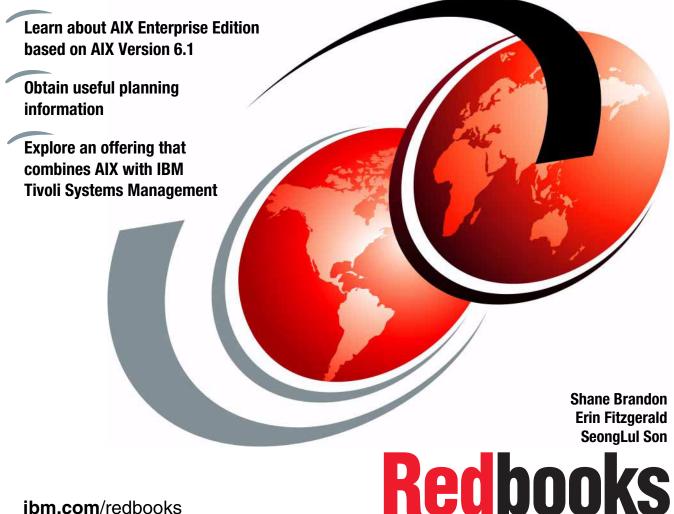


IBM AIX Enterprise Edition System Administration Guide



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International Technical Support Organization

IBM AIX Enterprise Edition System Administration Guide

May 2009

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

First Edition (May 2009)

This edition applies to IBM AIX Enterprise Edition 6.1 (product number 5765-AEZ).

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Preface

This IBM® Redbooks® publication will help you install, tailor, and configure AIX® Enterprise Edition 6.1 (5765-AEZ) and its incorporated IBM Tivoli® systems management tools.

This publication provides AIX Systems Administrators a broad understanding of the new features and products that make up the AIX Enterprise Edition offering. It will help you design or create a solution to maximize efficiencies and help organizations get the most from their Power Systems[™] platform.

AIX Enterprise Edition includes all the features of AIX with additional management software that is designed to complement the features of AIX V6.1. AIX Enterprise Edition is available only with AIX V6.1. AIX Enterprise Edition is designed to improve the manageability of a virtualized AIX environment. Potential benefits include:

- Improved service availability through access to relevant, real-time information about IT resources
- Enhanced operational efficiency through visualization of the relationships of IT resources and applications
- Improved operational efficiency by centralizing monitoring and automating the response to service issues
- Better utilization of IT resources through consolidated views of virtualized resource usage
- ► Improved service availability through Live Application Mobility
- Simplified ordering of AIX and essential service management tools at an attractive price

The team that wrote this book

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1

Introduction and overview

In this chapter, we introduce AIX Enterprise Edition. We provide an overview of the individual components that make up the AIX Enterprise Edition offering and list their key features.

We describe the management functions and discuss the benefits of implementing AIX Enterprise Edition on your IBM Power Systems servers:

- ▶ 1.1, "AIX Enterprise Edition" on page 2
- ▶ 1.2, "Comparing AIX offerings" on page 2
- ▶ 1.3, "IBM Service Management (ISM)" on page 3
- ► 1.4, "Components" on page 4
- ▶ 1.5, "Integration of the components" on page 6
- ▶ 1.6, "Advantages" on page 7
- ► 1.7, "Hardware prerequisites" on page 7
- ▶ 1.8, "Lab overview" on page 8

1.1 AIX Enterprise Edition

AIX Enterprise Edition is designed and packaged to enable administrators and organizations to simplify the managing and monitoring of their virtualized Power Systems-based environments. The AIX Enterprise Edition offering incorporates a suite of service management and monitoring tools designed to improve availability, enhance the operational efficiency of the systems within the environment, and to track, measure, and report on resource utilization and usage.

The AIX Enterprise Edition offering allows organizations to maximize all of the capabilities of virtualization, security, and performance of AIX 6.1, combined with the enterprise service management features of tools, such as Workload Partition Manager, IBM Tivoli Application Dependency Discovery Manager (TADDM), IBM Tivoli Monitoring, IBM Tivoli Usage and Accounting Manager, and DB2® Enterprise Server Edition (DB2 ESE), that allow the systems administrators to manage the environment in a more holistic way.

Note: AIX Enterprise Edition is exclusive to the AIX Version 6.1 operating system. Management Edition (ME) for AIX provides a similar suite of service management tools for managing and monitoring Power Systems running the AIX Version 5.3 or AIX Version 6.1 operating system.

1.2 Comparing AIX offerings

Table 1-1 on page 3 outlines and identifies the differences among several offerings for use with AIX on the Power Systems platform. It describes what is included with each offering and the functions of the tools and products associated with them.

Table 1-1 AIX offerings and tools

Offering	Description	OS support	OS included
AIX Enterprise Edition (EE)	AIX 6 including the Workload Partition Manager, Tivoli Monitoring, Tivoli Application Dependency Discovery Manager, and Tivoli Usage and Accounting Manager Virtualization Edition	AIX 6.1	Yes
Management Edition (ME) for AIX	Tivoli Monitoring, Tivoli Application Dependency Discovery Manager, and Tivoli Usage and Accounting Manager Virtualization Edition	AIX 6.1 and AIX 5.3	No
AIX Standard Edition	The AIX operating system	AIX 6.1, AIX 5.3, and AIX 5.2	Yes
Performance Management for Power Systems	Remote performance reporting	AIX 6.1, AIX 5.3, and IBM i	No
PowerVM [™] Workload Partitions Manager [™] for AIX (Workload Partition Manager)	Cross-systems management for Workload Partitions and enablement for Live Application Mobility	AIX 6.1	No
IBM Systems Director	Cross-system platform management	AIX, Linux (Linux on system z, p, and x), IBM i, and Windows®	No

1.3 IBM Service Management (ISM)

Today, companies focus on providing innovative services. To deliver these services, IT and operations departments must strive to guarantee compliance, security, and continuous uptime, which all play a part in helping to ensure these business services are effectively performed to support the organization's business goals. Yet, it is common for companies with organizational silos and traditional implementations to become entrenched in managing individual areas, such as IT infrastructure technologies, single product revenues and expenses, individual processes, and organizational efficiencies, instead of managing integrated solutions and services delivered by the sum of all these components. When these areas are isolated, there can be penalties for noncompliance and service level violations.

Enter IBM Service Management, a way to align your organization and all its related functions with your business. IBM Service Management encompasses the management processes, tactics, and best practices needed to deliver business services. IBM Service Management is about developing, deploying, and managing services, helping to reduce IT and operations costs by automating processes, and helping to more effectively manage compliance. It is about increasing flexibility and getting products, solutions, and services to market more quickly. It is about helping to respond to changes more efficiently and effectively than ever before.

IBM Service Management is designed with one thing in mind: to help you manage your business. Because IBM understands that IT and operations are very much a part of your business, we offer powerful tools to help you align the four primary components of your business:

- ► People
- Processes
- Information
- Technology

IBM Service Management lets you pull these critical components together with an array of tightly integrated solutions that can be viewed as three interconnected layers:

- IBM Process Management
- ► IBM Operational Management
- IBM Service Management Platform

1.4 Components

The AIX Enterprise Edition offering consists of a number of individual tools that combine to give an overall package designed to meet all the management and monitoring needs of the Power systems servers within the environment.

The AIX Enterprise Edition package bundle consists of:

- AIX Version 6.1
- PowerVM Workload Partitions Manager for AIX (WPAR Manager)
- IBM Tivoli Monitoring
- IBM Tivoli Application Dependency Discovery Manager (TADDM)

- IBM Tivoli Usage Accounting Manager Virtualization Edition for Power Systems
- ► An embedded version of DB2 Enterprise Server Edition (ESE)

Note that this component is only offered for use with the Tivoli components

PowerVM Workload Partition Manager for AIX

Workload Partition (WPAR) Manager provides a single centralized point of control for the management of Workload Partitions in AIX 6.1. Workload Partition Manager enables Live Application Mobility, which allows for the relocation of Workload Partitions from one host to another host without disruption to the applications running in the Workload Partition.

Workload Partition Manager can be used to manage automated relocation policies for moving Workload Partitions between systems based on specified metrics, such as system load. Workload Partition manager is a browser-based interface that provides the ability for an administrator to create, clone, and remove Workload Partition definitions, or start and stop Workload Partitions from an easy to use management interface. It also contains application programming interfaces (APIs) that allow IBM Tivoli Monitoring to capture data. For further technical information about IBM PowerVM Workload Portion Manager for AIX refer to:

http://www.redbooks.ibm.com/abstracts/sg247656.html?Open

IBM Tivoli Monitoring

IBM Tivoli Monitoring for AIX is designed to monitor the health and performance of Power systems servers while having the ability to capture and analyze data. IBM Tivoli Monitoring for AIX allows a system administrator to determine trending and forecast future usage to aid capacity planning and to assist in the overall manageability of the environment.

IBM Tivoli Monitoring for AIX includes best practice solutions created by developers, which include predetermined thresholds for alerting on key metrics. The Tivoli Enterprise Portal allows an administrator a comprehensive graphical view of the state of the AIX operating system, logical partitions (LPARs), Workload Partitions, server hardware, Hardware Management Console (HMC), and Virtual I/O Server resources.

You can obtain additional product information at:

http://www.ibm.com/software/tivoli/products/monitor

IBM Tivoli Application Dependency Discovery Manager

IBM Tivoli Application Dependency Discovery Manager (TADDM) uncovers application dependencies and configurations in your enterprise environment. TADDM uses the application mapping and agent-less, credential-free discovery capabilities of application dependency software to see relationships among applications, computer systems, and network devices in your environment.

TADDM discovers configurations and maps applications, changes, and address compliance measures. It can capture the configuration of each dependency, track changes to it, and provide information for analysis in order to report the history of configuration changes so that an administrator can see how configuration items have been configured and how they change over time.

TADDM compares the discovered configurations to a *reference* policy, can reveal policy violations, and determine if configurations comply with your policies. You can obtain detailed information about the IBM Tivoli Application Dependency Discovery Manager at:

http://www.redbooks.ibm.com/abstracts/sg247616.html?Open

IBM Tivoli Usage and Accounting Manager

IBM Tivoli Usage and Accounting Manager, Virtualization Edition delivers to the organization the ability to accurately track and report on usage across the Power Systems AIX environment. This product can determining resource consumption and utilization for business units, departments, or individuals in order to assist organizations in managing their assets and costs and to highlight where efficiencies can be made.

You can obtain further information at:

http://www.ibm.com/software/tivoli/products/usage-accounting

1.5 Integration of the components

AIX Enterprise Edition provides integration among the tools, such as IBM Tivoli Monitoring and IBM Tivoli Application Dependency Discovery Manager, to provide a foundation for service management across the Power Systems within your environment.

These tools are designed to deliver a set of capabilities that will assist you in getting the most from your AIX virtualized environment. AIX Enterprise Edition is designed to complement the platform management capabilities of the IBM Systems Director.

1.6 Advantages

The enterprise service management tools that make up the AIX Enterprise Edition offering have been designed make the manageability of AIX virtualized environments more efficient and to allow organizations to maximize the performance and utilization of their Power Systems environments.

The AIX Enterprise Edition provides visualization of system resources and application utilization and their behavior either in a historical view or in real time. It provides for a single central interface for monitoring and automation of all aspects of the environment and the ability to manipulate systems within the environment as well as to monitor the usage and accounting from all AIX hosts in the environment.

Live Application Mobility and the centralization function of the Workload Partition Manager provide for a single point of control in the environment for managing Workload Partitions (WPARs). Workload Partition Manager for AIX provides for improved system utilization and application performance by enabling more efficient load balancing throughout the operating system and enterprise environment. It improves application availability by giving the systems administrator the flexibility to seamlessly relocate workloads from one host to another host without disruption to the application, thus, increasing availability by reducing the need for planned outages due to system maintenance.

1.7 Hardware prerequisites

AIX Enterprise Edition has no prerequisites beyond the prerequisites of AIX Version 6.1 and can, therefore, be utilized on any hardware platform that supports the AIX 6 Operating System, including:

- ► IBM pSeries POWER4[™] technology-based servers
- ► IBM System p POWER5[™] technology-based servers
- ► IBM Power Systems POWER6TM technology-based servers
- ► IBM BladeCenter® JS21 with PowerPC® 970 processors
- IBM BladeCenter JS22 with POWER6 processors

Note: For the latest supported servers, see:

http://www-03.ibm.com/systems/power/software/aix/sysmgmt/enterprise/
requirements.html

1.8 Lab overview

The ITSO infrastructure setup for this project, which is seen in Figure 1-1, consisted of:

- IBM System p 550 (9113-550)
- Two Power Systems 570s (9117-MMA)
- ► A Hardware Management Console
- IBM TotalStorage® DS4800 (1815-88A)

The System p 550 was configured as a Network Installation Management (NIM) server and provided a centralized management role for our environment. Each of the Power Systems 570 servers were configured with a Virtual I/O Server, four partitions (one for each of the Tivoli products), and a generic AIX partition that hosted several Workload Partitions for both application and system.

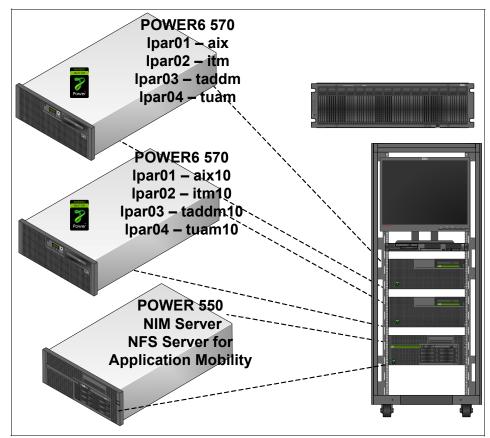


Figure 1-1 ITSO project infrastructure

2

Planning and sizing

In this chapter, we discuss the planning and sizing considerations for the installation and configuration of AIX 6.1 Enterprise Edition. We look at the requirements for planning the installation of each of the Tivoli tools included with Enterprise Edition, as well as Workload Partition Manager. We also provide a brief overview of logical partitioning (LPAR) and Workload Partition sizing:

- ► 2.1, "Planning and sizing virtualization" on page 10
- ► 2.2, "Planning and sizing logical partitions" on page 11
- ► 2.3, "Planning and sizing Workload Partition Manager" on page 11
- ► 2.4, "Planning and sizing DB2" on page 12
- ► 2.5, "Planning and sizing IBM Tivoli Monitoring V6.2" on page 14
- ▶ 2.6, "Planning and sizing TADDM" on page 18
- 2.7, "Planning and sizing IBM Tivoli Usage and Accounting Manager" on page 23

2.1 Planning and sizing virtualization

Virtualization enables the sharing or the aggregation of physical resources and the creation of logical resources that are used by AIX V6.1 Enterprise Edition. AIX V6.1 Enterprise Edition is not aware that it is using virtual resources or how these resources are implemented.

Note: Virtualization in this context can be used in two ways. One way is to divide a resource into smaller pieces, such as a powerful processor in several logical smaller processors. Another way is to combine smaller resources into a larger one, which is similar to joining several small disks in one large virtual disk. Also, virtualization can provide for uniform access to resources.

2.1.1 Virtualization advantages

Several advantages of virtualization are:

Improved hardware utilization

Server hardware resources can be more utilized, by being dynamically partitioned.

Hardware consolidation

Instead of having multiple small machines with lots of spare capacity, all the workload can be consolidated on a small number of machines, allowing you to experience a rapid return on investment (ROI).

Increased flexibility

Virtualization supports the pooling of resources that can be managed centrally through an enterprise hub to better support changing business requirements dynamically.

Enabled access through shared infastructure

Virtualization provides a resilient foundation and a shared infastructure that enable better access to infastructure and information in support of business applications and service-oriented architectures (SOA).

Rapid provisioning

Virtualization can enable rapid infastructure provisioning, down to the order of minutes, compared to the order of days in a non-virtualized environment.

Disaster recovery

Using the rapid provisioning features, additional instances of the application can be deployed quickly. An image copy of the instance can also be kept in order to speed up recovery.

Reduced power and cooling requirements

By virtualizing your resources, you can consolidate the load on fewer machines and reduce the overall power usage and cooling requirements.

2.2 Planning and sizing logical partitions

Each logical partition (LPAR) must have a set of resources available. Shared processor LPARs, also called *micro-partitions*, enable you to partition a processor into multiple virtual partitions and provide the flexibility to change the allocation of system resources dynamically.

With the launch of POWER6 processor-based servers, IBM added key features, such as the ability to migrate a running LPAR between systems (PowerVM Live Partition Mobility). The minimum LPAR resources that are needed are:

- At least 0.1 unit of processor for micro-partitions
- ► At least 256 MB of main memory
- ► At least one disk to store the operating system (for AIX, the rootvg)
- > At least one disk adapter or integrated adapter to access the disk
- At least one LAN adapter per partition to connect to the Hardware Management Console (HMC)
- A partition must have an installation method, such as Network Installation Management (NIM), and a means of running diagnostics, such as network diagnostics

2.3 Planning and sizing Workload Partition Manager

AIX workload partitions (WPARs) provide a software-based virtualization solution for creating and managing multiple AIX operating system environments within a single AIX-based logical partition. The WPAR provides isolation of software services, applications, and administration within a single instance of the AIX V6.1 operating system. WPARs can be used on any server platform that is capable of running AIX V6.1 Enterprise Edition, including POWER4 technology-based servers and beyond. When building a WPAR from the command line, you can configure and start it within a few minutes:

- Network File System (NFS) is a prerequisite to the WPAR mobility functionality.
- At least 256 MB of main memory is required.
- At least one disk to store the operating system (for AIX, the rootvg) is required.
- ► At least one disk adapter or integrated adapter to access the disk is required.
- ► At least one LAN adapter per partition to connect to the HMC is required.

2.3.1 Additional resources for virtualization

There are several additional IBM Redbooks publications about virtualization, as well as LPAR mobility. Several additional resources on these topics are:

- ► IBM PowerVM Live Partition Mobility, SG24-7460
- Multitenant Utility Computing on IBM Power Systems Running AIX, SG24-7681
- PowerVM Virtualization on IBM System p: Introduction and Configuration Fourth Edition, SG24-7940
- ► Workload Partition Management in IBM AIX Version 6.1, SG24-7656

2.4 Planning and sizing DB2

The two major considerations when planning the installation of DB2 Enterprise Server Edition are the space for the package images and then the space required for the database. In addition to the space requirements, you must create users for the database administration and instance. We discuss each of these items in this section.

Note that the DB2 Enterprise Server Edition as part of AIX Enterprise Edition is an embedded part of the Tivoli components and is not a separately licensed product.

2.4.1 DB2 installation requirements for DB2 server

You must meet the following operating system, hardware, and communications prerequisites to install a DB2 server product (Table 2-1 on page 13).

Table 2-1 Installation requirements for DB2 Server

AIX Version	Operating system	Hardware
6.1	64-bit AIX kernel xlC.rte 9.0.0.0 xlC.aix61.rte 9.0.0.0	All processors that are capable of running the supported AIX 6.1 operating system: Power 4 or above

2.4.2 DB2 file systems

Planning for installing DB2 includes considering the creation of additional file systems and, in certain cases, additional Volume Groups, depending on the environment on which you install DB2. The minimum DB2 installation requires:

▶ /opt/IBM/db2

Approximately 600 MB contains the DB2 source code installed on your system. This file system is static and does not grow after the initial installation.

/home/db2inst1

This name is the default name for the database instance home. It varies in size depending on database configuration and grows over time as data is added to the database.

Note: The name /home/db2inst1 can be any file system name. In many installations, the administrator chooses a name for the file system that is the same name as the application. Therefore, in our example, /home/db2inst1 is /tuam_data/ituamdb. We recommend that you create these file systems on a separate AIX Volume Group and not on the rootvg.

You need to consider other DB2 file systems, such as the DB transactional logs and the database backups. We recommend that these file systems are broken out into their own file system for better database performance when the database grows large. For more information about configuring and setting up DB2, refer to DB2 Deployment Guide, SG24-7653.

2.4.3 DB2 users and groups

Setting up user IDs and groups for DB2 is similar to setting up user IDs and groups for other applications in AIX. Table 2-2 on page 14 provides a list of the DB2 default user IDs and the groups that are created as part of the base installation of DB2.

Table 2-2 Default DB2 user IDs and groups

User ID	Group
dasusr1	dasadm1
db2fenc1	db2fgrp1
db2inst1	db2grp

These IDs can be used to create your database instance and install your Tivoli application, or you can create a custom DB2 user ID and group to help identify the instance with which the db2 user ID is associated. Example 2-1 shows how to create a DB2 user ID and group specifically for Tivoli Usage and Accounting Manager.

Example 2-1 Custom DB2 user ID

```
TUAM10:]mkgroup -A uamdbgrp
TUAM10:]mkuser -a "pgrp=uamdbgrp" ituamdb
TUAM10:]mkgroup -A uamdbadm
TUAM10:]mkuser -a "pgrp=uamdbadm" dbadmusr
TUAM10:]mkgroup -A uamfgrp
TUAM10:]mkuser -a "pgrp=uamfgrp" uamfusr
```

2.5 Planning and sizing IBM Tivoli Monitoring V6.2

In the following sections, we describe the hardware requirements for the IBM Tivoli Monitoring V6.2 infrastructure for distributed AIX systems. We describe the following components:

- Hub monitoring server
- Remote monitoring server
- Portal server
- Portal client
- ► Tivoli Data Warehouse
- Warehouse Proxy agent
- Summarization and Pruning agent

2.5.1 IBM Tivoli Monitoring processor considerations

For the best performance, we recommend that you use multiprocessor systems in the following scenarios:

- Running Tivoli Enterprise Portal client on a computer that is also running one of the server components.
- Monitoring the environment of 1000 or more monitored agents with multiple server components on the same computer. For example:
 - Portal server and hub monitoring server
 - Monitoring server (hub or remote) and Warehouse Proxy agent
 - Warehouse Proxy agent and Summarization and Pruning agent
- Running a small environment with all the server components (monitoring server, portal server, Warehouse Proxy agent, and Summarization and Pruning agent) on a single computer.
- For the Tivoli Data Warehouse database server. Except for a small installation, use a multiprocessor system for the Tivoli Data Warehouse database. If you install the Warehouse Proxy agent on the warehouse database server, consider using a two-way or four-way processor.
- If you install the Summarization and Pruning agent on the warehouse database server (with or without the Warehouse Proxy agent), consider using a four-way processor. For large environments where more CPU resources might be needed, we can run the Summarization and Pruning agent on a computer separate from the warehouse database server. In this case, ensure that a high-speed network connection exists (100 Mbps or faster) between the Summarization and Pruning agent and the database server.

2.5.2 IBM Tivoli Monitoring memory and disk sizing requirements

Table 2-3 on page 16 shows the estimated memory and disk storage requirements for IBM Tivoli Monitoring components on distributed systems.

Table 2-3 Memory and disk requirements

Component	Memory requireme	Disk storage requirements ^b	
	Small environment ^c	9-	
Hub Monitoring Server	70 MB	100 MB	650 MB ^e
Remote Monitoring Server	100 MB	300 MB	250 MB ^e
Portal Server	100 MB ^f	300 MB ^f	800 MB
Portal Client (Browser or Desktop)	150 MB	300 MB	150 MB
Tivoli Data Warehouse	2-4 GB depending on database configuration paramenters	2-8 GB depending on database configuration paramenters	Follow the <i>IBM Tivoli</i> <i>Monitoring Version</i> <i>6.2.0 Installation and</i> <i>Setup Guide</i> , GC32-9407 to estimate the database size. ⁹
Warehouse Proxy agent	50 MB	100 MB	150 MB
Summarization and Pruning agent	100 MB	300 MB	150 MB

a. The memory and disk sizings shown in this table are the amounts required for the individual component beyond the needs of the operating system and any concurrently running applications.b. The disk storage estimates apply to any size monitoring environment and are considered high estimates. The size of log files affects the amount of storage that is required.

c. A small environment is considered to be a monitoring environment with 500 to 1000 agents, with 100 to 200 monitored agents per remote monitoring server.

d. A large environment is considered to be a monitoring environment with 3000 or more monitored agents, with 500 to 1000 monitored agents per remote monitoring server.

e. The storage requirements for the hub and remote monitoring servers do not include storage for the agent depot, which can require an additional 1 GB or more.

f. The memory requirement for the portal server does not include database processes for the portal server database, which require up to 400 MB of additional memory, depending on configuration settings.

g. One of the factors to consider when planning the size of the database that you need is the amount and type of information that you will collect for agent history data collection. Refer to the "Planning Considerations for the Tivoli Data Warehouse" chapter in the *IBM Tivoli Monitoring Version 6.2.0 Installation and Setup Guide*, GC32-9407, to estimate database size.

2.5.3 IBM Tivoli Monitoring database estimation

The primary considerations when sizing the database are the amount and the type of data that will be collected and the type of historical data that will be retained. Each agent user's guide provides capacity planning information to help

a system administrator calculate the amount of disk space that is required of the data for each attribute group. This information can then be used to complete the following calculations that will determine how large the database needs to be:

- > Determine the number of detailed records per day for each attribute group
- Determine the storage footprint for each attribute group
- > Determine the amount of detailed data for the attribute group
- Calculate the amount of aggregate data for the attribute groups

Note: IBM Tivoli Monitoring is capable of recording large amounts of data if the recording interval is short, and if the scope of the recording is large. Validate your estimates with testing when your installation is complete.

The system administrator might prefer to use the planning speadsheet available in the IBM Tivoli Monitoring information center that is shown in Figure 2-1. Alternatively, you might prefer to use the Warehouse Load Projection tool that is available at the IBM Tivoli Open Process Automation Library at the following URL:

http://www.ibm.com/software/tivoli/opal

This tool does all the calculations for you and includes data for the monitoring agents.

		Data	from the User's	Guide			Attribute agent	Days of	Warehouse		Warehouse	Total warehouse
Attribute group	Number of agents	Record size - detailed	Record size- aggregated	Interval instances	Collection	Detailed records per day*	disk space (KB)*	detailed data kept	space - detailed (MB)*	Aggregate records	space - aggregated (MB)*	space for attribute group (MB)
group	ugents	ucturicu	uggregated	mstanoes	interval	per day	(no)	nept	(me)	Teooras	(mb)	group (ma)
Total warehouse data size												
(sum of all attribute group total warehouse space)												
	Total database size											
(Total warehouse data size * 1.5)												
*: Use the equations in Estimating the required size of your database for these values.						1						

Figure 2-1 Tivoli data warehouse database size estimation worksheet

2.5.4 IBM Tivoli Monitoring server protocols and values

You must consider which of the four possible communications protocols to use for your environment. The differences are distinguished in Table 2-4.

Protocol	Value	Definition
IP.UDP	IP.UDP port number. Default is 1918.	The port number for the monitoring server. The default is 1918.
SNA	Net name	The SNA network identifier for your location.
	Logical unit (LU) name	The LU name for the monitoring server. This LU name corresponds to the Local LU Alias in your SNA communications software.
	Log mode	The name of the LU6.2 LOGMODE. The default value is CANCTDCS.
IP.PIPE	IP.PIPE port number. Default is 1918.	The port number for the monitoring server. The default is 1918.
IP.SPIPE	IP.SPIPE port number. Default is 3660.	The port number for the monitoring server. The default is 3660.

Table 2-4 Tivoli Monitoring server protocols

2.5.5 IBM Tivoli Monitoring additional considerations

There are no additional software requirements beyond the elements packaged as part to the AIX Enterprise Edition offering, such as Java[™] and the XIc runtime environment that is also required to support the DB2 instance required by IBM Tivoli Monitoring.

A video card supporting 64 000 colors and 1024 x 768 resolution is required for the portal client.

2.6 Planning and sizing TADDM

In this section, we explain several terms related to TADDM and show an architecture of TADDM. In addition, we provide the planning and sizing considerations for hardware.

