivoli License Compliance Manager for z/OS this license term value is defined in the License Details section of the License Business Object, in the License Term field.

License serial numbers

Licenses often carry with them a license serial number. This information is essential since they often represent the only way to correlate a vendor's license information with that held by the customer.

IBM Tivoli License Compliance Manager for z/OS provides fields into which you can manually record the license serial number. For example, you can use the Name field or the Comments field to record this information.

Supported mainframe license models

The supported mainframe license models within Tivoli License Compliance Manager for z/OS - Tivoli Asset Compliance Center are presented in the following tables.

IBM Monthly license charge licenses (MLC)

All monthly license charge licenses are based on one product per license.

Each machine must be designated for pricing and compliance purposes as using Parallel Sysplex® License Charge (PSLC) or Workload License Charge (WLC) pricing. Each machine must also be designated as eligible for sub-capacity pricing or (only) full-capacity pricing (a PSLC machine may only be designated full-capacity).

For further details regarding for each license model WLC full-capacity, WLC sub-capacity, PSLC description, how the machine registration designation affects the discovered capacity and compliance calculations, and the possible combinations of license types and pricing metrics, refer to Appendix A of the *IBM Tivoli License Compliance Manager for z/OS: User Guide for Distributed Components*, SC32-2027.

In Table 8-3 we describe the Monthly license charge license types and what you must do to create a license of each type.

Note: Fields with an asterisk are automatically filled with the specified value once the license type value is selected.

Table 8-3   Monthly license charge licenses

License type	Scope	License term	Capacity unit	Full capacity/ Sub-capacity → **Capacity**	Serial number [Machines]	Software product
IBM Flat workload license charge (FWLC)	Machine*	Licensed*	Blank*	Full capacity, not need specify anything	Specify the machine serial number	Specify the software product
IBM Variable workload license charge (VWLC)	Machine*	Licensed*	MSUs*	Full capacity= specify the license capacity value	Optionally specify machine serial numbers in the **License Comments** field. Note: If there are multiple serial numbers, they must be in the same Qualified parallel sysplex.	Specify the software product
				Sub-capacity= No value at the license capacity value	Specify the machine serial number	

License type	Scope	License term	Capacity unit	Full capacity/ Sub-capacity → Capacity	Serial number [Machines]	Software product
IBM Entry workload license charge (EWLC)	Machine*	Licensed*	MSUs*	Full capacity= specify the license capacity value	Specify the machine serial number	Specify the software product
				Sub-capacity= Not value at the license capacity value		
IBM Tiered entry workload license charge (TWLC)	Machine*	Licensed*	MSUs*	Full capacity= specify the license capacity value	Specify the machine serial number	Specify the software product
IBM Parallel sysplex license charge (PSLC)	Machine*	Licensed*	MSUs*	Full capacity= specify the license capacity value	Specify the machine serial number. Note: If there are multiple serial numbers, they must be in the same Qualified parallel sysplex.	Specify the software product

zSeries IPLA one time charge (OTC)

This type of licensing is based on value units. The Aggregated Discovered Capacity in MSUs across the enterprise will be converted to value units based on the value unit exhibit that applies to each product.

Table 8-4 describes the IBM eServer™ zSeries® IPLA one time charge license types and what you must do to create a license of each type:

Note: Fields with an asterisk are automatically filled with the specified value once the license type value is selected.

Table 8-4   One time cost licenses

License type	Scope	License term	Capacity unit	Capacity	Serial number [Machines] / [Systems]	Software product
IBM IPLA execution-based full capacity	Enterprise	Executed*	Value Units*	Set the license capacity as Value Units	Specify the machine serial numbers (more than one serial number)	Specify the software product. And if not defined its Value Unit Exhibit Identifier specify it also
	Machine	Licensed*			Specify the machine serial number	
IBM IPLA execution-based sub-capacity	Machine	Licensed*	Value Units*	Set the license capacity	Specify the machine serial number. (There may be multiple serial numbers)	Specify the software product. And if not defined its Value Unit Exhibit Identifier specify it also
	LPAR				Specify the LPAR Identifier. (There may be multiple LPAR identifiers)	
IBM IPLA z/OS-based full capacity	Enterprise	Executed*	Value Units*	Set the license capacity	Specify the machine serial numbers (more than one serial number)	Specify the software product
	Machine	Licensed*			Specify the machine serial number	

License type	Scope	License term	Capacity unit	Capacity	Serial number [Machines] / [Systems]	Software product
IBM IPLA z/OS-based sub-capacity	Machine	Licensed*	Value Units*	Set the license capacity	Specify the machine serial number. (There may be multiple serial numbers)	Specify the software product. And if not defined its Value Unit Exhibit Identifier, specify it also
	LPAR				Specify the LPAR Identifier. (There may be multiple LPAR identifiers)	
IBM IPLA reference-based full capacity	Enterprise	Executed*	Value Units*	Set the license capacity	Specify the machine serial numbers (more than one serial number)	Specify the software product
	Machine	Licensed*			Specify the machine serial number	
IBM IPLA reference-based sub-capacity	Machine	Licensed*	Value Units*	Set the license capacity	Specify the machine serial number. (There may be multiple serial numbers)	Specify the software product
	LPAR				Specify the LPAR Identifier. (There may be multiple LPAR identifiers)	

Note: z/OS-based and reference-based IPLA pricing are similar. The difference is that for z/OS-based pricing, there is no special processing for qualified parallel sysplex; each machine is treated as a standalone machine.

ISV mainframe software license model

We describe licenses that are used by mainframe ISV vendors. Each ISV mainframe license supports one or more software products. The license is based on the capacity across the scope.

In Table 8-5 we describe the ISV mainframe software license types and what you must do to create a license of each type.

Note: Fields with an asterisk are automatically filled with the specified value once the license type value is selected.

Table 8-5   ISV mainframe software license model

License type	Scope	License term	Capacity unit	Capacity value	Software	Serial number [Machines] / [Location]
ISV Capacity	Enterprise	Licensed, Executed or Installed	MSUs	Specify the license capacity (allows unlimited)	Specify the software products	
	Site	Licensed, Executed or Installed				Specify the location
	Machine	Licensed, Executed or Installed				Specify the machines

Supported distributed license models

The supported distributed license models within Tivoli License Compliance Manager for z/OS - Tivoli Asset Compliance Center and Tivoli License Compliance Manager are presented in the following tables.

In Table 8-6 we describe the Distributed IBM license types and what you must do to create a license of each type.

Note: Fields with an asterisk are automatically filled with the specified value once the license type value is selected.

Table 8-6   Distributed IBM license models

License type	Scope	License term	Capacity unit	Capacity value	Software	[Machines] / [Location]
Installed Instance	Enterprise	Installed*	Installed Instances*	Specify the license capacity	Specify the software products	
	Site					Specify the location
	Machine					Specify the Machines
User Concurren t Session	Enterprise	Executed*	Concurrent Users*	Specify the license capacity	Specify the software products	
	Site					Specify the location
	Machine					Specify the Machines
User Concurren t Nodelock	Enterprise	Executed*	Concurrent Users*	Specify the license capacity	Specify the software products	
	Site					Specify the location
	Machine					Specify the Machines
IPLA Full-Capa city	Enterprise	Executed*	Value Units or Processors	Specify the license capacity	Specify the software products	
	Site					Specify the location
	Machine					Specify the Machines
IPLA Sub-Capa city	Enterprise	Executed	Value Units or Processors	Specify the license capacity	Specify the software products	
	Site					Specify the location
	Machine					Specify the Machines
Install IPLA Full-Capa city	Enterprise	Installed*	Processors*	Specify the license capacity	Specify the software products	
	Site					Specify the location
	Machine					Specify the Machines

License type	Scope	License term	Capacity unit	Capacity value	Software	[Machines] / [Location]
Install IPLA Sub-Capacity	Enterprise	Installed*	Processors*	Specify the license capacity	Specify the software products	
	Site					Specify the location
	Machine					Specify the Machines
IPLA Value Unit Full-Capacity	Enterprise	Executed*	Value Units*	Specify the license capacity	Specify the software products	
	Site					Specify the location
	Machine					Specify the Machines
IPLA Value Unit Sub-Capacity	Enterprise	Executed*	Value Units*	Specify the license capacity	Specify the software products	
	Site					Specify the location
	Machine					Specify the Machines
Install IPLA Value Unit Full-Capacity	Enterprise	Installed*	Value Units*	Specify the license capacity	Specify the software products	
	Site					Specify the location
	Machine					Specify the Machines
Install IPLA Value Unit Sub-Capacity	Enterprise	Installed*	Value Units*	Specify the license capacity	Specify the software products	
	Site					Specify the location
	Machine					Specify the Machines

In Table 8-7 we describe the Distributed ISV license types and what you must do to create a license of each type.

Note: Fields with an asterisk are automatically filled with the specified value once the license type value is selected.

Table 8-7   Distributed ISV license models

License type	Scope	License term	Capacity unit	Capacity value	Software	[Systems] / [Location] / [Named Users]
Seat/Installed Instance	Enterprise	Installed*	Seat/Installed Instances*	Specify the license capacity	Specify the software products	
	Site					Specify the location
Concurrent User	Enterprise	Executed*	Concurrent Users*	Specify the license capacity	Specify the software products	
	Site					Specify the location
Processor Count Full-Capacity	Enterprise	Executed*	Processors*	Specify the license capacity	Specify the software products	
	Site					Specify the location
Processor Count Sub-Capacity	Enterprise	Executed*	Processors*	Specify the license capacity	Specify the software products	
	Site					Specify the location
Generic	Enterprise	Licensed, Executed or Installed	MSUs, Seat/Installed Instances, Installed Instances, Concurrent Users, Value Units or Processors	Specify the license capacity	Specify the software products	
Generic	Site	Licensed, Executed or Installed	MSUs, Seat/Installed Instances, Installed Instances, Concurrent Users, Value Units or Processors	Specify the license capacity	Specify the software products	Specify the location

License type	Scope	License term	Capacity unit	Capacity value	Software	[Systems] / [Location] / [Named Users]
Generic	Machine	Licensed, Executed or Installed	MSUs, Seat/Installed Instances, Installed Instances, Concurrent Users, Value Units or Processors	Specify the license capacity	Specify the software products	
Generic	LPAR	Licensed, Executed or Installed	MSUs, Seat/Installed Instances, Installed Instances, Concurrent Users, Value Units or Processors	Specify the license capacity	Specify the software products	Specify the Systems
Generic	User	Licensed, Executed or Installed	MSUs, Seat/Installed Instances, Installed Instances, Concurrent Users, Value Units or Processors	Specify the license capacity	Specify the software products	Specify the Named Users

This Generic license model covers others possibilities. So, leave all the possible values for the scope, license terms, and capacity unit.

8.4 Steady state roles and responsibilities

To operate the solution in the best condition and to really perform License Management in your enterprise, roles and responsibilities should be defined within your organization.

8.4.1 Business License Management roles and responsibilities

Defining the targeted user community, and their activities and goals have been one of the design processes prior to the design of the distributed component of Tivoli License Compliance Manager for zOS, the Tivoli Asset Compliance Center (TACC) application. The following steps were defined by the Interaction Design methodology, and the designated Interaction Design team spent several months observing customers in their environments, conducting interviews with subject matter experts and stakeholders, and documenting the research.

The goal was a simple, easily understood design that directly supports users' goals and hides the complexity of the data model. We want users to be focused on achieving their goals, not the tool.

If you implement a License Management solution, the following roles must be defined in your enterprise. Some of them may already exist in your organization. In this case, new responsibilities related to License Management may need to be assigned.

Based on the targeted user community defined, we focus on the primary roles and scenarios that relate mostly to the License Management functions that are handled and supported by the IBM solution - IBM Tivoli License Compliance Manager for zOS and IBM Tivoli License Compliance Manager.

First, we introduce the primary personas and roles that will interact with the Tivoli Asset Management for IT applications that make up the solution presented in this book.
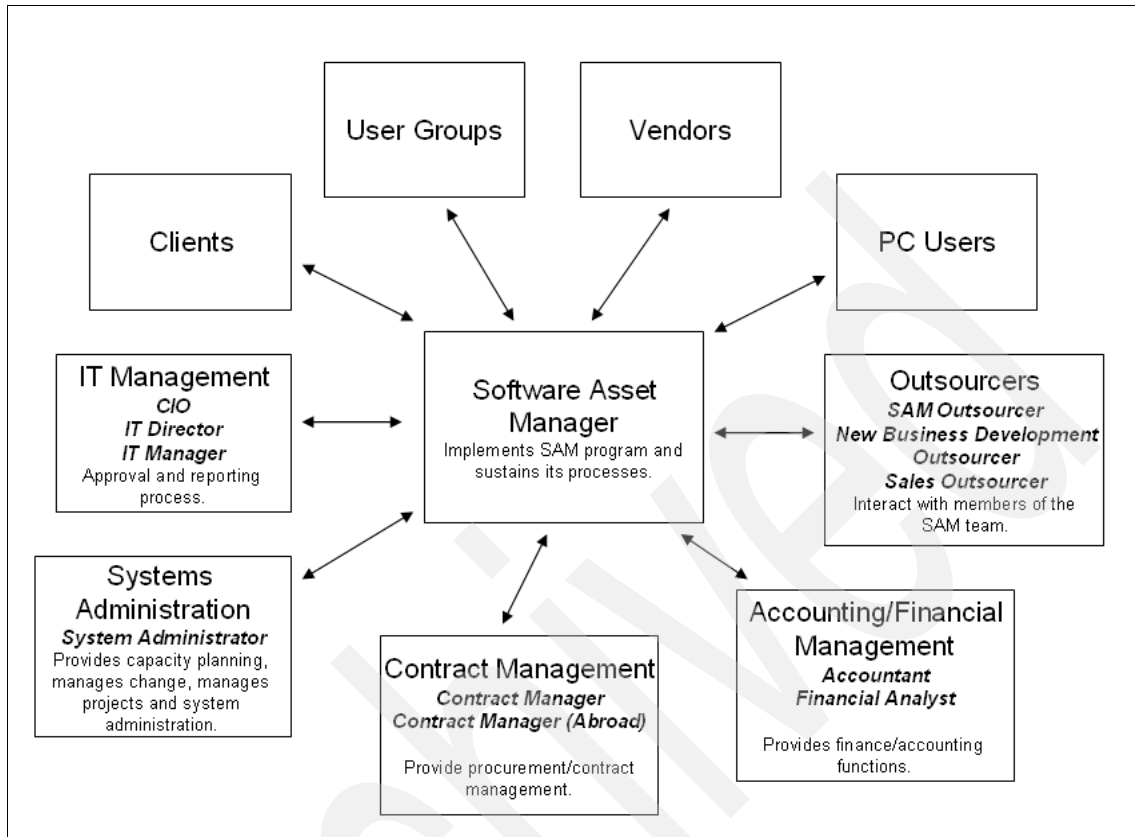
Figure 8-1   Key Roles

Software Asset Manager

The Software Asset Manager implements the Software Asset Management program and sustains its processes.

The Software Asset Manager role also correspondes with the following roles:

► Asset and License Administrator.

► Together with the Contract Manager role, the Software Asset Manager role correspondes with the Software Acquisition and Rights Manager.

► The Software Asset Manager performs many of the same compliance tasks as the SWG Software Compliance Manager, so it correspondes with that role also.

Software Asset Manager's goals include:

► Reducing the software budget by percent per year

- Knowing the company's software financial position at any given time
- Finding a balance between software licenses used versus software licenses purchased
- Insuring that the organization remains compliant with the terms of all licenses

Software Asset Manager assumes at least the following *enterprise wide* responsibilities:

- Provides compliance information for the licenses by doing the reconciliation between the procurement information and the inventory of the licenses
- Informs the Procurement Manager about violations or under-usage of licenses
- Verifies the accuracy of the inventory information about licenses
- Provides licenses inventory information to Management and Operations staff
- Supports and manages any licenses inventory request
- Optimizes the management of the licenses
- Provides internal and external reports about licenses inventory information

Contract/Procurement Manager

The Contract/Procurement Manager provides procurement and contract management.

The Contract/Procurement Manager role also corresponds with the following roles:

- Together with the Software Asset Manager role, the Contract Manager role corresponds with the Software Acquisition and Rights Manager.

Contract Manager's goals include:

- Making the entire contract management process more efficient
- Controlling software costs
- Ensuring that invoices and contract proposals comply with terms of current contracts
- Obtaining a competitive edge by utilizing usage data during contract negotiations

Contract Manager assumes at least the following *enterprise wide* responsibilities:

- Analyzes the license ordering request
- Orders licenses from the vendors
- Records the licenses contract information in the Contracts Database

- Makes the license contracts conform to the compliance information provided by the License Compliance Manager/Software Asset Manager
- Manages an ordering list of waiting licenses
- Charges back to the clients for the licenses ordered specifically for them

Financial Analyst

The Accountant Financial Analyst provides finance and accounting functions.

Financial Analyst's goals include:

- Reconciling all software invoices against contract terms
- Managing software costs within the constraints of the IT budget
- Calculating the financial impact of hardware and software upgrades and consolidations
- Supporting senior management in the preparation of budgets and forecasts

IT Manager

The IT Manager provides approval and reporting process.

The IT Manager's role corresponds with the following roles:

- Together with the Network Administrator (secondary persona), the IT Manager's role corresponds with the Systems Management Specialist
- System and Resource Manager (Distributed)
- Together with the Network Administrator (secondary persona), the IT Manager's role corresponds with the System and Resource Manager (zSeries)

IT Manager's goals include:

- Insuring 100% uptime for all users, by quickly solving hardware, software and license key problems
- Verifying that no unsupported software is running in the IT department
- Managing the inventory of uninstalled hardware and software and unallocated licenses
- Tracking all installed hardware and software in the IT environment

8.4.2 Operational roles and responsibilities

The following operational roles might be new to the organization. They provide administrative support for some of the business roles described above.

Application Administrator

The Application Administrator is the user of the administrative consoles and responsible for administering the Tivoli License Compliance Manager for zOS distributed component (Tivoli Asset Compliance Center) and the mainframe components, Tivoli License Compliance Manager and Tivoli Asset Management for IT. This role administers the user and user group accounts, including security permissions. This role does the task of importing, if necessary, and works with Software Asset Manager and other users to customize the applications to meet the Enterprise's needs.

Catalog Manager

The Catalog Manager assumes at least the following enterprise wide responsibilities:

► Adds and maintains configuration information about software signatures for all platforms

► Adds and maintains the relationship between the logical product hierarchy and the software signatures

► Adds and maintains the relationship for bundled software applications

► Ensures that the defined software signatures are the ones used to detect the use or installation of software

► Detects and reports non-authorized software used in the IT environment

8.5 Key sets of integrated information and business scenarios

The key information sets of integrated information is required for effective Software Asset Management across all significant environments. These are key questions that must be answered to align software spending with business goals.

This section introduces the key sets of information and how this information is presented in Tivoli License Compliance Manager for z/OS (Tivoli Asset Compliance Center) and Tivoli License Compliance Manager using example business scenarios.
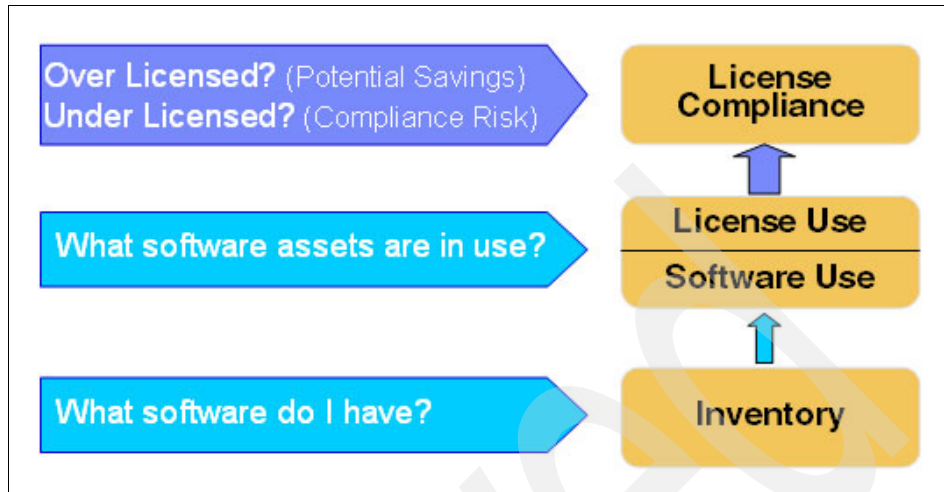
Figure 8-2   Key information: Inventory, software use, license use and license compliance

Inventory, software use, license use, and license compliance and license entitlements are the areas where IBM Tivoli License Compliance Manager and IBM Tivoli License Compliance Manager for z/OS apply and help.

Collecting software inventory data is essential from all significant platforms using a sophisticated heuristics combined with a "Software Catalog", bundling these into a usable inventory of software that is licensed.

Without software use, information Software Asset Management actions to reduce cost cannot take place. Eliminating no and low use software products produce quick financial returns. However, removing software without knowing if it is used can disrupt a key business activity and negate any potential savings.

Collecting license use information is essential to determine license compliance. You need to understand if you are over-licensed (savings opportunity) or under-licensed (potential compliance problem).

In the PC environment, the most common definition of license use historically has been that a product is installed on the C drive. This definition is changing with the introduction of multi-core processors which add the complexity of the number of "cores" where software is capable of running.

Currently, in the server and mainframe environments, logical partition or sub-capacity deployment and execution information is necessary information to determine license compliance.

So, collecting the essential license use information necessary to determine license compliance in today's increasingly complex software license entitlement environment is where IBM Tivoli License Compliance Manager for z/OS and IBM Tivoli License Compliance Manager can help.

An automatically linked software inventory, use activity, and license entitlements to determine license compliance is a task that IBM Tivoli License Compliance Manager for z/OS and IBM Tivoli License Compliance Manager does.

So, with these three sets of linked Software Asset Management information the primary key roles are enabled to:

► Proactively manage potential software license software issues
► Implement software cost management actions

8.5.1 Example business scenarios

This section provides examples of business scenarios in the areas of License Management and License Compliance. Tivoli License Compliance Manager for z/OS and Tivoli License Compliance Manager can help the License Manager and Software Asset Manager roles to afford the business tasks related to this area, in their daily work.

We categorize the scenarios in three main areas: management, risk situations, savings opportunities.

Management

Business objects creation as licenses, locations, vendors, software products (if they are not available in the software catalog provided), mainframe machine (if it does not exist), and so on, are tasks that will be performed as management tasks.