2.6.1 TADDM terminology and architecture

In TADDM, a *domain* is a logical subset of a company's infrastructure. It can be based on any convenient boundary criteria, such as geographical or departmental. Domains can delineate organizational (for example, IT operations or line of business (LOB) operations), functional (for example, finance IT domain or human resources IT domain), or geographical (for example, United States IT domain or Brazil IT domain) boundaries. There is typically one TADDM Server deployed per domain to discover domain applications and their supporting infrastructure, configurations, and dependencies.

The TADDM Server is also referred to as the *Domain Manager*. You might want to use one or multiple TADDM Servers (Domain Managers), depending on how many configuration items (CIs) exist in your environment. If you have a large environment with thousands of hardware, software, and other configuration items, one Domain Manager might not be enough, and you can expand to multiple Domain Managers.

You can have a view of all of the aggregated data at an *Enterprise Configuration Management Database (eCMDB) Domain Manager*. In an eCMDB environment, the participating Domain Managers perform the discoveries and supply data to the enterprise Domain Manager. The enterprise Domain Manager aggregates information from the Domain Servers. This behavior is configurable depending on the needs of an organization. Figure 2-2 on page 20 shows the relationship between Enterprise Domain Manager and Domain Manager.

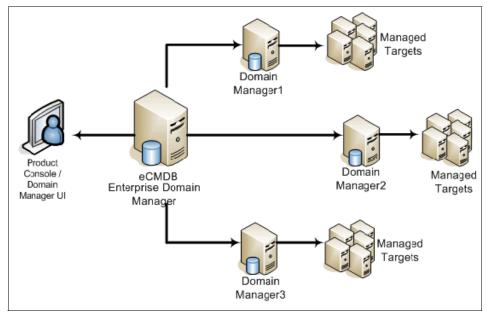


Figure 2-2 Multiple Domain Servers

Discovery *sensors* reside on the TADDM server and collect configuration attributes and dependencies. TADDM offers a wide variety of discovery sensors to enable immediate discovery of virtually all components that are found in the typical data center, across the application software, host, and network tiers.

Entities discovered by TADDM

TADDM discovers configurations and interdependencies across the following environment entities:

- Application components, such as Web servers, application servers, and databases
- System components, such as hosts, operating systems, load balancers, and database servers
- Network components, such as routers, switches, and firewalls
- Services, such as Domain Name System (DNS) and Lightweight Directory Access Protocol (LDAP) services

Table 2-5 on page 21 shows entities discovered by TADDM in detail.

Entity	Description
Network tier	 TADDM discovers the following devices at the network tier, along with the MIB2 (RFC 1213) parameter values for each device: Routers Switches Load balancers Firewalls Generic IP devices
System tier	 TADDM discovers the following devices at the system tier: Server hosts and disks Host IP interfaces Database servers Load balancers or clusters
Application tier	 TADDM discovers the following components at the application tier, along with version, configuration files and properties, host information, and vendor-specific extensions for each component (except the generic processes): Custom servers, based on custom templates that you design Java 2 Platform, Enterprise Edition (J2EETM) application servers and configurations J2EE and Java 2 Platform, Standard Edition (J2SETM) components and modules Web server components Web modules, configuration files, and installation directories Databases
Infrastructure service components	 The system infrastructure services that support the application environment are discovered along with the dependency structure between these service components and the application components. The infrastructure service components are: DNS and Network File System (NFS) services LDAP

Table 2-5 Entities discovered by TADDM

Entity	Description
Relationship structure	 In addition to the discovery of components, the physical and logical connectivity at the network, system, and application tiers is discovered at the following level of support in each of the tiers: Layer 3 IP connectivity Layer 2 connectivity Application component runtime dependencies Infrastructure service dependencies

Additional Required Software for TADDM

In order to install TADDM and to discover components at a later time, the following additional software is required:

- Database server is required for TADDM. You can use any existing databases or newly install the DB2 bundled in the IBM Management Edition (ME) for AIX.
- On a TADDM server:
 - Firefox if you plan to use Launchpad for installing ME for AIX
 - unzip
 - sudo
 - ssh
 - Isof
 - X filesets
- On target servers:
 - ssh
 - Isof

Note: You can install the ssh filesets from the Expansion Pack, while the unzip, sudo, and lsof files are in AIX Toolbox for Linux.

2.6.2 TADDM hardware sizing

This section describes the general sizing rules of TADDM and database.

TADDM server

The TADDM server must have the following attributes:

- ► 100 GB of available disk space
- ► 2 4 CPUs with a minimum process speed of 2 GHz
- ► 4 8 GB of memory
- ► 4 8 GB of swap space

Note: The size of a server that is shown in this section handle up to hundreds or thousands of target servers, depending on how many CIs each target server has. However, if you do not have many target servers, a small amount of CPU and memory might be suitable in your environment. For example, we have the TADDM server and database installed on the same server with 1 CPU (4.2 Ghz) and 6 GB of memory in our test environment.

It is difficult to provide a standard number of CIs in a server. The actual number of CIs in a server varies depending on the complexity of the infrastructure; for example, a complex database server with a large number of instances, databases, and table spaces has a larger number of CIs per server, and the number of CIs affects the overall performance. For further information about sizing TADDM, refer to the following publication: *Deployment Guide Series: IBM Tivoli Application Dependency Discovery Manager V7.1*, SG24-7616.

TADDM database sizing considerations

To calculate a database size, use this general rule: 2 MB per target host. For example, the following numbers of hosts work out to the following database sizes:

5000 hosts	10 GB
10 000 hosts	20 GB

An actual large-scale implementation had the following numbers. Having been running weekly discoveries of about 2500 hosts and network devices for 14 months uses about 7 GB of space. The reason that the planning information cannot be better qualified is that the determining factor, besides the number of hosts and devices, is the number of components that are discovered in the environment and the rate of change. Both of these factors can vary tremendously from one environment to another environment. In addition, the size of an individual component varies as well, for example, how many EJBs are deployed in a WebSphere® Application Server, or how many tables exist in a database? Using Custom Server Templates and Computer System Templates to collect and track files can also greatly influence the capacity requirements of the CMDB.

2.7 Planning and sizing IBM Tivoli Usage and Accounting Manager

IT departments are faced with unparalleled pressures to operate as businesses and align IT costs with company priorities, which is difficult to accomplish, especially when those resources are shared in your infastructure. With Tivoli Usage and Accounting Manager, Virtualization Edition (VE), you can help solve this problem by collecting, tracking, and reporting this usage. Understanding the overall usage of the system gives you a better picture to more effectively utilize CPU and memory resources in a shared environment, which can help manage costs.

Note: IBM Tivoli Usage and Accounting Manager, Virtualization Edition (VE) as part of AIX Enterprise Edition or Management Edition for AIX is fully supported.

2.7.1 IBM Tivoli Usage and Accounting Manager architecture

Tivoli Usage and Accounting Manager is comprised of several major components: the administration application, the reporting component, and the processing component. All of these components connect to a data source to store and retrieve information. There are several possible configurations that you can use. You need to evaluate your requirements and resource availability to determine the best configuration for your environment.

IBM Tivoli Usage and Accounting Manager components

This section covers the components for Tivoli Usage and Accounting Manager:

Administration server

The administration server is based on the Integrated Solutions Console (ISC). ISC is an administration tool that runs inside an embedded WebSphere Application Server. The administration server component for Tivoli Usage and Accounting Manager, Virtualization Edition, is installed on the AIX V6.1 TUAM server box that will run DB2.

Processing server

The data processing server is typically run on the same machine as the administration server. However, there might be a requirement, such as load balancing, that precludes running the data processing server on the same machine as the administration server. The Tivoli Usage and Accounting Manager processing engine applies business rules to the data and stores information in a database. The component will also run on AIX V6.1 Enterprise Edition.

Reporting server

For Tivoli Usage and Accounting Manager, Virtualization Edition, the reporting is supported via Business Intelligence and Reporting Tools (BIRT). BIRT is a tool that runs in the Eclipse environment and can be installed on Windows, Linux, or AIX. BIRT needs to be downloaded from the

http://www.eclipse.org Web site and installed separately from IBM Tivoli Usage and Accounting Manager.

Database server

The data server stores the information that is produced by the processing engine. It does not have to run on the same system or platform as the processing engine. DB2 V9.1 is supported for Tivoli Usage and Accounting Manager and is included with the installation CDs. You can select to install DB2 at the time that you select to install IBM Tivoli Usage and Accounting Manager.

Figure 2-3 shows the Tivoli Usage and Accounting Manager Virtualization Edition layout. In the next sections, we describe the components of IBM Tivoli Usage and Accounting Manager and the database to help you plan for the installation in your environment.

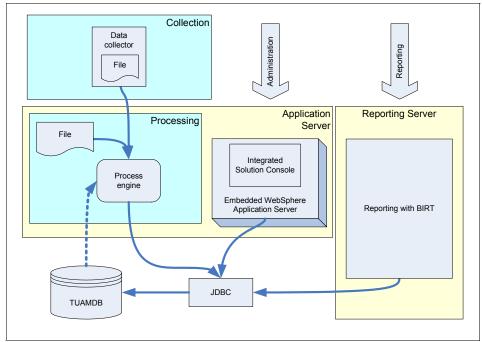


Figure 2-3 IBM Tivoli Usage and Accounting Manager architecture

2.7.2 IBM Tivoli Usage and Accounting Manager requirements

Table 2-6 on page 26 provides a list of the minimum IBM Tivoli Usage and Accounting Manager software requirements.

Operating system	AIX 5.3 or AIX 6.1		
Browser	Firefox 2		
Hard disk drive space	5 GB minimum, 40 GB recommended (available hard disk drive space) Note: This size varies by environment.		
Processor speed	3 GHz minimum		
Memory	2 GB minimum		
Core software	 If you use DB2 and the server is on another server than the database, you must install the DB2 client connection software on the TUAM server. 		
	► The Java Database Connectivity (JDBC [™]) drivers for DB2. The drivers are installed with DB2 and are db2jcc.jar and db2jcc_license_cu.jar.		
	 Red Hat® Package Manager (RPM) 		
	 Embedded WebSphere Application Server (installed during IBM Tivoli Usage and Accounting Manager installation) 		
	 Integrated Solutions Console (ISC) installed during the IBM Tivoli Usage and Accounting Manager installation 		
	 BIRT Report Engine and Report Designer available for download from http://www.eclipse.org for running data usage reports. 		

Table 2-6 Minimum software requirements for IBM Tivoli Usage and Accounting Manager

Table 2-7 provides a list of the core software installation files.

Table 2-7 Core requisite file

Required file	Contents
EmbeddedExpress_aix_ppc32.tar	Embedded WAS server (eWAS)
ISCA71_4_EWASv61.tar	Integrated Solutions Console (ISC)

2.7.3 Estimating IBM Tivoli Usage and Accounting Manager database size

In this section, we discuss estimating the Tivoli Usage and Accounting Manager database growth. Because it is a data and collection processing tool, it collects

and loads data into the database and keeps it for a certain period of time. Estimating its growth is critical to ensuring that the space is properly located and the resulting performance impact can be addressed (such as the time to back up the data, query response time, response needs, and so on.)

We start by checking our database size in the AIX file system directly after creation. The data size is roughly 350 MB, including the database catalog and the database log files.

Data elements

The primary growth in the database comes from the following usage and accounting data:

Resource utilization The collection of the resource usage metrics from the AcctCSR file. Collection is provided by an identifier for each resource (rate code). This collection is optional. You do not need to collect the resource usage. Billing summary This data provides a summary for each resource (rate code) by account code. This data links to the identifier table for to get the identifier key for each of the entries here. The data is one-to-one mapping for the BillDetail.txt file. Billing detail This data provides individual entries from the AcctCSR file. It gives the individual occurrences of source usage by resource name (rate code). This data links to the identifier table to get the identifier key for each of the entries here. The data is one-to-one mapping from the Ident.txt file. Identifier table This data lists the identifiers that are used by each billing detail entry. The data is one-to-one mapping from the Ident.txt file.

Important tips to keeping the database size manageable are:

- Run the DBpurge program using the Job runner to remove old data. Because Tivoli Usage and Accounting Manager data is an accounting financial tool, you might want to archive the data first.
- Sort by the Account_Code field before running the billing, or use a Common Source Resource (CSR) or Common Source Resource Plus (CSR+) file for billing input.
- Only collect the identifiers and resources in which you are interested. Modify the sample collection jobs, change the mapping, and remove any unwanted identifiers and resources fields.

IBM Tivoli Usage and Accounting Manager database growth factors

The growth factors for the database are:

Number of days	The retention of your data before you run the purge step to remove it.
Number of shifts	The number of shifts in a day that needs unique rate codes.
Collection source	Each collection is processed with various jobs. Each collection will generate a unique set of data.
Number of identifiers	Each identifier is put in a separate row in the CIMSDETAILIDENT table.
Identifier mix	This number is the number of unique identifiers in each collection. You must be able to estimate this number based on your understanding of the collection process.

Table 2-8 provides a list of how the database rows map to the database table.

Name	Row size	Affecting source
CIMSRESOURCE UTILIZATION	300	Source, Account_Code, Identifier mix, RateCode, Shift, and number of days
CIMSSUMMARY	300	Source, Account_Code, RateCode, Shift, and number of days
CIMSDATAIL	350	Source, Account_Code, Identifier mix, Rate per id, Shift, and number of days
CIMSDETAILIDENT	75	<ident mix=""> x <ident count=""></ident></ident>

Table 2-8 Table estimation and mapping

3

Installation and configuration

In this chapter, we provide information about installing and configuring each product that is included in AIX Enterprise Editions (EE):

- 3.1, "Launchpad" on page 30
- 3.2, "Installing and configuring DB2" on page 34
- 3.3, "Installing and configuring IBM Tivoli Monitoring V6.2" on page 50
- 3.4, "Installing and configuring TADDM" on page 97

3.5, "Installing and configuring IBM Tivoli Usage and Accounting Manager" on page 117

3.6, "Installing and configuring WPAR manager" on page 150

3.1 Launchpad

Launchpad is a program that helps you to install all the Tivoli products included in EE for AIX from a centralized GUI. EE for AIX consists of Launchpad, DB2, and three Tivoli products. The list of media shipped in the EE for AIX package is provided in Table 3-1.

Product	Media format	Approximate size
Launchpad V2.2	DVD	476 MB
DB2 ESE V9.1 Fix Pack 4	DVD	326 MB
IBM Tivoli Monitoring V6.2 Fix Pack 1 Tools	DVD	2.66 GB
IBM Tivoli Monitoring System p agents	CD	312 MB
TADDM V 7.1	DVD	4.17 GB
IUAM VE7.1	CD	555 MB

Table 3-1 The list of media that is included in EE for AIX

Installing Firefox

In order to use the Launchpad, you need to install a Web browser on AIX. We installed Firefox browser on our system. Example 3-1 on page 31 shows the steps for installing Firefox on AIX.

We downloaded the Firefox code from the following Web site:

http://www-03.ibm.com/systems/power/software/aix/browsers/index.html

The prerequisite files are also included in the downloaded filesets. Install those files first, and then install Firefox.

Note: When installing the Red Hat Package Manager (RPM) prerequisites for Firefox, if you get an error message about missing X11 libraries (libX11.a(shr.o) and so forth) that are already installed on your system, you need to run the following command:

/usr/sbin/updtvpkg

On AIX, the RPM package database creates a virtual package named AIX-rpm, which represents a snapshot of all of the installp files installed on the system. However, this virtual package can become out-of-date if you install additional installp software on the system after you have installed the rpm.rte fileset. The /usr/sbin/updtvpkg command will update the virtual package AIX-rpm to match the current state of the system.

Example 3-1 Installing Firefox on AIX

```
## Download and unzip Firefox.base.tar.gz
taddm10:/mnt/Firefox ] ls
Firefox
                                   gtk2-2.8.3-9.aix5.1.ppc.rpm
Firefox.base.tar.gz
                                   libjpeg-6b-6.aix5.1.ppc.rpm
Java5 64.sdk.tar.gz
                                   libpng-1.2.8-5.aix5.1.ppc.rpm
atk-1.10.3-2.aix5.1.ppc.rpm
                                   libtiff-3.6.1-4.aix5.1.ppc.rpm
cairo-1.0.2-6.aix5.1.ppc.rpm
                                   pango-1.10.0-2.aix5.1.ppc.rpm
expat-1.95.7-4.aix5.1.ppc.rpm
                                   xcursor-1.0.2-3.aix5.1.ppc.rpm
fontconfig-2.2.2-5.aix5.1.ppc.rpm xft-2.1.6-5.aix5.1.ppc.rpm
                                  xrender-0.8.4-7.aix5.1.ppc.rpm
freetype2-2.1.7-5.aix5.1.ppc.rpm
gettext-0.10.40-6.aix5.1.ppc.rpm
                                  zlib-1.2.3-3.aix5.1.ppc.rpm
glib2-2.8.1-3.aix5.1.ppc.rpm
taddm10:/mnt/Firefox ] rpm -ivh *.rpm
error: failed dependencies:
        libX11.a(shr4.o) is needed by cairo-1.0.2-6
        libX11.a(shr4.o) is needed by gtk2-2.8.3-9
        libXext.a(shr.o) is needed by gtk2-2.8.3-9
        libX11.a(shr4.o) is needed by pango-1.10.0-2
        libX11.a(shr4.o) is needed by xcursor-1.0.2-3
        libX11.a(shr4.o) is needed by xft-2.1.6-5
        libX11.a(shr4.o) is needed by xrender-0.8.4-7
taddm10:/mnt/Firefox ] ]s -] /usr/sbin/updtvpkg
-rwxr-x--- 1 root
                        system
                                        3880 Mar 2 17:11 /usr/sbin/updtvpkg
taddm10:/mnt/Firefox ] /usr/sbin/updtvpkg
Please wait...
taddm10:/mnt/Firefox ] rpm -ivh *.rpm
```

taddm10:/mnt/Firefox] smitty installp

Install Software

Type or select values in entry fields. Press Enter AFTER making all desired changes.

[TOP]			[Ent	ry Fields]	
* INPUT device / d	irectory for softwar	re			
* SOFTWARE to inst	all		[Firefo	x.base	> +
PREVIEW only? (i	nstall operation wi	ll NOT occur)	no		+
COMMIT software	updates?		yes		+
SAVE replaced fi	les?		no		+
AUTOMATICALLY in	stall requisite sof	tware?	yes		+
EXTEND file syst	ems if space needed	?	yes		+
OVERWRITE same o	r newer versions?		no		+
VERIFY install and check file sizes?			no		+
Include corresponding LANGUAGE filesets?			yes		+
DETAILED output?			no		+
Process multiple volumes?			yes		+
ACCEPT new license agreements?			yes		+
[MORE8]					
F1=Help	F2=Refresh	F3=Cancel		F4=List	
F5=Reset	F6=Command	F7=Edit		F8=Image	
F9=Shell	F10=Exit	Enter=Do			

If you have successfully completed the installation of the Web browser, put the Launchpad media into the media drive and run **launchpad.sh**. Remember that you need to have a graphical user environment to invoke the Launchpad with the Web browser.

Running the **launchpad.sh** file prompts you to accept the license agreement as shown in Figure 3-1. Read the license agreement for ME for AIX (the same panel will be displayed for the EE installation), and click **Accept**.

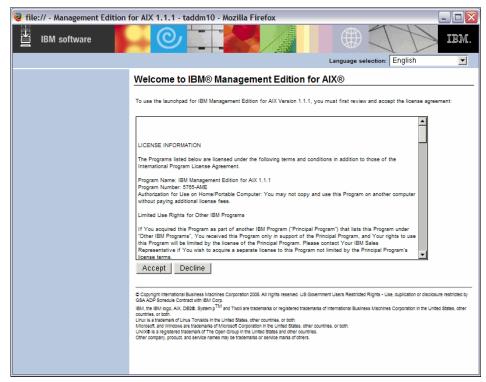


Figure 3-1 License agreement for ME for AIX

Figure 3-2 shows the main page of the Launchpad where you can install all the products in ME for AIX. Browse each menu in the left pane for future installation.

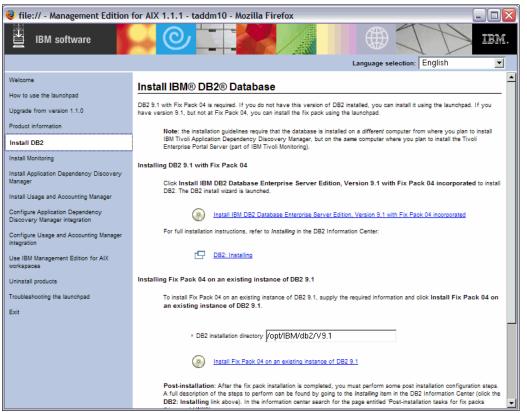


Figure 3-2 The main page of the Launchpad

3.2 Installing and configuring DB2

For our implementation, we chose to use DB2 for the database. In this section, we describe how to install DB2 using the Launchpad. Before installing DB2, we created separate file systems for the DB2 source code and the database instance home on a non-root volume group as shown in Example 3-2 on page 35:

/opt/IBM/db2 Approximately 600 MB contains the DB2 source code installed on your system. This file system is static and does not grow after the initial installation.

/home/db2inst1 This name is the default name for the database instance home. It varies in size depending on the database configuration, and it grows over time as data is added to the database.

Example 3-2 shows the installation and configuration of DB2 for the TADDM server that is used in this publication. You can select other naming conventions that are appropriate for your environment.

taddm10:/] lspv hdisk0 00c1f170aa7f638b rootvg active hdisk1 00c1f170b4c335e3 active appvg taddm10:/] lsvg -l appvg appvg: PPs TYPE I Ps PVs LV STATE LV NAME MOUNT POINT jfs2log 1 1 loglv00 1 closed/syncd N/A 128 fs1v00 jfs2 128 1 closed/syncd /home/db2inst1 128 128 fslv02 jfs2 1 closed/syncd /opt/IBM/db2 taddm10:/] mount /home/db2inst1 taddm10:/] mount /opt/IBM/db2

Example 3-2 File systems created for DB2

Install DB2 Enterprise Server

To simplify the installation process, we decided to use the Launchpad that is part of ME for AIX to install DB2. Launchpad is software that helps you install all the products in ME for AIX through the Web GUI interface.

We obtained the Launchpad and DB2 media and copied the install images into our Network File System (NFS) server. From the NFS server, we then exported the file systems and then mounted those file systems containing the install images on our AIX host, taddm10. We used the following directories for the NFS mount points:

/mnt/launchpad	For the Launchpad media
/mnt/db2	For the DB2 media

To install DB2 Enterprise Server:

- 1. Log on to the taddm10 server as root and change the directory to where the Launchpad is located, which is /mnt/launchpad.
- 2. Run the **launchpad.sh** command to display the Management Edition (ME) for AIX Launchpad panel, which is shown in Figure 3-3 on page 36.
- 3. Read the license agreement for ME for AIX and click Accept.

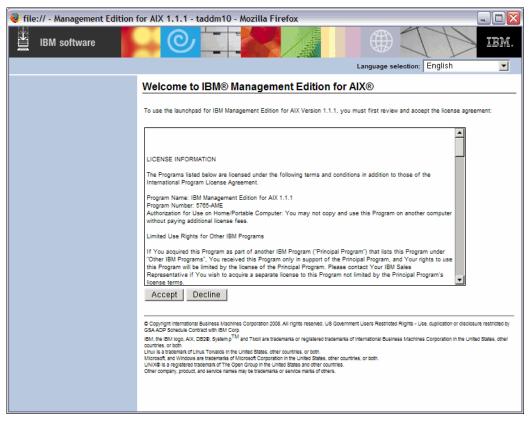


Figure 3-3 License agreement for ME for AIX

The next window (Figure 3-4 on page 37) shows the main page of Launchpad where you can install all the products in ME for AIX.

4. Select Install DB2 from the left pane.

There are two options that you can choose: you can either install DB2 with the fix pack or you can just apply the fix pack on an existing instance.

5. Select Install IBM DB2 Database Enterprise Server Edition, Version 9.1 with Fix Pack 04 incorporated as shown in Figure 3-4.

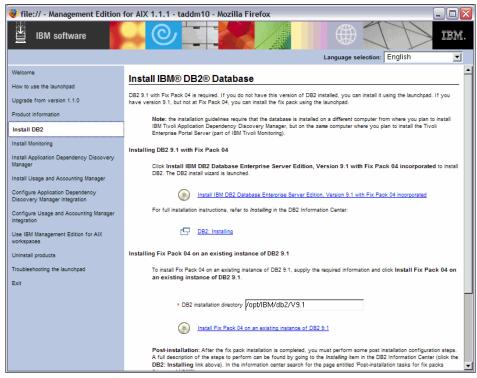


Figure 3-4 Installing DB2 through Launchpad

6. In the next window, provide the installation setup directory path where the DB2 installation image resides as shown in Figure 3-5. Click **OK**.

😻 file:// - Select DB2 setup directory	Mozilla Firefox 🛛 🛛 🔀
Select the IBM DB2 Database installation setup dire	ctory or CD.
/mnt/db2	
OK Cancel Browse	

Figure 3-5 Selecting DB2 setup directory

7. Click **Install New** to install DB2 as shown in Figure 3-6. We need to have at least 120 MB of free space for the /tmp file system.

🔀 IBM DB2 Setup Launch	pad 📃 🗌 🔤 🛛
	DB2. Information Management Software Version 9.1 Fix Pack 4
DB2 Setup Launchpad Installation Prerequisites Release Notes Migration Information Install a Product Exit	Install a Product Click Install New to launch the DB2 Setup wizard for the desired product. DB2 Enterprise Server Edition DB2 Enterprise Server Edition is designed to meet the data server needs of mid- to large-size businesses. It can be deployed on Linux, UNIX, or Windows servers of any size, from one CPU to any number of CPUs. DB2 Enterprise Server Editions, such as large data warehouses of multiple terabyte size or high performing 24x7 available high volume transaction processing business solutions, or Web-based solutions. DB2 Enterprise Server Edition incorporates a native XML data store and delivers flexible access to XML data using XQuery, XPath, SQL, and standard reporting tools. Optional features for DB2 Enterprise Server Edition are available that provide additional advanced product capabilities in areas such as database partitioning, performance, security, data federation, and database administration. Please see http://www.ibm.com/db2 for more information. Install New DB2 Client DB2 Client is a collection of graphical and nongraphical tools and components for administring DB2 products and developing applications with DB2 products. Add-ins for Eclipse and Microsoft Visual Studio 2005 development environments are also included. DB2 Client is a component of DB2 Server. DB2 Express. DB2 Connect Server, and DB2
4	A A A A A A A A A A A A A A A A A A A

Figure 3-6 Installing a product panel

8. The next window shows the Welcome to the DB2 Setup wizard panel, which is shown in Figure 3-7.

The DB2 Setup wizard leads you through the installation process. Notice the list of 14 installation steps on the left side of the wizard panel. As the setup wizard leads you through the installation of DB2, this list reminds you where you are in the installation process.

9. Click Next.

🗙 DB2 Setup wizard - DB2 Enterprise Server Edition	
Introduction 2. Software License Agreement 2. Instellation type 4. Instellation action 5. Instellation action 6. Dx30 user 7. Instellatesetup 8. Partitioning options 9. Instellation setup 10. Fanced user 11. Tools cetalog 12. Notification setup 13. Context 14. Summary	
Next Finish Can	Help

Figure 3-7 Welcome to the DB2 Setup wizard

The next window is the Software License Agreement panel. Read through the licensing agreement.

10. If you agree with the terms, click **Accept** and then click **Next** as shown in Figure 3-8.



Figure 3-8 Software License Agreement

11. The next window shows the Select the installation type panel, which is shown in Figure 3-9. Select **Typical: 490 - 590 MB** and then click **Next**.

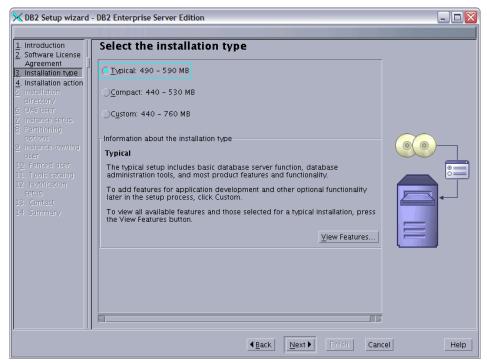


Figure 3-9 Selecting the installation type

In the next window, you have an option to choose whether to create a response file with the same configuration for future installation, which is shown in Figure 3-10.

12.Select Install DB2 Enterprise Server Edition on this computer and click Next.

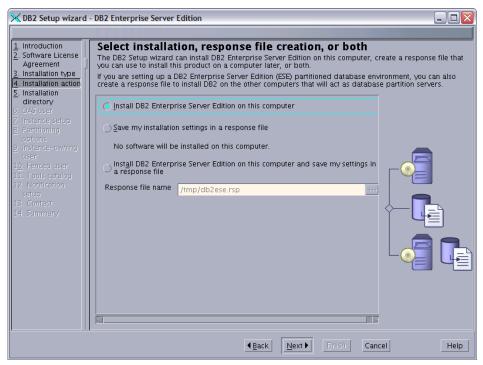


Figure 3-10 Selecting install, response file creation, or both panel

In the next window, you select the installation directory. Provide a directory where you want to put the DB2 files.

13.For a basic install, select the default and click **Next**, which is shown in Figure 3-11.

🔀 DB2 Setup wizard -	DB2 Enterprise Server Edition	_ 🗆 🛛
Introduction Software License Agreement Installation type Installation action Sinstallation action Sinstallation action Software OAS user Instance setup Partitioning options Instance-owning user I. Fenced user I. Tools carelog I2. Nonfincetion setup I3. Contact I4. Summary	Select the installation directory The DB2 Setup wizard installs DB2 Enterprise Server Edition in the following directory. To directory, type the path or click the ellipsis button and select another directory. Directory /opt/IBM/db2/V9.1 Space required: 489 MB Space available: 7884 MB	o select a different
	▲Back Next Emish Cancel	Help

Figure 3-11 Select the installation directory

14.On the next window, enter the information for the DB2 Administration Server (DAS) user information.

We accepted the default values and entered a password for the user, which is shown in Figure 3-12.

15.Click Next.

🔀 DB2 Setup wizard	- DB2 Enterprise Server	Edition		_ 🗆 🛛	
1. Introduction 2. Software License Agreement 3. Installation type 4. Installation action	A user with a minimal set of privileges is required to run the DAS. Specify the required user information for the DAS.				
5. Installation	💿 Ne <u>w</u> user				
directory 6. DAS user	User name	dasusr1			
7. Instance setup 8. Partitioning	UID		√ <u>U</u> se default UID		
options 9. Instance-owning	Group name	dasadm1			
user 1 <u>0</u> . Fenced user	GID		√ Use default <u>G</u> ID		
11. Tools catalog 12. Notification	Password	*****			
setup	Confirm password	*******			
13. Contact 14. Summary	Home directory	/home/dasusr1 ····			
	○ <u>E</u> xisting user				
	User name				
		▲Back Next	Einish Can	cel Help	

Figure 3-12 Set user information for the DB2 Administration Server

The next window lets you create a DB2 instance. In DB2, an *instance* is an independent environment where database objects can be created and applications can be run against them.

16.We will create the DB2 instance later; therefore, select **Do not create a DB2 instance** as shown in Figure 3-13.

17.Click Next.

Important: If you operate in an environment that requires a consistent user ID/group ID (UID/GID) for applications, database users, and groups, you need to manually assign and manage these UIDs/GIDs to ensure consistency between hosts in your environment. Installing via the GUI, by default, will allocate the next available ID, which might not be the most appropriate in all environments. In addition, in case you set up an expiration policy for a password, set up database users so that they cannot be expired.

🔀 DB2 Setup wizard -	DB2 Enterprise Server Edition
Introduction Software License Installation type Installation action Sinstallation direct OAS user T. Instance setup Notification setup Summany	Set up a DB2 instance A DB2 instance is an environment in which you store data and run applications. You must have an instance to use this product. If you would like to add this computer to an existing partitioned database environment, you should not create an instance on this computer. The instance should be created on the instance-owning database partition server. Create a DB2 instance C Do not create a DB2 instance C Do not create a DB2 instance
	▲ Back Next ▶ Finish Cancel Help

Figure 3-13 Set up a DB2 instance

In the next window, you can set up notifications.

18.Select **Do not set up your DB2 server to send notifications at this time** as shown in Figure 3-14.

19.Click Next.

X DB2 Setup wizard	- DB2 Enterprise Server Edition	
Introduction Software License Jostfware License Installation type Installation action DAS user Instance setup Notification setur S. Notification seture	Set up notifications You can set up your DB2 server to automatically send e-mail or pager notifications to alert admin when a database needs attention. The contact information is stored in the administration contact need an unauthenticated SMTP server to send these notifications. Image: Set up your DB2 server to send notifications Image: Notification SMTP server Image: Notification SMTP server	istrators : list. You
	Administration contact list location	
	© Do not set up your DB2 server to send notifications at this time If you do not set up your DB2 server to send notifications, the health alerts are stil recorded in the administration notification log.	
	<u>▲B</u> ack <u>N</u> ext <u>F</u> inish Cancel	Help

Figure 3-14 Set up notifications

In the next window, you can review the current settings.

20. If you are satisfied with the settings, then click Next as shown in Figure 3-15.



Figure 3-15 Start copying files

In the next window, a progress panel appears while the files are copied as shown in Figure 3-16.

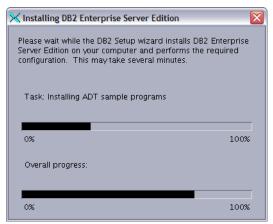


Figure 3-16 installation progress panel

The next window (shown in Figure 3-17) is displayed when all of the files have been copied and DB2 Enterprise Server is successfully installed.

🗙 Setup Complete	K
Setup has completed successfully	
If you have not already done so, it is recommended that you complete the post-install steps after installation.	
You can also review the log file for more details of the setup process. The setup log files db2setup.log and db2setup.err are located in the /tmp directory.	
Post-install steps Log file	
If you have not already done so, it is recommended that you complete the following steps. Tom web site using the internet: If you performed a custom installation, verify that you can access the DB2 Information Center location specified during the installation. Run First Steps (db2fs) as a regular, non-privileged userid. You will need a supported web browser	
in the path of this userid and you must execute the db2profile script from the instance to be administered.	
Set up a DB2 instance to work with DB2.	
Click Finish to exit.	1
<u>F</u> inish	Ĩ

Figure 3-17 Setup has completed successfully

Create DB2 database users

Now that we have installed DB2 Enterprise Server, we need to create the database instance. We created two user accounts before we create the database instance. These accounts, which are also known as the DB2 user and the DB2 archuser, are the primary and secondary users for the database instance, as shown in Table 3-2.

Table 3-2 DB2 database users

TADDM environment (host name)	Primary/ DB2 user	Secondary/ DB2 Archuser	DB2 instance name
taddm10	db2inst1	archuser	cmdb

Example 3-3 on page 49 shows the AIX commands that create the required users.

Example 3-3 Creating users for db2 instance

taddm10:/mnt/TADDM71] mkgroup db2grp1 taddm10:/mnt/TADDM71] mkuser pgrp=db2grp1 db2inst1 taddm10:/mnt/TADDM71] mkuser pgrp=db2grp1 archuser taddm10:/mnt/TADDM71] passwd db2inst1 Changing password for "db2inst1" db2inst1's New password: Re-enter db2inst1's new password: taddm10:/mnt/TADDM71] passwd archuser Changing password for "archuser" archuser's New password: Re-enter archuser's new password: taddm10:/mnt/TADDM71] login db2inst1 db2inst1's Password: [compat]: You are required to change your password. Please choose a new one. db2inst1's New password: Re-enter db2inst1's new password:

\$ login archuser archuser's Password: [compat]: You are required to change your password. Please choose a new one.

archuser's New password: Re-enter archuser's new password:\$

Create the DB2 instances

Next, you need to create the DB2 instance. We changed the directory and created the instance as shown in Example 3-4.

Example 3-4 Creating DB2 instance

```
taddm10:/ ] chown db2inst1.db2grp1 /home/db2inst1
taddm10:/ ] ls -ld /home/db2inst1
drwxr-xr-x 3 db2inst1 db2grp1 256 Mar 3 14:38 /home/db2inst1
taddm10:/opt/IBM/db2/V9.1/instance ]db2icrt -a SERVER -p 50010 -s ese -u
db2inst1 db2inst1 <
DBI1070I Program db2icrt completed successfully.
```

3.3 Installing and configuring IBM Tivoli Monitoring V6.2

In order to step through the installation of IBM Tivoli Monitoring V6.2, we build a lab environment, as shown in Figure 3-18. Here, we can see the topology using one of product features of the Tivoli Enterprise Portal: the self-monitoring topology.

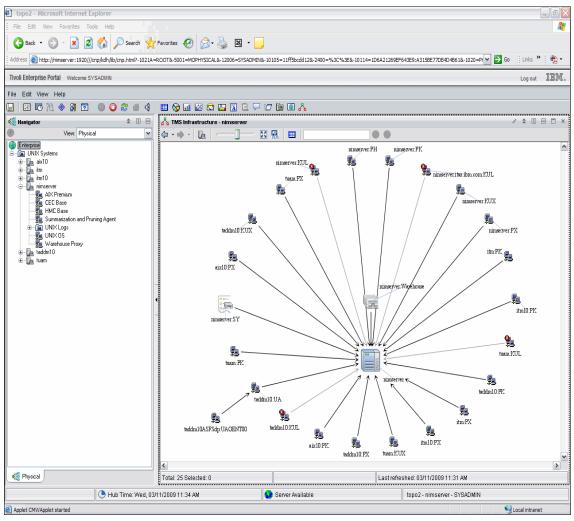


Figure 3-18 Lab environment self-monitoring topology

3.3.1 Pre-installation preparation

Before you begin, take note of the following information concerning the installation procedures in this section.

The installation procedures provide information for installing a single component (such as the monitoring server) on one computer. If you want to install multiple components (such as the monitoring server and the portal server) on the same computer and you want to install them simultaneously using the command line, the actual steps might vary. Refer to the *IBM Tivoli Monitoring Version 6.2.0 Installation and Setup Guide*, GC32-9407, for further information.

You need to consider several basic principles and guidelines when determining the procedure and setup that will best suit your environment.

For example, you can install a monitoring server on one host, a portal server on another host, and access the portal using a Windows desktop client.

If your site uses the IP.PIPE protocol for communications, be aware of the following considerations:

- ► There can be at most 16 IP.PIPE processes per host.
- IP.PIPE uses one, and only one, physical port per process. Port numbers are allocated using a well-known port allocation algorithm. The first process for a host is assigned port 1918, which is the default.
- ► KDC_PORTS is not supported for IP.PIPE.
- If you need to have more than 16 processes per host, use IP.UDP (User Datagram Protocol) for connections between IBM Tivoli Monitoring V6.2 components.
- Determine whether your environment requires a remote Tivoli Enterprise Monitoring Server hub or data warehouse.

We also need to plan for settings that will vary from one environment to another environment, such as:

- Host names
- ► UIDs and GIDs for the administration of IBM Tivoli Monitoring
- ► File systems and sizing
- Port numbers (unless the default port numbers will be used)
- Whether the monitoring server being installed or being connected to is configured as a hub or as a remote monitoring server
- Whether you want to configure a hot standby

3.3.2 Installing IBM Tivoli Monitoring from the Launchpad

The AIX Enterprise Edition Launchpad runs on IBM AIX 6.1 at a minimum technology level 1. The Launchpad runs in a Web browser window. Supported browsers are Mozilla Firefox for AIX, Versions 1.5.0.10, 1.5.0.11, and 1.5.0.12. Refer to the following Web site for a download of the last named version and information about its prerequisites:

http://www.ibm.com/systems/p/os/aix/browsers/index.html

Unless you are installing IBM Tivoli Monitoring by using the Launchpad on the console, you will also require the presence of a running X Windows emulator, because certain parts of the install spawn a shell for certain responses that determine the configuration. In our environment, we used Hummingbird Exceed 2008.

The prerequisites of the products that the Launchpad installs differ from the prerequisites for the browser. For details, consult the Product Information page in the Launchpad, which provides the documentation of the supported versions of those products and links to further reference material located in the IBM Tivoli Information Center.

To install IBM Tivoli Monitoring, from the LaunchPad initial window that is seen in Figure 3-19 on page 53, select **Install Monitoring** from the sidebar.

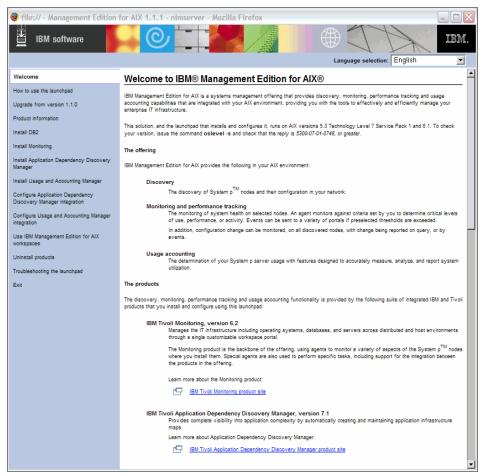


Figure 3-19 Launchpad Initial window

3.3.3 Installing the Tivoli Enterprise Monitoring Server

Figure 3-20 on page 54 shows the Launchpad initial options for installing the IBM Tivoli Monitoring components, as well as an overview of their functions and the sequence in which you must install the individual components. It also has links to more detailed information about using the Launchpad and the IBM Tivoli Monitoring product in the Tivoli Information Center.

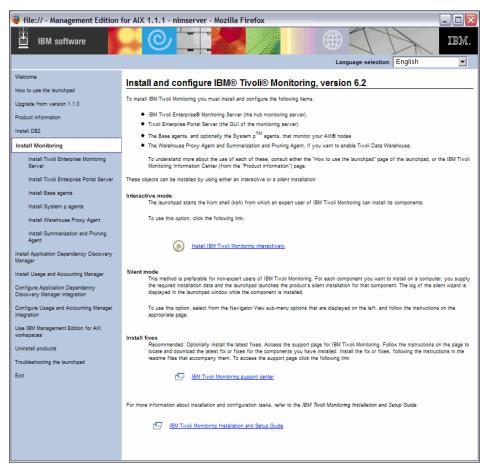


Figure 3-20 Installing Tivoli Monitoring options from the Launchpad

To start the installation:

1. Accept the license agreement if prompted.

After you accept the licensing agreement, you will be presented with the main Install Monitoring window. From here, the steps that are required to perform a silent installation are laid out logically in the left sidebar. Alternately, you can choose the option "Install IBM Tivoli Monitoring interactively." This option launches a Korn shell (ksh) that prompts you for the required configuration parameters for the installation. This option is essentially identical to installing the product from the command line. **Note:** We recommend the Silent Mode installation if you are inexperienced with the IBM Tivoli Monitoring product. This method prompts for the information that the wizard requires to complete an install of the selected component.

Figure 3-21 shows the options for installing and configuring the Tivoli Enterprise Monitoring Server (TEMS) from the Launchpad. From this window, you can either select the components that you want to install or configure from the list in the left sidebar.

The following sections guide you through each of these tasks.

🂐 file:// - Management Edition for AIX 1.1.1 - nimserver - Mozilla Firefox			
IBM software			
Welcome	Install and configure IBM® Tivoli® Monitoring, version 6.2		
How to use the launchpad	To install IBM Tivoli Monitoring you must install and configure the following items:		
Upgrade from version 1.1.0 Product information	IBM Tivoli Enterprise® Monitoring Server (the hub monitoring server).		
Install DB2	 Tivoli Enterprise Portal Server (the GUI of the monitoring server). The Base agents, and optionality the System pTM agents, that monitor your AUX0 nodes 		
Install Monitoring	 The base agents, and optionally the system p agents, that monitor your know nodes The Warehouse Proxy Agent and Summarization and Pruning Agent, if you want to enable Tivoli Data Warehouse. 		
Install Tivoli Enterprise Monitoring Server	To understand more about the use of each of these, consult either the "How to use the launchpad" page of the launchpad, or the IBM Tivoli Monitoring Information Center (from the "Product information") page.		
Install Tivoli Enterprise Portal Server	These objects can be installed by using either an interactive or a silent installation:		
Install Base agents Install System p agents	Interactive mode The launchpad starts the Korn shell (ksh) from which an expert user of IBM Tivoli Monitoring can install its components.		
Install Warehouse Proxy Agent	To use this option, click the following link:		
Install Summarization and Pruning Agent Install Application Dependency Discovery Manager	Install IBM Tivoli Monitoring Interactively		
Install Usage and Accounting Manager Configure Application Dependency Discovery Manager integration	Silent mode This method is preferable for non-expert users of IBM Tivoli Monitoring. For each component you want to install on a computer, you supply the required installation data and the launchpad launches the product's silent installation for that component. The log of the silent wizard is displayed in the launchpad window while the component is installed.		
Configure Usage and Accounting Manager integration	To use this option, select from the Navigator View sub-menu options that are displayed on the left, and follow the instructions on the appropriate page.		
Use IBM Management Edition for AIX workspaces Uninstall products Troubleshooting the launchpad	Install fixes Recommended. Optionally install the latest fixes. Access the support page for IBM Tivol Monitoring. Follow the instructions on the page to locate and download the latest fix or fixes for the components you have installed. Install the fix or fixes, following the instructions in the readme files that accompany them. To access the support page click the following link:		
Exit	EM Tivol Monitoring support center		
	For more information about installation and configuration tasks, refer to the IBM Tivoli Monitoring Installation and Setup Guide.		
	IBM Tivoli Monitoring Installation and Setup Guide		

Figure 3-21 Installing the Tivoli Enterprise Monitoring Server

Step 1: Install Tivoli Enterprise Monitoring Server (TEMS)

Clicking "Install Tivoli Enterprise Monitoring Server" in the sidebar launches the window that is seen in Figure 3-22. Here, you are prompted for the information that the wizard requires to proceed with installing the TEMS and the sequence to follow to install the TEMS, to configure the TEMS, and to enable application support for the monitoring agents. Finally, you will be asked to start the TEMS. The required fields are marked with a red asterisk (*):

- ► The install directory (the default is /opt/IBM/ITM) is a required field.
- ► The Tivoli Enterprise Monitoring Server name is a required field.
- Optionally, you can enter a 32-character encryption key or accept the default.

😻 file:// - Management Edition for AIX 1.1.1 - nimserver - Mozilla Firefox			
BM software			
Welcome		•	
How to use the launchpad	Install the IBM® Tivoli Enterprise® Monitoring Server, version 6.2		
Upgrade from version 1.1.0	Use this page to do the following:		
Product information	 Install a Tivoli@ Enterprise Monitoring Server as your IBM Tivoli Monitoring hub server 		
Install DB2	 Configure the server or servers 		
	Enable the application support for Base agents		
Install Monitoring	 If you plan to install System pTM agents, you must enable the application support for them 		
Install Tivoli Enterprise Monitoring Server	Note: If you want to install remote monitoring servers to handle large numbers of monitoring agents, follow the instructions in the IBM Tivoli Monitoring documentation.		
Install Tivoli Enterprise Portal Server	The steps are as follows:		
Install Base agents	1. To install Tivoli Enterprise Monitoring Server, enter the required information and click Install Tivoli Enterprise Monitoring Server:		
Install System p agents	* Installation path: /opt/IBM/ITM		
Install Warehouse Proxy Agent	Encryption key:		
Install Summarization and Pruning Agent	Tivoli Enterprise Monitoring Server name nimserver		
Install Application Dependency Discovery Manager	Install Tivoli Enterprise Monitoring Server		
Install Usage and Accounting Manager			
Configure Application Dependency Discovery Manager integration	 To configure Tivoli Enterprise Monitoring Server, enter the required information and click Configure Tivoli Enterprise Monitoring Server: 		
Configure Usage and Accounting Manager	* Installation path: /opt/IBM/ITM		
integration	* Tivoli Enterprise Monitoring Server name nimserver		
Use IBM Management Edition for AIX workspaces Uninstall products	Configure Triveli Enterprise Monitoring Server		
Troubleshooting the launchoad			
, , , , , , , , , , , , , , , , , , ,	3. To enable application support for monitoring agents, enter the required information and click the following links:		
Exit	Installation path: //opt/IBM/ITM		
	* Tivoli Enterprise Monitoring Server name nimserver		
	Enable application support for Base agents		
	Enable application support for System p agents		
		•	

Figure 3-22 Installing the Tivoli Enterprise Monitoring Server

After the install process has initiated, the install log is logged to the display window within the Launchpad while the component is installed. The install process will also identify any of the particular install logs that you need to inspect or review after the component is installed. You can view the entire log by utilizing the scroll bar as shown in Figure 3-23.

🈻 file:// - Management Edition	for AIX 1.1.1 - nimserver - Mozilla Firefox	
IBM software		IBM.
	Language selection: English	-
	Install the IBM® Tivoli Enterprise® Monitoring Server, version 6.2	
	The operation is in progress.	
	Please wait while the operation completes.	
	entrange extreme to the set of th	
	Finished processing áll filesets. (Total time: 8 secs).	
	+Summaries:	
	Installation Summary	
	Name Level Part Event Result	
	gskjt.ne 7.0.3.18 USR APPLY SUCCESS	
	gskta.rte 7.0.3.18 USR APPLY SUCCESS runGSkit : creating security files. runGSkit :creating GSkit security keyfile and certificate.	
	rungskit :Gskit version info.	

Figure 3-23 Installation progress information

The installation progresses, as shown in Figure 3-24.

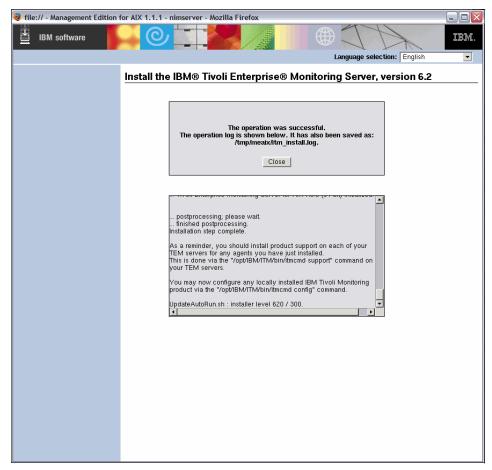


Figure 3-24 Tivoli Enterprise Monitoring Server Installation

After this installation completes successfully, click the link in Step 2 (Figure 3-25 on page 59).

Step 2: Configuring the Tivoli Enterprise Monitoring Server

Enter the required fields and select **Configure Tivoli Enterprise Monitoring Server** as shown in Figure 3-25. This selection initiates the configuration and prompts you for further information and settings that are required to complete the configuration the TEMS hub.

ile:// - Management Edition	for AIX 1.1.1 - nimserver - Mozilla Firefox
BM software	
	Language selection: English
Welcome	Install the IBM® Tivoli Enterprise® Monitoring Server, version 6.2
How to use the launchpad	
Upgrade from version 1.1.0	Use this page to do the following:
Product information	 Install a Tivoli® Enterprise Monitoring Server as your IBM Tivoli Monitoring hub server
	Configure the server or servers
Install DB2	 Enable the application support for Base agents
Install Monitoring	 If you plan to install System pTM agents, you must enable the application support for them
Install Tivoli Enterprise Monitoring Server	Note: If you want to install remote monitoring servers to handle large numbers of monitoring agents, follow the instructions in the IBM Tivoli Monitoring documentation.
Install Tivoli Enterprise Portal Server	The steps are as follows:
Install Base agents	1. To install Tivoli Enterprise Monitoring Server, enter the required information and click Install Tivoli Enterprise Monitoring Server:
Install System p agents	Installation path: /opt/IBM/ITM
Install Warehouse Proxy Agent	Encryption key:
Install Summarization and Pruning Agent	Tivoli Enterprise Monitoring Server name nimserver
Install Application Dependency Discovery Manager	Install Tivoli Enterprise Monitoring Server
Install Usage and Accounting Manager	
Configure Application Dependency Discovery Manager integration	 To configure Tivoli Enterprise Monitoring Server, enter the required information and click Configure Tivoli Enterprise Monitoring Server.
Configure Usage and Accounting Manager	* Installation path: /opt/IBM/ITM
integration	* Tivoli Enterprise Monitoring Server name nimserver
Use IBM Management Edition for AIX	
workspaces	Configure Tivoli Enterprise Monitoring Server
Uninstall products	Ŭ
Troubleshooting the launchpad	
Exit	3. To enable application support for monitoring agents, enter the required information and click the following links:
	* Installation path: /opt/IBM/ITM
	Tivoli Enterprise Monitoring Server name nimserver
	Enable application support for Base agents
	Enable application support for System p agents
	•

Figure 3-25 Tivoli Enterprise Monitoring Server Installation completion

Next, you enter additional install parameters that are required to finalize the configuration of the TEMS hub as shown in Figure 3-26.

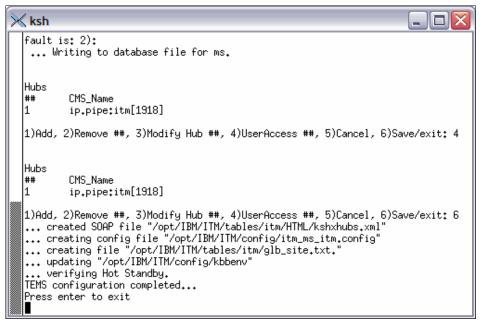


Figure 3-26 Additional configuration options

Configuration options

The configuration options provided in the Korn shell (ksh) that is spawned by the Launchpad are identical to the configuration options that are displayed if the install is initiated from the command-line interface (CLI) using the install.sh script from the directory that contains the IBM Tivoli Monitoring install images (provided in Example 3-5 on page 61):

- 1. When prompted for the IBM Tivoli Monitoring V6.2 home directory, press Enter to accept the default (/opt/IBM/ITM).
- 2. If you want to use another installation directory, type the full path to that directory and press Enter.
- 3. The output shown in Example 3-5 on page 61 is displayed. Type 1 to start the installation and press Enter. The user license agreement is displayed. Press Enter to read through the agreement.

Example 3-5 Tivoli Enterprise Manager Installation Output

Select one of the following: 1) Install products to the local host. 2) Install products to depot for remote deployment (requires TEMS). 3) Install TEMS support for remote seeding 4) Exit install. Please enter a valid number: 1 Initializing ... install.sh warning: unarchive of "/appo/itm62/unix/jraix526.tar" may have failed, continuing ... International Program License Agreement Part 1 - General Terms BY DOWNLOADING, INSTALLING, COPYING, ACCESSING, OR USING THE PROGRAM YOU AGREE TO THE TERMS OF THIS AGREEMENT. IF YOU ARE ACCEPTING THESE TERMS ON BEHALF OF ANOTHER PERSON OR A COMPANY OR OTHER LEGAL ENTITY, YOU REPRESENT AND WARRANT THAT YOU HAVE FULL AUTHORITY TO BIND THAT PERSON, COMPANY, OR LEGAL ENTITY TO THESE TERMS. IF YOU DO NOT AGREE TO THESE TERMS, - DO NOT DOWNLOAD, INSTALL, COPY, ACCESS, OR USE THE PROGRAM; AND Press Enter to continue viewing the license agreement, or enter "1" to accept the agreement, "2" to decline it, "3" to print it, "4" to read non-IBM terms, or "99" to go back to the previous screen.

- 4. Type 1 and press Enter to accept the agreement.
- Press Enter to accept the default encryption key, or type a 32-character encryption key and press Enter.

Note: Follow these tips to select an encryption key:

- Do not use the equal sign (=), the comma (,), or the I character in the encryption key.
- Ensure that if you select not to use the default encryption key that you record the key value. This same key will be required during the installation of components that communicate with this monitoring server.