Scenario: Enter a new license

The Contract Manager informs and provides the license manager (Software Asset Manager) with a mainframe license information for mainframe software acquired from Allen Systems Group.

This software recently has been purchased and it is pending delivery. The license manager wants to create this new license as received in the Tivoli Asset Compliance Center, where the licenses are managed.

1. The Software Asset Manager starts the task of creating a new license in the Tivoli Asset Compliance Center. The Software Asset Manager decides to do this task manually, because it is only one license to introduce.

2. To create the new license, click **File → New → Business Object → License**.

This opens the License definition form. The Software Asset Manager fills in the General Information details of the license.

– Provides a significant name for the license, and fills all the General Information details.

– Link to the Vendor, selecting it from the list provided with the Tivoli License Compliance Manager for z/OS software catalog, when Tivoli Asset Compliance Center was installed.

The license that the Software Asset Manager is going to introduce is a Parallel Sysplex License Charge license.

A PSLC software license is intended to provide processing and pricing benefits when running software on multiple machines that are combined into a Qualified Parallel Sysplex (QPS), as compared with licensing the same software on standalone machines.

A QPS is a type of Cluster business object. The License business object has a dependency on the QPS Cluster, which must be created first.

This QPS might already exist, due to previous imports of distiller files (xml format).

But if this is not the case, the following steps are presented to create a QPS:

a. To create a new QPS Cluster, click **File** → **New** → **Business Object** → **Cluster**. A new Cluster form opens in the editor.

b. In the Cluster form:

- Provide a name for the new QPS
- Set the Cluster Type attribute to Qualified Parallel Sysplex
- Specify the Domain
- Set the Platform to Mainframe
- Set the Parallel Sysplex Type property to Parallel Sysplex License Charge

c. After you have finished entering the attributes of the QPS, click **Save** and then close the Cluster form.

Continue with the license definition, as described in "IBM Monthly license charge licenses (MLC)" on page 134, and the values to provide are:

a. Select the Type of the license, PSLC. This automatically will define the values of Scope as Machine, License Term as Licensed, and Capacity Unit as MSUs.

b. Click Find, next to the QPS Name field. The Find Cluster dialog box is displayed. Then Click **Find**. All defined Clusters are displayed. Then Select the name of the QPS, *AXPSPLEX*, and then click **OK** to add the QPS to the new license.

c. Enter the license capacity value at the Capacity field.

Figure 8-3   New license overview

d. When Software Asset Manager is done specifying the License attributes on the Overview page, click the Software Products page to specify the licensed software products.

e. Click the + button on the local toolbar to display the Find Software Product dialog box. Search for the product, select it, and then click **OK** to add it to the grid that contains the list of licensed products.
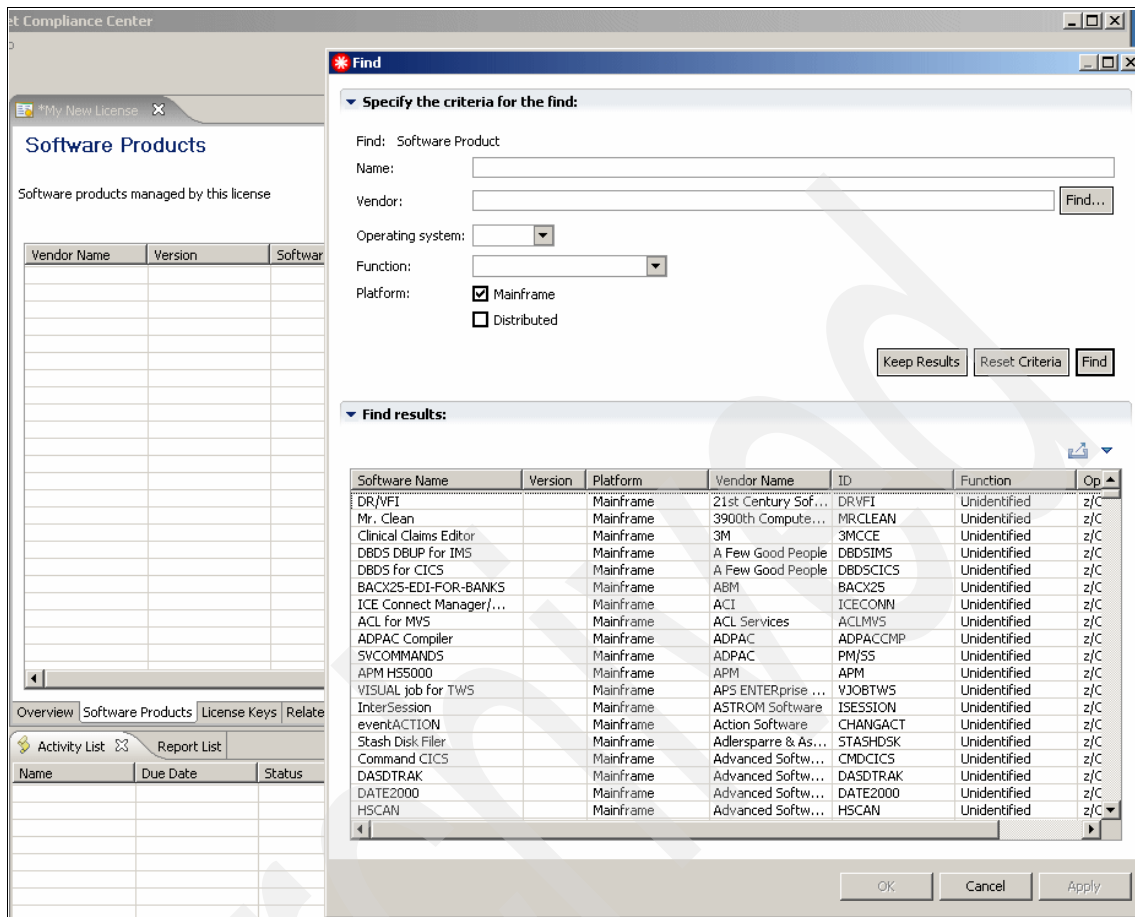
Figure 8-4   Add Allen Systems Group licensed software products into the license

The products selected by the Software Asset Manager for this Allen Systems Group license are as follows.

Figure 8-5   Allen Systems Group mainframe software products licensed

f. Once the Software Asset Manager has defined the software licensed products, click the Machines page to specify the machines designated to this license.

Following the same process as with the software, click the + button on the local toolbar to display the Find Hardware dialog box. And introduce the machines in the same way.

Figure 8-6   Machines in the license

g. License Keys also are managed in Tivoli Asset Compliance Center. So, Software Asset Manager introduces the available information for this license.

   i. Click the License Keys page to specify the license keys.

   ii. Click the + button on the local toolbar to display the License Key properties dialog box. Fill in the values for each product.

Figure 8-7   Introduce the License Key for the software licensed in the license

      iii. When Software Asset Manager finishes introducing the license keys, click **OK**.

Figure 8-8   License Keys for the software

3. Finally, click **Save**.

Software Asset Manager has completed entering the licenses received from Allen Systems Group.

At a future time, if Software Asset Manager needs to work with and review the licenses, this task can be accomplished using **Work with Licenses**.

The purpose of this activity is to identify licenses based on a combination of Domain, Location, Hardware, Software, or Vendor. The Software Asset Manager creates a new Work with Licenses activity by selecting **File** → **New** → **Activity** → **Work with Licenses**. Then Software Asset Manager will access all licenses defined, for a quick review.

Scenario: Work with Software

A mainframe machine is going to be removed, and the IT Director wants to check with the Software Asset Manager, to determine which software is installed on this machine.

To afford this task, Software Asset Manager defines a **Work with Software** activity. The purpose of this activity is to identify installed software, based on a wide variety of parameters.

Software Asset Manager is ready to start the task definition.

1. To define the activity, click **File** → **New** → **Activity** → **Work with Software**. The **Work with Software** activity form is displayed.

2. Complete the General Information panel of this form to describe the activity.

   – Introduce a descriptive name at the **Name**
   – The **Due date** for this task
   – The **Priority** (High, Low, Urgent, Medium) to classify this activity
   – The current **Status** of this activity (Open, Closed, Deleted)

3. After completing the General Information section, Software Asset Manager defines this specific activity with the Details section, where specific details and parameters are introduced.

   – Select the platform, **Mainframe**.
   – Select **Find by criteria**, filter by **Hardware** *000000000004567C*.

   As soon as the platform criteria is selected the Results tab appears.

   At this point saving the activity that was created will allow the Software Asset Manager to run the activity at a later time, as many times as necessary, to get the latest situation on compliance.

Figure 8-9   Definition of the activity using Work with Software activity form

4. When Software Asset Manager is finished specifying the Work with Software Activity on the General page, click the Results page to see the installed software products on this machine.

Figure 8-10   Software installed on Machine 4567C

The Software Asset Manager will see all the information regarding the software installed and running on this machine. The Software Asset Manager can export the information into a csv file by clicking on the export icon:

To send a report to the IT Director, Software Asset Manager runs a predefined report, through **File** → **New** → **Report** → **Mainframe Product Use By Product**.

On the Overview page of the report definition, the criteria selected is the machine where to get the data, as defined previously for the activity. That report can be sent to the IT Director as well.

Mainframe Product Use By Product

Software on Machine 4567C

As of Apr 5, 2007

Product	Vendor	Total Activity	Batch Jobs	Started Tasks	TSO Uses	Use Start Date	Use End Date
3270-PC File Transfer Subroutine Programs	IBM	0	0	0	0		
3890/XP MVS Support	IBM	7	7	0	0	1/10/07	1/17/07
Abend-AID/XLS	Compuware	0	0	0	0		
ACCOLADE	Computer Corporation of America	0	0	0	0		
ACF/NCP	IBM	0	0	0	0		
ACF/SSP	IBM	0	0	0	0		
ACR/Connector	INFOGIX	662	662	0	0	1/8/07	1/19/07
ACR/Detail	INFOGIX	608	608	0	0	1/8/07	1/19/07
ACR/File	INFOGIX	67	67	0	0	1/8/07	1/19/07
ACR/Summary	INFOGIX	108	108	0	0	1/8/07	1/19/07
ACTIVITY MONITOR for DB2	BMC Software	8	0	0	8	1/9/07	1/18/07
Advantage CA-ADS for CA-IDMS	CA	0	0	0	0		
Advantage CA-Datacom/DB	CA	50	32	0	18	1/8/07	1/18/07
Advantage CA-Datacom/DB Dictionary	CA	0	0	0	0		
Advantage CA-Datacom/DB Option/CICS	CA	0	0	0	0		
Advantage CA-Datacom/DB SQL Option	CA	0	0	0	0		
Advantage CA-Datacom Presspack Option	CA	0	0	0	0		
Advantage CA-Dataquery for CA-Datacom	CA	0	0	0	0		
Advantage CA-Ideal for CA-Datacom	CA	0	0	0	0		
Advantage CA-IDMS/DB Database	CA	0	0	0	0		
Advantage CA-IDMS/DC Transaction Server Opt.	CA	0	0	0	0		
Advantage CA-IDMS Database Culprit Option	CA	0	0	0	0		
Advantage CA-IDMS Presspack	CA	0	0	0	0		
Advantage CA-OLQ Online Query for CA-IDMS	CA	0	0	0	0		
Advantage VISION:Sixty	CA	0	0	0	0		
AllFusion CA-PanAPT	CA	777	251	0	526	1/8/07	1/19/07
AllFusion CA-Panvalet for z/OS and OS/390	CA	2,513	2,000	0	513	1/4/07	1/18/07
AllFusion CA-Panvalet ISPF Option	CA	506	0	0	506	1/4/07	1/18/07
Allocation Control Center (ACC)	DTS Software	0	0	0	0		
A-net	Esker	0	0	0	0		
Application Backup Center (ABC)	DTS Software	0	0	0	0		
Application Monitor for z/OS and OS/390	IBM	0	0	0	0		
Apply Plus for DB2	BMC Software	0	0	0	0		
APS MVS	MERANT	158	158	0	0	1/8/07	1/18/07

Figure 8-11   Subset of software on machine 4567C - Mainframe Product Use by Product report

Risk situations

Being in a risk complaint situation is something that we normally want to avoid. Tivoli License Compliance Manager for z/OS (with Tivoli Asset Compliance Center) and Tivoli License Compliance Manager can help you with business tasks for these risk situations.

Scenario: Conduct a software audit

A software audit is generated for different reasons. A software vendor might want to conduct an audit, or an audit may be generated by the internal audit group, or by the need for contract negotiations or contract renewals, or by a periodic review of the top number of vendors, etc. Different reasons launch a software audit process workflow.
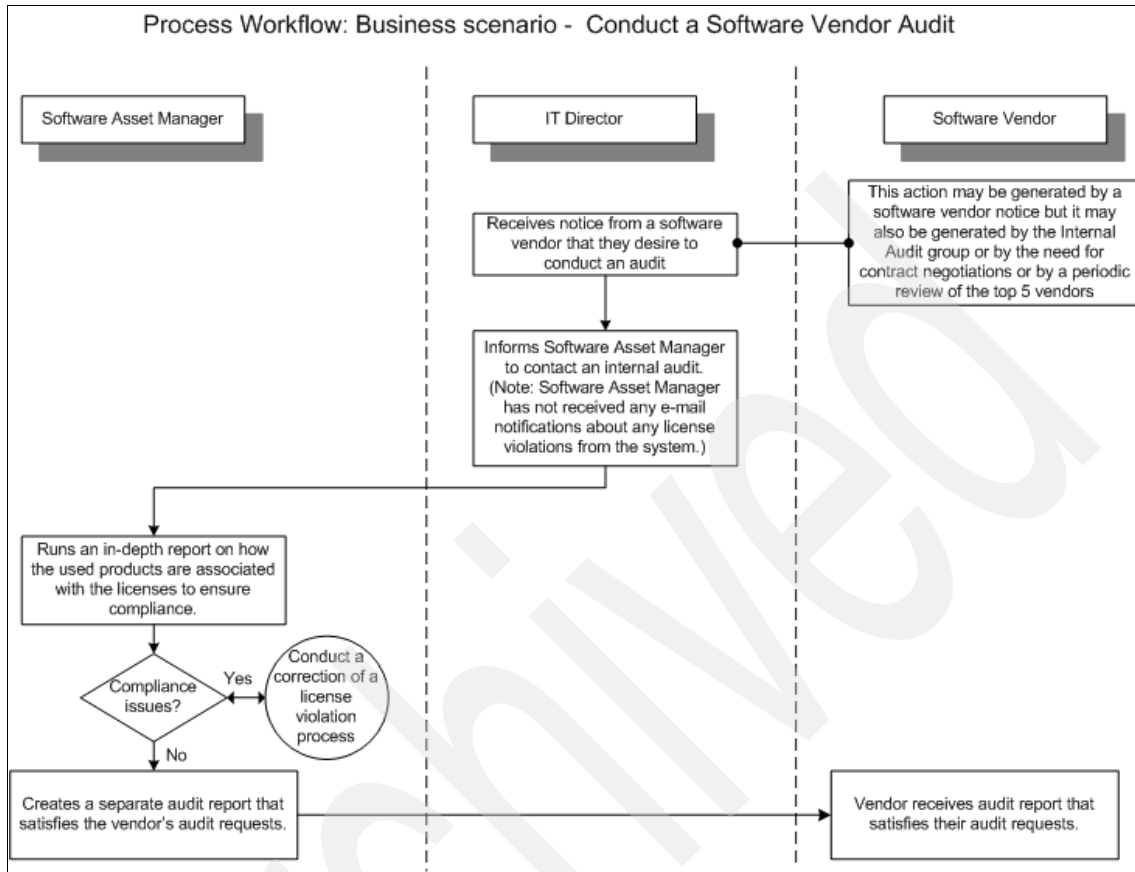
Figure 8-12   Software Asset Management process workflow for conduct a software audit business scenario

Whatever the source that initially launches the software audit, the IT Director informs Software Asset Manager to conduct an internal audit.

This scenario describes the process of defining and running the task to review software licenses to confirm that they are compliant, and generates reports for the stakeholders, which could be for contract negotiation, contract renewal, a software vendor audit notice, etc. Whatever the source, the software audit might relate to mainframe and/or distributed software platforms.

In this scenario we show an evaluation on both platforms, for example, a mainframe software audit on the Allen Systems Group vendor is going to be conducted, and a distributed software audit of an IBM vendor. Our Software Asset Manager decides to start the review of compliance on the mainframe platform, and later they will do the same with the distributed platform.

At a later time, we expect to see a common GUI, which will simplify the above process.

Starting with the mainframe platform, Software Asset Manager accesses Tivoli Asset Compliance Center, the GUI of Tivoli License Compliance Manager for z/OS, to start evaluating compliance.

This scenario assumes that the distiller files (xml) with the inventory and usage information and the Sub-Capacity Reporting Tool files (that last one if available) are periodically imported into the Aggregation Server component of Tivoli Asset Compliance Center, and the corresponding data workflows between Aggregation Server and Data Management server have been performed. Most likely, the TACC administrator already has scheduled these tasks, and the most current data is what the Software Asset Manager uses to analyze this compliance.

Software Asset Manager is ready to start the task definition.

1. To define the activity, click **File → New → Activity → Manage License Compliance**. The **Manage License Compliance** activity form is displayed.

Figure 8-13   Manage License Compliance activity form

2. Complete the General Information panel of this form to describe the activity.

   – Introduce a descriptive name at the **Name**
   – The **Due date** for this task
   – The **Priority** (High, Low, Urgent, Medium) to classify this activity
   – The current **Status** of this activity (Open, Closed, Deleted)

3. After completing the General Information section, Software Asset Manager defines this specific activity with the Details section, where specific details and parameters are introduced.

   – Select the platform, **Mainframe**.
   – Select **Find by criteria**, filter by **Vendor** *Allen Systems*, which **Vendor ID** is *ALLENGRP*.

   As soon as the platform criteria is selected the Results tab appears.

   At this point saving the activity that was created will allow the Software Asset Manager to run the activity at a later time, as many times as necessary, to get the latest situation on compliance.

Figure 8-14   Definition of the activity using the Manage License Compliance activity form

   The Software Asset Manager can click the **Results** tab to see the compliance situation with Allen Systems Group, as defined in the activity.

Figure 8-15   Compliance results for "Conduct a mainframe software audit on Allen Systems Group" activity

The results show that there is a non-compliant situation with Allen Systems Group license, since the last compliance task ran.

Note: In the actual results, this row appears highlighted in red.

From the results panel you can see the License Detail information: **Type** of license PSLC, **Scope** Machine, **Capacity** 332 MSUs, and the **Capacity Delta** that reports the non-compliant is -98 MSUs.

4. Double-click the row to see the license details, per machines designated, and the licensed software delivery on the systems.

Figure 8-16   ALLENGRP 4568925 license overview details

5. Click the Machines tab to see the machines information for this ALLENGRP 4568925 active license.

Figure 8-17   Machine information for that ALLENGRP 4568925

These machines have been designated for the purposes of pricing and compliance as using PSLC. So this is displayed at the **Machine Designation** field.

Double-click each of the machines rows, and it will provide overview information for the machine and the systems on this machine.

6. Click the Licensed Software tab, and this shows all the licensed software discovered on the machines designated. The Software Asset Manager can see which systems (Hardware, Partition) have the software installed, where the Total Activity is used, and the range of usage, Use Start Date, Use End Date, and other information.

License Name	Vendor	Partition	Hardware	Name	Product ID	Total Activity	Use Start Date	Use End Date	Operating System	Cluster	Start Tasks
ALLENGRP 4568925	Allen Systems	PRODAX21	00000000000097AB	ASG-OASIS	OASIS	373	Oct 29, 2006	Feb 13, 2007	z/OS	AXPGPLEX	5
ALLENGRP 4568925	Allen Systems	PRODAX21	00000000000097AB	ZARA	ZARA	403	Oct 29, 2006	Feb 13, 2007	z/OS	AXPGPLEX	2
ALLENGRP 4568925	Allen Systems	PRODAX21	00000000000097AB	ZEBB	ZEBB	335	Oct 29, 2006	Feb 13, 2007	z/OS	AXPGPLEX	1
ALLENGRP 4568925	Allen Systems	PRODAX21	00000000000097AB	ZEKE	ZEKE	354	Oct 29, 2006	Feb 13, 2007	z/OS	AXPGPLEX	3
ALLENGRP 4568925	Allen Systems	PRODAX21	00000000000097AB	ODE II	ODEII	0			z/OS	AXPGPLEX	0
ALLENGRP 4568925	Allen Systems	PRODAX22	00000000000097AB	ASG-OASIS	OASIS	214	Oct 29, 2006	Dec 29, 2006	z/OS	AXPGPLEX	5
ALLENGRP 4568925	Allen Systems	PRODAX22	00000000000097AB	ODE II	ODEII	133	Oct 29, 2006	Feb 13, 2007	z/OS	AXPGPLEX	42
ALLENGRP 4568925	Allen Systems	PRODAX22	00000000000097AB	ZARA	ZARA	246	Oct 29, 2006	Jan 28, 2007	z/OS	AXPGPLEX	2
ALLENGRP 4568925	Allen Systems	PRODAX22	00000000000097AB	ZEBB	ZEBB	90	Oct 29, 2006	Feb 13, 2007	z/OS	AXPGPLEX	1
ALLENGRP 4568925	Allen Systems	PRODAX22	00000000000097AB	ZEKE	ZEKE	191	Oct 29, 2006	Feb 13, 2007	z/OS	AXPGPLEX	3
ALLENGRP 4568925	Allen Systems	PRODAX23	000000000004567C	ASG-OASIS	OASIS	460	Oct 29, 2006	Feb 13, 2007	z/OS	AXPGPLEX	42
ALLENGRP 4568925	Allen Systems	PRODAX23	000000000004567C	ZARA	ZARA	403	Oct 29, 2006	Feb 13, 2007	z/OS	AXPGPLEX	2
ALLENGRP 4568925	Allen Systems	PRODAX23	000000000004567C	ZEBB	ZEBB	225	Oct 29, 2006	Feb 13, 2007	z/OS	AXPGPLEX	1
ALLENGRP 4568925	Allen Systems	PRODAX23	000000000004567C	ODE II	ODEII	192	Dec 5, 2006	Jan 18, 2007	z/OS	AXPGPLEX	29
ALLENGRP 4568925	Allen Systems	PRODAX23	000000000004567C	ZEKE	ZEKE	0			z/OS	AXPGPLEX	0

Figure 8-18   Discovered licensed software information for the ALLENGRP 4568925 license

7. Software Asset Manager has collected all the information about this license.

However, this situation of license violation needs to be solved and further analysis and investigation should be done.