6. Type the number for the operating system on which you install the monitoring server. The default value is your current operating system.

Press Enter.

7. Type 1 to confirm the operating system and press Enter.

A numbered list of available components is displayed.

- 8. Select the number which corresponds to the option for the Tivoli Enterprise Monitoring Server and press Enter.
- 9. Type 1 to confirm the selection and press Enter.

Note: If you are installing on AIX Version 6.1 and if you only see AIX 5.3 in the selection list, select AIX 5.3. After the closest level to your level is selected, the component will install and operate normally.

At this point, the installation begins as shown in Example 3-6.

Example 3-6 Installation of the Tivoli Enterprise Monitoring Server

Product packages are available in /opt/IBM/ITM

Product packages are available for the following operating systems and component support categories:

1) AIX R5.2 (32 bit) 2) AIX R5.2 (64 bit) 3) AIX R5.3 (32 bit) 4) AIX R5.3 (64 bit) 5) Tivoli Enterprise Portal Browser Client support 6) Tivoli Enterprise Portal Server support 7) Tivoli Enterprise Monitoring Server support Type the number for the OS or component support category you want, or type "q" to guit selection [number "4" or "AIX R5.3 (64 bit)" is default]: You selected number "4" or "AIX R5.3 (64 bit)" Is the operating system or component support correct [1=Yes, 2=No; default is "1"] ? y The following products are available for installation: 1) Monitoring Agent for UNIX Logs V06.20.00.00 2) Monitoring Agent for UNIX OS V06.20.00.00

3) Summarization and Pruning Agent V06.20.00.00

```
4) Tivoli Enterprise Monitoring Server V06.20.00.00
5) Tivoli Enterprise Portal Server V06.20.00.00
6) Tivoli Enterprise Services User Interface V06.20.00.00
7) Universal Agent V06.20.00.00
8) Warehouse Proxy V06.20.00.00
9) all of the above
Type the numbers for the products you want to install, or type "q"
to quit selection.
If you enter more than one number, separate the numbers by a comma
or a space.
Type your selections here: 4
The following products will be installed:
Tivoli Enterprise Monitoring Server V06.20.00.00
Are your selections correct [ 1=Yes, 2=No ; default is "1" ] 1
... installing "Tivoli Enterprise Monitoring Server V06.20.00.00
for AIX R5.3 (64 bit)"; please wait.
=> installed "Tivoli Enterprise Monitoring Server V06.20.00.00 for
AIX R5.3 (64 bit)".
... Initializing component Tivoli Enterprise Monitoring Server
V06.20.00.00 for AIX R5.3 (64 bit).
```

10.At the prompt, enter a host name for your Monitoring Server and press Enter as shown in Example 3-7.

Note: Do not use the fully qualified domain name as the host name for your monitoring server.

Example 3-7 Installation completion

```
Please enter TEMS name [ TEMS is default ]: nimserver
... creating config file
"/opt/IBM/ITM/config/server2_ms_HUB_TEMS.config"
... creating file "/opt/IBM/ITM/tables/HUB_TEMS/glb_site.txt."
... updating "/opt/IBM/ITM/config/kbbenv"
... verifying Hot Standby.
... Tivoli Enterprise Monitoring Server V06.20.00.00 for AIX R5.3
(64 bit) initialized.
```

```
Do you want to install additional products or product support
packages [ 1=Yes, 2=No ; default is "2" ]
... postprocessing; please wait.
... finished postprocessing.
Installation step complete.
```

As a reminder, you should install product support on each of your TEM servers for any agents you have just installed. This is done via the "/opt/IBM/ITM/bin/itmcmd support" command on your TEM servers.

```
You may now configure any locally installed IBM Tivoli Monitoring product via the "/opt/IBM/ITM/bin/itmcmd config" command.
```

The Tivoli Enterprise Monitoring Server is now installed and configured.

You can confirm that the server is installed and functional by using the **cinfo** command as shown in Example 3-8.

Example 3-8 The cinfo command displaying running processes

HostProdPIDOwnerStartID..Statusnimserverms483604root18:06:01nimserver...running

After you have successfully installed and configured the Tivoli Enterprise Monitoring Server hub, you can then proceed with Step 3 where you install the application support on the TEMS hub for both the base agents and the System p agents as shown in Figure 3-27 on page 65.

Step 3: Enabling application support for agents

When we installed the IBM Tivoli Monitoring V6.2 components, the application support was installed for the base agents. The agents that come with the installation for the System p are located on separate media.

After they are installed, you need to enable the application support for these agents to function correctly. In addition, you need to configure and start the agents on the Virtual I/O Server.

Figure 3-27 Installing the application support for the agents

Step 4: Starting the Tivoli Enterprise Monitoring Server

When the TEMS hub is installed and configured and you have installed the application support for the agents, you can now start the TEMS either by clicking the option at Step 4 of the Install Panel, or alternatively, you can the start the TEMS from the command line using the **itmcmd** command.

Example 3-9 on page 66 shows starting and confirming the TEMS from the command line. After the TEMS has been started, you can then confirm that the server process is running by using the **cinfo** command.

Example 3-9 Starting the Tivoli Enterprise Monitoring Server from the command line

root@nimserver:/# /opt/IBM/ITM/bin/itmcmd server start nimserver >
/tmp/meaix/startstop_server.log 2>&1
root@nimserver:/# cat /tmp/meaix/startstop_server.log
Starting TEMS...
It can take up to ten minutes.
KCIIN0082E TEMS started...

Note: Before proceeding with installing the Tivoli Enterprise Portal, you need to stop the TEMS hub either by using Step 4 on the Tivoli Enterprise Monitoring window or by using the command line and the **itmcmd** command.

3.3.4 Installing the Tivoli Enterprise Portal Server

The second phase of the process is to install and configure the IBM Tivoli Enterprise Portal Server.

Start by selecting **Install Tivoli Enterprise Server** from the Launchpad sidebar. You will see the installation window and the steps, as well as an explanation of the process and the required information and details to launch the installation wizard and configure the required components.

This page assists you to:

- Install the Tivoli Enterprise Portal Server
- Install the Tivoli Enterprise Portal Server support for monitoring agents
- Install the Tivoli Enterprise Portal Server Browser Client support for monitoring agents
- Configure the server

Step 1: Installing the Tivoli Enterprise Server Portal

Use the following steps to install the Tivoli Enterprise Portal Server:

- 1. Click Install Tivoli Enterprise Portal Server.
- 2. Then, enter the required information in the wizard for the installation directory and the encryption key, or you can use the default encryption key.
- 3. Click **Install Tivoli Enterprise Portal Server** in the main window as shown in Figure 3-28 on page 67.

Note: The IBM Eclipse Help Server is automatically installed when you install the Tivoli Enterprise Portal.

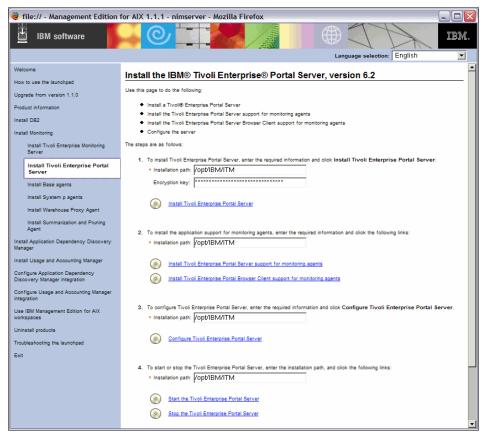


Figure 3-28 Tivoli Enterprise Portal Server installation window

Prior to installation, you are required to accept the license agreement. After you accept the agreement, the wizard prompts you for the installation directory where the IBM Tivoli Monitoring install images are located, which is shown in Figure 3-29 on page 68.

- 4. Enter the full path to the install images or browse to locate them.
- 5. Select Open.
- 6. Click OK to proceed.

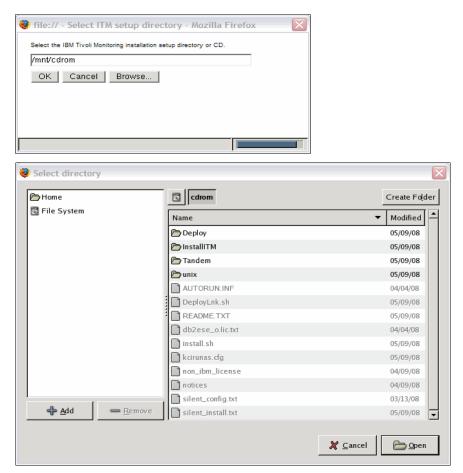


Figure 3-29 Installation setup directory

Next, the wizard installs the Tivoli Enterprise Portal Server and displays the detailed output in the window until the process completes, as shown in Figure 3-30.

😻 file:// - Management Edition for AIX 1.1.1 - nimserver - Mozilla Firefox	
BM software	IBM.
Language selection: English	-
Install the IBM® Tivoli Enterprise® Portal Server, version 6.2	
The operation is in progress.	
Please wait while the operation completes.	
(oa mikura (oa mit	
silent install input parameters	
INSTALL_ENCRYPTION_KEY=***** INSTALL_PRODUCT=cq	
MS_CMS_NAME=TEMS INFO - platform selection defaulting to aix536.	
end of silent install input parameters	
You selected the following products:	
Tivoli Enterprise Portal Server	
installing "Tivoli Enterprise Portal Server for AIX R5.3 (64 bit)";	

Figure 3-30 Tivoli Enterprise Portal Server installation progress window

In addition to logging in to the window, you are informed about the success or failure of the installation and which logs to review.

Figure 3-31 shows the wizard after the successful installation of the Tivoli Enterprise Portal Server.

😻 file:// - Management Edition for AIX 1.1.1 - itm - Mozilla Firefox	. 🗆 🗙
BM software	IBM.
Language selection: English	•
Install the IBM® Tivoli Enterprise® Portal Server, version 6.2	
The operation was successful. The operation log is shown below. It has also been saved as:	
/tmp/meaix/itm_install.log.	
Close	
Citrix Access Suite V610R100"	
postprocessing, please wait.	
finished postprocessing. Installation step complete.	
As a reminder, you should install product support on each of your TEM servers for any agents you have just installed.	
This is done via the "/opt/IBM/ITM/bin/Itmcmd support" command on vour TEM servers.	
You may now configure any locally installed IBM Tivoli Monitoring	
product via the "/opl/IBM/ITM/bin/itmcmd config" command.	
UpdateAutoRun.sh : installer level 620 / 300.	

Figure 3-31 Tivoli Enterprise Portal Server installation success window

Step 2: Installing TEPS support for monitoring agents

Next, we guide you through installing the application support that is required for the monitoring agents:

1. After reading and accepting the license agreement, select the installation path for IBM Tivoli Monitoring.

2. Click to install both the Tivoli Enterprise Portal Server support for monitoring agents and the Tivoli Enterprise Portal Server Browser Client support for monitoring agents in that sequence using the Launchpad install wizard window, as shown in Figure 3-32.

Note: The Tivoli Enterprise Portal Browser Client support package is portal server code that supports the browser clients. You must install the browser client support package on the computer where you install the portal server if you want to connect to it using a browser client.

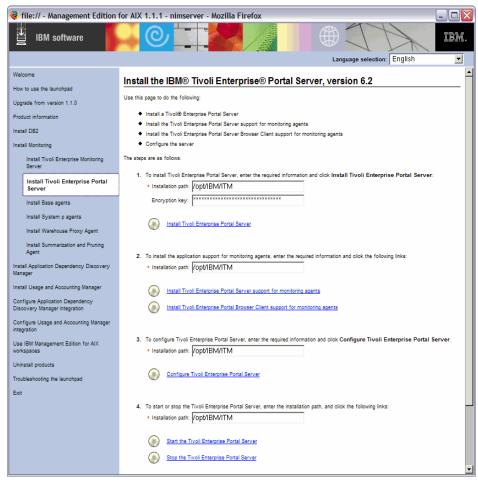


Figure 3-32 Installing the TEPS support for monitoring agents

- 3. Enter the path for the IBM Tivoli Monitoring setup directory in the dialog box or browse for the location of the setup directory where the install images are, as shown in Figure 3-33.
- 4. Select **Open** and then click **OK**.

🧶 file:// - Select ITM setup directory - Mozilla Firefox			
Select the IBM Tivoli Monitoring installation setup directory or CD.			
/mnt/ITM62			
OK Cancel Browse			
Select directory			
🗁 Home	mnt launchpad	Create Folder	
🔄 File System	Name	Modified	
	CDE CDE	02/26/09	
	ExpansionPack	Thursday	
	🗁 Firefox	Today	
	🗁 ITM62	02/24/09	
	TTM_agents	Yesterday	
	TTM_tools	02/24/09	
	Linux_tools	02/26/09	
	TADDM71	02/24/09	
	aix_update1	02/25/09	
	aix_update2	02/25/09	
	aix_update3	02/25/09	
	aix_vol_1	02/25/09	
	aix_vol_2	02/25/09	
Add Remove	aix_vol_3	02/25/09 👻	
	💥 <u>C</u> ancel	🗁 Open	

Figure 3-33 Select installation path

Step 3: Configure the Tivoli Enterprise Portal Server

The wizard will now launch a Korn shell (ksh) as shown in Figure 3-34 on page 75, which prompts you for further detailed options to configure the connector settings for the Tivoli Enterprise Portal Server. After this configuration completes, the wizard starts the Install Tivoli Enterprise Portal Server step and connects to the DB2 database instance.

If you are extremely familiar with IBM Tivoli Monitoring and the Tivoli Enterprise Portal Server, you can configure the connector settings for the Tivoli Enterprise Portal Server from the command line using the command **itmcmd config -A cq**. **Note:** This part of the process requires you to enter the DB2 and IBM Tivoli Monitoring UIDs, passwords, and the 32-character encryption key in order for the Install Tivoli Enterprise Portal Server to connect to the DB2 instance.

Configuring the Portal Server Connector settings

In the Korn shell (ksh), perform the following steps:

1. Press Enter to accept the default for the following prompt:

```
Edit 'ITM Connector' settings? [ 1=Yes, 2=No ] (default is: 1):
```

- 2. Press Enter to enable the connector.
- 3. Press Enter to accept the default name of ITM1 or type your preferred name and press Enter. This name displays in the Common Event Console for this connector.
- 4. Press Enter to accept the default number of events (100) that are to be available in the Common Event Console for this connector, or type the number of events that you want to see displayed and press Enter.
- 5. Type 2 and press Enter to display only active events in the Common Event Console for this connector. Type 1 and press Enter to view both active and closed events. By default, only active events are displayed.
- 6. Type 2 and press Enter to skip defining data for extra columns in the Common Event Console.

When you define a Tivoli Enterprise Console® or Tivoli Netcool/OMNIbus connector, you can define the information that is to be mapped to each of these customizable columns. Refer to the *IBM Tivoli Monitoring Version 6.2.0 Administrator's Guide,* SC32-9408, for information about configuring these connectors.

7. Press Enter when you are asked if the agent connects to a Tivoli Enterprise Monitoring Server.

Note: Although the prompt refers to an agent (which the **itmcmd** command does also), this command is used to configure the portal server.

Configure the connection between the portal server and the hub monitoring server:

- 1. Type the host name for the hub monitoring server and press Enter.
- 2. Type the protocol that the hub monitoring server uses to communicate with the portal server. You have four choices: IP.UDP, SNA, IP.PIPE, or IP.SPIPE.

- 3. If you want to set up a backup protocol, enter that protocol and press Enter. If If you do not want to use a backup protocol, press Enter without specifying a protocol.
- 4. Depending on the type of protocol that you specified, provide information according to the information shown in Table 2-4 on page 18.
- 5. Press Enter when you are asked if you want to configure the connection to a secondary monitoring server. The default value is none.
- Press Enter to accept the default for the Optional Primary Network Name (none).
- 7. Press Enter to accept the default setting for Secure Sockets Layer (SSL) between the portal server and clients (N).

Note: By default, SSL is disabled. If you want to enable it, type 1 and press Enter.

Configure the connection between the portal server and the portal server database.

- 8. Type the DB2 instance name. The default value is db2inst1. Press Enter.
- 9. Type the DB2 administrator ID. The default is db2inst1. Press Enter.

Note: The DB2 Administrator account was created during DB2 installation.

- 10. Type the password for the DB2 administrator ID and press Enter.
- 11.Confirm the password for the DB2 administrator ID by typing it again. Press Enter.
- 12. Type the name of the portal server database. The default is TEPS. Press Enter.
- 13. Type the login name of the database user that the portal server will use to access the database. The default is itmuser. Press Enter.
- 14. Type the password for the database user and press Enter.
- 15. Confirm the password for the database user by typing it again. Press Enter.
- 16. You are now asked if it is okay to create the itmuser login ID if it does not exist. Type 1 and press Enter.
- 17. You are asked if you are using DB2 or Oracle® for the Tivoli Data Warehouse. Enter D for DB2 or J for Oracle Java Database Connectivity (JDBC). DB2 is the default.

The configuration now proceeds with the parameters that you have entered. You will see a message telling you that InstallPresentation.sh is running and then a message telling you that the installation has completed.

≼ ksh 📃 🗖 🖾
Enable this connector [1=Yes, 2=No] (default is: 1): Connector name (default is: ITM1): Maximum number of events for this connector (default is: 100): View closed events [1=Yes, 2=No] (default is: 2): Edit 'Names of Extra Columns' settings? [1=Yes, 2=No] (default is: 1): 2
Will this agent connect to a TEMS? [1=YES, 2=NO] (Default is: 1): TEMS Host Name (Default is: nimserver):
Network Protocol [ip, sna, ip.pipe, or ip.spipe] (Default is: ip.pipe):
Now choose the number of next protocol from one of these: - ip
- sna - ip.spipe - 0 for none
Network Protocol 2 (Default is: 0): IP.PIPE Port Number (Default is: 1918): Enter name of KDC_PARTITION [type 0 for null] (Default is: 0):
Enter Optional Primary Network Name or 0 for "none" (Default is: 0): Enable SSL for TEP Clients (1=Yes, 2=No)(Default is: 2): Enter the DB2 admin ID(Default is: db2inst1): Enter the DB2 admin ID(Default is: db2inst1): Enter the password for the DB2 admin ID(Default is: *******):
Re-type: Enter the password for the IB2 admin IN(Default is: ********); Enter the TEPS DB2 database name(Default is: TEPS); Enter the TEPS DB2 database login ID(Default is: itnuser); Enter the password for the TEPS DB2 database login ID(Default is: ********);
Re-type: Enter the password for the TEPS DB2 database login ID(Default is: ********): Is it OK to create the TEPS login ID if not found (1=Yes, 2=No)(Default is: 1): Are you using DB2 or Oracle(JDBC) for Warehouse? [D=DB2, J=JDBC] (Default is: D): Enter the Warehouse database name(Default is: WAREHOUS): Enter the Warehouse user ID(Default is: itmuser):
Enter the password for the Warehouse user ID(Default is: ********): Re-type: Enter the password for the Warehouse user ID(Default is: ********);
LDAP Security: Validate User with LDAP ? (1=Yes, 2=No)(Default is: 2);

Figure 3-34 Configuring the Tivoli Enterprise Portal

Step 4: Starting and stopping the Portal Server

You can start or stop the Tivoli Enterprise Portal by clicking the links in Step 4 or by entering the following command from the command line:

itmcmd agent <start/stop> <product code>

The **itmcmd** command can facilitate executing the same command on multiple agents simultaneously from the CLI as shown in Example 3-10.

Example 3-10 The itmcmd multi agent start

```
root@nimserver:/# itmcmd agent start px pk ph cq
Multi-agent start: px
Starting Premium Monitoring Agent for AIX ...
Premium Monitoring Agent for AIX started
```

```
Multi-agent start: pk

Starting Base Monitoring Agent for CEC ...

Base Monitoring Agent for CEC started

Multi-agent start: ph

Starting Base Monitoring Agent for HMC ...

Base Monitoring Agent for HMC started

Multi-agent start: cq

Starting Tivoli Enterprise Portal Server ...

Eclipse Help Server is required by Tivoli Enterprise Portal Server

(TEPS) and will be started...

Eclipse Help Server is already started.

Tivoli Enterprise Portal Server started

Multi-agent start completed
```

Note: If you start the Enterprise Portal Server from the command line, it starts the IBM Eclipse Help Server first if it is not already running.

Table 3-3 on page 77 provides a list of the IBM Tivoli Monitoring product codes and a description of the respective functions of a particular agent or server. You can obtain a thorough and comprehensive list on the system in the file \$INSTALLDIR/registry/proddsc.tbl.

IBM Tivoli Monitoring product code	Description
ms	Tivoli Enterprise Monitoring Server
ax	IBM Tivoli Monitoring Shared Libraries
cq	Tivoli Enterprise Portal Server
p5	Base Monitoring Agent for AIX
рх	Premium Monitoring Agent for AIX
pv	Base Monitoring Agent for Virtual I/O Server
va	Premium Monitoring Agent for Virtual I/O Server
ph	Base Monitoring Agent for Hardware Management Console (HMC)
pk	Base Monitoring Agent for Common Event Console (CEC)
cg	IBM Tivoli Monitoring for Cryptographic Coprocessors
kf	IBM Eclipse Help Server
cw	Tivoli Enterprise Portal Browser Client
hd	Warehouse Proxy
it	Tivoli Enterprise Console (TEC) Graphical User Interface (GUI) Integration
iw	IBM Tivoli Enterprise Portal Server Extensions
cj	Tivoli Enterprise Portal Desktop Client

 Table 3-3
 IBM Tivoli Monitoring product codes

3.3.5 Install and configure the Base agents

In this next phase, we install the Base agents. You must install and configure the Base agents and System p agents on all of the AIX hosts in the environment that are to be monitored.

Step 1: Installing the Base agents

To install one or more Base agents on this computer:

- 1. Select the check box for the corresponding agent or agents to install.
- 2. Enter the installation path and the encryption key.

3. Click Install selected agents as shown in Figure 3-35.

Install and configure the Base agents, version 6.2			
 To install one or more Base agents on this computer, select the agent or agents to install, enter the installation selected agents. For more information about the input data and the agents, see the IBM® Tivoli® Monitoring 			
✓ Install the UNIX® OS agent			
Install the UNIX Logs agent			
✓ Install the Universal Agent			
* Installation path: /opt/IBM/ITM			
Encryption key:			
Install selected agents			

Figure 3-35 Installing the Base agents

- 4. After reading and accepting the licensing agreement, enter the path to the install images or browse for the path to the install images and click **Open**.
- 5. Then, select **OK** to proceed.

The install information window will list the agents and their corresponding two character product code as they are installed as shown in Figure 3-36 on page 79.

🍓 file:// - Management Edition for AIX 1.1.1 - nimserver - Mozilla Firefox		
IBM software		BM.
	Language selection: English	•
	Install and configure the Base agents, version 6.2	
	The operation is in progress.	
	Please wait while the operation completes.	
	install.sh : running aix526 jre.	
	Use of silent install mode implies license agreement acceptance. You can view the license	
	file details in the /opt/IBM/ITM/LAP/license directory nurGSkit : Keyfile.kdb already exists, skipping keyfile and certificate creation.	
	Product packages are available in /mnt/ITM82/unix	
	silent install input parameters INSTALL_ENCRYPTION_KEY=*****	
	INSTALL_PRODUCT=ux INSTALL_PRODUCT=ul	
	INSTALL_PRODUCT=um MS_CMS_NAME=TEMS	
	INFO - platform selection defaulting to aix638.	
	end of silent install input parameters	

Figure 3-36 Installing Base agents

After the installation completes, the information window appears with information about the success of the installation and where the installation log file can be found as shown in Figure 3-37.

🏺 file:// - Management Edition for AIX 1.1.1 - nimserver - Mozilla Firefox
BM software
Install and configure the Base agents, version 6.2
The operation was successful. The operation log is shown below. It has also been saved as: /tmp/mstall.log. Close
Installed "Universal Agent for AIX R5.3 (64 bit)". Installed "Universal Agent for AIX R5.3 (64 bit). Universal Agent for AIX R5.3 (64 bit). Sector 20 (64 bit). Copylog work files, please wait. Copylog work files, please wait. Copylog work files, please wait. Installation step complete. As a reminder, you should install product support on each of your TEM servers for any agent to all you have just installed. This is done via the "copyliBM/TM/bin/tmcmd support" command on your TEM servers. You may now configure any locally installed IBM Tiveli Monitoring product via the "copyliBM/TM/bin/tmcmd on fig" command. UpdateAutoRun sh :: installer level 620 / 300.

Figure 3-37 Base agents successfully installed

Step 2: Configuring the Base agents

You must now configure each of the Base agents that you have just installed on this host:

1. To configure an agent, enter the installation path of the agent, and click the corresponding link as shown in Figure 3-38.

-	re each of the agents you have installed on this computer lick on the corresponding link.	. To configure an agent, enter the installation path
* Install	ation path: /opt/IBM/ITM	
۲	Configure the UNIX OS agent	
۲	Configure the UNIX Logs agent	
۲	Configure the Universal Agent	

Figure 3-38 Configuration options for the Base agents

Figure 3-39 shows the Korn shell (ksh) agent configuration.

🗙 ksh	
Agent configuration started	
Will this agent connect to a TEMS? [1=YES, 2=N0] (Default is: 1): TEMS Host Name (Default is: 1par07): nimserver	
Network Protocol [ip, sna, ip.pipe or ip.spipe] (Default is: ip.pipe):	
Now choose the next protocol number from one of these: - ip - sna - ip.spipe - O for none Network Protocol 2 (Default is: 0): IP.PIPE Port Number (Default is: 1918): Enter name of KDC_PARTITION (Default is: null):	
Configure connection for a secondary TEMS? [1=YES, 2=NO] (Default is: 2): Enter Optional Primary Network Name or O for "none" (Default is: 0): Are you installing this product into a clustered environment [1=YES, 2=NO] (De ult is: 2): Agent configuration completed Press enter to exit]	fa

Figure 3-39 Agent configuration shell

You are required to configure the agent parameters individually, because there are slight variations on the parameters that are required for separate agents.

Step 3: Starting the Base agents

You can now start the Base agents by selecting the corresponding check box for the agent and then selecting the link as shown in Figure 3-40.

 To start or stop one or more Base ager installation path, and click the following 	ts on this computer, select the agent or agents you want to start or stop, enter the links:
UNIX OS agent	
UNIX Logs agent	
Universal agent	
* Installation path: /opt/IB	M/ITM
Start the selected a	<u>ients</u>
Stop the selected as	ents

Figure 3-40 Starting the Base agents

3.3.6 Install and configure System p agents

In this phase, you install the System p agents in the same manner in which you installed the Base agents. You begin by selecting **Install System p agents** in the sidebar of the Launchpad, which will launch the Install window that is shown in Figure 3-41 on page 83.

You must install both the Base agents and System p agents on all AIX hosts to be monitored. In the case of a Workload Partition (WPAR), the agents only need to be installed in the Global Environment. In order to monitor a WPAR setup for application mobility, the agents need to be installed on all systems that can potentially host the WPAR, including the Network File System (NFS) Server.

The systems administrator must be sure to not move the logical partition (LPAR) that has the common event console (CEC) agent installed, because the CEC agent must be on an LPAR of the system that it is monitoring.

Important: Prior to configuring the Hardware Management Console (HMC) Base agent, edit the \$CANDLEHOME/configph_dd.properties file and add the following lines to the end of the file:

KQZ_PRODDESC=IBM Tivoli Monitoring: HMC Base Agent

KQZ_PRODNAME=IBM Tivoli Monitoring: HMC Base Agent

Failure to add these lines will generate Java exception errors when you try to configure the HMC Base agent.