Software Asset Manager engages the process to respond to a license violation. The Contract Manager is informed about the license violation situation. The Contract Manager has access to Tivoli Asset Compliance Center and can get the detailed information also.

Nevertheless, Software Asset Manager runs a predefined report, through **File** → **New** → **Report** → **Software License Compliance Summary by Vendor and Platform**.

This report is sent to the Contract Manager.

Figure 8-19   Report with the violation situation

A correct license violation process workflow needs to be applied.
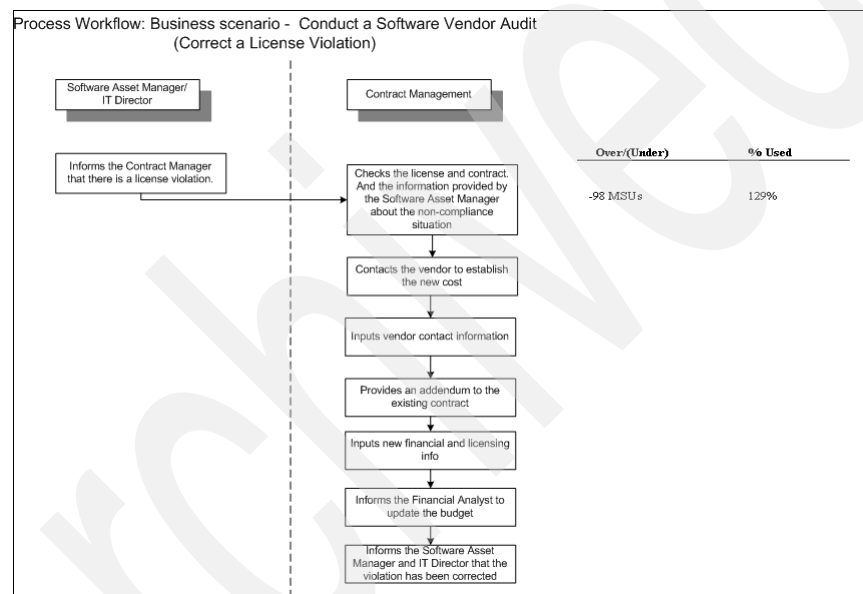
Figure 8-20   SAM process workflow for correct a license violation

Assume that the correction results in a license modification.

When the violation has been corrected, and the new license information has been introduced, Software Asset Manager can see the compliance situation again by checking the activity that was generated.

Savings opportunities

Having an opportunity to identify situations for possible savings will be helpful for the business. New projects can obtain budgets for their development. The following scenario finds opportunities where software is underused, and analyzes those situations.

Scenario: Find opportunities with underused software

In this activity, Software Asset Manager has the premise to reduce the budget by a percentage every year. The task is to evaluate or review the usage of software in search of underused software. With this information, the Software Asset Manager can follow a process to analyze the situation and make decisions, for example, to consolidate machines, move the software to another machine, and so forth, depending on the contracts.
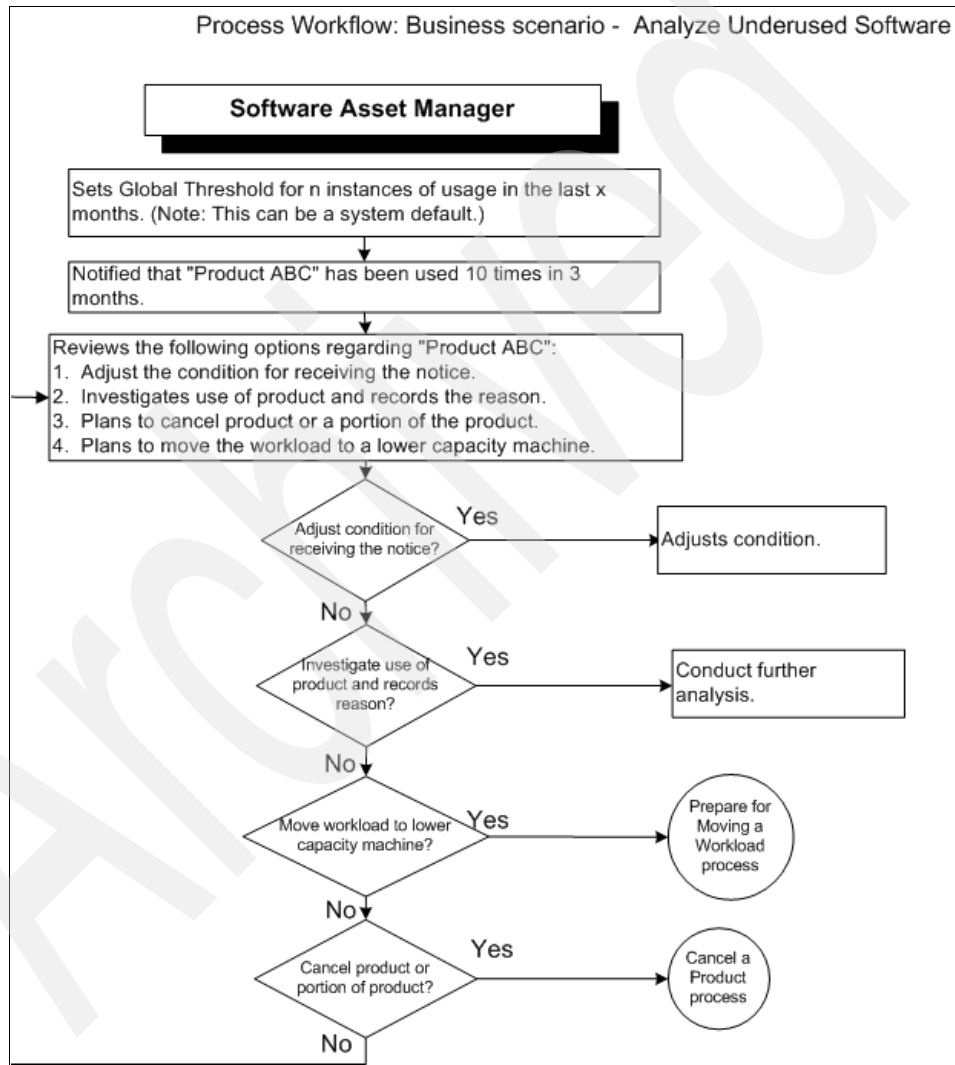
Figure 8-21   SAM process workflow for analyzing underused software

To afford this task, Software Asset Manager defines a **Find Opportunities with Underused Software** activity.

Software Asset Manager is ready to start the task definition.

1. To define the activity, click **File** → **New** → **Activity** → **Find Opportunities with Underused Software**. The **Find Opportunities with Underused Software** activity form is displayed.

2. Complete the General Information panel of this form to describe the activity.

   – Introduce a descriptive name at the **Name**
   – The **Due date** for this task
   – The **Priority** (High, Low, Urgent, Medium) to classify this activity
   – The current **Status** of this activity (Open, Closed, Deleted)

   After completing the General Information section, Software Asset Manager defines this specific activity with the Details section, where specific details and parameters are introduced.

   – Select the platform, **Mainframe**.
   – Select **Usage date range**, and select Prior Quarter.

Figure 8-22   Check periodically underused software for the prior quarter

3. When Software Asset Manager has finished specifying the Find Opportunities with Underused Software Activity on the General page, click the Results page to see the installed software products with their usage information for the prior quarter.

Figure 8-23   List all software and their usage value during the prior quarter

Once the results are presented, sort by Total Activity. Click over the column header, to see the possible underused software.

Based on the results, Software Asset Manager can then engage a process, and make decisions and further investigations.

8.5.2 List of activities and predefined reports available in TACC

In the previous section, we provided scenarios working with some of the activities and reports available in Tivoli Asset Compliance Center. In this section, we provide an overview of all the activities and predefined reports available at the Tivoli Asset Compliance Center 4.2.

An activity is an operation that you perform to accomplish your daily IT asset management tasks. Tivoli Asset Compliance Center 4.2 provides the following activities for you to manage your IT assets and licenses. See Figure 8-24.
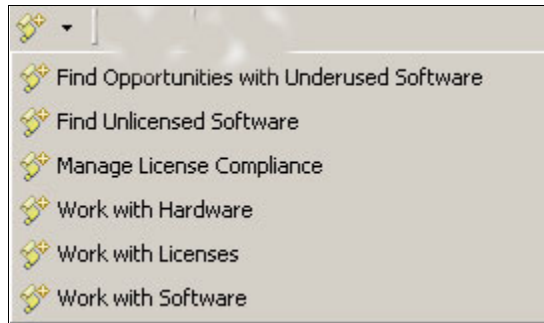
Figure 8-24   List of activities in Tivoli Asset Compliance Center

Table 8-8 is a description for each of these activities listed in Figure 8-24.

Table 8-8   Tivoli Asset Compliance Center activities descriptions

Activity	Description
Work with Hardware	Use the Work with Hardware activity to identify installed hardware in your organization.
Work with Software	Use the Work with Software activity to identify installed software in your enterprise.
Work with License	Use the Work with Licenses activity to identify licenses in your organization.
Find Opportunities with Underused Software	Use the Find Opportunities with Underused Software activity to identify software in your organization that is underused or not used.
Find Unlicensed Software	Use the Find Unlicensed Software activity to identify installed software that is not licensed or authorized. For example, this could include installed software outside the scope of an existing license, or installed software for which no license exists.
Manage License Compliance	Use the Manage License Compliance activity to review software licenses to confirm that they are compliant.

Tivoli Asset Compliance Center 4.2. provides the following set of predefined reports for you to retrieve the asset information you need.
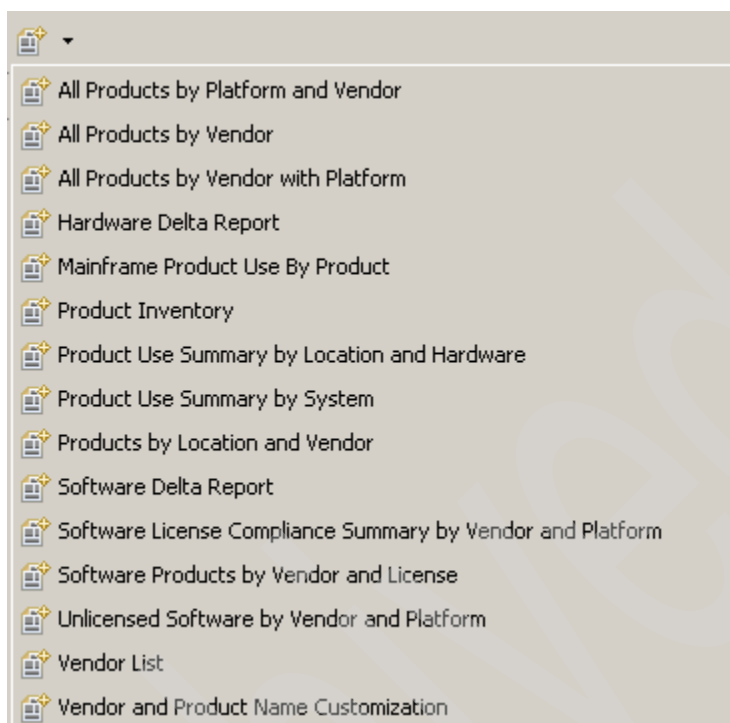
Figure 8-25   List of predefined reports in Tivoli Asset Compliance Center

Table 8-9 has a description for each of these predefined reports as well the parameters.

Table 8-9   TACC predefined reports parameters and descriptions

Report	Report parameters	Description
All Products by Platform and Vendor	► Mainframe, distributed, or both ► Domain ► Vendor ► Operating System	This report shows all vendors and products for each platform in the enterprise.

Report	Report parameters	Description
All Products by Vendor	► Mainframe, distributed, or both ► Cluster ► Domain ► Hardware ► Location ► Operating system ► System ► Vendor	This report shows all vendors in the enterprise, with associated products. Vendor ID and product ID are included. A total product count is provided for each vendor. A total vendor and product count for the enterprise is also shown.
All Products by Vendor with Platform	► Mainframe, distributed or both ► Domain ► Vendor ► Operating system	This report shows all products for each vendor, vendor ID and product ID.
Hardware Delta Report	► Mainframe, distributed, or both ► Data range ► Added, removed, or both ► Domain ► Location	This report provides a listing of hardware that is newly found in data imported from an auto-discovery tool, as well as the hardware that was previously found by is now missing in the same type of data within a defined date range.
Mainframe Product Use by Product	► Mainframe, distributed, or both ► Cluster ► Domain ► Location ► Hardware ► System ► Vendor ► Usage dates	This report shows all mainframe products with vendor ID and usage information
Product Inventory	► Mainframe, distributed, or both ► Cluster ► Domain ► Location ► Hardware ► System ► Vendor ► Operating system	This report shows all products in the enterprise. Each product lists the vendor, product ID, and vendor ID.

Report	Report parameters	Description
Product Use Summary by Location and Hardware	► Mainframe, distributed, or both ► Usage dates ► Domain ► Location ► Hardware ► Operating system ► Vendor	This report shows all products in each location, divided by platform and the hardware where the product is installed. Each product shows vendor ID and usage information.
Product Use Summary by System	► Mainframe, distributed, or both ► Cluster ► Domain ► Location ► Operating system ► System ► Vendor ► Usage dates	This report shows all products with product ID and usage information. The systems and CPU where they are installed is also included.
Product by Location and Vendor	► Mainframe, distributed, or both ► Cluster ► Domain ► Location ► Hardware ► System ► Vendor ► Operating system	This report shows the vendors and products based on each location in the enterprise. Each vendor shows the vendor ID and total number of products. Each product includes its product ID.
Software Delta Report	► Mainframe, distributed, or both ► Date range ► Added, removed, or both ► Domain ► Location ► System	This report provides a listing of software that is newly found in data imported from an auto-discovery took, as well as the software that was previously found but is now missing in the same type of data within a defined date range.

Report	Report parameters	Description
Software License Compliance Summary by Vendor and Platform	► Mainframe, distributed, or both ► Domain ► Operating system ► Vendor ► Date range ► Non-compliant licenses ► Excess capacity licenses	This report summarizes license compliance for software products, arranged by vendor and platform.
Software Products by Vendor and License	► Domain ► Vendor	This report provides a list of vendors with whom there are licenses and the software products associated with them.
Unlicensed Software by Vendor and Platform	► Mainframe, distributed, or both ► Cluster ► Domain ► Location ► Hardware ► System ► Vendor ► Operating system ► Usage dates	This report shows unlicensed software, grouped by vendor and platform, with usage information.
Vendor List	► Domain	This report shows all vendors in the enterprise, vendor ID, and the number of products for each vendor. The total number of vendors and products in the enterprise is also included.
Vendor and Product Name Customization	There are no parameters to set for this report.	

8.5.3 Create new license definition in TLCM

Though the TACC provides a robust environment for software license definition and management, a stand alone TLCM environment also provides capabilities in this area. This scenario provides a brief overview of how software licenses can be defined in TLCM and other related tasks.

Roles involved

The following roles and associated activities are involved in this scenario.

License and Software Asset Manager

► Receives the license acquisition information from procurement department.

► Creates the license definition in ITLCM application based on actual records in the licensing terms and/or contract.

► Categorizes software licenses according to their respective license types.

Software Inventory Administrator

If required, Software Inventory Administrator updates the Software Product Catalog with the new software definition.

Activities

The following activities are described:

► Create a License definition and assign contract information to it.

► Assign Product information from the Catalog to the License definition.

► Distribute licenses to eligible machines to be monitored.

► Run inventory scan report of eligible machines to make sure the Software license definitions have been distributed.

► Use inventory reports to make sure licenses are being reported correctly.

1. From the Manage Licenses Option, select the Create button to define new license properties or select the **Change** button to edit existing license properties.
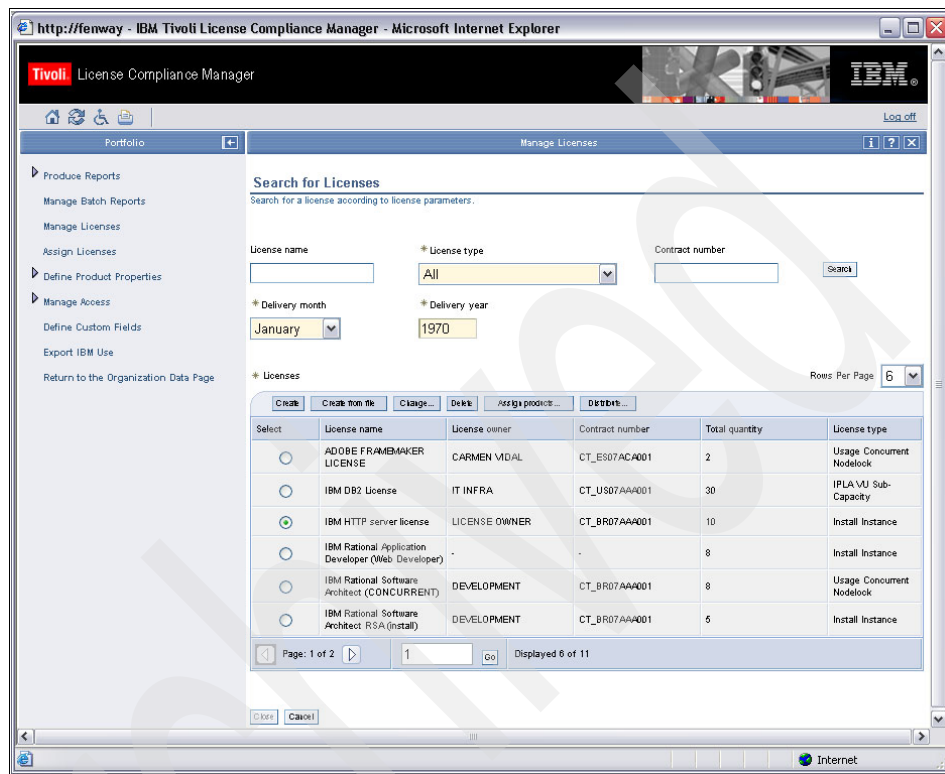
Figure 8-26 Select Create to Define License properties

2. Manually create a Software License definition by clicking the **Create** button. If an Electronic Entitlement file is available, it can be used to speed up the creation of IPLA licenses. Electronic entitlements are available to automate the creation of IPLA licenses. For details, see *IBM Tivoli License Compliance Manager: Administration*, SC32-1430.

3. To create or modify a license definition, enter the required(*) information in the License Parameters forms as shown below.

Figure 8-27   License definition Parameters - Business information

4. Use this form to input required information about the license being created.

   – License Name - Use descriptive names preferably beginning with the manufacturer name. Duplicate license names are allowed.

   – License type - Select one of the license types available.

   – Total Quantity - Inform the amount of license units according to the chosen license type.

   Total Cost (optional) - Inform the total cost of the license being registered.

   Currency (optional) - Inform the currency to be considered.

   Purchase Type (Optional) - Select the type of purchase.

   – Start Date (MM/DD/YYYY) - This means the date to be referred to as the starting point for checking compliance of that software. There should be evidence that backs up this record for auditing purposes.

   – Expiration date (MMDD/YYYY) - This is the expiration date for that particular licensing term.

5. Next move on to the Legal Information form as shown in Figure 8-28.

Figure 8-28   License definition Parameters - Legal Information

6. Use this form to record license information referring to documents that provide the legal support for license compliance checking. All editable fields on this form are optional.

– License reference - This is a non-editable field that contains the unique key automatically assigned by ITLCM to each licence definition.

– License key - This is used for recording the license key or activation code provided by the software manufacturer to be used when the product is installed/activated.

– License owner - This is the identification of the entity, such as a person or a department, that is responsible for the license.

– Contract Number - This is a Contract Identification code, preferably an existing code obtained from contract management systems. It can be any identification that identifies unequivocally an existing contract.

- Order Reference - This is a reference to an existing purchase order or equivalent "proof-of-purchase".
- Delivery date - The date when the software related to the license is delivered.
- Terms and conditions - The terms and conditions of the license agreement.
- Notes - Any additional notes associated with the license.

7. The next form is the custom fields form as described in the following table.

Table 8-10   Custom fields

Field	Description
CPU Model	A text field used to indicate the CPU model. It has a maximum length of 40 characters.
CPU Serial Number	A text field used to record the serial number of the CPU. It has a maximum length of 40 characters.
CPU MIPS	An integer field used to indicate the number of CPU instructions per second.
CPU MSUs	An integer field used to indicate the number of MSUs (millions of service units) for the CPU.
LPAR Name	A text field used to indicate the name of the LPAR. It has a maximum length of 40 characters
LPAR MIPS	An integer field used to indicate the number of LPAR instructions per second.
LPAR MSUs	An integer field used to indicate the number of MSUs (millions of service units) for the LPAR.
Product Number	A text field used to indicate the reference number for the product. It has a maximum length of 40 characters.
Serial Number	A text field used to indicate the serial number. It has a maximum length of 40 characters
Maintenance Cost	A money field used to indicate the cost of a maintenance type license.
Upgrade Cost	A money field used to indicate the cost of an upgrade type license
Cost Center	A text field used to indicate the cost center that purchased the license. It has a maximum length of 60 characters.

Field	Description
Supply Vendor	A text field used to indicate the supplier of the software. It has a maximum length of 60 characters.
Purchase Vendor	A text field used to indicate the purchaser of the software. It has a maximum length of 60 characters.

8. Now, from the Portfolio View as shown in Figure 8-26 on page 177, select Manage License. We will use this view to assign our newly defined license.

9. Select the **Assign products** button as shown in Figure 8-29.
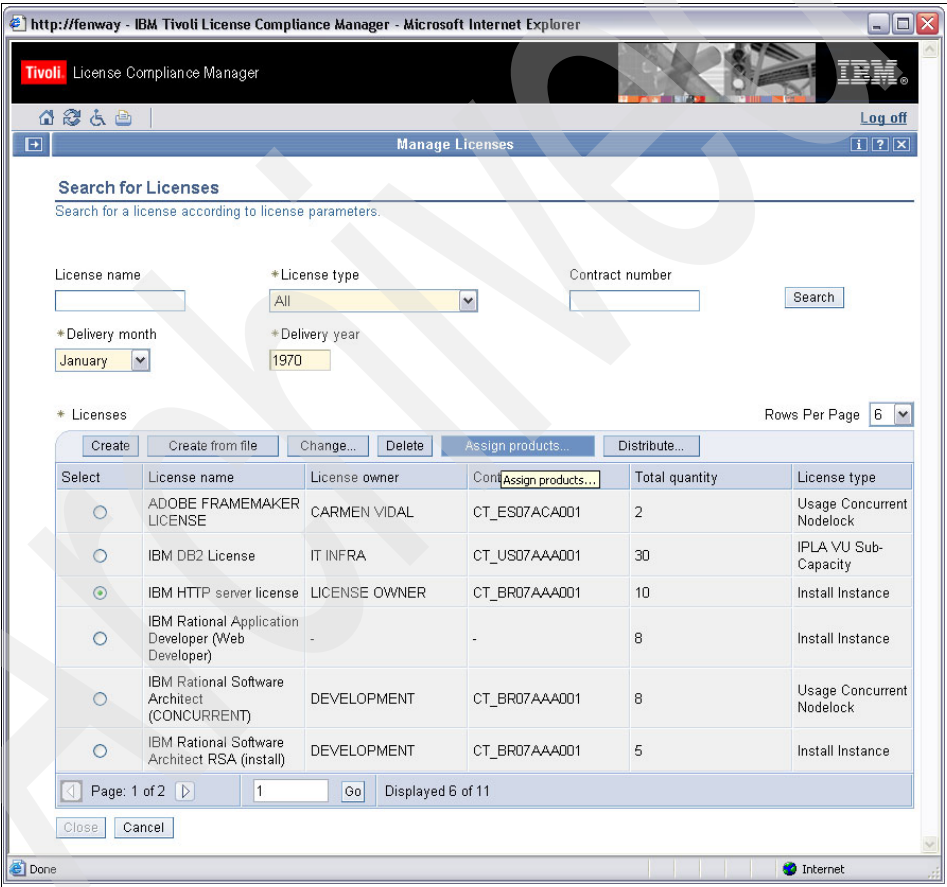
Figure 8-29   Assign the license to a cataloged product

10. Enter the search string in the product name field (such as %IBM HTTP% as shown in Figure 8-30). After clicking the **Search** button, the bottom part of the window will be populated with the products matching this string.
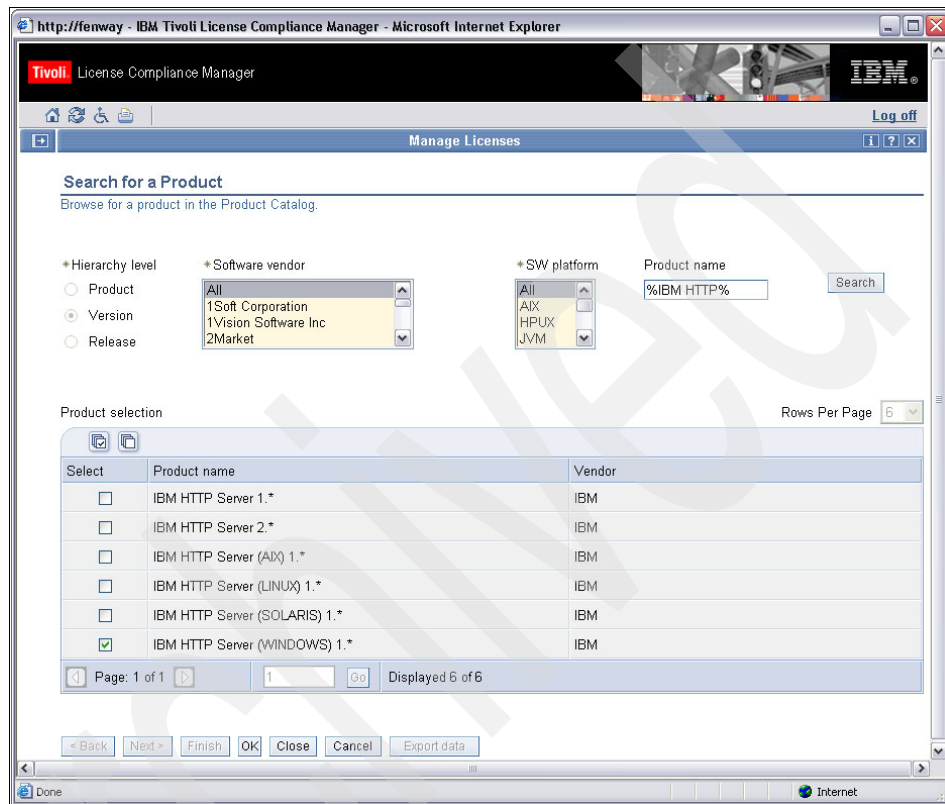
Figure 8-30   Search for cataloged products

11. You can now select the desired product, in our case, we selected IBM HTTP Server (Windows). Click **OK**.
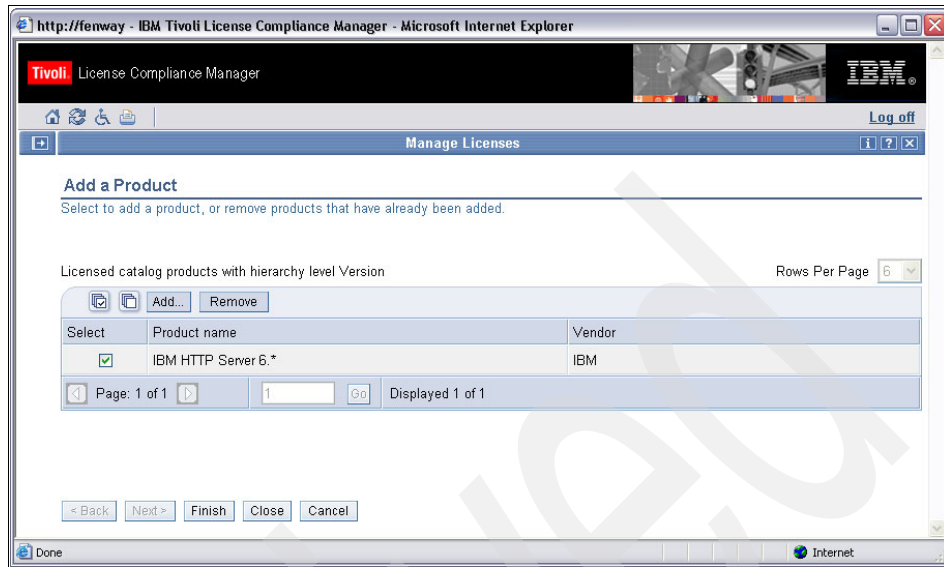
Figure 8-31   The product named IBM HTTP Server 6.* is assigned to the license

12.Click **Finish** to make the assignment.

13.After linking the license with product definitions, we want to distribute the license to the target recipients (Organization, Division, Nodes, or Agents).

Select **Distribute** from the panel shown in Figure 8-29 on page 181, to show the panel below (Figure 8-32).

Figure 8-32   Distribute licenses to target recipients

Choose the target type. Figure 8-32 shows Organization is selected. However, if we chose Node instead, we would see the panel as shown in Figure 8-33 on page 185.
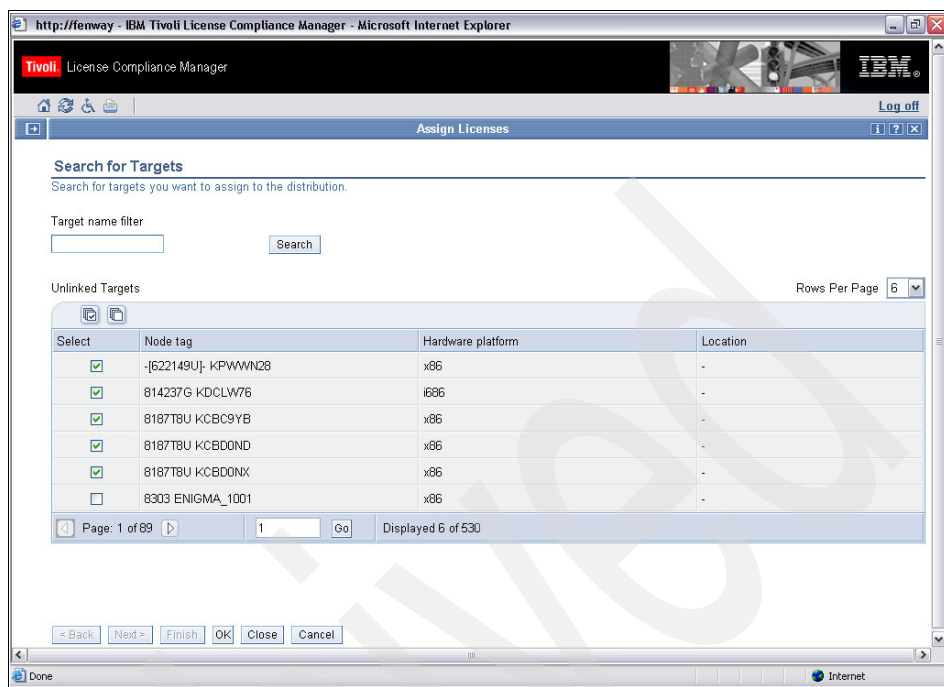
Figure 8-33   Select targets to link

14.Choose the appropriate nodes and select **OK**.

15.Finally, we want to generate reports that show our licensed software and installation status. From the main panel as displayed in Figure 8-26 on page 177, choose **Produce reports** on the left-hand menu. From the resulting panel as shown in Figure 8-34 on page 186, search within the organization and define criteria and filters to produce a report that fits your needs.
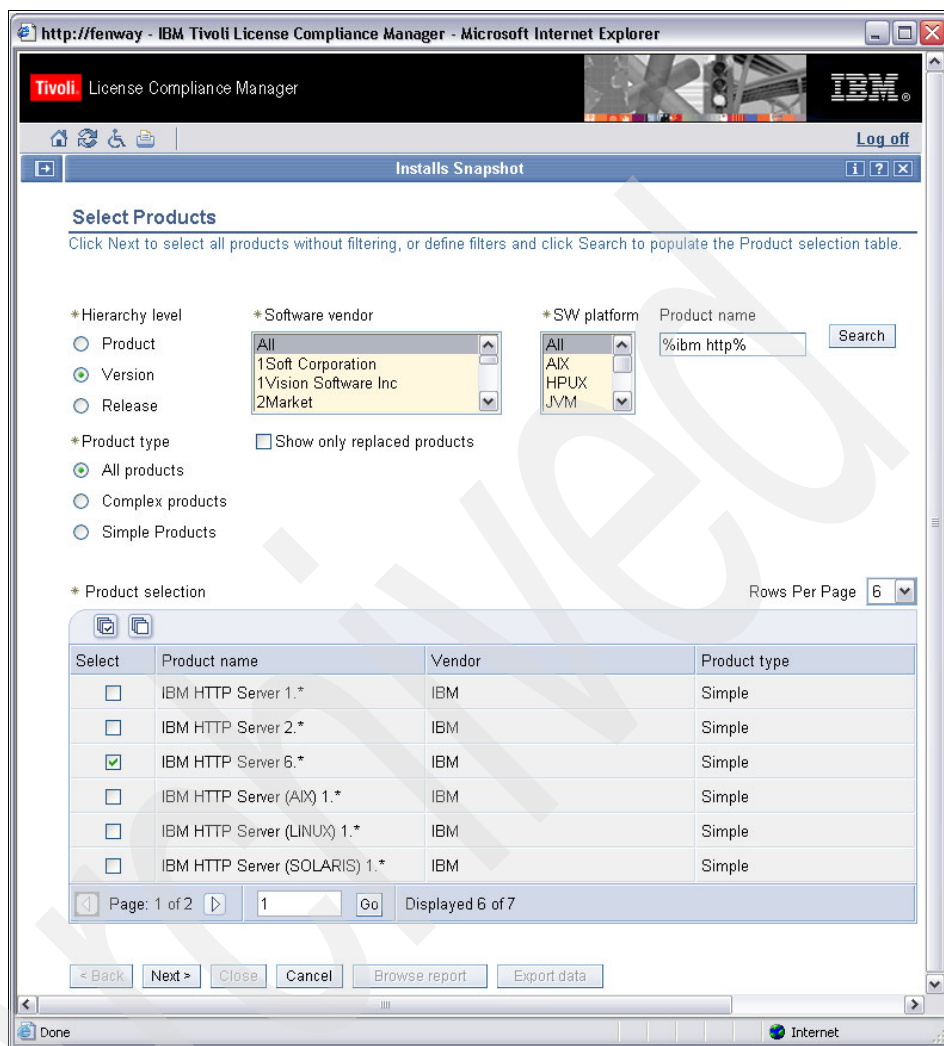
Figure 8-34   Generate a Report for the selected installation

For instance, search for all licenses related to IBM HTTP Server 6 as shown above, to receive a list of host names on which this software is installed as shown in Figure 8-35 on page 187. Select **Next**, and a panel will be displayed with additional report parameters such as date, time and sorting criteria.
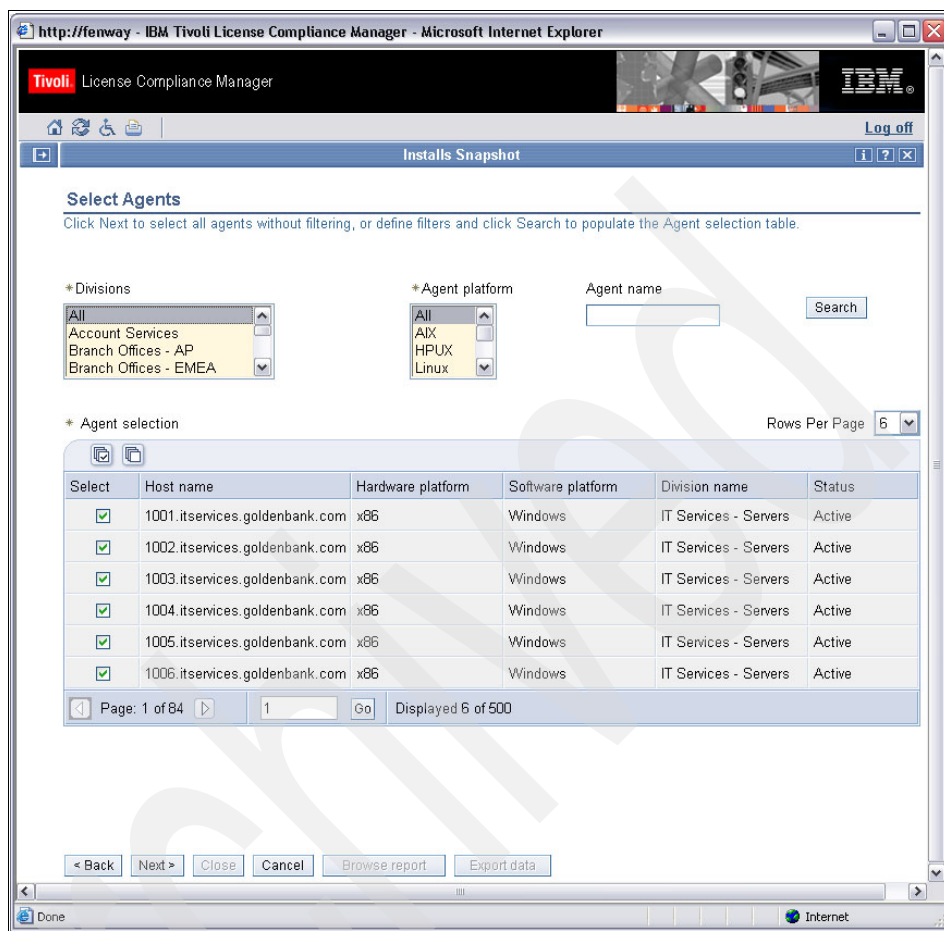
Figure 8-35   Define criteria and filters to create the install Snapshot report

16. Set reference time and date for the report and select **Browse report** to view the resulting report.

Figure 8-36   Set time, date, and sorting criteria for the report

17. The Install Snapshot report can be browsed through using the ITLCM application and also can be exported using the export button to an XML output format, so that it can be viewed afterwards.
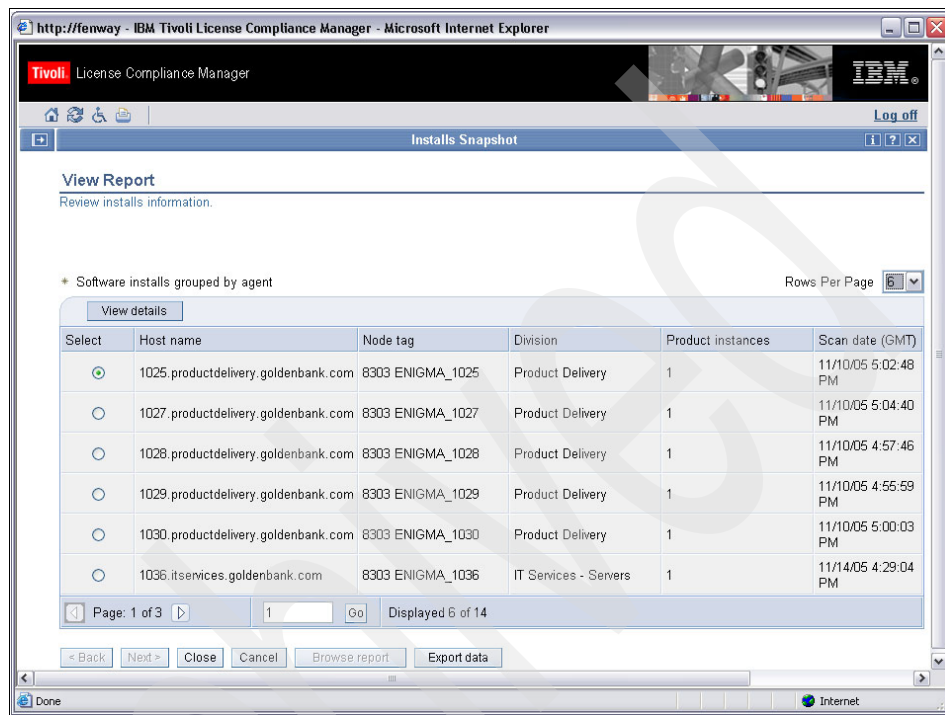
Figure 8-37   Review Install Snapshot report

8.5.4 Prepare for an Audit

In this section we show how TLCM can help to prepare for a software audit.

Objective: Identify and resolve out-of-compliance situations, certify the accuracy of the Licensing information systems for all managed assets to make sure all software installed in the Organization have valid licenses.

Activities:

► Check the license agreements available.

► Review the Unlicensed report for a given period to find any Unlicensed software.
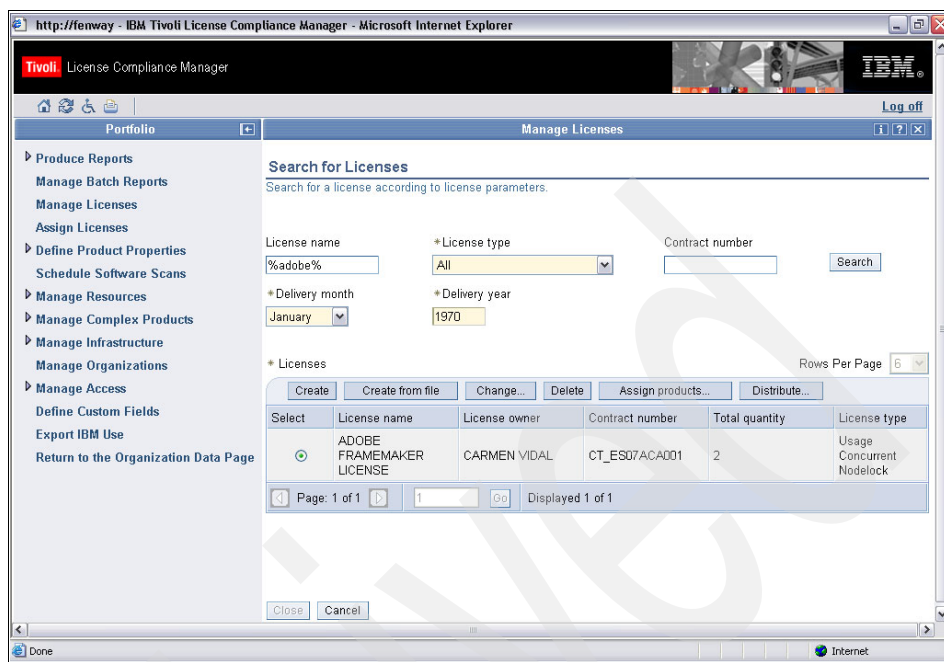
Figure 8-38   List licenses available

1. Click the Manage Licenses option and search for the licenses that should be audited to make sure that the license levels correspond to the licenses that are effectively available.

2. Make sure all documentation corresponding to those records are available and can be validated.

3. From the Portfolio window, select **Produce Report** → **Unlicensed Use** to generate an unlicensed use report.
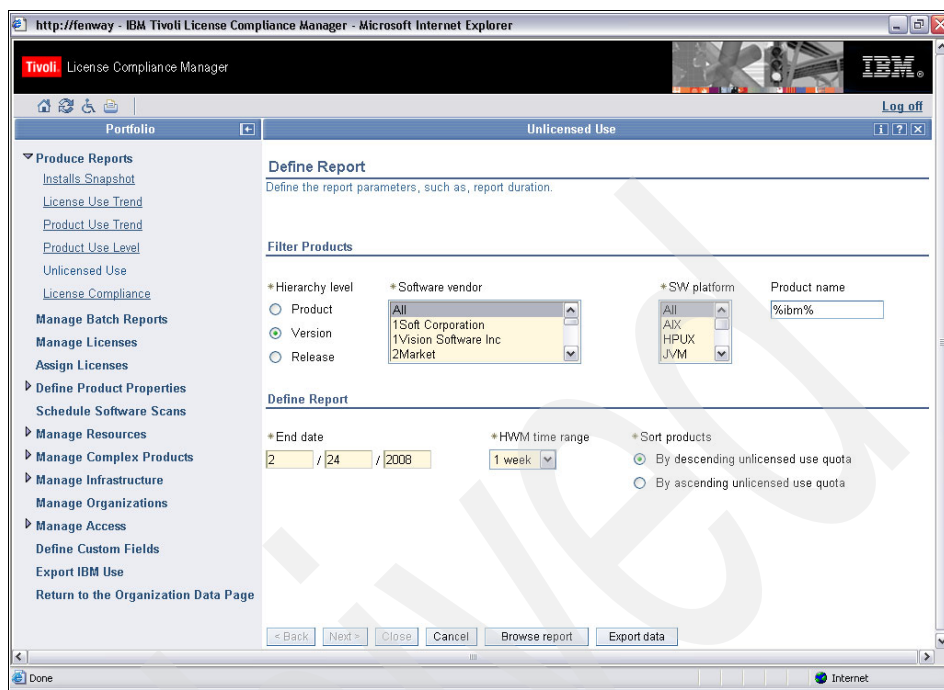
Figure 8-39   Report Unlicensed Software

Inform the filter criteria to generate the Unlicensed use report. It is possible to establish filters by Product Hierarchy, Vendor, Platform or Product name.