😻 file:// - Management Edition	for AIX 1.1.1 - nimserver - Mozilla Firefox	X
IBM software		
	Language selection: English	
Welcome	Install and configure the System p TM agents, version 6.2	1
How to use the launchpad	install and configure the System p agents, version 6.2	
Upgrade from version 1.1.0 Product information	 To install one or more System p agents on this computer, select the agent or agents to install, enter the installation path and the encryption key, and click Install selected agents. For more information about the input data and the agents, see the IBM Twolk Montoring documentation. 	
Install DB2	Install the AIX® Premium agent	
Install Monitoring	Install the Central Electronics Complex Base agent	
Install Tivoli Enterprise Monitoring Server	Install the Hardware Management Console Base agent Installation path: //opt/IBM/ITM	
Install Tivoli Enterprise Portal Server		
Install Base agents	ынаурын кеу.	
Install System p agents	Install selected agents	
Install Warehouse Proxy Agent		
Install Summarization and Pruning Agent	You must configure each of the agents you have installed on this computer. To configure an agent, enter the installation path of the agent and click on the corresponding link.	
Install Application Dependency Discovery Manager	* Installation path: //opt//BM//TM	
Install Usage and Accounting Manager Configure Application Dependency	Sonfigure the AIX Premium agent	
Discovery Manager integration Configure Usage and Accounting Manager integration	Configure the Central Electronics Complex Base agent	
Use IBM Management Edition for AIX workspaces	Configure the Hardware Management Console Base agent	
Uninstall products	3. To start or stop one or more System p agents on this computer, select the agent or agents you want to start or stop, enter the	
Troubleshooting the launchpad	installation path, and click the following links:	
Exit	Central Electronics Complex Base agent	
	Hardware Management Console Base agent	
	Installation path: /opt/IBM/ITM	
	Start the selected agents	
	Stop the selected agents	
	For more information about installing and configuring agents, refer to the following publications:	
	 For general information about installing and configuring agents, see the section Installation and initial configuration of base components and agents -> Installing IBM Tivoli Monitoring -> Installing monitoring agents -> Linux or UNIX: Installing a monitoring agent in: 	
	IBM Tivoli Monitoring Installation and Setup Guide	-

Figure 3-41 Installation options window for System p agents

Step 1: Installing the System p agents

Select the corresponding System p agents to install on the system, and click **Install selected agents** to launch the install process as shown in Figure 3-42. During the process, the information window shows the products or agents being installed and their corresponding product codes that identify the individual agents.

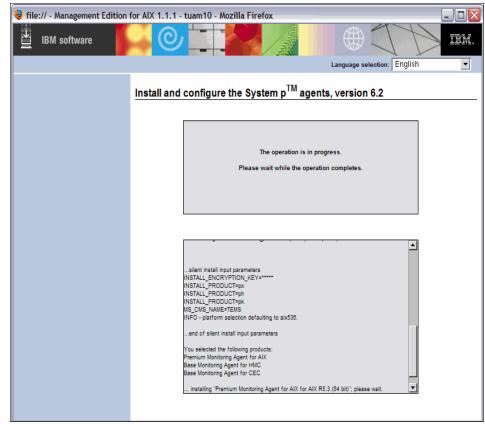


Figure 3-42 System p agents installation

Step 2: Configuring the System p agents

After the installation has completed, configure each agent individually in the "Install and configure the System p agents, version 6.2" window as shown in Figure 3-43.

🍓 file:// - Management Editio	on for AIX 1.1.1 - tuam10 - Mozilla Firefox
IBM software	
	Language selection: English
Welcome How to use the launchpad	▲ Install and configure the System p TM agents, version 6.2
Upgrade from version 1.1.0 Product information	 To install one or more System p agents on this computer, select the agent or agents to install, enter the installation path and the encryption key, and click Install selected agents. For more information about the input data and the agents, see the IBM Trudi Monitoring documentation.
Install DB2	Install the AIX® Premium agent
Install Monitoring	✓ Install the Central Electronics Complex Base agent
Install Tivoli Enterprise Monitoring Server	Install the Hardware Management Console Base agent Installation path: /opt/IBM/ITM
Install Tivoli Enterprise Portal Server	Encryption key:
Install Base agents	Install selected agents
Install System p agents	Install selected agents
Install Warehouse Proxy Agent	-
Install Summarization and Pruning Agent	You must configure each of the agents you have installed on this computer. To configure an agent, enter the installation path of the agent and click on the corresponding link.
Install Application Dependency Discovery Manager	Installation path: //opt/IBM/ITM
Install Usage and Accounting Manager	Configure the AIX Premium agent
Configure Application Dependency Discovery Manager integration	Configure the Central Electronics Complex Base agent
Configure Usage and Accounting Manager integration	Configure the Hardware Management Console Base agent
Use IBM Management Edition for AIX workspaces	-
Uninstall products	To start or stop one or more System p agents on this computer, select the agent or agents you want to start or stop, enter the installation path, and click the following links:

Figure 3-43 Configure System p agents window

Or, click **Configure** <*agent type*> to launch a Korn shell (ksh), which prompts you for the configuration parameters that are required for the customization of each of the agents as shown in Figure 3-44.

>	🕻 ksh	X
	Agent configuration started	
	Will this agent connect to a TEMS? [1=YES, 2=NO] (Default is: 1): TEMS Host Name (Default is: lpar07): nimserver	
	Network Protocol [ip, sna, ip.pipe or ip.spipe] (Default is: ip.pipe):	
	Now choose the next protocol number from one of these: - ip - sna - ip.spipe - 0 for none Network Protocol 2 (Default is: 0): IP.PIPE Port Number (Default is: 1918): Enter name of KDC_PARTITION (Default is: null):	
	Configure connection for a secondary TEMS? [1=YES, 2=NO] (Default is: 2): Enter Optional Primary Network Name or O for "none" (Default is: 0): Are you installing this product into a clustered environment [1=YES, 2=NO] (ult is: 2): Agent configuration completed Press enter to exit]	Defa

Figure 3-44 Installation parameters for System p agents

Step 3: Starting the agents

You can now select the check box corresponding to the System p agent or agents that are required to start as shown in the Launchpad window in Figure 3-45 on page 87.

3.	To start or stop one or more System p agents on this computer, select the agent or agents you want to start or stop, enter the installation path, and click the following links:
	AIX Premium agent
	Central Electronics Complex Base agent
	✓ Hardware Management Console Base agent
	* Installation path: /opt/IBM/ITM
	Start the selected agents
	Stop the selected agents

Figure 3-45 Starting the System p agents

3.3.7 Installing the Warehouse Proxy agent

To install the Warehouse Proxy agent, enter the required information with the installation path and encryption key as shown in Figure 3-46 on page 88, and then click **Install the Warehouse Proxy Agent**.

file:// - Management Edition	for AIX 1.1.1 - nimserver - Mozilla Firefox
IBM software	Language selection: English
Welcome	
How to use the launchpad	Install the Warehouse Proxy Agent, version 6.2
Upgrade from version 1.1.0	 Create the IBM® Tivoli® Data Warehouse database. For instructions refer to the IBM Tivoli Monitoring Installation and Setup Guide in the IBM Tivoli Monitoring information center:
Product information	
Install DB2	IBM Tivoli Monitoring Installation and Setup Guide
Install Monitoring	2. To install the Warehouse Proxy Agent, enter the required information below, then click Install the Warehouse Proxy Agent.
Install Tivoli Enterprise Monitoring Server	* Installation path: //opt/IBM/ITM
Install Tivoli Enterprise Portal Server	
Install Base agents	
Install System p agents	Install the Warehouse Proxy Agent
Install Warehouse Proxy Agent	
Install Summarization and Pruning Agent	 If the Tivoli Data Warehouse is not located on this computer where you have installed the Warehouse Proxy Agent, copy the DB2 UDB JDBC Universal Driver (Type 4 driver) JAR files, included with the DB2 product installation, to this computer. For instructions refer to the <i>IBM Twoli Monitoria</i> Installation and Seture Guide.
Install Application Dependency Discovery Manager	4. To configure the Warehouse Proxy Agent, enter the required information below, then click Configure the Warehouse Proxy Agent.
Install Usage and Accounting Manager	The "Manage Tivoli Enterprise Monitoring Services" window is opened, where you select the Warehouse Proxy Agent and then choose
Configure Application Dependency	the Configure option.
Discovery Manager integration	If you do not see the Warehouse Proxy Agent in the list of services to manage, it could be that you have not yet launched the installation of the agent, that the installation did not complete successfully, or that the agent has been uninstalled. Check which is the
Configure Usage and Accounting Manager integration	case, complete the installation, and then repeat this operation.
Use IBM Management Edition for AIX workspaces	Installation path: //opt/IBM/ITM
Uninstall products	Configure the Warehouse Proxy Agent
Troubleshooting the launchpad	
Exit	
	 To start or stop the Warehouse Proxy Agent, enter the installation path, and click the following links:
	* Installation path: /opt/IBM/ITM
	Start the Warehouse Proxy Agent
	Stop the Warehouse Proxy Agent

Figure 3-46 Installing the Warehouse Proxy agent

Review and accept the licensing agreement. Then, enter the path to the install images. The window will switch to the install information window as shown in Figure 3-47 until the installation completes.

File:// - Management Edition	or AlX 1.1.1 - nimserver - Mozilla Firefox	
IBM software	Contraction of the second seco	English
	Language selection	n: English
	The operation was successful. The operation log is shown below. It has also been saved as: /tmp/meaix/im_install.log. Close	
	Ve10R100" WARNING - Installing SAME version of "TMS Monitoring Agent for UNIX OS VE30R100" WARNING - Installing SAME version of "TMS Monitoring Agent for UNIX OS VE30R100" Ve10R100" postprocessing; please wat. finished postprocessing, Installation step complete As a reinider, you should install product support on each of your TEM servers for any agents you have just installed. This is done the "copt/IBM/TMM/init/mond support" command on your TEM servers. You may now configure any locally installed IBM Tivoli Monitoring product via the Topt/IBM/TM/Binitimond corfig command. UpdateAutoRun sh : installer level 820 / 300.	- -

Figure 3-47 Installation information window

To configure the Warehouse Proxy agent, enter the installation directory in Step 3 of the Install Warehouse Proxy agent, and then click **Configure the Warehouse Proxy Agent**.

The Manage Tivoli Enterprise Monitoring Services window opens, where you select **Warehouse Proxy** and then choose **Actions** \rightarrow **Configure** as shown in Figure 3-48.

Note: If you do not see the Warehouse Proxy agent in the list of services to manage, you might not have launched the installation of the agent, the installation might not have completed successfully, or the agent has been uninstalled. Determine which situation happened, complete the installation, and then repeat this operation.

figure				
figure Advanced				
t Service	Version V06.10.02.00	Platform	Configured	Status
Service	V06.10.02.00	AIX R5.1 (32 bit)/R AIX R5.1 (32 bit)/R		Stopped
	V06.20.01.00	AIX R5.3 (32 bit)/R		Stopped Stopped
te MultiInstance	V06.20.01.00	AIX R5.2 (64 bit)/R		Stopped
Catalog and Attribute files	V06.20.01.00	AIX R5.2 (64 bit)/R		Stopped
all Product Support	V06.20.01.00	ADX R5.1 (32 bit)/R		Stopped
an risuace support	V06.20.01.00	AIX R5.2 (32 bit)/R		Stopped
on enterprise wonitoring server	V06.20.01.00		Yes	Stopped
oli Enterprise Portal Server	V06.20.01.00	AX R5.3 (32 bit)/R		Stopped
versal Agent	V06.20.01.00	AIX R5.2 (64 bit)/R		N/A
rehouse Proxv	V06.20.01.00	AX R5.2 (32 bit)/R		Stopped
	1	Aessages		

Figure 3-48 Configuring the Warehouse Proxy agent

3.3.8 Installing the Summarization and Pruning agent

To install the IBM Tivoli Monitoring Summarization and Pruning agent, enter the installation directory and encryption key, and then click **Install the Summarization and Pruning Agent** in Step 1 on the LaunchPad window as shown in Figure 3-49.

😻 file:// - Management Edition	for AIX 1.1.1 - nimserver - Mozilla Firefox	X
IBM software		
	Language selection: English	
Welcome	Install the Summarization and Pruning Agent, version 6.2	-
How to use the launchpad		
Upgrade from version 1.1.0	 To install the IBM® Tivoli® Monitoring Summarization and Pruning Agent, enter the required information below, then click Install the Summarization and Pruning Agent. 	
Product information	Installation path: //opt/IBM/ITM	
Install DB2		
Install Monitoring		
Install Tivoli Enterprise Monitoring Server	Install the Summarization and Pruning Agent	
Install Tivoli Enterprise Portal Server		
Install Base agents	 If the Tivoli Data Warehouse is not located on this computer (where you installed the Summarization and Pruning Agent), copy the DB2 UDB JDBC Universal Driver (Type 4 driver) JAR files, included with the DB2 product installation, to this computer. 	
Install System p agents	For instructions refer to the IBM Tivoli Monitoring Installation and Setup Guide.	
Install Warehouse Proxy Agent	3. To configure the Summarization and Pruning Agent, enter the required information below, then click Configure the	
Install Summarization and Pruning Agent	Summarization and Pruning Agent. The "Manage Tivoli Enterprise Monitoring Services" window is opened, where you select the Summarization and Pruning Agent and then choose the Configure option.	
Install Application Dependency Discovery Manager	If you do not see the Summarization and Pruning Agent in the list of services to manage, it could be that you have not yet	
Install Usage and Accounting Manager	I you do not see the source and proving Agent in the inst services to manage, it could be not you have not yet launched the installation of the agent, that the installation did not complete successfully, or that the agent has been uninstalled. Check which is the case, complete the installation did not expect successfully.	
Configure Application Dependency		
Discovery Manager integration	* Installation path: //opt/IBM/ITM	
Configure Usage and Accounting Manager integration		
Use IBM Management Edition for AIX workspaces	Configure the Summarization and Pruning Agent	
Uninstall products	4. To start or stop the Summarization and Pruning Agent, enter the installation path, and click the following links:	
Troubleshooting the launchpad		
Exit	* Installation path: //opt/IBM/ITM	
	Start the Summarization and Pruning Agent	۲
	Stop the Summarization and Pruning Agent	
		•

Figure 3-49 Installing the Summarization and Pruning agent

Note: Further information regarding the complex deployments of agents, including remote deployment, is described in detail in Chapter 7, "Deploying IBM Tivoli Monitoring agents in a large scale environment," in *IBM Tivoli Monitoring: Implementation and Performance Optimization for Large Scale Environments*, SG24-7443.

Changing the file permissions

When you install the agents, you install them as the root user, or with privileges greater than those privileges of an applications user.

Follow this procedure to ensure that the permissions are set appropriately:

- 1. Log in to the host as root.
- 2. Create a user, such as itm1, that will own the files and the running agents. Use this command:

mkuser itm1

3. Create a group to which the itm1 user will belong:

mkgroup itmusers

4. Add the itm1 UID to the itmusers group:

```
chgroup users=itm1 itmusers
```

5. List the *itmusers* group to check that the *itm1* UID has been added as shown in Example 3-11.

Example 3-11 IBM Tivoli Monitoring application Group ID and user ID

```
root@aix:/opt/IBM/ITM# lsgroup itmusers
itmusers id=201 admin=false users=itm1 registry=files
```

6. Run the following command to ensure that the CANDLEHOME environment variable correctly identifies the IBM Tivoli Monitoring V6.2 installation directory:

echo \$CANDLEHOME

7. Change to the directory that is returned in the previous step:

cd \$CANDLEHOME

8. Confirm that you are in the correct directory:

pwd

9. Run the following commands:

```
chown -R itm1.itmusers .
chmod -R o-rwx .
```

Important: Running the following steps in the wrong directory can change the permissions on every file in every file system on the host.

10.Run the following command to change the ownership of additional agent files: ./bin/SetPerm

11. The \$CANDLEHOME directory now looks Example 3-12.

root@aix:/op	ot/IE	BM/ITM	I# 11					
total 136								
drwxr-x	-	itm1	itmusers				10:09	
drwxr-xr-x	5	bin	bin	256	Mar	10	16 : 38	••
drwxrwx	-	itm1	itmusers				2008	HTML
drwxrwx	3	itm1	itmusers					InstallITM
drwxr-x	4	itm1	itmusers				2005	JRE
-rw-rr		itm1	itmusers	86	Mar	15	10:21	KPHOUT.LOG
-rw-rr	1	itm1	itmusers	37	Mar	15	10:08	KPKOUT.LOG
-rw-rr	1	itm1	itmusers	37	Mar	15	10:09	KPXOUT.LOG
drwxrwx	3	itm1	itmusers	256	Mar	13	15 : 24	LAP
drwxrwx	6	itm1	itmusers	256	Mar	13	15:26	aix513
drwxrwx	7	itm1	itmusers	256	Mar	13	15:16	aix526
drwxrwx	3	itm1	itmusers	4096	Mar	13	15:37	bin
drwxr-x	2	itm1	itmusers	4096	Mar	13	15:12	classes
drwxrwx	4	itm1	itmusers	12288	Mar	15	10:23	config
drwxr-x	2	itm1	itmusers	256	Mar	13	15:12	doc
drwxr-x	2	itm1	itmusers	256	Mar	13	15:12	download
drwxr-x	6	itm1	itmusers	256	Mar	13	15:24	gskit
drwxr-x	4	itm1	itmusers	4096	Mar	13	2008	images
drwxr-x	2	itm1	itmusers	256	Mar	13	15:14	keyfiles
drwxrwx	4	itm1	itmusers	256	Mar	13	15:25	licenses
drwxrwx	2	itm1	itmusers	8192	Mar	15	10:11	logs
drwxr-x	2	itm1	itmusers	256	Mar	13	15:08	lost+found
drwxr-x	2	itm1	itmusers	256	Mar	13	2008	misc
drwxr-x	2	itm1	itmusers	256	Mar	13	15:24	old_registry
drwxr-x	2	itm1	itmusers	4096	Mar	13	15:28	registry
drwxrwx	2	itm1	itmusers	256	May	10	2008	samples
drwxrwx	2	itm1	itmusers	256	Mar	13	15:15	sqllib
drwxr-x	2	itm1	itmusers	256	Mar	13	15:12	tables
drwxrwx	2	itm1	itmusers	256	Mar	13	15:15	teclib
drwxrwx	9	itm1	itmusers	256	Mar	13	15:25	tmaitm6
drwxrwx	2	itm1	itmusers	12288	Mar	15	10:23	tmp
drwxr-x	2	itm1	itmusers	256	Mar	13	15:12	xfer

Example 3-12 User and Group ownership in the \$CANDLEHOME directory

12.We now restart the agents by either logging in as the itm1 user or by issuing the following command:

su - itm1 -c /opt/IBM/ITM/bin/itmcmd agent start all

13.By using the **cinfo** command, we check to confirm that the agents are running and that their processes are owned by our new application user as shown in Example 3-13 on page 94.

Example 3-13 Showing itm1 running agents

3.3.9 Configuring and starting the Virtual I/O Server agent

You can now configure the monitoring agent for the Virtual I/O Server:

1. List the available monitoring agents on the Virtual I/O Server:

```
$ lssvc
ITM_base
ITM_premium
TSM_base
ITUAM_base
TPC
DIRECTOR agent
```

2. From the results of the previous command, decide which agent you want to configure:

ITM_premium

3. Run the following command:

\$ cfgsvc -ls ITM_premium MANAGING_SYSTEM HOSTNAME RESTART_ON_REBOOT

4. Using the cfgsvc command, configure the agent attribute:

\$ cfgsvc ITM_premium -attr HOSTNAME=nimserver RESTART_ON_REBOOT=TRUE
MANAGING_SYSTEM=hmc1.itso.ibm.com
Agent configuration started...
Agent configuration completed...

5. Start the monitoring agent using the **startsvc** command:

startsvc ITM_premium

Next, in order for the monitoring agent to gather data from the HMC, you must:

Note: After you configure a Secure Shell connection for one agent, you do not need to configure it for subsequent agents.

- 1. Determine the name of the managed system that hosts the Virtual I/O Server where the monitoring agent is located.
- 2. Obtain the public key for the Virtual I/O Server using the following command:

```
viosvrcmd -m <managed system> -p <vios name>-c "cfgsvc -key <ITM
agent name>"
```

For example:

```
hscroot@hmc1:~> viosvrcmd -m 9117-MMA-SN101F170-L10 -p VIOS1_L10 -c
"cfgsvc -key ITM_premium"
ssh-rsa
AAAAB3NzaC1yc2EAAAABIwAAAQEAnCD5GAC3tKxv7f1A4PTrH15N57ZT+laoKOUVY9rH
LQQ0fPeerykvwJ0/YUhg51D4dVD1/uN81UnvbGrXTjVq4QwEGv0t3kwy9+ACI8E6xp/Q
HugUoBzSyJMPd3FUPeXHBTvdyY046wFak8AP7pHjuf+q3xvB0U/e3ax9rmv5oTcaNbhn
a5mc1VuIy11tbegsduwnvA3udaDpe0ev733gY5aTySGGai3BRhImkGFFHbW11qp06IG9
H8N8b1zt0hwY4rgEYE+09Nizx4xvmz5Z/DycA/xr/e1hhiRFKGpP2pg+RzfatKXIFGVE
FQg117f6iKi55WPJ9cpHtcUyLYsQIQ== root@vios1 110
```

Where:

- Managed system is the name of the managed system on which the Virtual I/O Server and monitoring agent are located.
- vios name is the name of the Virtual I/O Server LPAR as defined on the HMC.
- ITM agent name is the monitoring agent, for example, ITM_premium.
- 3. Update the authorized_key2 file on the HMC using:

mkauthkeys --add public_key

Where *public_key* is the output obtained in Step 2. For example:

```
hscroot@hmc1:~> mkauthkeys --add 'ssh-rsa
AAAAB3NzaC1yc2EAAAABIwAAAQEAnCD5GAC3tKxv7f1A4PTrH15N57ZT+1aoKOUVY9rH
LQQ0fPeerykvwJ0/YUhg51D4dVD1/uN81UnvbGrXTjVq4QwEGv0t3kwy9+ACI8E6xp/Q
HugUoBzSyJMPd3FUPeXHBTvdyY046wFak8AP7pHjuf+q3xvB0U/e3ax9rmv5oTcaNbhn
a5mc1VuIy11tbegsduwnvA3udaDpe0ev733gY5aTySGGai3BRhImkGFFHbW11qp06IG9
H8N8b1zt0hwY4rgEYE+09Nizx4xvmz5Z/DycA/xr/e1hhiRFKGpP2pg+RzfatKXIFGVE
FQg117f6iKi55WPJ9cpHtcUyLYsQIQ== root@vios1_110'
```

After you complete these tasks, you can view the data that the monitoring agent has gathered in the Tivoli Enterprise Console.

3.3.10 Viewing the Tivoli Enterprise Console

You can now launch a client browser, Internet Explorer® V5 or higher. In the address field, enter the URL that is shown in Figure 3-50.

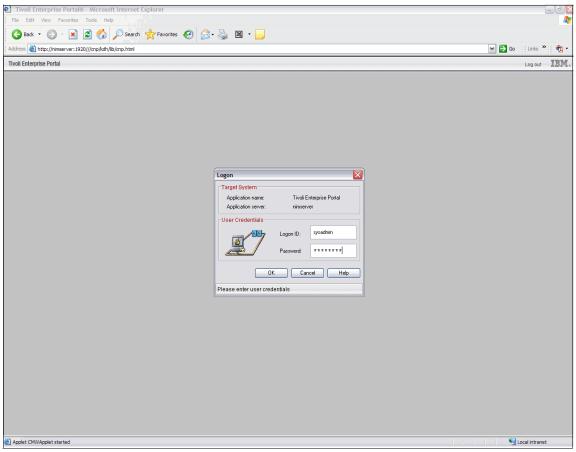


Figure 3-50 Tivoli Enterprise Console login window

After you log in, the enterprise environment view workspace appears that is shown in Figure 3-51.

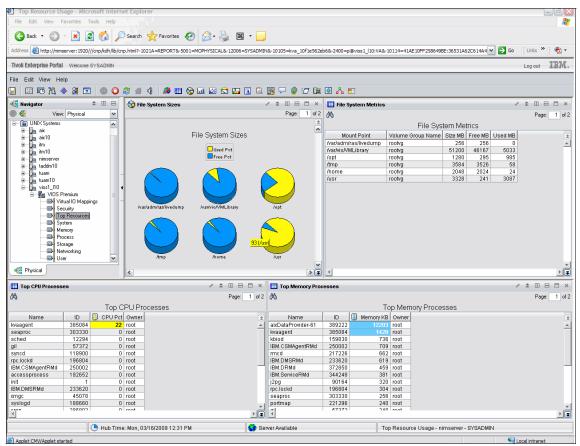


Figure 3-51 Enterprise view of the environment

We describe the Tivoli Enterprise Console and managing the workspaces or views and queries in the console in greater detail in Chapter 4, "Operations" on page 159.

3.4 Installing and configuring TADDM

In this section, we provide steps to install Tivoli Application Development Discovery Manager (TADDM) on AIX:

▶ 3.4.1, "Preparing AIX" on page 98

- ▶ 3.4.2, "Install DB2" on page 99
- ▶ 3.4.3, "Create DB2 database" on page 100
- ► 3.4.4, "Install TADDM 7.1" on page 100
- ► 3.4.5, "DNSLookup configuration" on page 117

3.4.1 Preparing AIX

The test systems referenced in this publication have five logical partitions on two physical servers. One of the partitions is the TADDM server, and the other partitions are target servers. Even though there can be multiple TADDM servers in a large environment, we will have one TADDM server, and it will manage target partitions. If you are interested in configuring multiple TADDM servers for better performance or other management purposes, refer to *Deployment Guide Series: IBM Tivoli Application Dependency Discovery Manager V7.1*, SG24-7616.

Before starting to install DB2 and TADDM, perform the following steps at the operating system level:

- 1. Install the base operating system (AIX 6.1).
- 2. Install the Common Desktop Environment (CDE) bundle for X Windows.
- 3. Install a Web browser (Firefox 2.0) as shown in "Installing Firefox" on page 30
- 4. Install **unzip** and **sudo** on the TADDM server (After installing **sudo**, type the **visudo** command and then add in the User privilege specification as shown in Example 3-14:

cmdbadm ALL=(ALL) NOPASSWD:ALL

Example 3-14 Installing and configuring sudo

```
taddm10:/mnt/Linux_tools/ppc ] ls -l sudo*
                                 205789 Feb 26 11:00
-rw-r----
            1 root
                     system
sudo-1.6.9p15-2.aix5.2.ppc.rpm
-rw-r----
            1 root
                                 200394 Feb 26 11:00
                     system
sudo-1.6.9p15-2noldap.aix5.2.ppc.rpm
taddm10:/mnt/Linux tools/ppc ] rpm -ivh
sudo-1.6.9p15-2noldap.aix5.2.ppc.rpm
sudo
taddm10:/mnt/Linux tools/ppc ] visudo
# sudoers file.
#
```

This file MUST be edited with the 'visudo' command as root. # Failure to use 'visudo' may result in syntax or file permission errors # that prevent sudo from running. # See the sudoers man page for the details on how to write a sudoers file. ## Host alias specification # User alias specification # Cmnd alias specification # Defaults specification # Runas alias specification # User privilege specification ALL=(ALL) ALL root cmdbadm ALL=(ALL) NOPASSWD:ALL # Uncomment to allow people in group wheel to run all commands

- 5. Install d **ssh** and **1sof** on all the target servers as well as TADDM server. (The ssh needs to be configured on both TADDM and target servers.)
- 6. Create a file system for TADDM (size: 3 GB): /opt/IBM/cmdb on a non-rootvg volume group.

Note: The **unzip** and **sudo** programs are required on the TADDM server, and the **ssh** and **lsof** programs are necessary on all the target servers, as well as the TADDM server. You can find the ssh filesets in the Expansion Pack, while the unzip, sudo, and lsof files are in AIX Toolbox for Linux.