Establish a time Range and Sorting Criteria to be considered.
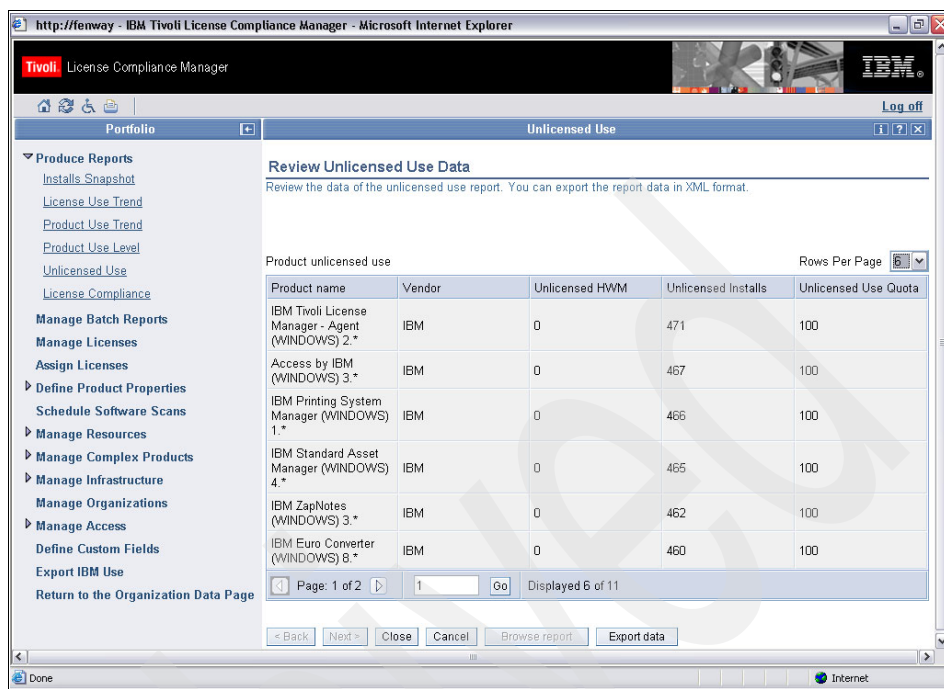
Figure 8-40   Unlicensed Use Report

Software Administrator should review the Unlicensed Software report to identify any possible non-compliance situation and take the corrective actions for each case, analyze the unlicensed situations and resolve the out-of-compliance conditions.

► Verify if there is a license for each software, the quantity available, and what is the license type.

► Check the current allocation of the existing licenses.

► If the license is underused, the administrator may reallocate the license to resolve the situation.

► Check the Install Snapshot report to verify if those licenses have been assigned to the right targets.

► Trigger an out-of-compliance notification to the owner of the equipment, if needed, for uninstalling the Software.

   Or, trigger a purchase process for the exceeded installs.

8.5.5 Renewal of a Contract

This activity requires that the Software Asset Manager provides the Contract Manager with a compliance report for a given period that informs which products licensed in a given contract that need to be renewed. The Software Asset Manager also should provide details about license and software usage information for a period of 12 months.

1. From the Portfolio view, select **Produce Reports** and **Product Use Level** option.

2. Use the Select Products pane to search for specific products or to define Filter criteria. You can use wildcard characters "%" at any point in the search criteria to substitute any character or string.

3. The filtered list of products that match the given criteria will be presented on the product selection pane.

4. Click the check boxes to select the products to be reported, then click **Next** to select the organization or division.
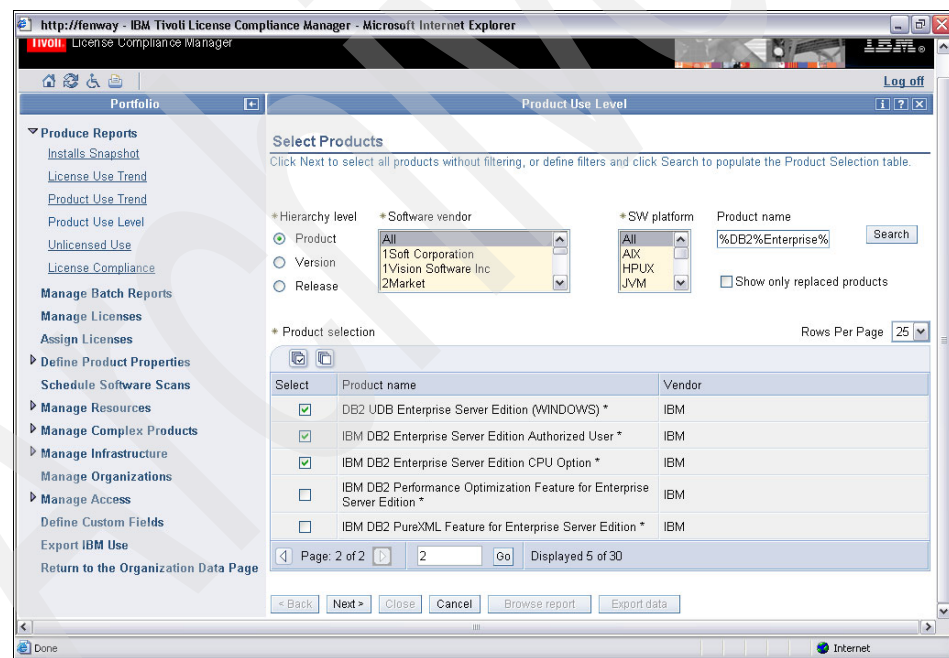
Figure 8-41   Select product for Use Level Report

5. If you do not specify any search criteria or division name, the reports will present information for all of the organization. Indicate the division you want to search for. It is possible to use wildcard (%) characters to search or filter the display for specific organizations in a given division.

6. Once the desired divisions appear, select the desired division and click the **Search** button.

7. Click **Next** to go to the report parameters configuration page.
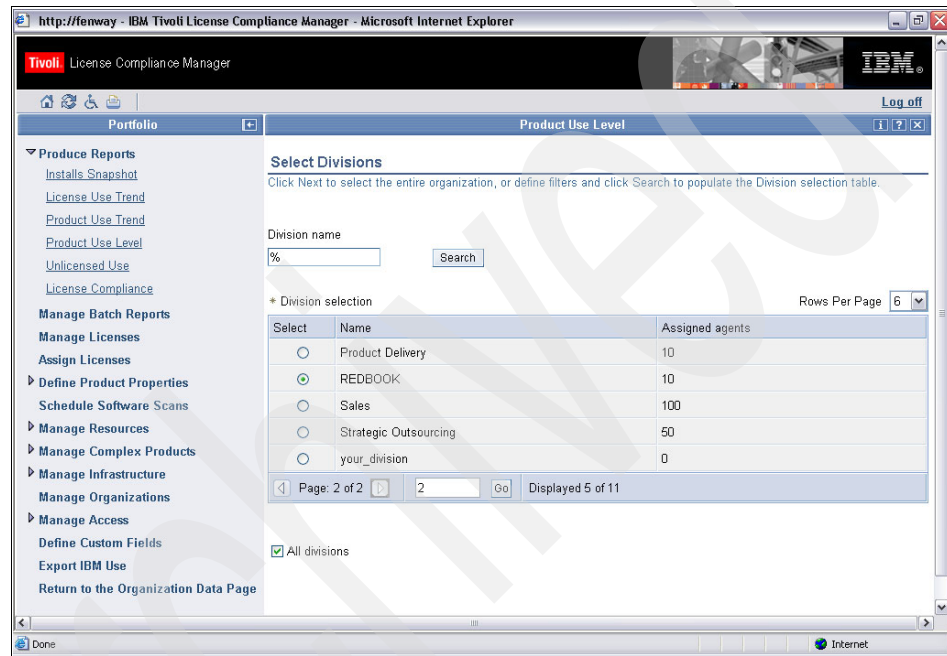
Figure 8-42   Select which organization or division to search

8. Set the parameters for generating the reports. It is possible to define the high water mark (HWM) use, reporting period, and sorting criteria.

9. Select the reporting period and sort criteria and click the **Browse report** button to preview the report.

10. You can click the **Export data** button to export the output of the report to an XML file.

Figure 8-43   Set report parameters and period to browse or export the report

11. View the level of use information and then choose **Export data**.
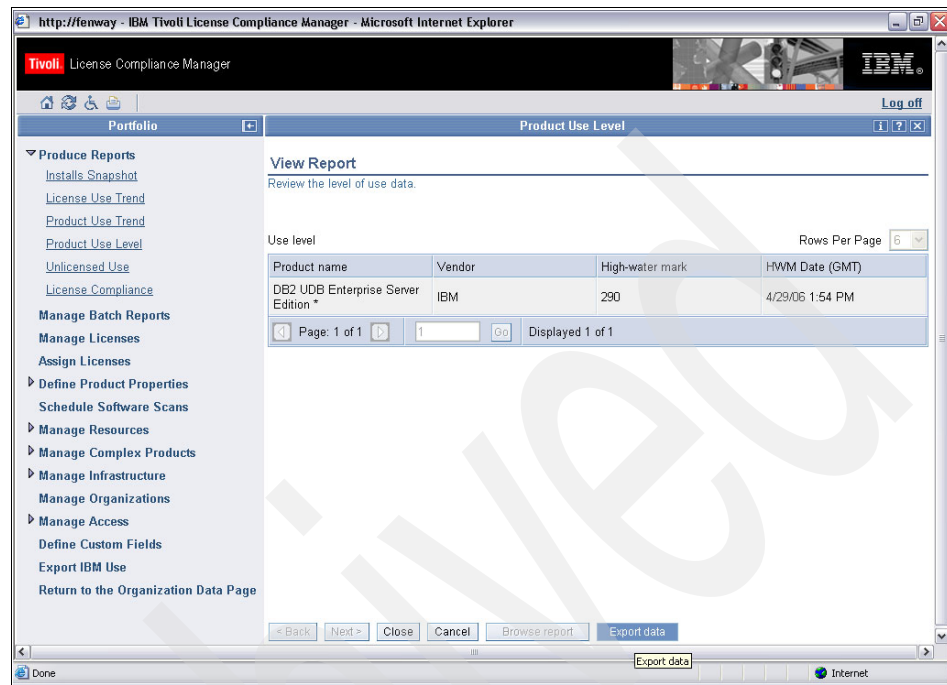
Figure 8-44   View the level of use and export data

12. The report request is queued and will be available from the Manage Batch Reports menu.
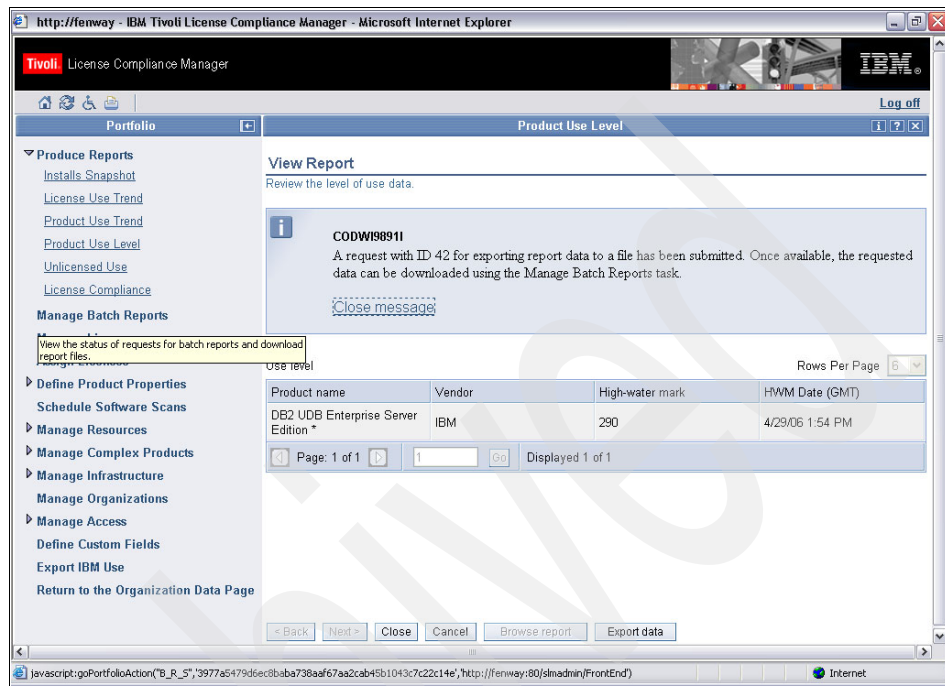
Figure 8-45   Queued report request

13. From the "Select Requests for Batch Reports" view, it is possible to search for report requests by informing criteria like Request ID, Request Owner, Request type, status or date of request. Reports matching this given criteria will be listed in the status pane below, where they can be managed. It is possible to delete or download any listed report.

14. Select and click the download button to download the desired report.
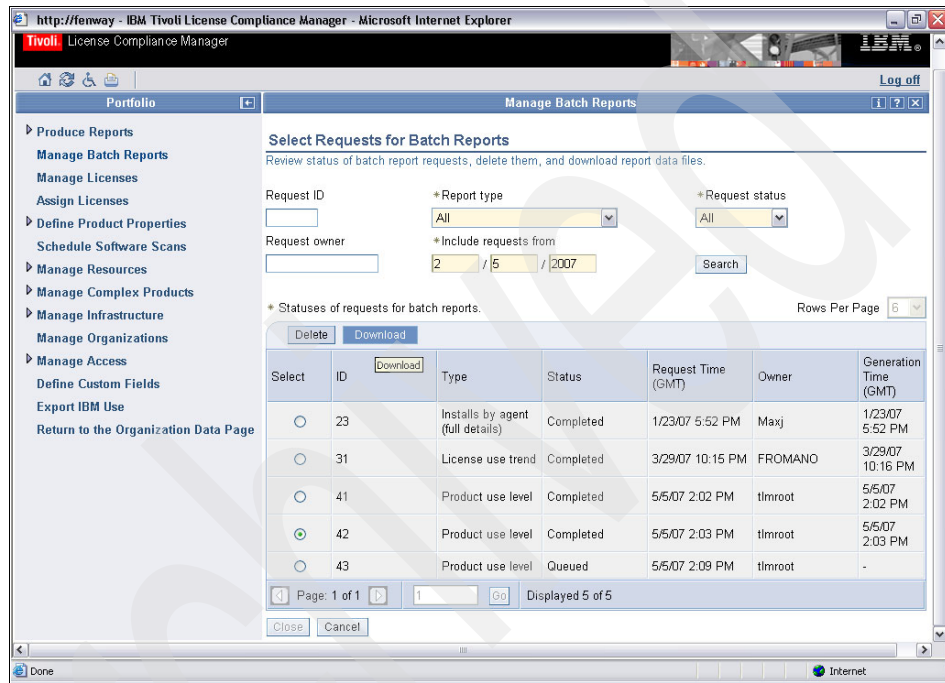
Figure 8-46   Select and download the requested reports

15. When available, the generated report will be displayed as a link to a ZIP file with the corresponding Stylesheet file. Right-click those links to download them to your workstation and extract them in a temporary space.
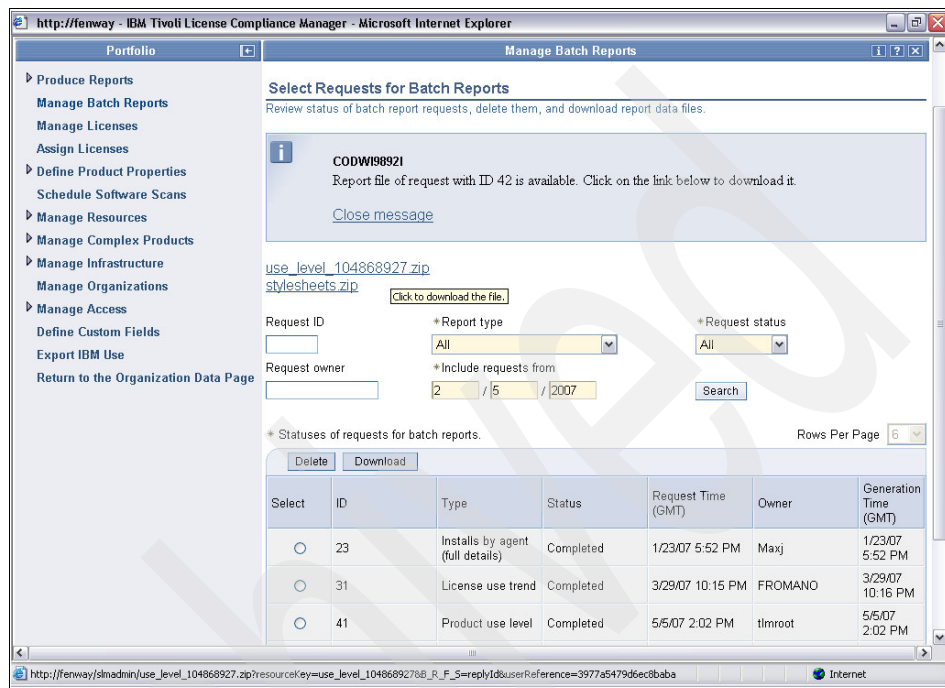

Figure 8-47   Click the zip files to download XML and Stylesheet report

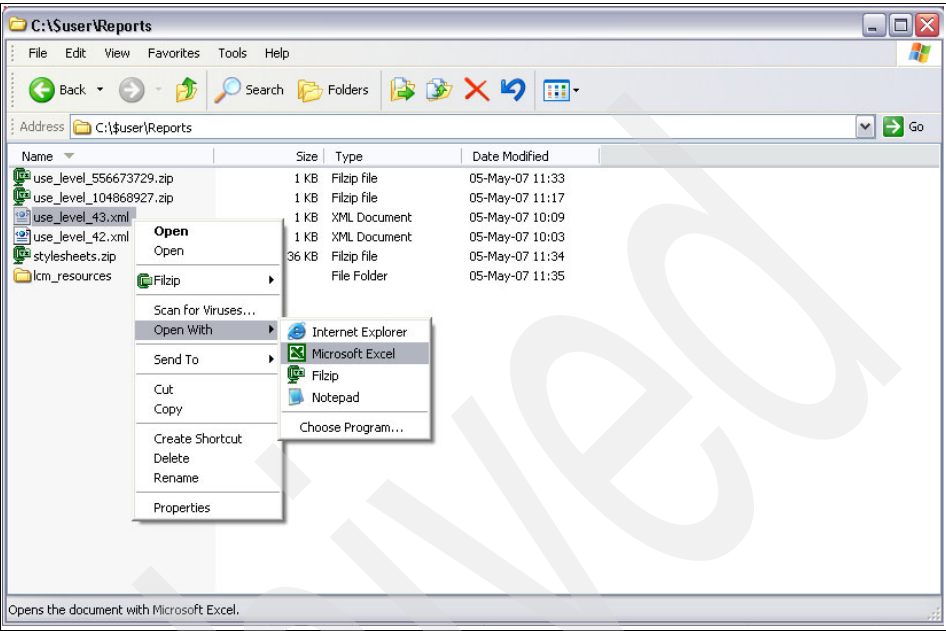16. Once unpacked and saved, these reports can be viewed using tools such as Microsoft Excel®.

Figure 8-48   Files downloaded to a local directory ready to be viewed

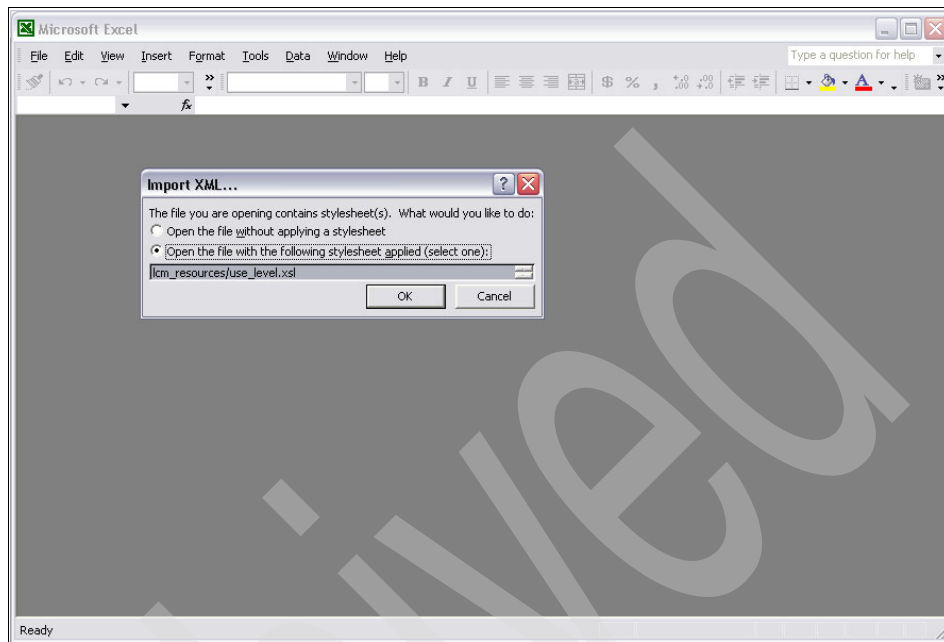17.Open the files with the appropriate stylesheet as shown in Figure 8-49.

Figure 8-49   Open the report using the Stylesheet

An example of the resulting report is shown in Figure 8-50.

Figure 8-50   High-Water Mark Use report for that given period

9

Integration with Service Desk applications

This chapter discusses, at a high level, the benefits of integration between Asset Management for IT and Service Desk applications. Unlike the previous chapters, we do not provide specific examples and scenarios. The intention here is to introduce you to the potential benefits of this integration. Examples and detailed scenarios could be included in future IBM Redbooks publications.

9.1 Overview

As we have already discussed several times in this book, IT has always existed in support of maintaining a competitive advantage, but that support has been largely tactical, given that IT has historically been viewed as a cost center, not a strategic business unit.

Things have changed dramatically in recent years as more and more businesses are moving out of a cost-centric view of IT's potential — and into a realization that IT can transform business processes. This phenomenon is largely driven by increased competition in the marketplace, and the understanding that moving toward an IT-driven, customer-centric business approach is not a luxury — it is imperative.

IT operations are increasingly expected to operate as a business unit, and with this expectation comes many of new challenges: improving performance, reducing operational costs, driving effective organizational change (via new processes and technology) to support IT's bid to succeed in this new role and demonstrating the business impact of the department.

This chapter provides an overview of how IT can function more effectively as a business unit, by using asset and service desk solutions to implement and support IT Infrastructure Library® (ITIL)-based processes for managing:

► Configuration
► Incidents
► Problems
► Change
► Releases
► Service levels
► Availability

9.2 ITIL processes to align IT with business objectives

ITIL provides a non proprietary, concrete framework for implementing service management best practices that are aligned with overall business objectives. Basing IT processes on ITIL guidelines enables organizations to more effectively manage IT changes, assets, personnel and service levels — going beyond simple IT asset management and service desk applications to deliver proactive IT business improvement. A well-implemented service can help:

► Reduce the occurrence of IT failures
► Improve service levels and customer satisfaction
► Reduce fixed and variable costs.

This helps IT to develop credibility, improve performance, reduce costs and achieve business effectiveness and efficiency in the use of information systems. Moving toward a service oriented IT model is daunting but possible — especially given the best-of-breed service management software tools that are available and specifically designed to facilitate ITIL processes.

However, most ITIL-related offerings fall short in two important areas: resource management and service costs. If a solution has built-in capabilities for detailed analysis of labor, materials, and asset and service provisioning costs related to ITIL process activities, IT managers would have the information they need to support both a more effective service delivery process and ongoing service delivery investment decisions.

The IBM Tivoli Asset Management for IT portfolio and service desk solutions are can work together to support key IT business processes — enabling different groups to work together more seamlessly, generally free of data conflicts or duplication.

9.2.1 Two core products generate a single comprehensive view

Combining two core products — IBM Tivoli Asset Management for IT and IBM Tivoli Service Desk - asset and service management solutions provide a comprehensive view that helps:

- ► Optimize IT processes
- ► Maximize return on assets
- ► Reduce risks and costs
- ► Improve service levels

One of the keys to more efficient management of IT assets is knowing what the organization has and where it is located. That is why asset and service management solutions integrate to help an organization build and maintain information on deployed IT assets more efficiently. By incorporating this information into IBM asset and service management solutions, customers can make more prudent investment decisions regarding technology resources and capital.

Even better, IBM Tivoli asset and service management solutions can grow with the organization as the ITIL processes are phased in. Each organization can implement Tivoli software to create a more complete asset and service management solution — or choose to establish individual components according to a phased ITIL service delivery implementation. However the organization chooses to use them, IBm Tivoli asset and service management solutions integrate with most business systems, allowing each customer to work the way he or she wants to work.

9.2.2 Integrate ITIL processes with the IT environment

As described in the following sections, IBM Tivoli asset and service management solutions integrate seven ITIL processes from the ITIL Service Support and Service Delivery groupings. Consequently, they help organizations bridge what is sometimes an enormous gap between business and technology — and develop a superior service delivery approach to better meet internal and external customers' needs, at a justifiable cost.

Configuration management

Configuration management is the process of identifying, recording and reporting on all IT components in your infrastructure. The key to a successful configuration management process is the ability to discover, identify, verify and record all *configuration items* (CIs) and their relationships in a central or federated configuration management database (CMDB) and use this as the official database of record to help maintain an accurate picture of your IT infrastructure.

CIs comprise all components of the IT infrastructure that currently exist in the IT environment — such as PCs, servers and network devices, software and software license agreements. A CMDB not only contains the attributes and history of each CI but also the relationships between and among them.

With IBM Tivoli asset and service management products, CIs are stored in a central database that is accessible to all and helps avoid costly integrations. The products present a logical, current picture of the organization's infrastructure and services by identifying, controlling, maintaining and verifying each version of existing CIs, as well as their relationships with each other and the customers they support — helping to improve service management processes.

Incident management

Incident management is the process of restoring normal service operation as quickly as possible to help minimize an incident's adverse impact on business operations. In ITIL terms, an incident is any deviation from the expected standard operation of a system or service. Best-practice incident management involves immediate service restoration utilizing standard processes of investigation, diagnosis, resolution and recovery.

Tivoli Service Desk documents incidents from end users, service technicians and network systems management applications. Streamlining the process further, it leverages ticket types and classifications with powerful visual workflow escalation and e-mail notifications for quicker resolution, helping to meet customer expectations and improve service desk efficiency. Consolidation of user communication across channels — including phone, e-mail, Web and fax — captures each incident, creating a searchable knowledge base that can vastly

reduce staff response time to anomalies or outages if similar incidents reoccur. Incidents can be linked with appropriate problems or changes, and are associated with their related CIs in the CMDB.

Problem management

A problem is the underlying error in the infrastructure that is the cause of one or more incidents. Problem management is the process of diagnosing the root cause of the error and arranging for a correction. Furthermore, it seeks to prevent recurrence of incidents related to these errors. Effective problem management depends on IT's ability to quickly and accurately determine the root cause and turn an unknown error into a known error — that is, problems for which the root cause is determined and attributed to a specific CI.

With Tivoli Service Desk, IT operations can more readily identify and classify the root cause of problems, assisting staff to quickly recognize and resolve known errors with minimal downtime. Built-in, real-time dashboards provide insight into all levels of service desk operations, so that any support staff, manager or executive can monitor role-based key performance indicators (KPIs) in an intuitive, graphical display. Dashboards provide actionable information and can identify potential problem areas, enabling IT to take appropriate corrective actions in most cases before critical services are adversely affected. Tivoli Service Desk enables the creation of changes from identified problems and ties appropriate incidents to these problems.

Change management

Change management is the process of ensuring that standardized methods and procedures are used for efficient and prompt handling of all changes to help minimize the risk of change-related incidents and improve day-to-day operations.

In ITIL terms, a change is any action that alters the form, fit, or function of one or more CIs. Most often, an authorized individual initiates a change via an approved request for change (RFC), which details the proposed change and includes both a justification and authorization for the change. Change management is vital to any IT organization that wants to provide the highest level of service delivery. A finely tuned process enables improved stability of the IT environment, provides a clear audit trail for compliance and helps to maximize the efficiency of IT staff. In addition, a true change management process helps decrease help-desk incidents generated by random, unapproved, or unmapped changes.

Change management is an essential process in the overall service delivery approach because it arms IT staff with the ammunition to respond to change, and to more successfully support the organization's business goals. Change management should offer a road map for significant alterations to the IT

infrastructure, thereby helping to reduce operational risk and decrease the time and effort of implementing the alterations.

IBM Tivoli asset and service management solutions offer comprehensive change management capabilities.They help minimize the often overwhelming breadth of a change management process by parceling its components into smaller, more manageable pieces:

► Tasks
► Labor
► Materials
► Services
► Tools

Using the change manager features of Asset Management for IT, automates requests and approvals, leveraging powerful visual workflow and escalations, and provides proactive service to help reduce outages. Thanks to a shared central database, IT staff can invoke change management from problem management, thus proactively planning for changes as part of an overall IT asset management process. Changes are automatically updated, and notifications of scheduled changes can alert support staff to actions that could temporarily increase the number of incidents. Additionally, the change management features can identify and classify RFCs, and its workflow utilizes predefined processes for review and approval according to ITIL guidelines.

Release management

Release management is the process of ensuring that all aspects of a release, both technical and nontechnical, are considered together in order to optimally navigate the release, and bridge the gap between application development and operations.

An effective release management process depends on the ability to ensure that only authorized and correct versions of software, hardware and other related assets (training materials and documentation, for example) are available for use.

Change management features include release management capabilities and simplify the release management process by making available, anytime, all available information about approved software and hardware.

Service level management

Service level management is the process of maintaining and improving IT service quality through a constant cycle of establishing agreements, then monitoring and reporting on them to meet the customers' business objectives.

Successful service level management depends on planning and implementing service level agreements (SLAs), or contracts between IT and its customers that guarantee a service deliverable in quantitative terms. The building blocks of SLAs are:

► Operational level agreements (OLAs) that document all goals and metrics agreed on by internal IT groups working toward a common goal.

► Underpinning service contracts that capture the metrics agreed on by IT and any of its external vendors.

Once defined and agreed on, SLA metrics must be actively monitored by both IT and the customer to ensure the commitments are met and to verify that service quality is cost-justified and gradually improved.

IBM Tivoli asset and service management helps manage service level operations and provides advanced processes for creating, managing and monitoring SLAs. It enables increased communication between IT and its internal customers and helps to align service levels with business strategies. For example, the service catalog feature allows IT organizations to more clearly define the services they will provide the business. They can then link assets, locations, contracts and SLAs to these services. Users can proactively monitor service levels via predefined key performance metrics (KPMs). Escalation management capabilities help manage resources properly to more consistently achieve service level commitments.

While SLAs are most closely associated with the service desk, service level management capabilities enable an organization to tie SLAs to other ITIL processes, enabling tighter management of configurations, changes, releases, problems and incidents. For example, it can be used to establish target response and resolution dates in incidents, problems, changes and releases, allowing for more agile service support and greater reliability in daily operations.

IBM Tivoli asset and service management solutions can be used to establish reliability, capacity and availability commitments for assets, locations and services, assisting users to more proactively deliver critical business services.

Availability management

Availability management is the process of optimizing the capabilities of the IT infrastructure, services and supporting organization to deliver a cost-effective and sustained level of availability, to help the business meet its objectives. Availability tends to be a catch-all term that encompasses system reliability and resilience, maintainability, serviceability and security.

Availability is defined and promised within individual SLAs, but availability management moves a step beyond service level management in that it requires

a thorough understanding of the IT infrastructure's capabilities to deliver, and a sound process improvement loop to help optimize performance.

Both Tivoli Service Desk and IBM Tivoli Asset Management for IT utilize KPIs to calculate the following availability metrics:

► Total availability and unavailability
► Mean time between failures (reliability)
► Mean time to repair (maintainability)
► Vendor responsiveness (serviceability)

Escalation and workflow capabilities monitor and proactively notify managers of availability shortfalls and flag opportunities to improve. Specific availability metrics — such as downtime — can be analyzed using operational availability data provided by integrations to third-party solutions.

9.3 Conclusion

This brief chapter has highlighted how the integration of IBM Tivoli Asset Management for IT and service desk applications can help IT organizations manage key processes. These asset and service management solutions help provide a smooth implementation of ITIL best practices.

10

Asset reconciliation

Asset reconciliation is an important part of asset management. It is the capability to reconcile the differences between a physical inventory of what actually exists, and the database/accounting system of what we believe exists. This reconciliation is important for support reasons, and maybe even more importantly for financial and compliance management.

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10.1 Roles

The reconciliation process can be used by and affects several roles within the organization, including:

Service Desk - This role requires a view of the asset hierarchy with specifications, last scanned details of user defined critical values to potentially resolve an issue the customer is reporting. For example, the user installed a new version of a JRE™ that caused the Expense Reporting tool to no longer function.

Configuration Management - This role would want to view the current configuration of the asset as it compares to the deployed asset reported configuration. For example, how many desktops currently have Windows 2000 Service Pack 4 installed, or how many servers have DB2 Enterprise Server 8.2 Fix 5?

Asset Manager - This is the primary user of this application and generates a series of reconciliation reports, which allow them to identify hardware and software compliance and configuration standards established by the organization. For example, checking for unauthorized software and sending out notifications to the asset custodian and/or user to remove the software could be accomplish through the use of reconciliation, escalations, actions, and communication templates. Hardware reconciliation is also important, because it may have financial implications based on depreciation or proper accounting of assets.

10.2 Implementation

What can be reconciled depends on four things. The first is determining what the organization is tracking. For example, if the organization only cares about servers and just wants to know that all servers in the authorized list match the servers that are discovered, things are simple. For instance, we could use the Serial Number as a basis for the reconciliation (which is normally burned into the BIOS). The Asset Tag is another candidate but not something that is normally burned into the BIOS. The criteria that can be used for link rules is defined by either using the Asset table, or the Asset Specification table. The Asset table provides a limited number of options, such as Serial Number and/or Asset Tag. However the Asset Specification table could contain an unlimited number of attributes, such as MAC Addresses. However, the Deployed Asset table has a limited number (seventeen) possible fields none of which are MAC Address. While MAC Address may not be a good Link Rule it could be a great comparison rule to determine if the network card has been replaced. The major point here is to identify the candidates and make informed decisions along with the various

roles within the organization to reach a agreement on what fields should be used to link the assets across the various tables.

The second area of requirement deals with the configuration of the asset. From a configuration management view the Operating system and the current patch level may be one requirement. From an asset management view knowing the amount of RAM on the system is a requirement, but the organization does not want to track RAM as an asset. Both of these requirements can be achieved through the use of a *Classification Structure* and the attributes associated with the structure, know as the *Specifications*. Specifications are applied either at the Asset level, typically applied at this level when the asset is not considered a *Rotating Item*, or at the *Item Master* level when the rotating item will become an asset.

When the asset is created and the item number is associated to the asset the asset inherits the specifications of the item number. For example, the organization has decided not to track hard drives and RAM, but wants to know the configuration and be able to accomplish reconciliation on those items. Each of these entities would be part of the specifications for the desktop classification.

The Procurement Manager or role responsible for maintaining the various standard configurations of desktop's would create a new item in the item master and apply the classification structure to that item, They would enter the amount of RAM and hard drive size the item is pre-configured with at the factory. These attributes can them be used to create *Comparison Rules* that would provide a reconciliation result as required.

A third area is software compliance and the reconciliation of these items can be challenging. Maximo has numerous ways to account for software.

► Treat all software as rotating assets. - This may make life easy for tracking purposes but the asset table could grow very large very quickly. Further, when a technology refresh is accomplished each asset would need to be first issued to a Configuration Location (Operating) then an Asset Swap could be accomplished.

  If at the time of receipt we placed those items in the configuration location we lose accountability of the assets, that is, we know where they are at, but not how many we have issued, nor can we use the inventory application to set up record points and place these items on reservation.

  The reconciliation process would work very similar to a hardware scenario with the exception that the comparison rule would reference the Asset Object and the Deployed Asset table that would be used would be DPAMSOFTWARE.

► Treat some software as rotating assets and others as spare parts. For example, the organization has limited copies of Visio® but an enterprise

agreement with Microsoft for Windows 2000. The asset manager would establish Visio as a rotating item and create Windows 2000 as a spare part or non-trackable item.

The fourth area is that what the discovery tool can detect impacts what the reconciliation processes can reconcile. Further, the organization may want the discovered data to become the authorized inventory list during the initial implementation phase. How the authorized list is created will determine how easy the mapping is from the discovery tool is to the asset table.

In essence Maximo is divided into two parts, the *physical* and the *authorized*.

► Authorized: The authorized asset and configuration as defined by the Asset Manager, Configuration Manager, and Contract Manager. Each of these managers may have different needs.

► Physical: The actual asset and its current configuration based on what is being captured by the discovery tool or tools.

The physical inventory is captured by any number of tools, one could be Maximo Discovery. Maximo Discovery can be set up in any number of ways. One organization may have one Discovery database that all administration consoles utilize to store the current asset configuration. Or they may separate databases and consoles for the varies parts of the organization. The administration consoles can be deployed by region, for example, North America, Asia-Pacific, EMEA, South America. Or they may be deployed by the Site structure that is going to be developed in Maximo. Maximo Discovery Agents can be deployed to any of the following systems running on a Windows, Unix, or Linux platform.

► Desktop
► Servers
► Laptop
► MAC's

The agent is installed as a service, a hidden system folder in most cases. The agent can be deployed by scanning the network domains, through import of a list of computers using a text file, entering an IP address range, or entering the computer name, this is called pushing the agent. The agent can also be deployed in the following manners:

► Email - May not work if the organization is blocking any email with an attachment with an exe extension. Plus it requires the user to install.

► Login Script File- This could be accomplished through any program that pushes updates out to systems, for example ISSI, or SMS. This is often the preferred method for Unix and Linux machines.

► Standalone Diskette - For example, one can use a USB drive to download the agent. The USB would then be taken to the system and the agent ran on the

system, and the scan results are written to the USB drive. The scan results are then imported into the Discovery Console.

When an agent is installed on a machine, LANPROBE will determine the physical location of the network PC's and other devices, such as network printers, and adapters the asset is attached to.

The Maximo database has a second set of tables that store the deployed asset information, including the last known configuration information, including installed software and hardware for computer assets that have an agent deployed on them and any network devices and network printers that LANPROBE has discovered.

The data stored in these tables can be viewed through two Maximo deployed assets modules:

Under **Assets** → **Deployed Assets**, there are three applications, Computers, Network Printers, and Network Devices. For example, if you want to see an asset's last discovered configuration, you would use the Computers application, which would breakout the configuration to include all the software, network adapters, software suite, operating systems, hardware configuration (to include drive size and remaining space) and more depending on what the discovery tool captures.

A second Deployed Asset Module exists under **Administration** → **Deployed Asset**. The Deployed Assets Administration module applications let you control how Maximo displays the data collected by your asset discovery tool in the Deployed Asset module applications. Deployed Assets administration includes seven conversion applications that let you translate inconsistent names discovered by the asset discovery tools to standard naming conventions.

▶ **Adapter Conversion**- Used to establish standard adapter naming conventions for adapters used in computers, both media adapters (such as video and sound cards) and network adapters.The Adapter Conversion application determines how Maximo displays deployed asset adapter data in reports and in the Computers and Network Devices applications.

▶ **Manufacturer Conversion** - Used to establish standard manufacturer naming conventions for hardware and software manufacturers. The Manufacturer Conversion application determines how Maximo displays deployed asset manufacturer data in reports and in the Computers, Network

▶ **Operating System Conversion** - Used to establish standard naming conventions for operating systems used in computers. The Operating System Conversion application determines how Maximo displays deployed asset operating system data in reports and in the Computers application.

- ► **Processor Conversion**- Used to establish standard processor naming conventions for central processors (CPUs) used in computers. The Processor Conversion application determines how Maximo displays deployed asset processor data in reports and in the Computers application.

- ► **Software Conversion** - Used to establish standard naming conventions for software applications used in computers. The Software Conversion application determines how Maximo displays deployed asset software names in the Computers application.

- ► **Software Suite Setup** - Used to define which software applications should be considered part of a suite. A software suite is a group of software applications licensed as a single unit. Maximo displays data about software suites on the Suites subtab of the Software tab in the Computers application.

- ► **Software Usage Setup** - Used to specify a range for usage frequency and to assign that range a user-friendly, textual description that is displayed in the Computers application. For example, administrators can use the word "frequently" to describe software that is used between 10 and 20 times or "rarely" to describe software that is used between 0 and 4 times. Maximo provides usage frequency data for both individual software applications and application suites. The frequency for a software suite is determined based on the component application with the highest usage count.

These tables are either manually populated or, in most cases, will be populated using Integration Composer (also known as Fusion). Integration Composer is a facility that is used to map data from the Deployed Asset Repository or Change and Configuration Database (CCMDB) into either of the following set of tables:

- ► Tables as discussed above

- ► Asset tables when the Discovered Assets will form the baseline for initial Authorized asset lists.

Mappings are called Adapters and are predefined based on the standard schema of the network discovery tool and Maximo. If the data structure of either database has changed, changes to the adapter will be required. For example, a field was added and the client wants that field in the deployed asset table(s), you would need to map the field and potentially convert the data types or field values into something Maximo and/or the client wants to see in the Maximo Interface. Adapters are purchased separately based upon the need of the implementation. The following is a list of some of the Adapters currently available:

- ► Altiris Inventory Solution
- ► Centennial Discovery
- ► HP CM Inventory Manager
- ► IBM Tivoli Configuration Manager
- ► Maximo MainControl i.collect
- ► Maximo Discovery

- Microsoft SMS
- Generic Adapter.

Adapters may be used to connect to other discovery tools. If this occurs, then Maximo Discovery is not used. Integration Composer can be set up to execute via a batch file. Timing of the execution is important, especially when the discovery tool is configured to run on a specific schedule.

A batch file is used to transfer of information from Discovery to Maximo CCMDB.

The module applications let you configure a behind-the-scenes process that reconciles the IT asset information maintained in the Assets module applications against the deployed asset data maintained in the Deployed Assets module applications. The reconciliation process identifies successful matches between IT assets and deployed assets as well as discrepancies and variances between the two. Your enterprise can use this reconciliation to determine whether the IT assets actually deployed comply with corporate plans and whether the changes over an asset's life cycle are in compliance with corporate policies.

Discrepancies might be caused by a variety of factors, including:

- incorrect data entry
- reconfigured equipment
- retired equipment
- theft
- unauthorized use of hardware and software in the enterprise

The Reconciliation module includes six applications:

- **Link Rules** – This application defines a link between a top-level IT asset and a computer, network printer, or network device in deployed assets.The link rule establishes the basis of the comparison by identifying the object and attribute in IT assets to link to a specific attribute in deployed assets.

- **Reconciliation Tasks** – This application combines one or more link rules and, if necessary, a task filter and one or more comparison rules into a reconciliation task. If you do not define a task filter for a reconciliation task, Maximo compares all top-level IT assets with all deployed assets when it processes the reconciliation task. This application also lets you specify how Maximo reports results for comparison rule evaluations—all results, failed reconciliations, or successful reconciliations.

- **Reconciliation Results** – This application lists results of comparison rule evaluations. When you create a reconciliation task, you specify what results to report here for comparison rule evaluations—all results, failed reconciliations, or successful reconciliations. In addition, the Reconciliation Results application lists link failures that occur when Maximo does not find a successful one-to-one link between an IT asset and a deployed asset

specified in a link rule; failures occur when the reconciliation process finds no link or finds multiple links.

- ► **Link Results** – This application lists successful one-to-one links between a top-level IT asset and a computer, network printer, or network device in deployed assets.

- ► **Task Filters** – This application defines a subset of either assets or deployed assets to reconcile.

- ► **Comparison Rules** – This application identifies objects or attributes of a child or parent IT asset to compare with objects or attributes of a child or parent deployed asset when Maximo executes a reconciliation task.

In order to accomplish reconciliation the following must exist:

- ► Link Rule.

- ► Reconciliation Task.

- ► Crontask scheduling the Reconciliation Task.

- ► Assets with the IT Classification Structure associated to them.

- ► The top level Classification Structure CLASSSTRUCTUREID of the IT Classification must be entered in the MAXVARS table in the ITASSETS var value.

Once executed, the reconciliation will produce positive and/or negative results when based on a Link Rule. The Link Results will have a list of all positive results. The Reconciliation Results will list all negative results, that is, did not find a matching Asset or Deployed Asset. Escalations can be set up to notify the Asset Manager of these results. These escalations could also create Incidents or other records, in order to close the loop or kick off a workflow to resolve the inconsistencies.