3.4.2 Install DB2

The TADDM installation supports several installation scenarios, including:

- 1. Simple installation with the installation of a DB2 database. This scenario installs and configures a local DB2 database as part of the TADDM installation.
- 2. Simple installation without the installation of a DB2 database. This scenario is for situations where you already have your local DB2 database installed.

 Advanced installation with a remote DB2 database. This scenario requires you to install your DB2 database on a remote server prior to the installation of TADDM.

For our implementation, we chose the second option in the previous list of options, which is the simple installation without the installation of a DB2 database. This installation scenario is relatively straightforward, and it can help you understand the relationship between DB2 and TADDM.

Refer to "Install DB2 Enterprise Server" on page 35 for installing a database.

3.4.3 Create DB2 database

In the TADDM DVD, there is a script named make_db2_db.sh that helps you to create the initial database for TADDM.

To run make_db2_db.sh, log on (or su) as the instance owner, and copy the script from \$TADDM_MEDIA/TADDM/support/bin or to the home directory of the instance owner of db2inst1. And then, run the make_db2_db.sh as shown in Example 3-15. We will create a database that has a name of cmdb.

Example 3-15 Creating database for TADDM

\$ /home/db2inst1/make_db2_db.sh cmdb

3.4.4 Install TADDM 7.1

To complete the installation of TADDM:

- 1. Log in to the AIX system as the root user.
- Locate the installation media and copy it to the AIX system. We will use the /mnt/TADDM71 directory as a TADDM installation image.
- 3. Go to the directory where you have the Launchpad directory and run the launchpad.sh command, for example:

/mnt/launchpad/launchpad.sh

4. Issue the **launchpad.sh** command to display the Launchpad panel, which is shown in Figure 3-52 on page 101.

5. Click Install Application Dependency Discovery Manager → Install product on the left pane, and then click Install Tivoli Application Dependency Discovery Manager.

Note: If you want to invoke an install program for TADDM directly instead of using Launchpad, then run the /TADDM_media/TADDM/setupAix.bin command on the X Windows environment.

😻 file:// - Management Edition	for AIX 1.1.1 - taddm10 - Mozilla Firefox
IBM software	
	Language selection: English
Welcome	Install IBM® Tivoli® Application Dependency Discovery Manager, version 7.1
How to use the launchpad	
Upgrade from version 1.1.0	To complete the IBM Tivoli Application Dependency Discovery Manager installation you need to install the product itself.
Product information	Note: if, after installing and configuring the IBM Tivoli Application Dependency Discovery Manager database you did not change to a different system to where the database is installed, do so now, by exiting from the launchpad, moving it to the system
Install DB2	where Application Dependency Discovery Manager is to be installed, relaunching the launchpad, and returning to this page.
Install Monitoring	1. Click Install IBM Tivoli Application Dependency Discovery Manager to install the product:
Install Application Dependency Discovery Manager	Install IBM Tivoli Application Dependency Discovery Manager
Create database	
Install product	2. The configuration change information cannot be viewed correctly in the Tivoli Enterprise Portal without applying a fix to
Install Usage and Accounting Manager	Application Dependency Discovery Manager.
Configure Application Dependency Discovery Manager integration	Apply the latest fixes, ensuring to apply at least Interim Fix 03
	Access the support page for IBM Tivoli Application Dependency Discovery Manager. Follow the instructions on the page to locate and download the latest fix or fixes for the product you have installed. Ensure that the fix you choose to
Configure Usage and Accounting Manager integration	install includes Interim Fix 03. Install the fix or fixes, following the instructions in the readme files that accompany them. To access the support page click the following link:
Use IBM Management Edition for AIX	
workspaces	IBM Tivoli Application Dependency Discovery Manager support center
Uninstall products	
Troubleshooting the launchpad	
Exit	

Figure 3-52 Launchpad to install TADDM

6. The next window (Figure 3-53) explains, "IBM Tivoli Application Dependency Discovery Manager must be installed on a different computer than where its database is installed."

Click **OK** to continue, because we intended to install the database and TADDM on the same server to simplify our configuration.



Figure 3-53 Prompt for database and TADDM on a separate server

7. In the next window, provide a directory path for the TADDM setup and click **OK** as shown in Figure 3-54.

😻 file:// - Select TADDM setup directory Mozilla Firefox 🛛 🔀
Select the IBM Tivoli Application Dependency Discovery Manager installation setup directory or CD.
/mnt/TADDM71
OK Cancel Browse

Figure 3-54 Selecting TADDM setup directory

The next window displays the InstallShield Wizard, which is shown in Figure 3-55.



Figure 3-55 InstallShield Wizard Welcome panel

The next window shows the license agreement for TADDM. Read the licensing terms, and if you agree to the licensing terms, click **I accept both the IBM and the non-IBM terms** as shown in Figure 3-56.

🔀 Tivoli Application De	ependency Discovery Manager v7.1 - InstallShield Wizard 📃 🗔 🔀
	Please read the following license agreement carefully.
Tivoli, software	Part 1 - General Terms
*	BY DOWNLOADING, INSTALLING, COPYING, ACCESSING, OR USING THE PROGRAM YOU AGREE TO THE TERMS OF THIS AGREEMENT. IF YOU ARE ACCEPTING THESE TERMS ON BEHALF OF ANOTHER PERSON OR A COMPANY OR OTHER LEGAL ENTITY, YOU REPRESENT AND WARRANT THAT YOU HAVE FULL AUTHORITY TO BIND THAT PERSON, COMPANY, OR LEGAL ENTITY TO THESE TERMS. IF YOU DO NOT AGREE TO THESE TERMS,
CON CONTRACTOR	Read non-IBM terms
Y Y	I accept both the IBM and the non-IBM terms
	I do not accept the terms in the license agreement
	Print
InstallShield	
	< Back Next > Cancel

Figure 3-56 License Agreement

In the next window, you will be prompted to enter the name of the directory where you want to install TADDM. We chose /opt/IBM/cmdb as shown in Figure 3-57. Click **Next.**

🔀 Tivoli Application Dependency Discovery Manager v7.1 - InstallShield Wizard 📃 🗆 🔀			
Tivoli software	Click Next to install "Tivoli Application Dependency Discovery Manager v7.1" to this directory, or click Browse to install to a different directory.		
*	Directory Name:		
	Browse		
Installshield			
maranameta -	< Back Next > Cancel		

Figure 3-57 Selecting the installation directory for TADDM

In the next window, you can enter the user that you want to start the TADDM Server process. This user must be a non-root user. If this user does not exist, you might request that the InstallShield Wizard create the user account for you by selecting **Create user ID if it does not exist** as shown in Figure 3-58.

🔀 Tivoli Application Dependency Discovery Manager v7.1 - InstallShield Wizard 📃 🗔 🔀			
	Enter a non-root user that you can use to run the Tivoli Application Dependency Discovery Manager server. This non- root user is used to start the server process. cmdbadm I Create user ID if it does not exist.		
	< Back Next > Can	icel	

Figure 3-58 Defining a TADDM user

The next window shows installation type options. Choose the installation type: simple or advanced. A simple installation uses default values for a local DB2 database. We chose **Advanced** because we have a database up and running for TADDM as shown in Figure 3-59.

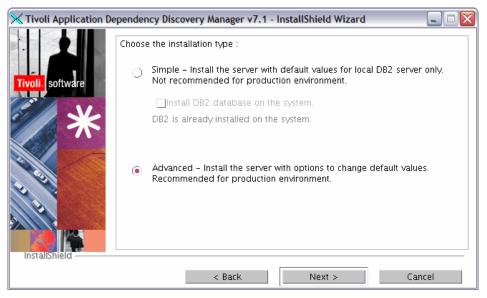


Figure 3-59 Choose the installation type

In the next window, you can select the server type. Select the server type for the TADDM Server that you are installing. We chose **Domain Manager (CMDB) Server**, because we plan to have only one TADDM server in our environment as shown in Figure 3-60.



Figure 3-60 Selecting server type

The next window shows the TADDM server port information. Review the default port information and change any port numbers that need to be changed. We accepted all of the default port values as shown in Figure 3-61.

🔀 Tivoli Application Dependency Discovery Manager v7.1 - InstallShield Wizard 🛛 📃 🗌 🔀			
	Tivoli Application Dependency Discovery Manager server port information		
	Web Server port	9430	
Tivoli software	Web Server SSL port	9431	
AT AN	JNDI port	9432	
	RMI port	9433	
	Topology Manager communication port	5636	
	Topology Builder port number	5637	
(O)	RMID port	1098	
N N	GUI-Server communication port	9435	
	GUI-Server SSL communication port	9434	
InstallShield -			
	< Back Next >	Cancel	

Figure 3-61 Port information for TADDM Server

In the next window, you can provide the port information for the domain manager server. We took the default values as shown in Figure 3-62.

14.Click Next.

🔀 Tivoli Application Dependency Discovery Manager v7.1 - InstallShield Wizard 📃 🗆 🔯			
Tivoli, software	Domain Manager server port information when r environment.	running in an enterprise	
Joint and	Security Manager port	9 540	
	Topology Manager port	9550	
	API Server port	9560	
	Change Manager port	9570	
Q Y	Report Server port	9580	
I PI			
InstallShield			
	< Back Ne	xt > Cancel	

Figure 3-62 Port information for domain manager server

In the next window, you can enter the host name for the Remote Method Invocation (RMI) server. We took the default for the host name for the RMI server. Next, select the platform binaries that you want installed. Choose **AIX**, because we are not installing the original TADDM, but the TADDM that is part of Management Edition (ME) for AIX.

15. To start this TADDM Server when the system is started, select **Start the server at system boot**.

16.To start the server after the installation of TADDM is complete, select **Start the server after install** as shown in Figure 3-63. Click **Next**.

K Tivoli Application De	pendency Discovery Manager v7.1 - Inst	allShield Wizard 📃 🗆 🔀
	Tivoli Application Dependency Discovery N	fanager server information
	RMI server Host Name	default
Tivoli. software	Install the binaries for the anchor server	
CAR I LA CAR	Solaris on Sparc	
El / No	ORedhat Enterprise Linux or SUSE	Linux Enterprise server on x86
	⊖Linux/390	
	AIX	
	Windows	
NY Y		
	Start the server at system boot	
	✓ Start the server after install	
InstallShield		
CONTRACTOR CONTRACTOR		
	< Back	Next > Cancel

Figure 3-63 Specifying RMI information

The next window, which is shown in Figure 3-64, asks for the host name and port number of the Change and Configuration Management Database (CCMDB). We left this panel blank, because our implementation did not include a CCMDB.

🔀 Tivoli Application Dependency Discovery Manager v7.1 - InstallShield Wizard 📃 🗆 🔀			
	Optional – Specify the Change Configuration name and port number.	n Management Database server host	
Tivoli. software	Host Name		
	Port		
InstallShield			
	< Back	Next > Cancel	

Figure 3-64 Optional CCMDB host name and port

In the next window, which is shown in Figure 3-65, you can select the database type for the TADDM database that you are installing.

18.We are using DB2, so we selected **DB2**.

We chose not to set up the WebSphere Federation Server; therefore, we did not select the Setup WebSphere Federation Server check box.

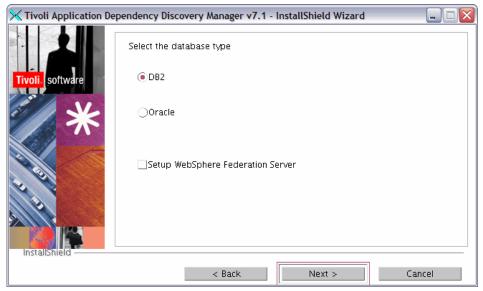


Figure 3-65 Select database type

The next window asks for information about the database. We created our database prior to installing TADDM. Enter the database information here as shown in Figure 3-66.

20.Click Next.

🔀 Tivoli Application Dependency Discovery Manager v7.1 - InstallShield Wizard 📃 🗌 🔀			
	DB2 configuration information		
	Database Host Name	taddm10	
Tivoli, software	Database Port		50010
	Database node name (DB2 client only)		
	Database Name		cmdb
	DB2 Instance User ID		db2inst1
	DB2 Instance User Password		*****
	Additional User ID for database access		archuser
	Additional Password for database access		*****
9	Create the database during install. Local D	DB2 only.	
Installshield	Help with create database		
	< Back	Vext >	Cancel

Figure 3-66 Database configuration information

In the next window, you can select the option for the user registry that will be used with TADDM.

- 21.We selected **File Based User Registry** in this configuration as shown in Figure 3-67.
- 22.Click Next.

🔀 Tivoli Application De	pendency Discovery Manager v7.1 - InstallShield Wizard	_ 🗆 🗙
	Select the User Registry Option	
Tivoli, software	File Based User Registry	
E V	OLDAP User Registry	
InstallShield	⊖WebSphere Federated Repositories	
	< Back Next > Can	cel

Figure 3-67 Select user registry

The next window shows the summary information.

23.If the information is correct, click **Install** to begin the installation as shown in Figure 3-68.

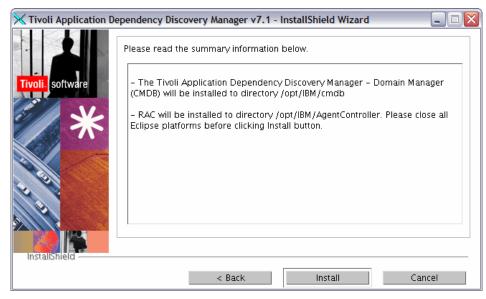


Figure 3-68 Summary information

24. When the installation completes, review the installation summary information, and click **Finish** as shown in Figure 3-69.



Figure 3-69 Completion of TADDM installation

3.4.5 DNSLookup configuration

If you do not use Domain Name System (DNS) in your environment, edit the \$TADDM_installed_directory/dist/etc/collation.properties file to disable DNSLookup (In our example, the \$TADDM_installed_directory is /opt/IBM/cmdb.):

- com.collation.platform.os.disableDNSLookups=true (the default is false)
- com.collation.platform.os.disableRemoteHostDNSLookups=true (the default is false)

3.5 Installing and configuring IBM Tivoli Usage and Accounting Manager

In this section, we provide the steps to install Tivoli Usage and Accounting Manager:

- ► 3.5.1, "Our lab environment" on page 118
- ► 3.5.2, "Installation process overview" on page 119

- ► 3.5.3, "Installing the Application server" on page 119
- ▶ 3.5.4, "Database configuration" on page 129
- ▶ 3.5.5, "Set up the processing directories" on page 139
- ▶ 3.5.6, "Run sample jobs" on page 141
- ► 3.5.7, "AIX and Virtual I/O Server data collectors" on page 143
- ► 3.5.8, "AIX Advanced Accounting overview" on page 144
- ► 3.5.9, "AIX data collector installation and configuration" on page 145
- "Installation prerequisites" on page 146

3.5.1 Our lab environment

Our lab environment for this installation consists of the Tivoli Usage and Accounting Manager server, three AIX Client LPARs, and a Virtual I/O Server. The TUAM server has a DB2 database that is installed locally on the system. The client LPARs and the Virtual I/O Server are configured with AIX Advanced Accounting, and then, the data collector is installed on each of the systems as shown in Figure 3-70.

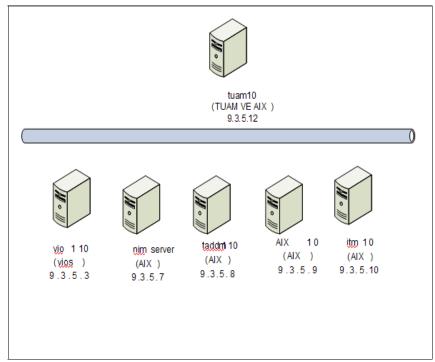


Figure 3-70 TUAM lab set up

3.5.2 Installation process overview

At a high level, the installation process for IBM Tivoli Usage and Accounting Manager Virtualization Edition consists of these tasks:

- Install the application server on the system.
- Create the database, and perform the initial configuration and database initialization.
- Install the Business Intelligence Reporting Tools (BIRT) reporting server. We discuss this topic in 4.4.4, "Installing Business Intelligence and Reporting Tools (BIRT)" on page 250.
- Install data collection in the target systems.

3.5.3 Installing the Application server

To complete the installation of IBM Tivoli Usage and Accounting Manager:

- 1. Log in to the server as root.
- 2. Change your directory to the location that contains the Launchpad program. In our example, we have mounted and copied all of the installation files that are needed to a NFS server and we are mounting remotely over /mnt. Run launchpad.sh, and the Launchpad program appears.

3. The installation of DB2 Enterprise Server Edition is a prerequisite to installing IBM Tivoli Usage and Accounting Manager. We provide the instructions for installing DB2 in 3.2, "Installing and configuring DB2" on page 34. If you have not already installed DB2, you can install it at this time either by following the steps provided in that section, or simply by choosing to install DB2 at the same time that you set up the database in the Launchpad. In the Launchpad, select Install Usage and Accounting Manager → Create Database as shown in Figure 3-71.

😻 file:// - Management Edition	for AIX 1.1.1 - tuam10 - Mozilla Firefox	
IBM software		
	Language selection: English	_
Welcome	Create IBM® Usage and Accounting Manager database	
How to use the launchpad		
Upgrade from version 1.1.0	To install Usage and Accounting Manager, you must first create and configure the Usage and Accounting Manager da DB2 Database instance that you are using for Management Edition for AIX. Ensure you are running the launchpad fro system.	
Product information		
Install DB2	Enter the required information below, then click Create IBM Usage and Accounting Manager database.	
Install Monitoring	* DB2 instance db2inst1	
Install Application Dependency Discovery Manager	• Database name ituamdb	
Install Usage and Accounting Manager	Create IBM Usage and Accounting Manager database	
Create database		
Install product		
Configure Application Dependency Discovery Manager integration		
Configure Usage and Accounting Manager integration		
Use IBM Management Edition for AIX workspaces		
Uninstall products		
Troubleshooting the launchpad		
Exit		

Figure 3-71 Create database

The database is created, and the log appears as shown in Figure 3-72. Click **Close** to continue.

😻 file:// - Management Edition	for AIX 1.1.1 - tuam10 - Mozilla Firefox	
IBM software		
	Language selection: Er	nglish 🗾
	Create IBM® Usage and Accounting Manager database	
	The operation was successful. The operation log is shown below. It has also been saved as:	
	/tmp/meaix/run_tuam_db.log.	
	Close	
	Starting ituamdb1 database creation	
	DB200001 The CREATE DATABASE command completed successfully.	
	Database Connection Information	
	Database server = DB2/AIX84 9.1.4 SQL authorization ID = DB2INST1	
	Local database alias = ITUAMDB1	
	DB200001 The SQL command completed successfully. DB200001 The SQL command completed successfully.	
	DB200001 The SQL command completed successfully.	
	DB200001 The SQL command completed successfully. DB200001 The SQL DISCONNECT command completed successfully.	
	Database creation successful	

Figure 3-72 Successful database completion message

 In the Launchpad, select Install Usage and Accounting Manager → Install Product → Install IBM Usage and Accounting Manager as shown in Figure 3-73 on page 122.

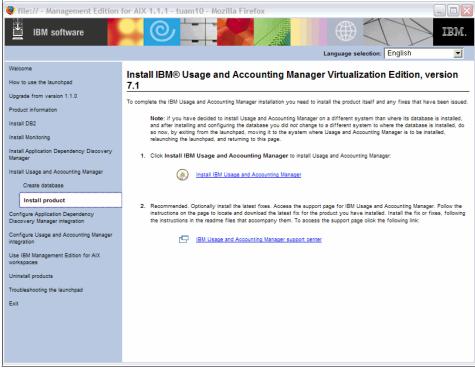


Figure 3-73 IBM Tivoli Usage and Accounting Manager Launchpad Installation

5. After choosing to install IBM Tivoli Usage and Accounting Manager, you will be prompted for the installation path as shown in Figure 3-74. Enter your path and click **OK**.

😻 file:// - Select IUAM setup directory Mozilla Firefox 👘 💈	R)
Select the IBM Usage and Accounting Manager installation setup directory or CD.	
/mnt/uam71	
OK Cancel Browse	

Figure 3-74 CD prompt

6. The InstallSheild Wizard for Usage and Accounting Manager Virtualization Edition starts as shown in Figure 3-75. Choose **Next** to continue.

Usage and Account	ing Manager Virtualization Edition	_ 🗆 🗙
	Welcome to the InstallShield Wizard for L Accounting Manager Virtualization Editio	-
	The InstallShield Wizard will install Usage and Accounting Manager Edition on your computer. To continue, choose Next.	Virtualization
	Usage and Accounting Manager Virtualization Edition IBM Corporation http://www.ibm.com	
InstallShield		
	<u>Next ></u>	<u>C</u> ancel

Figure 3-75 InstallShield Wizard for Usage and Accounting Manager

You will be presented with the license terms and agreement as displayed in Figure 3-76.

 Read the terms and agreement, and if you accept these terms, choose I accept both the IBM and the non-IBM terms and then click Next to continue.

IS Usage and Accountin	ng Manager Virtualization Edition 7.1.0						
	Discourse of the Collection Research and the second disc						
	Please read the following license agreement carefully.						
	International Program License Agreement						
	Part 1 – General Terms						
	BY DOWNLOADING, INSTALLING, COPYING, ACCESSING, OR USING THE						
And the second sec	PROGRAM YOU AGREE TO THE TERMS OF THIS AGREEMENT. IF YOU ARE						
	ACCEPTING THESE TERMS ON BEHALF OF ANOTHER PERSON OR A COMPANY OR OTHER LEGAL ENTITY, YOU REPRESENT AND WARRANT THAT YOU HAVE						
	FULL AUTHORITY TO BIND THAT PERSON, COMPANY, OR LEGAL ENTITY TO						
	THESE TERMS. IF YOU DO NOT AGREE TO THESE TERMS,						
	N.						
	Read non-IBM terms						
	I accept both the IBM and the non-IBM terms						
	OI do not accept the terms in the license agreement						
	Print						
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InstallShield							
and the second second second	< Back Next > Cancel						

Figure 3-76 IBM Tivoli Usage and Accounting Manager Virtualization Edition License Agreement

You will then see the InstallShield summary as displayed in Figure 3-77. The InstallShield summary gives details of exactly what will be installed on your system and the location and size of the installation.

8. Click **Install** to continue or **Cancel** to quit the installation.

Usage and Accountin	ng Manager Virtualization Edition 7.1.0
	Please read the summary information below.
	Usage and Accounting Manager Virtualization Edition will be installed in the following location: /opt/ibm/tuam
	for a total size: 1053.2 MB
InstallShield	< <u>B</u> ack <u>I</u> nstall <u>C</u> ancel

Figure 3-77 IBM Tivoli Usage and Accounting Manager Virtualization Edition summary information

While IBM Tivoli Usage and Accounting Manager installs, the InstallShield changes status to update the progress of your installation. The installation takes several minutes and might appear stalled on a couple of the windows for several minutes prior to continuing.

Figure 3-78 is an example of one of the installation status updates. You can cancel the installation at any point during the install by selecting **Cancel** while the InstallShield is running.

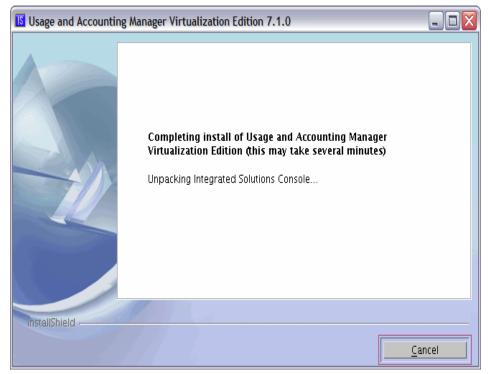


Figure 3-78 IBM Tivoli Usage and Accounting Manager Virtualization Edition InstallShield status

After the installation completes, the InstallShield completion panel appears as shown in Figure 3-79. If there are any issues with the installation, you can obtain the install log at:

/opt/ibm/tivoli/common/AUC/logs/install

9. If the installation succeeds, select **Finish** to exit the wizard.

Usage and Accountin	ng Manager Virtualization Edition 7.1.0	- 🗆 🛛
	Please read the summary information below.	
	The InstallShield Wizard has successfully installed Usage and Accounting Manager Virtualization Edition. Choose Finish to exit the wizard.	
InstallShield		
	<u> </u>	sh

Figure 3-79 IBM Tivoli Usage and Accounting Manager Virtualization Edition installation completion message

Verifying the application server

After the application server is installed, run the Tivoli Usage and Accounting Manager console application:

1. Change directory to the embedded WebSphere Application Server directory:

```
/opt/ibm/tuam/ewas/profiles/AppSrv01/bin
```

 In this directory, run the script to first stop the embedded WebSphere Application Server and then to restart the server using the stopServer.sh and startServer.sh commands. The application name for TUAM is server1. Example 3-16 on page 128 shows an example of successfully running the commands. Example 3-16 TUAM embedded WAS server restart

3. Open a Web browser and direct it to the Integrated Solution Console URL:

http://tuam10:11052/ibm/console

4. After you log in, the Welcome page appears (Figure 3-80). Verify that the product information matches the version that you have installed.

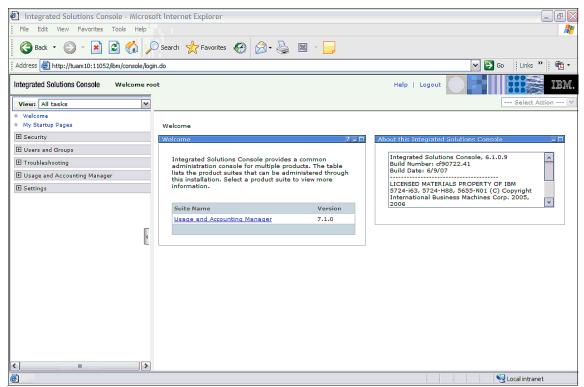


Figure 3-80 Integrated Solutions Console Welcome page

3.5.4 Database configuration

After creating the initial database and installing the application server, the next step is to configure the database server to connect correctly to the application server. Tivoli Usage and Accounting Manager requires a database with a page size of at least 16 KB. This size is not the default. In order to change it:

 Log on to the system containing the DB2 UDB database as the database user, db2inst1. Query the DB2 system tables to determine whether a large enough buffer pool exists. The SQL statement and results are in Example 3-17 on page 130.

Example 3-17 Connecting to database and listing buffer pool

 Define a buffer pool with a page size larger than the 4 KB default by using the CREATE BUFFERPOOL command. The SQL syntax is shown in Example 3-18.

Example 3-18 Creation of larger buffer pool

```
$ db2 "create bufferpool BP32K size 1000 pagesize 32k"
DB200001 The SQL command completed successfully.
```

3. Create a regular table space that uses the larger buffer pool as shown in Example 3-19.

Example 3-19 Creation of a regular table space

\$ db2 "create tablespace USERSPACE2 PAGESIZE 32K managed by system
using ('/home/db2inst1/db2inst1/NODE0000/SQL00002/SQLT004') bufferpool
BP32K"

DB20000I The SQL command completed successfully.

4. Create a temporary table space that uses the larger buffer pool as shown in Example 3-20. Ensure that the temporary parameter is used when creating this table space.

Example 3-20 Creation of temporary table space

```
$ db2 "create temporary tablespace TEMPSPACE2 PAGESIZE 32K managed by
system using ('/home/db2inst1/db2inst1/NODE0000/SQL00002/SQLT005')
bufferpool BP32K"
DB20000I The SQL command completed successfully.
```

5. Restart the database instance. Use the **LIST APPLICATION** command to check where the are any processes that are still using the database. The restart process is shown in Example 3-21.