10.3 Summary

This chapter has provided a high level description of some of the facilities and capabilities that would be used to perform asset reconciliation. Asset reconciliation is an important capability that would be used by several roles across the enterprise.

11

Integration with ERP Systems

It is important that IT Asset Management is implemented in a proactive way. This includes capturing assets and asset requirements before they are acquired, and through out their complete life cycle.

To do this effectively, it is important that an asset management solution be integrated with enterprise resource planning systems. This chapter describes how this integration can be accomplished with IBM Tivoli Asset Management for IT.

Throughout this chapter we will refer to the Maximo Enterprise Adapter, which was part of the original MRO Maximo Asset Management solution, now being rebranded as IBM Tivoli Asset Management.

Enterprise Resource Planning systems, or ERPs, attempt to integrate all data and processes of an organization into a unified system. A typical ERP system will use multiple components of computer software and hardware to achieve the integration. A key ingredient of most ERP systems is the use of a unified database to store data for the various system modules. IBM Tivoli Asset Management for IT includes an Enterprise Adapter, that enables the integration with key ERP systems.

IBM Maximo Enterprise Service Adapter for SAP ERP

IBM Service Management

Process Management

Service Management Platform

Operational Management

Best Practices

- Integration capabilities to SAP and Oracle applications to incorporate ERP financial and HR information to the IT asset management lifecycle.

- Web-based GUI for ubiquitous access

- Powerful customization, workflow and alert capabilities.

- A robust contract and procurement application that is integrated with the IT asset management solution

- Continuous investment to improve discovery capabilities

Figure 11-1   IBM Tivoli Enterprise™ Service Adapter for SAP ERP

11.1 A brief history of ERP

The term ERP originally implied systems designed to plan the use of enterprise-wide resources. Although the acronym ERP originated in the manufacturing environment, today's use of the term ERP systems has a much broader scope.

ERP systems typically attempt to cover all basic functions of an organization, regardless of the organization's business or charter. Business, non-profit organizations, non governmental organizations, governments, and other large entities utilize ERP systems. Additionally, it may be noted that to be considered an ERP system, a software package generally would only need to provide functionality in a single package that would normally be covered by two or more systems.

Technically, a software package that provides both payroll and accounting functions would be considered an ERP software package. However, the term is typically reserved for larger, more broadly based applications. The introduction of an ERP system to replace two or more independent applications eliminates the need for external interfaces previously required between systems, and provides additional benefits that range from standardization and lower maintenance (one system instead of two or more) to easier and/or greater reporting capabilities (as all data is typically kept in one database).

Examples of modules in an ERP that formerly would have been stand-alone applications include: Manufacturing, Supply Chain, Financials, Customer Relationship Management (CRM), Human Resources, and Warehouse Management.

Some organizations - typically those with sufficient in-house IT skills to integrate multiple software products - choose to only implement portions of an ERP system and develop an external interface to other ERP or stand-alone systems for their other application needs. Increasingly, the tool of choice for those organizations has become the IBM Maximo Enterprise Adapter.

Ideally, ERP delivers a single database that contains all data for the software modules, which would include:

► Manufacturing

– Engineering
– Bills of Material
– Scheduling
– Capacity
– Workflow Management
– Quality Control
– Cost Management
– Manufacturing Process
– Manufacturing Projects
– Manufacturing Flow

► Supply Chain Management

– Inventory
– Order Entry
– Purchasing
– Product Configurator
– Supply Chain Planning
– Supplier Scheduling
– Inspection of goods
– Claim Processing
– Commission Calculation

► Financials

– General Ledger
– Cash Management
– Accounts Payable
– Accounts Receivable
– Fixed Assets

- Projects
    - Costing
    - Billing
    - Time and Expense
    - Activity Management
- Human Resources
    - Human Resources
    - Payroll
    - Training
    - Time and Attendance
    - Benefits

At this point, we need to introduce the Asset Lifecycle, which leads to Asset Lifecycle Management. This is a process that covers all other HR aspects from application to retirement. The system records basic demographic and address data, selection, training and development, capabilities and skills management, compensation planning records and other related activities. Leading edge systems provide the ability to "read" applications and enter relevant data to applicable database fields, notify employers and provide position management and position control.

Typically, Human Resource Management System technology replaces the four core HR activities by streamlining them electronically:

- Payroll
- Time and Labor Management
- Benefit Administration
- HR Management

While using the internet or corporate intranet as a communication and workflow vehicle, the HRMS technology can convert these into Web-based HRMS components of the ERP system and permit to reduce transaction costs, leading to greater HR and organizational efficiency. Through employee or manager self-service (ESS or MSS), HR activities shift away from paper based processes to using self-service functions that benefit employees, managers and HR professionals alike. Costly and time consuming HR administrative tasks, such as travel reimbursement, personnel data change, benefits enrollment, enrollment in training classes (employee side) and to instruct a personnel action, authorize access to information for employees (manager's side) are being individually handled and permit to reduce HR transaction time, leading to HR and organizational effectiveness. Consequently, HR professionals can spend fewer resources in managing administrative HR activities and can apply freed time and resources to concentrate on strategic HR issues, which lead to business innovation.
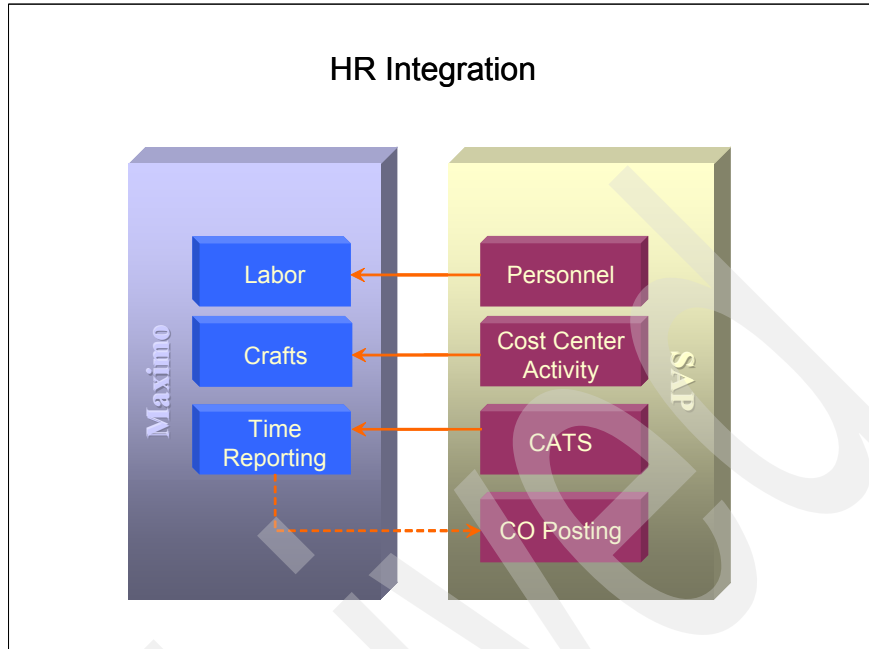
HR Integration

Figure 11-2   Human Resources Integration

In the diagram above, employees exist as Personnel records within the SAP HR data base.

The employee (personnel) records are transmitted to Maximo as Labor. Activity Types, Codes and Cost Center are transmitted from SAP CO to Maximo as Crafts. Employee hours are entered in SAO CATS against Maximo Work Orders (SAP Internal Orders) are transmitted to Maximo as Labor transactions.

11.2 Customer Resources and Marketing

In similar fashion, a variety of other forms of enterprise tracking may exist to support Sales and Marketing, Commissions, Service, Customer Contact and Call Center support.

11.3 Data Warehouse

ERP systems typically handle the manufacturing, logistics, distribution, inventory, shipping, invoicing, and accounting for a company. Enterprise Resource

Planning or ERP software can aid in the control of many business activities, like sales, marketing, delivery, billing, production, inventory management, quality management, and human resources management.

ERPs are often incorrectly called back office systems indicating that customers and the general public are not directly involved. This is contrasted with front office systems like customer relationship management (CRM) systems that deal directly with the customers, or the eBusiness systems such as eCommerce, eGovernment, eTelecom, and eFinance, or Supplier Relationship Management (SRM) systems.

ERPs are cross-functional and enterprise wide. All functional departments that are involved in operations or production are integrated in one system. In addition to manufacturing, warehousing, logistics, and Information Technology, this would include accounting, human resources, marketing, and strategic management.

EAS - Enterprise Application Suite is a new name for formerly developed ERP systems which include (almost) all segments of business, using ordinary Internet browsers as thin clients.

11.4 Before ERP

Prior to the concept of ERP systems, departments within an organization would have their own computer systems. For example, the Human Resources (HR) department, the Payroll (PR) department, and the Financials department. The HR computer system (Often called HRMS or HRIS) would typically contain information about the department, reporting structure, and personal details of employees. The PR department would typically calculate and store paycheck information. The Financials department would typically store financial transactions for the organization. Each system would have to rely on a set of common data to communicate with each other. For the HRIS to send salary information to the PR system, an employee number would need to be assigned and remain static between the two systems to accurately identify an employee. The Financials system was not interested in the employee level data, but only the payouts made by the PR systems, such as the Tax payments to various authorities, payments for employee benefits to providers, and so on. This provided complications. For instance, a person could not be paid in the Payroll system without an employee number.

11.5 After ERP

ERP software, among other things, combined the data of formerly disparate applications. This made the worry of keeping employee numbers in synchronization across multiple systems disappear. It standardized and reduced the number of software specialities required within larger organizations.

11.6 Best practices

Best practices were also a benefit of implementing an ERP system. When implementing an ERP system, organizations essentially had to choose between customizing the software or modifying their business processes to the "Best Practice" functionality delivered in the vanilla version of the software.

Typically, the delivery of best practice applies more usefully to large organizations and especially where there is a compliance requirement such as IFRS, Sarbanes-Oxley or Basel II, or where the process is a commodity such as electronic funds transfer. This is because the procedure of capturing and reporting legislative or commodity content can be readily codified within the ERP software, and then replicated with confidence across multiple businesses who have the same business requirement.

Where such a compliance or commodity requirement does not underpin the business process, it can be argued that determining and applying a best practice actually erodes competitive advantage by homogenizing the business compared to everyone else in their industry sector.

Evidence for this can be seen within EDI, where the concept of best practice, even with decades of effort remains elusive. A large retailer, for example, wants

EDI plus some minor tweak that they perceive puts them ahead of their competition. Mid-market companies adopting ERP often take the vanilla version and spend half as much as the license cost doing customizations that deliver their competitive edge. In this way they actively work against best practice because they perceive that the way they operate is best practice, irrespective of what anyone else is doing. IBM has wholeheartedly supported the ITIL framework for best practices for all software products. IBM Service Management remains the hallmark for all Tivoli products, including IT Asset Management and Maximo Enterprise Adapter for SAP ERP.

11.7 Consulting

Consulting for a large ERP project involves three levels:

- ► Systems architecture
- ► Business process consulting (primarily re-engineering)
- ► Technical consulting (primarily programming and tool configuration activity).

A systems architect designs the overall dataflow for the enterprise including the future dataflow plan. A business consultant studies an organization's current business processes and matches them to the corresponding processes in the ERP system, thus 'configuring' the ERP system to the organization's needs. Technical consulting often involves programming. Most ERP vendors allow modification of their software to suit the business needs of their customer.

11.7.1 Project Reviews

Evaluating a project at the outset will ensure a customer's requirements will be met, and if there are potential issues identified, mitigation plans can be established. Mid project reviews ensure projects are on track and deliverables are meeting requirements prior to acceptance testing, and also allow for scope modification to ensure project success. Post project reviews provide lessons learned and documentation of configurations, as well as defining any follow up activities required to keep the project momentum going through system start up and the critical first few months. Earned Value and progress reviews justify project activities.

11.7.2 Project Plans

MRO's experience through thousands of implementations provides project plans for client specific implementations taking into account, budgets, client resource availability and potential parallel implementations of ERP or financial packages, schedules and communication requirements. The project plan, activities and timelines are used to manage project progress and success.

11.7.3 Project Management

MRO Software's Project Management Office (PMO) is an internal organization of project management professionals whose charter is to facilitate and improve the quality of our Maximo implementation delivery process. Customer benefits include:

- ► Sound management of project scope, time, and quality
- ► Justifiable measurement and evaluation of deliverables

- ► Risk mitigation
- ► Accumulation and documentation of expertise in managing complex projects
- ► Customer satisfaction by virtue of a streamlined process

11.8 Implementation

Because of their wide scope of application within a business, ERP software systems are typically complex and usually impose significant changes on staff work practices (if they did not, there would be little need to implement them).

Thanks to the Maximo Enterprise Adapter, or MEA, the ERP solutions become much simpler to implement.

The MEA for SAP, also called the SAP adapter and the integration, is an end-to-end integration solution between Maximo and an SAP ERP system.

The MEA for SAP integrates data between Maximo and an SAP system, with transaction messages handled through Maximo JMS queues and the SAP Exchange Infrastructure (XI). It also updates the systems when changes are made on either side of the integration, depending on how the integration points are configured and customized.

The MEA for SAP installation process places integration objects and files in Maximo, in the SAP system, and in SAP XI. You configure the integration, for example, integration mapping, settings, parameters, rules and conditions, and so on, in Maximo, SAP, and SAP XI. The MEA for SAP includes user exits for customizing the default functionality of the adapter for your business practices.

11.9 Integration Components

Figure 11-3 shows an overview of the integration software components, in Maximo and in SAP. It also shows their relationships with the server machines and where you install them.
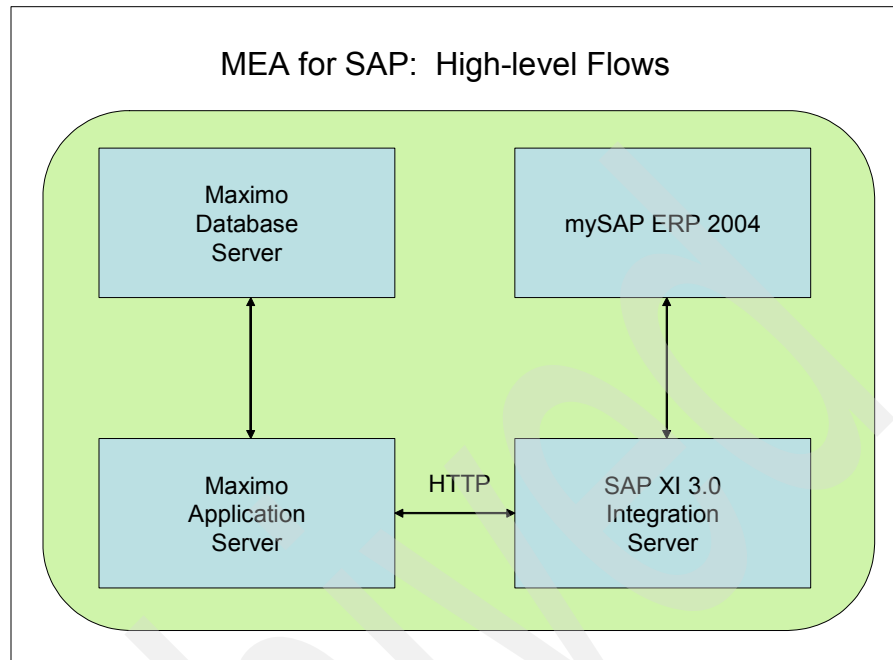
Figure 11-3   Maximo Enterprise Adapter for SAP High Level Flows

11.9.1 Financial Integration

As mentioned earlier, a key benefit of the Maximo Enterprise Adapter is its linkage with ERP solutions that offer support of financial applications. Specifically, Charts of Accounts that are entered and maintained in SAP including SAP Cost Objects (Cost Centers, Business Areas, Profit Centers) and General Ledger accounts are transmitted to MEA. Likewise, Work Orders entered into SAP are also maintained in MEA.

Optionally, Maximo Work Orders transmitted to SAP can create corresponding Internal Orders.

Maximo journal feeds to SAP include:

► Inventory transactions
► Labor transactions
► Tool transactions
► Purchase transactions
► Invoice transactions
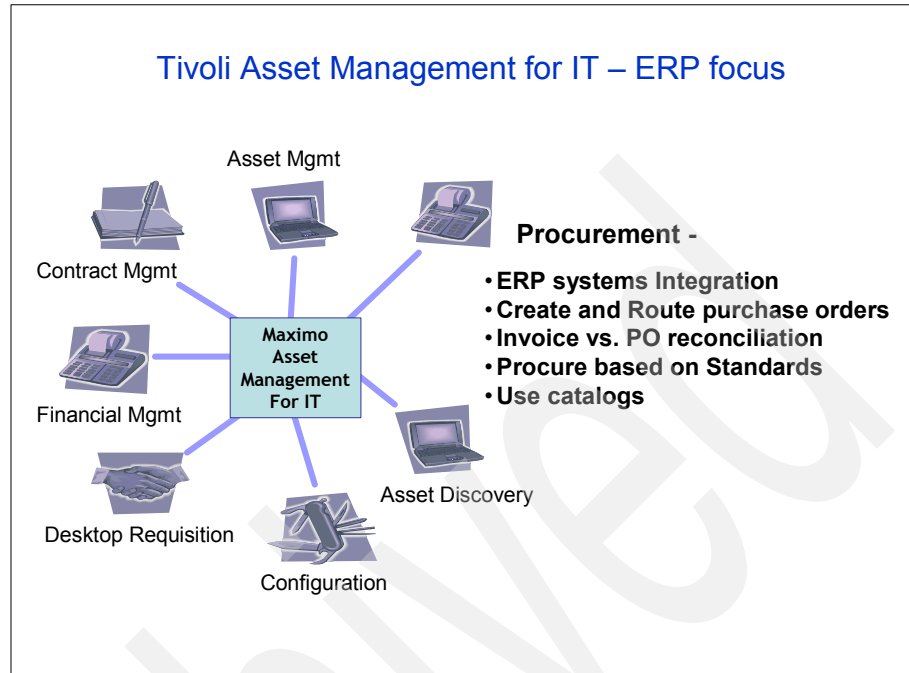
Figure 11-4   Tivoli Asset Management for IT - ERP Focus

Actual Labor Hours entered in Maximo can optionally be sent to SAP for job costing, to supplement or update Internal Orders.
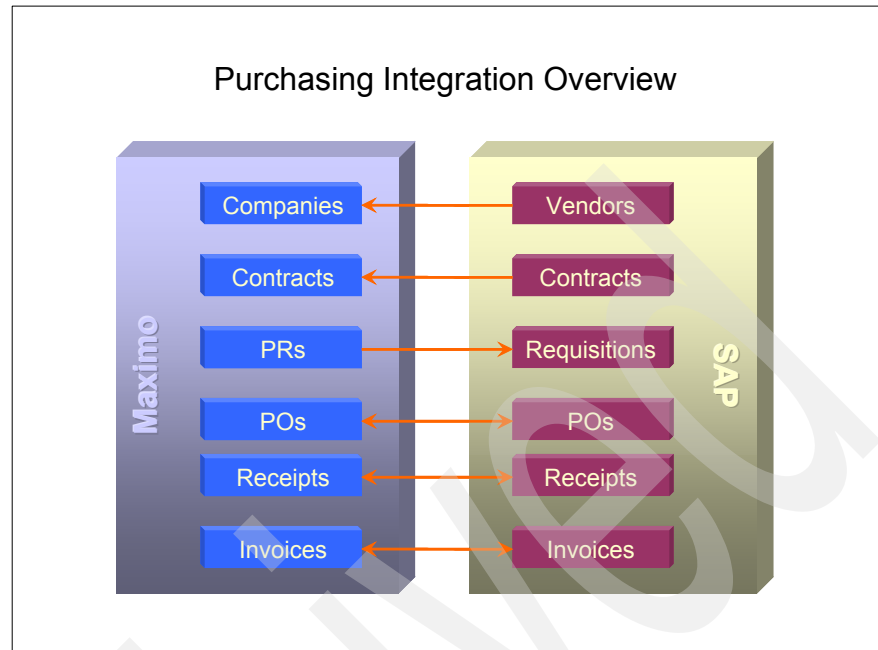
Figure 11-5   Purchasing Integration overview

As mentioned earlier, purchasing is a key component of Supply Chain Management. The term purchasing can be misleading however, because there are a number of directly attached, integrated activities that really need to be considered within an ERP solution. For SAP, they include:

► Vendors identification and maintenance

► Purchasing Contracts entered and maintained

► Requisitions entered and maintained in Maximo

► Purchasing in either system

► Receiving in either system

► Invoicing in either system

► Support for distributed purchasing management where some purchasing (for example, production) managed in SAP while MRO (Maintenance and Repair Inventory) purchasing managed in Maximo

Figure 11-6   SAP Managed Purchasing Integration

The details involved within managing an integrated process involve the activities above, but this time, with Maximo involvement:

► Vendors entered and maintained in SAP, and transmitted to Maximo

► Purchasing Contracts entered and maintained in SAP, with Contracts transmitted to Maximo

► Requisitions (PRs) entered and maintained in Maximo, with PRs transmitted to SAP (upon approval)

► Requisition status updates from SAP

► Purchase Orders (POs) entered and maintained in SAP, with POs transmitted to Maximo on approval and PO updates transmitted from SAP

► Receipts entered and maintained in SAP, with receipts transmitted to Maximo. Updates the corresponding inventory and direct costs. Alternatively, receipts can be entered in Maximo and transmitted to SAP