<pre>\$ db2stop 03/04/2009 10:18:51 SQL1064N DB2STOP proce \$ db2start 03/04/2009 10:19:03 SQL1063N DB2START proc tuam10:/opt/ibm/tuam/ewa ADMU0116I: Tool informa /opt/ibm/tuam/ewas/prof ADMU0128I: Starting too ADMU3100I: Reading conf ADMU3200I: Server launci</pre>	0 0 SQ ssing was s 0 0 SQ essing was as/profiles tion is bei iles/AppSrv 1 with the iguration f hed. Waitin	L1063N DB2START processing was successful. successful. /AppSrv01/bin] ./startServer.sh server1 ng logged in file 01/logs/server1/startServer.log AppSrv01 profile		
Auth Id Application Name		Application Id	DB Name	# of Agents
DB2INST1 db2jcc_applica DB2INST1 db2evmg_DB2DET DB2INST1 db2evmg_DB2DET	34 33 32 31	*LOCAL.DB2.090304163442 *LOCAL.DB2.090304163441	ITUAMDB ITUAMDB ITUAMDB ITUAMDB ITUAMDB ITUAMDB	1 1 1 1

Note: If db2 LIST APPLICATION returns connections to the database, which it does in the second run in Example 3-21 on page 131, you must run /opt/ibm/tuam/ewas/profiles/bin/stopServer.sh server1 to terminate the connections. If you are running other applications that are accessing DB2, you must also stop those applications.

Configuring the JDBC driver

Tivoli Usage and Accounting Manager requires two JDBC drivers to connect to the DB2 database. The drivers are included with the DB2 base installation, and you need to load them into IBM Tivoli Usage and Accounting Manager using the Integrated Solutions Console. The default path for the JDBC drivers is /opt/IBM/db2/V9.1/java, and the two drivers that we need to use are:

- ► db2jcc.jar
- ▶ db2jcc_license_cu.jar

To configure the JDBC driver:

 To add the drivers to TUAM, open the Integrated Solutions Console (ISC) menu and select Usage and Accounting Manager → System Maintenance → Configuration. On the Drivers tab, click New to define a driver. Enter the path and filename of the DB2 UDB drivers as shown in Figure 3-81. Click OK.

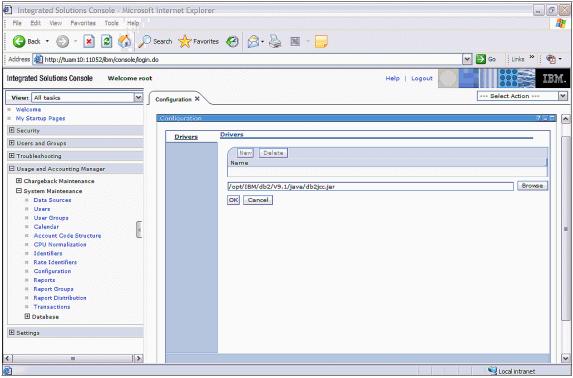


Figure 3-81 Adding JDBC driver db2jcc.jar

 Repeat the steps to add the second JDBC driver /opt/IBM/db2/V9.1/java/db2jcc_license_cu.jar to the IBM Tivoli Usage and Accounting Manager as shown in Figure 3-82, and click OK.

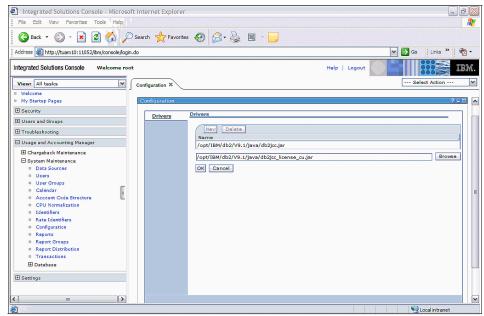


Figure 3-82 Adding JDBC driver db2jcc_license_cu.jar

Configuring the data sources

The second step to accessing the DB2 database from Tivoli Usage and Accounting Manager is to set up the data sources. We must set the database sources for the Server data source at minimum:

- In the ISC, select Usage and Accounting Manager → System Maintenance → Data Sources on the Server tab, and the database that you created from the Launchpad will be listed. If you do not see your database listed under the Server tab, you can add your database on this same tab by clicking New and filling in the fields as shown in Figure 3-83.
- 2. Then, click **OK** at the bottom of the page.

If your database is already listed, you need to edit the data source by selecting the view pop-up menu icon next to the data source **EditDataSource**. The same window that is shown in Figure 3-83 appears. Ensure that you change the fields for your environment, including User Name, Password, Host, and Database Type. When complete, click **OK** on the bottom of the page.

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= Transactions	Password		
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Figure 3-83 Adding or editing a data source

If you use multiple databases to store Usage and Accounting Manager (for example, you have a production database and a development database), you must select the data source for one database as the default for administration, data processing, and Web reporting. Note: This process is applicable for Server data sources only.

3. In the ISC, click Usage and Accounting Manager \rightarrow System Maintenance \rightarrow Data Sources on the Server tab.

Then, set the Default Admin, Processing, and Reporting data source by selecting the data source name and clicking **Set Admin** from the pop-up menu.

4. Then, select **Set Processing**, and finally, select **Set Reporting** so that all three functions are now set and show on the Server tab with a yes in the last three columns as shown in Figure 3-84.

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Figure 3-84 Setting the Default Admin, Processing, and Reporting data source

- 5. After the JDBC drivers have been loaded and the data source properties have all been configured, you must stop and start the embedded WebSphere server for the changes to take affect. As the root user, run:
- /opt/ibm/tuam/ewas/bin/stopServer.sh server1
- > /opt/ibm/tuam/ewas/bin/startServer.sh server1

Verify connectivity to database

We need to test the connection to verify that Tivoli Usage and Accounting Manager is able to communicate to the DB2 database. To test connection in the ISC, go to **Usage and Accounting Manager** \rightarrow **System Maintenance** \rightarrow **Data Sources,** click the pop-up menu next to your database name, and select **Edit**. Figure 3-85 appears. Select **Test** at the bottom of the page.

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Figure 3-85 Data Source ISC window

You should receive a response that your connection was successful. If you receive any errors, for example, the password is incorrect, correct the issue and try again.

Initialize the database

The steps used to initialize the database are:

- To initialize the Tivoli Usage and Accounting Manager database using the ISC menu, select Usage and Accounting Manager → System Maintenance → Database → Initialize Database as shown in Figure 3-86.
- 2. Click Initialize Database to initialize the database.

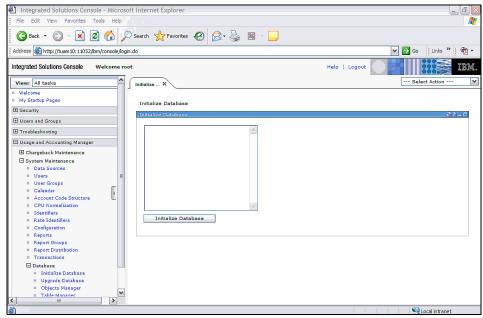


Figure 3-86 Initialize database

The confirmation message that is shown in Figure 3-87 appears. Verify that the database name and server match the system that you want to initialize.

3. Click Yes to continue to initialize the database.

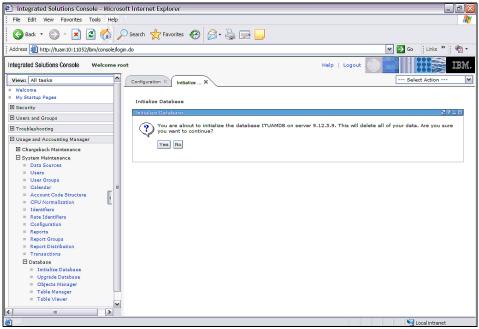


Figure 3-87 Confirmation window for database initialization

The results of the initialization appear.

4. Confirm that the database initialized successfully. If there were any issues, review the log that is present, correct the issue, and try again. A successful initialization log is shown in Figure 3-88.

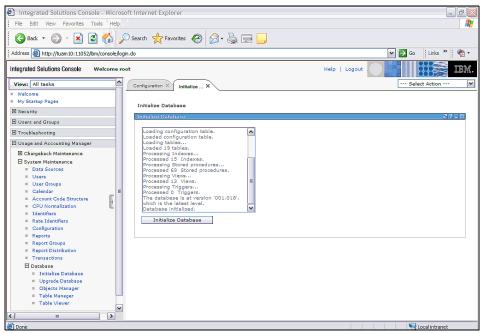


Figure 3-88 Results of database initialization

3.5.5 Set up the processing directories

To set up the processing directories:

- After you install Usage and Accounting Manager, you must set up directories to store the required files that are listed when you select ISC Configuration → Processing and Configuration → Reporting. The Configuration tab Processing page is shown in Figure 3-89 on page 140. In order for a remote system to process or send files to these directories, that system must have read-write permissions on these directories:
 - Job Files Path

Location of job files or the XML file that defines the process of collecting data and loading it into Usage and Accounting Manager database.

- Sample Job Files Path

Directory that contains the sample job files.

Job Log Files Path

The job logs provide processing results for each step that is defined in the job file. If a warning or failure occurs during processing, the file indicates at which point the warning or failure occurred.

Collector Log Files Path

Directory that will contain the collector log files.

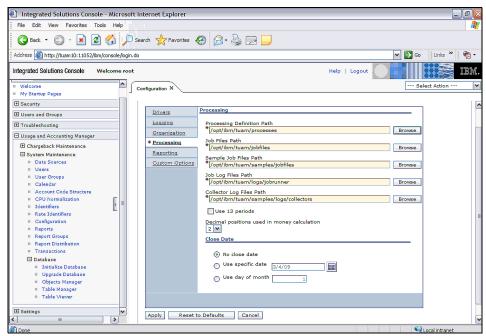


Figure 3-89 ISC Configuration Processing

- 2. The directories that are on the Configuration tab Reporting page need to be changed from the default directories for Tivoli Usage and Accounting Manager Virtualization Edition. The paths are:
 - Path to Standard Reports Folder

Directory that contains Usage and Accounting standard reports. There are five templates included for BIRT with IBM Tivoli Usage and Accounting Manager VE.

Path to Custom Reports Folder

Directory that contains custom reports. You create custom reports with your report developer either independently or by using one of the standard reports as a template. - Path to Published Reports Folder

Directory that contains published reports. Published reports are reports that have been saved with the data that was generated at the time that the reports were run.

The type of reporting supported with Tivoli Usage and Accounting Manager Virtualization Edition is BIRT reporting, which is an Open Source reporting tool. We need to set each of the reporting directories to point to the BIRT directories as shown in Figure 3-90.

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Figure 3-90 ISC Configuration tab Reporting page

3.5.6 Run sample jobs

Sample jobs allow you to validate the installation:

1. Before performing any additional configuration in Tivoli Usage and Accounting Manager, run the provided samples:

/opt/ibm/tuam/bin/RunSamples.sh | tee RunSamples.log

You can ignore warning messages pertaining to Simple Mail Transfer Protocol (SMTP), because we have not configured any of these jobs to use SMTP. To check the results, from the ISC menu, select **Usage and** Accounting Manager \rightarrow Chargeback Maintenance - Job Runner \rightarrow Log Files as shown in Figure 3-91.

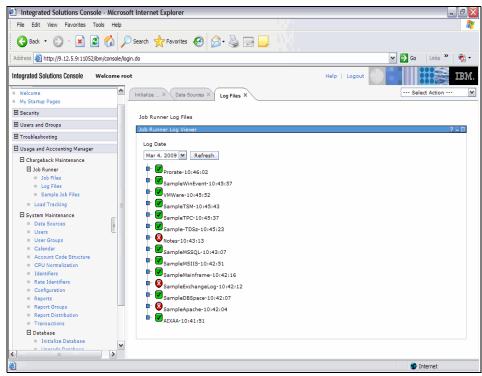


Figure 3-91 Sample log output

Other errors are caused by not installing the enterprise collector pack (ecp). To perform a final database cleanup, re-initialize it as described in the previous section, "Initialize the database" on page 137.

Alternatively, you can unload the data using the ISC menu selections **Usage** and Accounting Manager \rightarrow Chargeback Maintenance \rightarrow Load Tracking as shown in Figure 3-92. Clear the check box for the **End Date** filter and mark all by clicking the Select check boxes.

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Figure 3-92 Load tracking

2. Click **Delete Load** and confirm the security question to delete the data.

3.5.7 AIX and Virtual I/O Server data collectors

Tivoli Usage and Accounting Manager Virtualization for System p includes collectors for:

- AIX or Linux Operating System (pacct)
- AIX or Linux File System
- AIX Advanced Accounting
- Virtual I/O Server data collector

The configuration of the data collectors must be automated in order to gather the data from all the systems in the environment back to the Tivoli Usage and Accounting Manager Server. You will need to install the data and configure the data collectors on each of the AIX or Virtual I/O Server systems where you want to gather data. The process of gathering AIX Advanced Accounting Data for use with Tivoli Usage and Accounting Manager is shown in Figure 3-93.

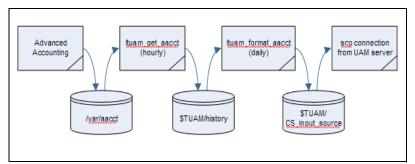


Figure 3-93 IBM Tivoli Usage and Accounting Manager data flow

3.5.8 AIX Advanced Accounting overview

AIX Advanced Accounting was introduced in AIX 5L[™] V5.3, to provide more detailed accounting than the traditional UNIX® accounting. Advanced Accounting supports the new virtualization technologies that are available with Power Systems and AIX, such as logical partitions (LPARs), micro-partitioning, and workload partitions (WPARs). You can also configure and use AIX Advanced Accounting on the Virtual I/O Server.

The data sources for Advanced Accounting include resources, such as disks, network interfaces, virtual devices, file systems, processors, and memory. We discuss the eleven major transaction record IDs in Advanced Accounting. When you turn on accounting, you need to select to enable any of the transactions that you want to track. Table 3-4 on page 145 lists the transaction records along with the type of data that it will record.

AACCT Transaction Record ID	Type of data
1-2	Process activity
4	System interval
6	File system activity
7	Network interface I/O
8	Disk I/O
10	Virtual I/O Server I/O
11	Virtual I/O Server client I/O
16	ARM-enabled transactions
36	WPAR system interval
38	WPAR file system activity
39	WPAR disk I/O

 Table 3-4
 AIX Advanced Accounting record types

You can obtain more details about AIX Advanced Accounting in Chapter 5 "Advanced Accounting," in *Accounting and Auditing on AIX 5L*, SG24-6396.

3.5.9 AIX data collector installation and configuration

In our implementation, data collection on the client side consists of three parts:

- AIX Advanced Accounting writes the accounting information into predefined files in the directory /var/aacct.
- Every hour, any new primary accounting files are copied from the directory /var/aacct to the directory \$TUAM/history and released to be reused.
- Every night, the files in the directory \$TUAM/history are processed to create separate accounting files for each Advanced Accounting record type in \$TUAM/CS_input_source.

The Tivoli Usage and Accounting Manager server collects the separate accounting files daily using the **scp** command.

In Figure 3-93 on page 144, \$TUAM represents our Tivoli Usage and Accounting Manager data collector installation directory /opt/ibm/tuam/collectors/unix.

Installation prerequisites

For the installation of the AIX Advanced Accounting and Tivoli Usage and Accounting Manager data collector, we created a directory on the NFS server that contains the files that are described in Table 3-5.

File name	Description
tuam_unpack_uc_collector	Installation script for the Tivoli Usage and Accounting Manager package
ituam_uc_aix5.tar	Tivoli Usage and Accounting Manager data collector package for AIX
ituam_schedule.sh	Our custom script to manage hourly and daily processing of AIX Advanced Accounting data
install-tuam.sh	Our custom installation script for setting up AIX Advanced Accounting and Tivoli Usage and Accounting Manager
id_rsa.pub	SSH public key for root user of our Tivoli Usage and Accounting Manager server, which is required for setting up data collection and generated with the ssh-keygen command

Table 3-5 Tivoli Usage and Accounting Manager AIX collector installation files

You must also install the openssh packages on all the systems to which you will be adding data collectors. You can locate the openssh packages on the Expansion Pack CD-ROM that is included with AIX V6.1 Enterprise Edition.

Example 3-22 shows the installation script for IBM Tivoli Usage and Accounting Manager AIX collector.

Example 3-22 Installation script: install-tuam.sh

#!/usr/bin/ksh

INSTPATH=/opt/ibm/tuam/collectors/unix
TUAMUSER=tuam

#First set up AIX Advanced Accounting

```
acctctl on
acctctl fadd /var/aacct/aacct0.dat 1
acctctl fadd /var/aacct/aacct1.dat 1
acctctl fadd /var/aacct/aacct2.dat 1
acctctl fadd /var/aacct/aacct3.dat 1
```

```
acctct] fadd /var/aacct/aacct4.dat 1
acctctl isvstem 5
acctctl iprocess 5
acctctl agproc on
acctctl agke on
acctctl agram on
mkitab 'aacct:2:once:/usr/bin/acctctl on >/dev/console 2>&1'
# Next set up userid for TUAM collector and enable ssh from the TUAM server
mkgroup ${TUAMUSER}
mkuser pgrp=${TUAMUSER} ${TUAMUSER}
mkdir ~${TUAMUSER}/.ssh
cp ./id rsa.pub ~${TUAMUSER}/.ssh/authorized keys2
chown -R ${TUAMUSER}.${TUAMUSER} ~${TUAMUSER}/.ssh
chmod 755 ~${TUAMUSER} ~${TUAMUSER}/.ssh
#Set up the script for the data collection
mkdir -p /usr/local/bin
cp ./ituam schedule.sh /usr/local/bin
#Install the TUAM collector
mkdir -p ${INSTPATH}
cp ./tuam unpack uc collector ./ituam uc aix5.tar ${INSTPATH}
cd ${INSTPATH}
#use aacct config=true when calling tuam unpack uc collector to prevent
#traditional UNIX process accounting for being started
./tuam unpack uc collector path=${INSTPATH} user=${TUAMUSER} aacct config=true
rm ${INSTPATH}/tuam unpack uc collector ${INSTPATH}/ituam uc aix5.tar
chmod 755 ${INSTPATH}/tuam unpack uc collector ${INSTPATH}/ituam uc aix5.tar
#Adjust TUAM AAA collector to include client vscsi
cp {{INSTPATH}/data/A config.par ${INSTPATH}/data/A config.par.back
cat ${INSTPATH}/data/A config.par sed
'/^AACCT TRANS IDS/s/^.*$/AACCT TRANS IDS="1,4,6,7,8,11"/' >/tmp/A config.tmp
cp /tmp/A config.tmp $INSTPATH}/data/A config.par
#Adjust the crontab for the data collection
crontab -1 sed '/.*aacct/s/^/#/' >/tmp/tempcrontab
echo '59 * * * * /usr/local/bin/ituam schedule.sh >
/opt/ibm/tuam/collectors/unix/log/ituam schedule.log 2>&1' >> /tmp/tempcrontab
crontab /tmp/tempcrontab
rm /tmp/tempcrontab
```

Example 3-23 on page 148 shows an example of the collector installation script output from one of our systems.

Example 3-23 The install-tuam.sh output

taddm10:/mnt, total 42248	/tuam] ls	-1		
-rwxr-xr-x	1 root	system	1921 Mar 19 15	5:18 install-tuam.sh
-rwxr-xr-x	1 root	system	450 Mar 19 11	:43 ituam-schedule.sh
-rwxr-xr-x	1 root	system	21575680 Mar 19 11	:45 ituam_uc_aix5.tar
-rwxr-xr-x	1 root	system	393 Mar 19 11	:52 tuam10.pub
-rwxr-xr-x	1 root	system	36719 Mar 19 11	:45 tuam_unpack_uc_collector

taddm10:/mnt/tuam] ./install-tuam.sh

chmod: /opt/ibm/tuam/collectors/unix/tuam_unpack_collector: No such file or directory
./tuam_unpack_uc_collector: Begin ITUAM UNIX/Linux Data Collector Installation

./tuam_unpack_uc_collector: ITUAM UNIX/Linux Data Collector will be installed in /opt/ibm/tuam/collectors/unix

Nodename	: taddm10
Platform Type	: AIX
Distribution tar file	: ituam_uc_aix5.tar
ITUAM UNIX/Linux Collector Home	: /opt/ibm/tuam/collectors/unix
ITUAM UNIX/Linux Collector User	: tuam
ITUAM UNIX/Linux cs_method	: HOLD
ITUAM UNIX/Linux server	:
ITUAM UNIX/Linux cs_user	:
Config AACCT	: TRUE

./tuam_unpack_uc_collector: Unpacking ituam_uc_aix5.tar in /opt/ibm/tuam/collectors/unix
x accounting

x accounting/README.txt, 0 bytes, 0 tape blocks

```
...
```

x scripts/oracle/ituam_stop_odb, 10526 bytes, 21 tape blocks

x scripts/oracle/ituam_view.sql, 3001 bytes, 6 tape blocks

./tuam_unpack_uc_collector: Initialize /opt/ibm/tuam/collectors/unix/accounting directory

```
./tuam_unpack_uc_collector: Initialize /opt/ibm/tuam/collectors/unix/bin directory
./tuam_unpack_uc_collector: Initialize /opt/ibm/tuam/collectors/unix/etc directory
./tuam_unpack_uc_collector: Initialize /opt/ibm/tuam/collectors/unix/scripts directory
./tuam_unpack_uc_collector: Initialize /opt/ibm/tuam/collectors/unix/data directory
./tuam_unpack_uc_collector: Initializing ITUAM Configuration File.
Setting - ITUAM_ACCDAT
Setting - ITUAM_BIN
Setting - ITUAM_DATA
Setting - ITUAM_DESCR
Setting - ITUAM_ETC
```

Setting - ITUAM EXAMPLES

- Setting ITUAM_HELP
- Setting ITUAM_HIEF
- Setting ITUAM_HISTORY
- Setting ITUAM_HOME
- Setting ITUAM_LOG
- Setting ITUAM_SCRIPTS
- Setting ITUAM_SUPER
- Setting ITUAM_USER
- Setting ITUAM_SERVER

```
Setting - ITUAM DEST
   Setting - ITUAM ACCOUNT
   Setting - ITUAM GROUP
   Setting - AACCT ONLY
   Setting - ITUAM SAMPLE
   Setting - CS_PLATFORM
   Setting - CS USER
   Setting - CS KEY
   Setting - CS UPATH
   Setting - CS METHOD
   Setting - CS PROC PATH
Starting ITUAM/UNIX create A storage.par Script at Thu Mar 19 15:37:26 CDT 2009
ITUAM/UNIX create A storage.par: Moving /opt/ibm/tuam/collectors/unix/data/A storage.par
to /opt/ibm/tuam/collectors/unix/data/A_storage.par.bck
ITUAM/UNIX create A storage.par: Creating new
/opt/ibm/tuam/collectors/unix/data/A storage.par
Ending ITUAM/UNIX create A storage.par Script at Thu Mar 19 15:37:34 CDT 2009
./tuam unpack uc collector: Initialize /opt/ibm/tuam/collectors/unix/description
directory
./tuam unpack uc collector: Initialize /opt/ibm/tuam/collectors/unix/examples directory
./tuam unpack uc collector: Initialize /opt/ibm/tuam/collectors/unix/help directory
./tuam_unpack_uc_collector: Updating root crontab
   previous ituam uc nightly entry replaced in crontab
./tuam unpack uc collector: ITUAM UNIX/Linux Data Collector installation complete
```

Virtual I/O Server data collector set up

Tivoli Usage and Accounting Manager Virtualization Edition also supports usage reporting for Virtual I/O Servers. Because the Virtual I/O Server is a closed architecture, the data collectors come installed with Virtual I/O Server Version 1.4. We recommend fix pack 8.1.0 or later to run Tivoli Usage and Accounting Manager agents. Example 3-23 on page 148 shows the steps to turning on data collection on Virtual I/O Server. The commands are run by the Virtual I/O Server user padmin. The high-level steps are:

- 1. List all the available IBM Tivoli Usage and Accounting Manager agents using the **1ssvc** command.
- 2. Using the **cfgsvc** command, list the attributes that are associated with the IBM Tivoli Usage and Accounting Manager agent that you want to configure.
- 3. Configure the IBM Tivoli Usage and Accounting Manager agent with its associated attributes using the **cfgsvc** command.

4. Start the IBM Tivoli Usage and Accounting Manager agent using the **startsvc** command.

Example 3-24 Configuration and start of data collector on Virtual I/O Server

```
$ lssvc
ITM_base
ITM_premium
TSM_base
ITUAM_base
TPC
DIRECTOR_agent
$ cfgsvc -1s ITUAM_base
ACCT_DATA0
ACCT_DATA1
ISYSTEM
IPROCESS
$ cfgsvc ITUAM_base -attr ACCT_DATA0=10 ACCT_DATA1=10 ISYSTEM=5
IPROCESS=5
$ startsvc ITUAM base
```

3.6 Installing and configuring WPAR manager

In this section, we briefly describe the concept of workload partitions (WPARs) and the functions of WPAR Manager.

Note: For installing and configuring a WPAR Manager, refer to the following publication that describes WPAR and WPAR Manager in-depth: *Workload Partition Management in IBM AIX Version 6.1*, SG24-7656.

3.6.1 WPAR concept

In AIX 6, workload partitions add an additional operating system software-based layer for the virtualization of operating environments. Each workload partition can host applications and isolate them from applications executing within other WPARs. This capability can be leveraged on any server platform capable of running AIX Version 6, including IBM pSeries POWER4 technology-based servers and later. Figure 3-94 on page 151 shows three application-specific or service-specific WPARs being hosted within a single LPAR.

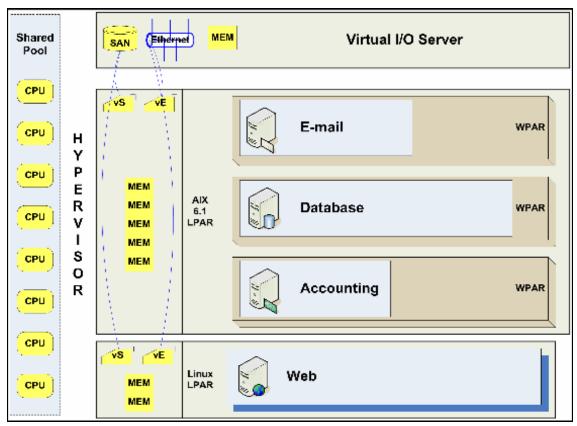


Figure 3-94 WPARs reduce LPARs but still provide workload isolation

Workload partitions can be created within an AIX V6 LPAR. Each workload partition provides an isolated environment for the application that it hosts. From the application or service point of view, the WPAR provides a replica of a standard AIX operating system environment. Furthermore, the WPAR runtime environment can be dedicated to only hosting that application (the workload) and can be tuned to optimize performance based on the specific workload characteristics of that application. Logically, WPARs can be considered as an operating system-level boundary around a specific set of AIX processes. Inside the WPAR, the applications have the following benefits:

- Private execution environments
- Isolation from other processes outside the WPAR
- Dedicated network addresses and file systems
- Interprocess communication that is restricted to processes executing only in the same workload partition

IBM Workload Partition Manager for AIX (WPAR Manager) is a tool for monitoring and managing WPARs. It will also gather information about CPU, memory, and other useful statistics.

There are new concepts introduced in WPAR:

Global environment

This term refers to the part of the AIX operating system that hosts workload partitions. This environment is the classical AIX environment. Typically, only the AIX V6 system's root superuser has access to to this environment, because it must be set up to host WPARs exclusively, not native applications.

System WPAR

This term refers to a more flexible WPAR-based instance of AIX. It contains dedicated writable file systems and system service daemons.

Application WPAR

This term refers to a WPAR that is set up to host only a single application or process. It provides an AIX runtime environment that is suitable for execution of one or more processes that can be started from a single command.

3.6.2 WPAR Manager components and functions

WPAR Manager is a Web-based Java application that uses Common Agent Services (CAS) and a database. CAS is installed automatically when you install WPAR Manager.

WPAR Manager can use either Apache Derby or DB2 as a database. During WPAR Manager installation, you select which database to use. If DB2 is selected, you also have to install and configure DB2, which is a separate installation process.