► Invoices entered, matched, and paid in SAP and Invoices, plus variances, transmitted to Maximo. This will then update corresponding inventory and direct costs.
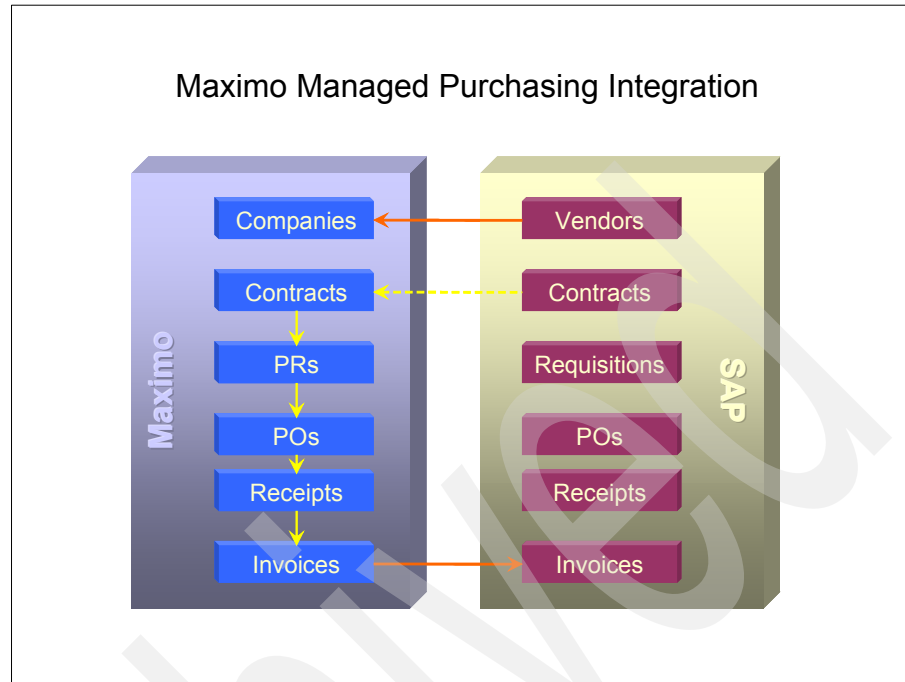
Figure 11-7 Maximo Managed Purchasing Integration

Note, below, how a reverse flow is also possible:

▶ Vendors entered and maintained in SAP, then transmitted to Maximo

▶ Purchasing Contracts entered and maintained in Maximo, alternatively, Contracts can be entered in SAP and transmitted to Maximo

▶ Requisitions (PRs) entered and maintained in Maximo

▶ Purchase Orders (POs) entered and maintained in Maximo

▶ Receipts entered and maintained in Maximo

▶ Invoices entered and matched in Maximo, with approved invoices transmitted to SAP for payment

Figure 11-8   Maximo Managed Purchasing with SAP Invoice Matching Integration

And here are the process details for SAP invoice matching integration;

► Vendors entered and maintained in SAP, then transmitted to Maximo

► Purchasing Contracts entered and maintained in Maximo, alternatively, Contracts can be entered in SAP and transmitted to Maximo

► Requisitions (PRs) entered and maintained in Maximo

► Purchase Orders (POs) entered and maintained in Maximo, then transmitted to SAP on approval

► Receipts entered and maintained in Maximo, then transmitted to SAP

► Invoices can be entered in either system but are matched and paid in SAP. Then, invoice variances transmitted to Maximo. This will update corresponding inventory and direct costs
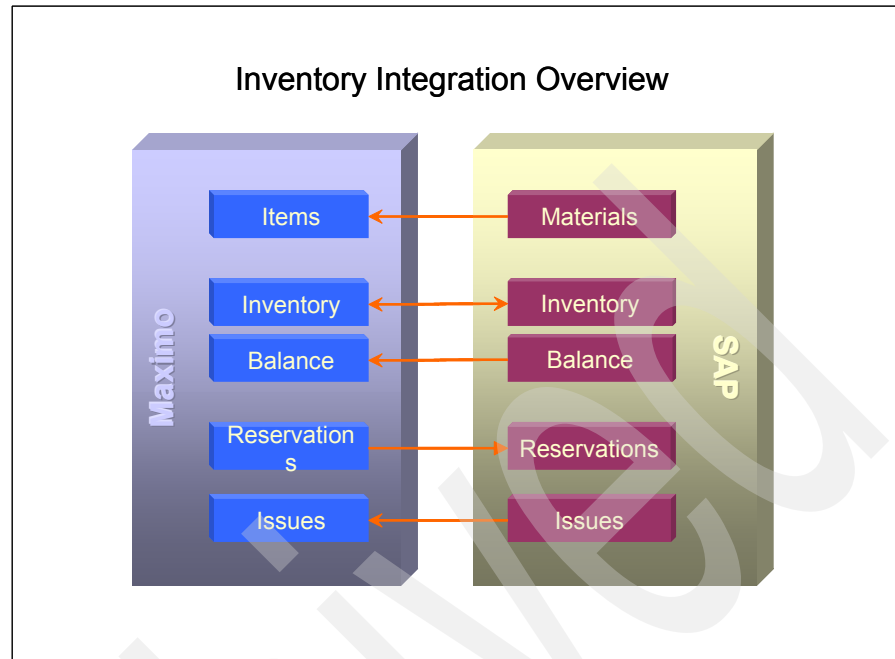
Figure 11-9   Inventory Integration Overview

Notice that item definitions and inventory can be maintained in either system. Inventory balance (availability) is transmitted to Maximo when SAP is managing the inventory. Also, support for distributed inventory management where some inventory (for example, production inventory) is managed in SAP while MRO (Maintenance and Repair Inventory) inventory is managed in Maximo.
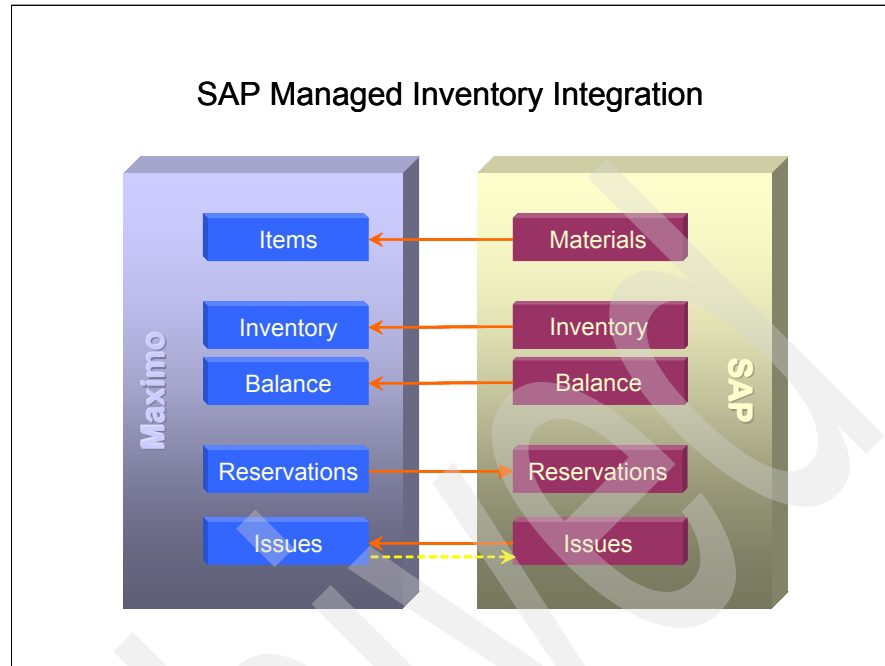
Figure 11-10   SAP Managed Inventory Integration

Item definitions, balances and pricing are managed in SAP, while Items and Inventory in SAP synchronized with Maximo Inventory. Maximo Material Reservations are transmitted to SAP.

Material Issues transmitted from SAP, while Issues entered in SAP transmitted to Maximo. Updates corresponding to inventory and direct costs are transmitted, as well. Alternatively, Material Issues can be entered in Maximo and transmitted to SAP, supporting the requirement that Inventory must be in an enterprise system but the people issuing the items can have either system (self service capabilities)
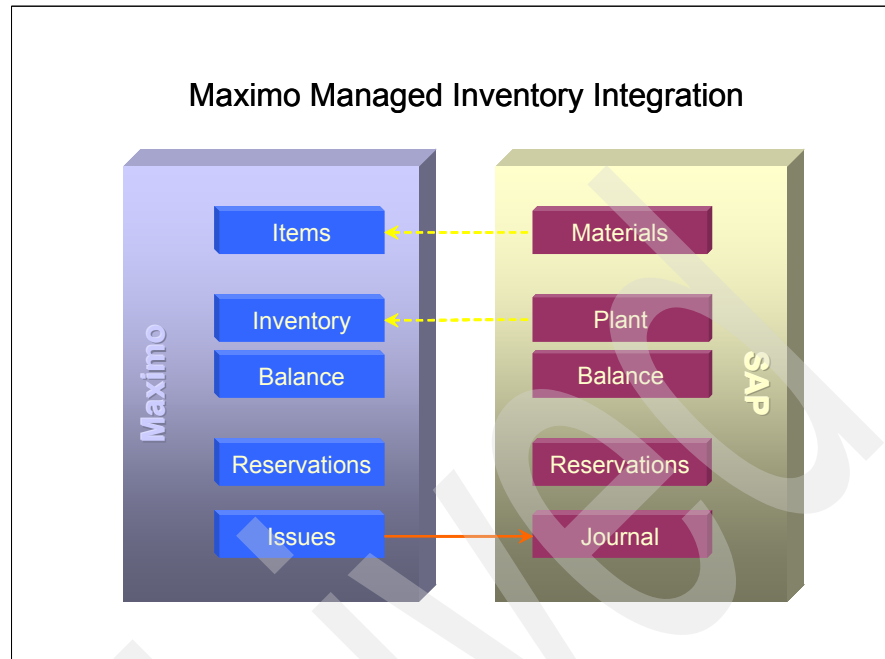
Figure 11-11   Maximo Managed Inventory Integration

The definitions for Items can be created and maintained in either system. Item updates in SAP can be synchronized with Maximo. Maximo inventory is linked to SAP Plant.

11.10 Enterprise Deployment Scenarios

The Maximo Enterprise Adapter may deployed in three different configurations:

1. With Enterprise Integration Hub

2. Multi-system deployment

3. Multi-system deployment with Enterprise Integration Hub

The following three graphics illustrate the scenario. The first scenario represents an ideal configuration for the small to medium sized business as they migrate to ERP with MEA.

Figure 11-12   MEA with Enterprise Integration Hub

As the enterprise grows, a multi-system strategy will become necessary to leverage the value that MEA provides.
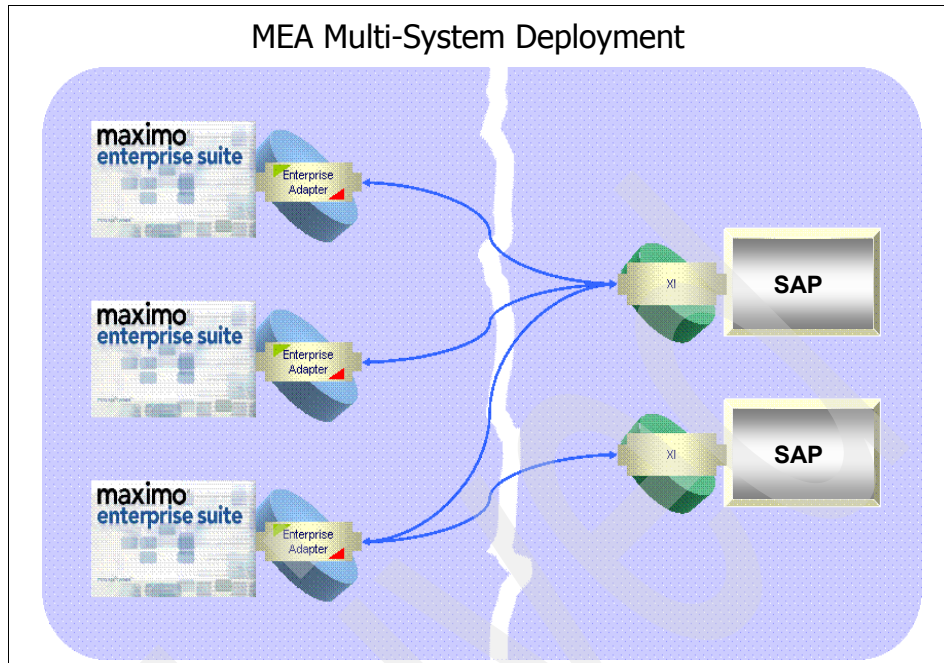
Figure 11-13   MEA Multi-System Deployment

Combining both the multi-system strategy with the enterprise hub offers the most flexibility and expansion for future growth.
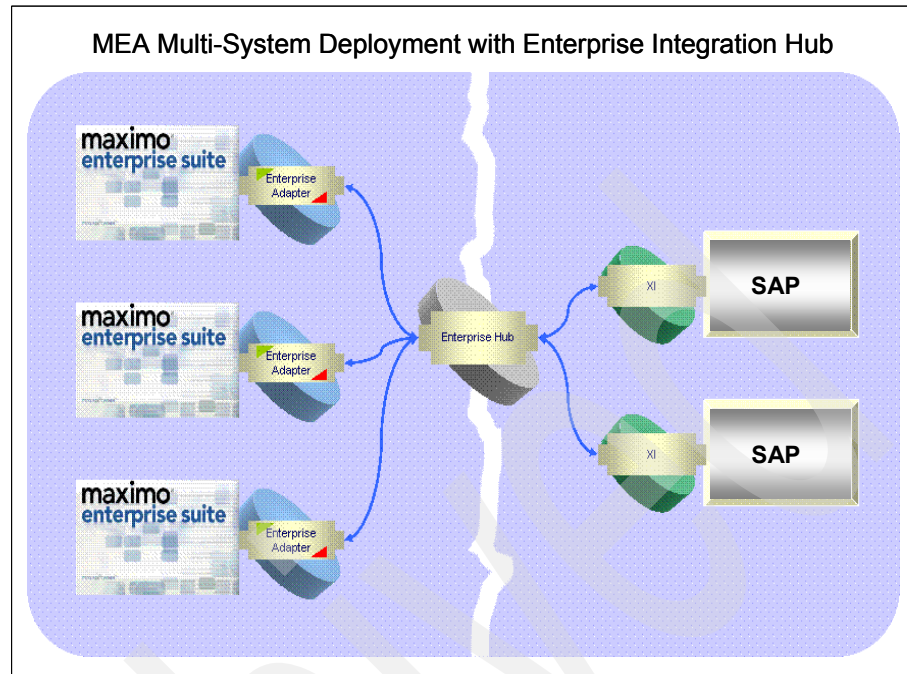
Figure 11-14   MEA Multi-System Deployment with Enterprise Integration Hub

11.11 Maximo Enterprise Adapter Summary

The Maximo Enterprise Adapter represents a cost efficient and seamless ERP linkage to help make e-Business easy, practical and affordable. To recap the benefits, the values include the following:

► Increase asset reliability

By automating the procurement processes and making it more efficient, order cycle times can be significantly reduced, get the right statistics and reports at the right time to ensure your critical assets are always up and running.

► Reduce inventory costs

By procuring items only when they're needed, an organization can buy less at a time and do it efficiently. By spreading the MRO costs out over time, one can reduce inventory carrying costs and preserve cash.

► Reduce purchasing process costs

By automating the procurement process, an organization can reduce or eliminate activities that add cost without adding value. No more frantic phone calls, re-faxing, order corrections, and returns.

► Improve supply chain management

Purchasing professionals can invest more time in higher value activities like long term contract management, because they're not spending it on paper processing and transaction follow-up. Electronic processes also provide purchasing managers with the ability to capture and analyze spend data and supplier performance information more quickly and less expensively than they could with manual processes. This valuable information helps improve the sourcing process and makes for more effective supplier negotiations.

Extending Asset Management for IT: Where we are headed

Tivoli's strength in Software Asset Management combined with MRO's Hardware Asset Management capabilities delivers a comprehensive Asset Management solution that covers end-to end platforms for both hardware and software. The IBM Tivoli Asset Management for IT (Maximo AM for IT) portfolio consists of the Tivoli License Compliance Manager for z/OS (TLCMz), which discovers mainframe inventory, software use and license use; Tivoli License Compliance Manager (TLCM), which discovers distributed inventory, software use and license use; and IBM Tivoli AM for IT, which provides contract management, procurement, license management and asset management life cycle tracking. The Tivoli Asset Compliance Center (TACC) is the user interface bundled with TLCMz to provide mainframe inventory, software use, and license compliance, as well as to integrate TLCM distributed data for an end-to end enterprise view. The combination of the extended IBM Tivoli Asset Management for IT product portfolio yields these benefits:

► Automatically identify mainframe and distributed license use activity to help manage and verify software license compliance

► Identify software inventory with no or low use to reduce unnecessary license fees

- Monitor software use and related growth to plan cost effectively for future capacity needs

- Help make funds available for key business services

- Receive notifications, scanned contract reviews and comparisons of key terms and conditions to prepare more effectively for contract negotiations

- Gain a centralized view of all IT contracts and details across your organization

- Conveniently store and manage IT contract details for hardware and software purchases, leases and maintenance agreements, within a central repository

- Help catch vendor invoice errors by comparing bills against negotiated prices, terms and conditions

- Manage the asset life cycle from procurement to retirement.

- Reduce penalties for unreturned leased assets

- Increase return on assets through efficient asset management

- Eliminate maverick purchasing through centralization

- Reduce software and hardware maintenance and support costs

- Provide a streamlined process for procurement and receiving of IT assets

- Reconcile actual assets with authorized assets (those purchased and under contract)

12.1 The road ahead

Tivoli Asset Management for IT customers will benefit from Tivoli's Software Asset Management through two phases. This will provide continuous improvement to the Tivoli AM for IT portfolio while allowing Tivoli customers to benefit from the Tivoli AM for IT capabilities.

The first goal of phase one is to provide seamless access to license information defined in TACC or TLCM to Tivoli AM for IT. License information can be associated to contracts. This will allow the contract manager to understand the licenses and associated costs that covered under a software or maintenance contract. In addition, the contract manager will be able to work with the Software Asset Manager, who uses the TACC or TLCM, to get license compliance and software use information. This will give the contract manager leverage during contract negotiations.

The second goal is provide the capability in TLCM to provide the hardware inventory information that is necessary for asset tracking in Tivoli AM for IT.

TLCM can then be used to provide both hardware and software inventory without the need to purchase Tivoli Configuration Manager, which is used for software configuration, software distribution and patch management.

Phase two also has two goals, to provide full integration between Tivoli AM for IT, TACC and TLCM and to seamlessly integrate asset management with the CCMDB used in IT Service Management. Once the TACC is integrated, the license compliance and inventory and software use management function will be offered as the Maximo Asset Compliance product under the Tivoli AM for IT portfolio. In addition the license management functions and reporting, currently in TLCM, such as license distribution will be integrated into the Tivoli License Optimization Manager. At this milestone, Tivoli AM for IT will gain the ability to have full license management, license compliance and inventory and software use management. TLCMz and TLCM will continue to be important discovery products that provide inventory, software use and license use information to the Tivoli License Optimization Manager.

Asset management will seamlessly integrate with ISM through the CCMDB. This gives Asset Management and ISM process managers access to critical data in each other's domains. For example, users of the ISM Change and Release Management processes will be able to check license entitlements before approving a change request to roll-out a new version of software. Users of the ISM Configuration Management process will be able to identify hardware and software that is discovered by TLCMz and TLCM. Capacity Planners can use the ISM Capacity Management process to utilize software usage information when determining future configurations. Users of the ISM Financial Management process will use asset costs for use with chargeback and resource cost allocation processes. In turn, Asset Managers will utilize the ISM Change Management process for processing IMAC requests throughout the asset life cycle.

The following are the high-level features and benefits that both MRO and Tivoli customers will realize throughout Phase One and Phase Two of the MRO/Tivoli Asset Management integration.

Phase One

Feature	Benefit
Seamlessly pass license information from TACC to Tivoli AM for IT and associate to contracts.	Manage license costs.
Software contract form.	A comprehensive software contract form is provided as a template.
Import distributed hardware inventory information into Tivoli AM for IT from TLCM.	For asset management only solutions, TLCM can provide both hardware and software inventory.
Import zSeries hardware inventory into Tivoli AM for IT.	Hardware asset management also covers mainframes for an end-to end platform solution.
Track Asset costs using purchasing and inventory applications in Tivoli AM for IT.	Identify cost avoidance through automated usage and acquisition processes.
Track and manage assets through a full life cycle in Maximo.	Maintain asset integrity through reconciliations.
Enhanced Software Asset Management solution with contract management and notifications in Maximo and license management and license compliance in Asset Compliance Center.	Track software costs, verify license compliance and facilitate future contract negotiations.
Provides flexibility through business process configuration and monitoring, application designer and custom reports in Maximo.	Adaptable to a dynamic business Environment.

Phase Two

Feature	Benefit
Provides full License Management and Compliance for all aspects of Software Models in Maximo.	Track software costs, verify license compliance and facilitate future contract negotiations in a single application across the enterprise.
Integrates IT AM with ITSM Process Managers (Change Management, Release Management).	Improved accuracy of deployed assets from multiple sources.
Provides End to End Enterprise Asset solution encompassing full procurement, compliance, contracts, financial and ITSM capabilities.	Improved efficiency and adherence to compliance policies through ITSM and IT AM integration.

Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this book.

IBM Redbooks

For information about ordering these publications, see "How to get IBM Redbooks" on page 248. Note that some of the documents referenced here may be available in softcopy only.

- ► *Problem Determination for WebSphere for z/OS*, SG24-6880
- ► *Implementation Best Practices for IBM Tivoli License Manager*, SG24-7222

Other publications

These publications are also relevant as further information sources:

- ► *IBM Tivoli License Compliance Manager for z/OS OS Administration Guide for Mainframe Components,* SC32-1575

Online resources

These Web sites are also relevant as further information sources:

- ► National Institute of Standards and Technology Web site

  http://csrc.nist.gov/publications/fips/

- ► IBM IT Service Management

  http://www.ibm.com/software/tivoli/features/it-serv-mgmt/index.html

- ► IBM Information Center - IBM Product documentation

  http://www.ibm.com/support/publications/us/library/

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IBM Tivoli Asset Management for IT Portfolio Overview

IBM Tivoli
Asset Management for IT
Portfolio Overview

IBM ®

Redbooks

Understand IT Asset Management basics

Position the portfolio of products

Learn from management scenarios

This IBM Redbooks publication provides an overview of the IBM Tivoli Asset Management for IT portfolio. The portfolio is made up of the three primary products, IBM Tivoli Asset Management for IT, IBM Tivoli License Compliance Manager for z/OS, and IBM Tivoli License Compliance Manager.

By using these products together, you can implement a comprehensive IT asset management solution. This book provides a functional overview of each of the products in the portfolio and also provides example scenarios of how they can be used to address IT asset management disciplines.

The IBM Tivoli Asset Management for IT product is a relatively new acquisition. It has its roots in enterprise asset management and has very rich function. This product will be enhanced and adapted to provide functions specific to IT asset management, such as facilities to handle contract management, full asset life-cycle management, integration with Enterprise Resource Planning (ERP) solutions and much more.

This book introduces the portfolio and describes its current capabilities. Our intention for the future is to provide additional materials for a deeper understanding of best practices for using the portfolio to implement a complete IT asset management solution.