After the basic installation, CAS, WPAR Manager, and the database must be configured. When these configurations are complete, WPAR Manager is ready to orchestrate mobility events among servers.

Common Agent Service

To help you understand how WPAR Manager components work, we provide a brief overview of the Common Agent Services (CAS) framework. Figure 3-95 on page 153 shows WPAR Manager components, including the management server and two managed servers.

In this scenario:

- WPAR Manager is the application and user interface. It is in charge of communicating with the user and updating the database.
- CAS Agent Manager is in charge of the communication between the WPAR agent and the WPAR Manager in the LPAR.
- ► The database is the repository for all WPAR definition data.

There are WPARs running on the managed servers. B and G are set up as system WPARs, and W is set up as an application WPAR.

In this setup, the WPAR Manager must be able to move WPARs $\ensuremath{\texttt{W}}$ and $\ensuremath{\texttt{G}}$ between the two nodes.

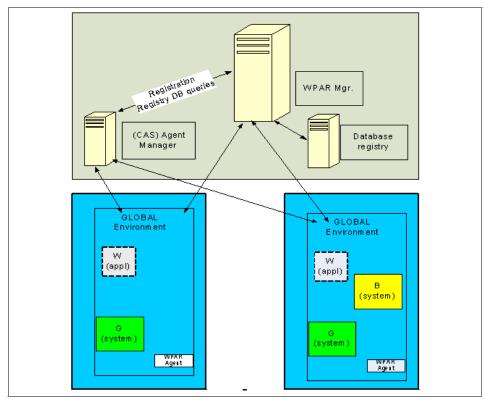


Figure 3-95 Components of WPAR Manager

Deploying WPAR Management software usually requires a server that hosts the management software and an agent that has to be installed on each server to be managed, as shown in Figure 3-95.

The effort required to install, configure, maintain, and monitor various agent implementations can become an extremely time-consuming management task. In addition, the number of redundant functions that is provided by each agent implementation (for example, listening to ports, the runtime daemon, and memory consumption) leads to ineffective usage of the system resources.

The goal of Common Agent Services is to minimize the complexity of the software management deployment by reducing the effort that is needed for deployment and utilizing system resources more effectively.

CAS accomplishes this goal by providing a common framework that can be reused by various management applications that are deployed across the enterprise.

This Common Agent Services framework consists of the following components:

- Agent Manager
- Resource Manager
- Common Agent

Agent Manager

Note: The Agent Manager component implements the CAS in the WPAR Manager application. This agent talks to the Common Agent on the managed systems.

The *Agent Manager* is the server component of the Common Agent Services. It provides authentication and authorization services, enables secure connections between managed systems in your deployment, and maintains the registry about the managed systems and the software running on those systems. It also handles queries from the Resource Managers against the database.

The Agent Manager has the following components:

► The Agent Manager service

The Agent Manager service serves as a certificate and registration authority to provide authentication and authorization using X.590 digital certificates and the Secure Sockets Layer (SSL) protocol. It also handles requests for registry information from Common Agents and Resource Managers.

Resource Managers and Common Agents must register with the Agent Manager service before they can use its services to communicate with each other. This registration is password-protected, and there are separate passwords for the Common Agents and Resource Managers. **Note:** For WPAR Manager, you only need to specify the registration password for the Common Agents. The password for the Resource Manager is automatically generated during the configuration of WPAR Manager.

► The registry

The registry is the database that contains the current configuration of all known Common Agents and Resource Managers.

Information contained in the registry includes:

- The identity, digital certificates, and communication information for each Resource Manager
- The identity, digital certificates, and communication information for each Common Agent
- Basic configuration information for each Common Agent (for example, hardware type and operating system version)
- The status of each Common Agent
- The last error or, optionally, a considerable number of errors, reported by each Common Agent

The registry information is updated by events, such as the registration of Common Agents and Resource Managers, and by periodic updates from the Common Agents.

Note: For WPAR Manager, the Agent Manager uses an Apache Derby database to implement the registry. This Derby database is included within the lightweight runtime fileset that is delivered with WPAR Manager.

The agent recovery service

The agent recovery service provides error logging for Common Agents that cannot communicate with other Agent Manager services.

WPAR Manager does not make use of this feature.

Note: The Agent Manager functionality for WPAR Manager is in the fileset wparmgt.cas.agentmgr.

CAS Agent Manager listens to communication from WPAR Agent and WPAR Manager on ports 9511, 9512, and 9513. These ports are default ports that can be overridden by the user during the configuration of WPAR Manager.

Resource Manager

A *Resource Manager* is management software that uses the services of the Agent Manager to communicate securely with, and obtain information about, the managed systems running the Common Agent software. The Resource Manager uses the services of the Common Agent to deploy and run its software on the managed systems.

Note that in our case, the WPAR Manager component of WPAR Manager is the Resource Manager of the CAS framework.

Note: The Resource Manager functionality for WPAR Manager is in the fileset wparmgt.mgr.rte. This fileset also includes the functionality of the WPAR Management console.

WPAR Manager listens to ports 14080 and 14443 and communicates to port 9510 on the WPAR Agent. WPAR Manager listens to ports 9511, 9512, and 9513 on the CAS Agent Manager. These ports are default ports that can be overridden by the user during the configuration of WPAR Manager.

Common Agent

Each managed system in your deployment runs a *Common Agent*, which provides a single implementation of common services that can be used by all management products.

The Common Agent consists of:

- Common Agent services
- Product-specific subagent (for example, for WPAR Manager, this code is the code for WPAR Agent)

For instance, if two management products (A and B) manage the same system, the Common Agent is installed only one time on that system, and it runs two product-specific subagents: one for product A and one for product B.

The Common Agent provides the following functions:

- A single set of security credentials and a common security infrastructure for all management applications
- Automated management of security credentials

The Common Agent certificate is automatically renewed when it is near the expiration date.

• Common Agent health monitoring and configuration monitoring services

The Common Agent has a "heartbeat" function that sends periodic status and configuration reports to the Agent Manager. It also allows any subagent to participate and to provide application-specific status.

The frequency of this update can be set, or it can be turned off. Management applications can register to the Agent Manager to receive these updates.

The registry contains only the most recent configuration update. By default, only the most recent status information is saved for each Common Agent. The retention period is configurable.

4

Operations

This chapter describes and discusses several of the more common optimization and utilization features of the components in day to day operations within a Power System environment:

- ► 4.1, "Live Application Mobility" on page 160
- ▶ 4.2, "Operating TM" on page 161
- ► 4.3, "Operating TADDM" on page 185
- ► 4.4, "Operating IBM Tivoli Usage and Accounting Manager" on page 237

4.1 Live Application Mobility

The ability to relocate a system's or an application's workload partitions (WPARs) from one AIX host or global environment to another AIX host or global environment means that we can optimize our virtualized System p hosts by deploying and redeploying WPARs using application mobility manually or automatically based on policies.

Policy-based Live Application Mobility assists in the overall utilization of WPARs within an environment by balancing the workloads across a range of Power Systems within the environment without administrator intervention.

Note: Live Application Mobility currently relies on common Network Flle System (NFS)-mounted file systems between the two global environments or AIX images. Future support for SAN and GPFS file systems is expected.

There are two modes of operation available for relocation: a classic mode that stops execution within the WPAR during the migration and an asynchronous mode that allows execution to continue during the migration. During the mobility operations, the application undergoes active relocation (*hot migration*) without stopping or disrupting the application.

Note: Live Application Mobility is not designed to, in any way, be a replacement for a High Availability (HA) solution. However, live application mobility can complement the IBM PowerHA offering.

Application mobility provides us with not only another optimization tool to better utilize our physical resources, it also allows for better management of planned migrations of workloads from one system to another system during planned outages, for instance, such as hardware maintenance, firmware installation, or energy conservation. The workload does not need to be aware of the migration, but we always recommend that you perform proper planning and testing before moving anything into or around a production environment.

For further information, refer to:

http://www.redbooks.ibm.com/abstracts/sg247656.html?Open

4.2 Operating TM

The following sections outline the basic operations involved with IBM Tivoli Monitoring:

- ▶ 4.2.1, "Workspaces" on page 161
- ► 4.2.3, "Managing Tivoli Monitoring Services" on page 168
- ▶ 4.2.4, "Historical data collection" on page 169
- ► 4.2.5, "Understanding situation events" on page 172
- ► 4.2.6, "IBM Tivoli Monitoring command line" on page 175
- ▶ 4.2.9, "Best practices" on page 184

4.2.1 Workspaces

The IBM Tivoli Monitoring tool that is packaged as part of AIX Enterprise Edition comes bundled with a range of queries and views to assist you with getting the tool operational in a short amount of time. You can then create your own views and queries, based on the predefined offerings for AIX, Virtual I/O Server, Hardware Management Console (HMC), and common event console (CEC).

4.2.2 Views

A range of predefined workspaces are built into your IBM Tivoli Monitoring product that consists primarily of chart views and table views. You can save them as new workspaces and customize them with a range of views.

Data views

The table and chart views are the first steps to getting something meaningful from the data that is being collected. When you understand what values and states cause problems, you can refine your views to show what is important.

The table view and the chart view provide current and historical information about monitoring data from Tivoli Enterprise Monitoring agents, such as system performance and configuration:

- ► Pie charts show portions of a whole (such as a percentage).
- ► Bar and plot charts, as well as gauges, show the values of each attribute.

The following sections provide an explanation of each of the views and provide an example of the same system metrics from our Network Installation Management (NIM) server represented in the various views. Each view can be initiated by clicking the corresponding icon from the Tivoli Enterprise Portal Toolbar and dragging the icon onto the panel that you want displayed in that particular view.

Table views

Table views show current data that is retrieved from a monitoring agent and show one column for every attribute. The table reports a single row of data or multiple rows, depending on the nature of the attribute group.

The table view also has features for refining the display to suit your needs. These features include adjusting column width, locking columns, and using drag and drop to change the order of columns. You can also sort column data differently in ascending or descending sequence by clicking the column heading. Figure 4-1 shows a table view.

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	^		Node	Timestamp	Name	Mount Point	۱.
	er Premium		nimserver:PX	03/18/09 09:13:50	livedump	/var/adm/ras/livedump	r 🔺
	Top Resou		nimserver:PX	03/18/09 09:13:50	hd10opt	/opt	r
	System		nimserver:PX	03/18/09 09:13:50	fslv05	/wpars/wp12/var	r
	Memory		nimserver:PX	03/18/09 09:13:50	fslv02	/wpars/wp12	r
	Process		nimserver:PX	03/18/09 09:13:50	hd3	/tmp	r
			nimserver:PX	03/18/09 09:13:50	db2lv	/home/db2inst1	r
	Networking _		nimserver:PX	03/18/09 09:13:50	fslv04	/wpars/wp12/tmp	r
	User		nimserver:PX	03/18/09 09:13:50	fslv01	/tftpboot	r
	WPAR	1	nimserver:PX	03/18/09 09:13:50	wpar1lv	/w/wpar01	8
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Figure 4-1 Table view

Chart views

You can view the predefined workspaces in one of five ways as shown in Table 4-1 on page 168:

A pie chart shows a slice for every data point in a single data series (row). Pie charts are well suited for showing the proportional value of related attributes to a whole, such as the percentage attributes that show how memory is being used (Figure 4-2).

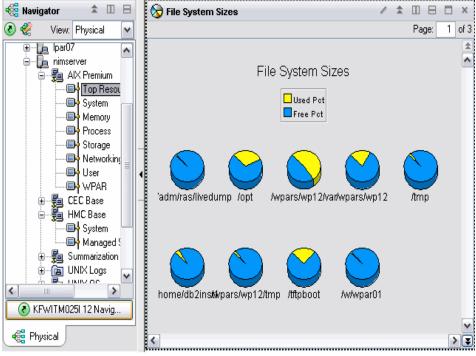


Figure 4-2 Pie chart

 A bar chart displays a bar for each data point. Bar charts are best suited for comparing values among related attributes. The stacking bar chart is well suited for showing multiple values for the same attribute (Figure 4-3).

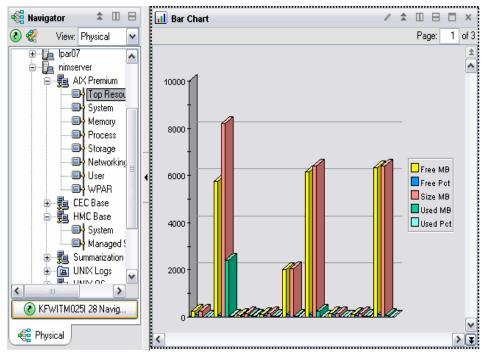


Figure 4-3 Bar chart

A plot chart shows changes over a period of time by drawing a continuous line from one data point to the next data point with one data point for each data sampling and one line for each selected attribute. The plot chart can be used for plotting multiple-row attribute groups (or historical data from a single-row attribute group) and multiple managed systems. You can also control the refresh rate of the plot chart so that it is independent of the refresh rate of the workspace as a whole. The plot chart is well suited for showing trends over time and among related attributes (Figure 4-4).

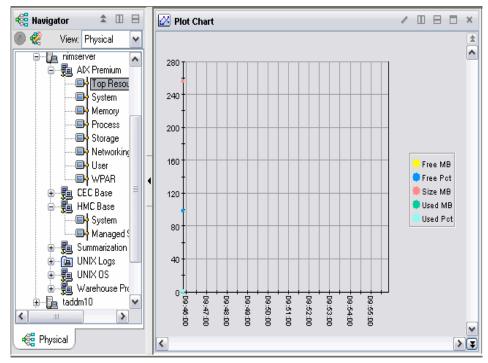


Figure 4-4 Plot chart

 A *circular gauge* shows the proportional amount of a data series with one gauge for each chosen attribute. This type of chart is well suited for showing individual elements that change frequently, such as a percentage of user time (Figure 4-5).

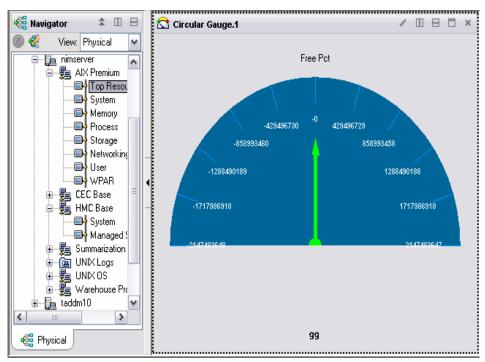


Figure 4-5 Circular gauge

 A *linear gauge* shows the collective value of every item in a single data series with one gauge for each chosen attribute. This type of chart is well suited for showing cumulative values (Figure 4-6).

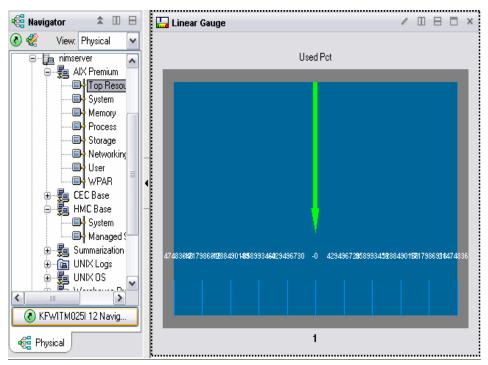


Figure 4-6 Linear gauge

In Table 4-1 on page 168, we look at the best rendering of the individual views based on the data to be displayed. This view changes from query to query and largely depends on how you configure the workspace.

Chart type	Best for	Multiple attributes	Multiple rows	Multiple managed systems	Time span
Pie chart	Displays proportional value to the whole	One slice per attribute	One pie for each row	One pie for eachmanaged system	Yes
Bar chart	Compares values among related attributes	One bar per attribute; stacking bars show one segment per attribute	No	No	Yes
Plot chart	Displays trends over a period of time for related attributes	One line per attribute; one data point for each data sampling	Yes	Yes	Yes
Circular gauge	Shows frequently changing elements	One gauge per attribute	No	No	No
Linear gauge	Displays cumulative values	One gauge per attribute	No	No	No

Table 4-1 Chart types and their best uses

4.2.3 Managing Tivoli Monitoring Services

Manage Tivoli Enterprise Monitoring Services, which is seen in Figure 4-7 on page 169, is often the component of the IBM Tivoli Monitoring V6.2 product suite that is overlooked. The Manage Tivoli Enterprise Monitoring Services tools functionality includes:

- Install product support (TEMS)
- Add application support (TEMS)
- Start and stop the server or agents
- Make configuration changes
- Manage log files

You can launch the Manage Tivoli Enterprise Monitoring Services application by exporting your display, ensuring that you have an X Windows Server, such as Hummingbird's Exceed, running, and entering the command /opt/IBM/ITM/bin/CandleManage or \$CANDLEHOME/bin/CandleManage on any of the machines that have agents or server components installed. Refer to Figure 4-7.

ctions Options View Help				
Service	Version	Platform	Configured	Status
Base Monitoring Agent for CEC	V06.10.02.00	AIX R5.1 (32 bit)/R	Yes	Started
Base Monitoring Agent for HMC	V06.10.01.00	AIX R5.1 (32 bit)/R	Yes	Started
BM Eclipse Help Server	V06.20.01.00	AIX R5.3 (32 bit)/R	Yes	Started
Monitoring Agent for UNIX Logs	V06.20.01.00	AIX R5.2 (64 bit)/R	Yes	Stopped
Monitoring Agent for UNIX OS	V06.20.01.00	AIX R5.2 (64 bit)/R	Yes	Started
Premium Monitoring Agent for AIX	V06.10.01.00	AIX R5.1 (32 bit)/R	Yes	Started
Summarization and Pruning Agent	V06.20.01.00	AIX R5.2 (32 bit)/R	Yes	Started
Tivoli Enterprise Monitoring Server	V06.20.01.00	AIX R5.2 (32 bit)/R	Yes	Started
Tivoli Enterprise Portal Server	V06.20.01.00	AIX R5.3 (32 bit)/R	Yes	Started
Universal Agent	V06.20.01.00	AIX R5.2 (64 bit)/R	No	N/A
Warehouse Proxy	V06.20.01.00	AJX R5.2 (32 bit)/R		Started
	V06.20.01.00	AIX R5.2 (32 bit)/R		
	V06.20.01.00			
	V06.20.01.00	AIX R5.2 (32 bit)/R		
	V06.20.01.00	AIX R5.2 (32 bit)/R		
	V06.20.01.00	AIX R5.2 (32 bit)/R		

Figure 4-7 Manage Tivoli Enterprise Monitoring Services

4.2.4 Historical data collection

The ability to collect and store historical data allows us to examine the performance of the monitored components over a period of time and to provide a sound basis for forecasting growth and capacity planning, as well as allowing us to manage our virtualized components within the environment to maximize efficiencies.

How it works

If historical data has been configured, it is collected by either the monitoring agent or the TEMS in the short term. The data is stored in tables, with one table per attribute that is collected. If the Tivoli data warehousing facility has been set up, the collection goes into either an Open Database Connectivity (ODBC) or Java Database Connectivity (JDBC) database for long-term storage.

If historical data has been enabled for the attributes for a view, there is a time span icon on the toolbar. To view the historical data instead of the real-time feed in the workspace view, you use the tool to specify the period and duration for the data that you want to display. When the query is run, data less than 24 hours old is extracted from the sourced binary files, while the data older than 24 hours is taken from the data warehouse.

The History Collection Configuration window in the Tivoli Enterprise Portal enables you turn the collection on or off and to configure how often and where the historical data is stored.

Note: Data collection cannot be started unless you have configured it.

Configuring data collection and warehousing

Take the following steps to configure historical data collection:

1. Click the Bistory Configuration icon from the Edit menu in the TEPS to open the History Collection Configuration window that is shown in Figure 4-8.

History Collection Configuration	1						
Select a product							
AIX Premium							~
Select Attribute Groups							
Group	Collection	Collection Interval	Collection Location	Warehouse Interval	Summarize Yearly	Prune Yearly	
KPX TOP 50 CPU PROCESSES							
KPX TOP 50 MEMORY PROCESSES KPX CPU SUMMARY							
KPX CPU SUMMARY KPX CPU DETAIL							-01
KPX SYSTEM ID							- 11
KPX SYSTEM CALL							- 11
KPX PAGING SPACE							- 11
KPX LOGICAL PARTITION							
KPX WORKLOAD MANAGER							
KPX NIM RESOURCES							~
	<					1	
Configuration Controls							
Collection Interval	Collection Loca	ation		⊢Warehouse	Interval		
15 minutes	ТЕМА		~	1 day			~
Summarization	Pruning						
Yearly	🔽 Yearly	keep	3	Years	~		
Quarterly	🔲 Quarterly	keep		Years	~		
Monthly	Monthly	keep		Months	~		
Veekly	🔲 Weekly	keep		Months	~		
✓ Daily	📃 Daily	keep		Days	~		
Hourly	Hourly	keep		Days	~		
	🔲 Detailed data	a keep		Days	~		
Configure Groups Unconfigure Groups Show Default Groups Start Collection Stop Collection Refresh Status							
					Close	Hel	
L							

Figure 4-8 History Collection Configuration window

2. Select the agent type for which you want to collect data from the **Select a product** drop-down list.

The attribute groups for which you can collect historical data are displayed in the **Select Attribute Groups** list box. Note that when you select a product type, you are configuring collection for all monitoring agents of that type that report to the selected monitoring server. If your monitored environment is large scale with many hundreds of agents of a type, there might be a delay when you select the product.

3. Select one or more attribute groups. You can also click **Show Default Groups** to automatically select the attribute groups that have predefined historical workspaces.

If you have configurations that you want to populate to several attribute groups, click the attribute group that has the configurations that you want to see reflected in the Configuration Controls area, then highlight the other attribute groups (Ctrl+click to select multiples, or Shift+click to select all groups from the first one selected up to this point) to configure and click **Configure Group**. All the selected attribute groups will reflect the same configurations. If collection has been started for any of the attribute groups that you have selected, stop the collection before attempting to change the configurations.

- 4. Specify the following collection options:
 - Collection Interval

Specify the frequency of data sample transmission to the history file. The options are: every 1, 5, 15, or 30 minutes, every hour, or every day. The default interval is 15 minutes. The shorter the interval, the faster and larger the history file grows at the collection location. This history file can overload the database, Warehouse Proxy agent, and Summarization and Pruning agent. For example, if you set a 1 minute collection interval for process data, expect the summarization and pruning for that attribute group to take a long time. Only enable such a short interval for an attribute group that is critical in your work and then preferably only for a short period of time.

Note that selecting too short of an interval can quickly fill file systems. We recommend that you monitor your data collection rates following any changes to the collection settings.

Collection Location

Specify where the historical data files will reside: at the Tivoli Enterprise Monitoring Agent (TEMA) or the Tivoli Enterprise Monitoring Server (TEMS). The default location is the monitoring agent, which minimizes the performance impact on the monitoring server from the management of historical data; however, the TEMS might be a better choice for certain environments.

Warehouse Interval

Specify whether the collected data is warehoused and how often. The options are 15 minutes, 30 minutes, 1 hour, 12 hours, 1 day, or Off. If you choose to warehouse historical data, the scheduling options for Summarization and Pruning are enabled. A more frequent warehousing interval enables quicker availability of warehoused data for retrieval. Shorter intervals cause additional processing to check for and transmit the newly collected data. And there are more frequent elevated levels of transmission activity, but for shorter durations.

The collection options for an attribute group apply on all monitoring servers on which collection for those attributes is currently enabled. For certain sets of attribute groups, the configuration is hard-coded by the product. These attribute groups will display a (fixed) in the Collection and Warehouse Interval cells of the Select Attribute Groups table.

- 5. If warehousing is enabled, specify the time periods for which data in the warehouse is summarized.
- 6. If summarization is scheduled, specify the duration to keep the summarized data for each time period.
- 7. If pruning is scheduled, specify how long to keep the pruned data for each time period.
- 8. Click **Configure Groups** to apply the configuration selections to the attribute group or groups. If you have currently configured controls for this group (and the controls are running), click **Stop Collection** first. Apply your new settings, and click **Start Collection**.

Note: Your user ID must have permissions sufficient to edit workspaces in the Tivoli Enterprise Portal in order for you to be able to configure, start, or stop the historical data collection.

4.2.5 Understanding situation events

Situations notify you when an event occurs on a monitored system. The IBM Tivoli Monitoring product provides a set of predefined situations for your immediate use to expedite the time frame in which you can have your environment monitored. You can view and edit these situations and create other customized situations in the Situation Editor to suit your specific environment.

The Situation Editor window is divided into two frames. The left frame contains the Situation tree, which shows the situations associated with the Navigator item from which the Situation Editor was opened as shown in Figure 4-9, or the situations for all installed monitoring products if you opened the editor from the toolbar (the situations show in the left frame of Figure 4-9).

KPX_Active_Disk_Pct_Info KPX_Avg_Read_Transfer_I KPX_Avg_Read_In_WaitQ_I	Description The percent of time the disks are busy is higher than normal.	
KFX_Avg_Write_Transte_L KFX_Bad_Pkts_Recvd_Inti KFX_Bad_Relad_Per_Sec KFX_Failed_Read_Per_Sec KFX_Failed_Writes_Per_Sec KFX_LPARBusy_per_Wan KFX_LPARBrespool_Wan KFX_LPARBrespool_Wan KFX_LPARPhantus_Info KFX_LPARPhantus_Info KFX_LPARPhantus_Info KFX_LPARPhantus_Info	Formula Active Disk Pct	& •
KFX_LPAR/byb_used_info KFX_LPAR/vs_info KFX_memrepage_info KFX_memrepage_info KFX_perCPU_cs_info KFX_perCPU_csc_info KFX_perCPU_csc_info KFX_perCPU_csc_info KFX_perCPU_osc_info KFX_percPU_posts_info KFX_percPU_osc_info KF	Click inside a cell of the formula editor to see a description of the attribute for that column and to compose the expression. Add a condition by clicking Add conditions and selecting the situations to embed or attributes you want to include.	×
KPX_perproc_mem.textsz] KPX_perproc_memres_texts KPX_perproc_memres_texts KPX_perproc_nonl0_pg] KPX_perproc_nonl0_pg] KPX_perproc_vol_cs_info KPX_Perproc_vol_cs_info KPX_Perproc_trons_info KPX_Rts_Beret_crons_info KPX_Rts_Boverflow_info W	Situation Formula Capacity 4% Add conditions Advanced Sampling interval 0 / 0 : 1 : 0 / ▼ Run at startup ddd hh mm ss	i

Figure 4-9 Situation Editor

Situation formula

Situation formulas are one or more expressions of which options are given when you click the Formula button in the Situation Editor window. For example, when a situation checks for free disk space below 10%, it uses the group and item attributes that we see in Figure 4-10 on page 174.

You can also create more elaborate situations that are based on multiple conditions being met before an event is triggered.

Situations for - aix	$\overline{\mathbf{X}}$
Image: Second	T Action EIF 🗑 Until
AIX Premium	
Select condition Image: Select condition	
Condition Type Attribute Comparision Situation Comparision Attribute Group KPX CPU SUMMARY Free MB Free MB	S
Intermediation Intermediation KPX FILE SYSTEMS Free Pot KPX FILE SYSTEMS Free Pot KPX FILE SYSTEMS Free Pot KPX FILE SYSTEMS Node KPX FILE SYSTEMS Size MB KPX FPROESSES SUMMARY Size MB KPX FPROESSES SUMMARY Used MB KPX FPROESSES SUMMARY Used MB KPX FPROESSES SUMMARY Used MB KPX VIRTUAL MEMORY MANAGEMENT Volume Group Name	I).
Select All Deselect All Deselect All Deselect All This attribute group contains file system information.	Table critical wav Critical Edit Image: Run at startup DK Cancel

Figure 4-10 Attributes of a situation formula

Situation event indicators

When a situation triggers an event on a managed system, it also has a *state* setting, which determines the light and color displayed in the *Navigator* window on the item for which the situation threshold has been reached. The list of states running from highest to lowest severity can be seen in Figure 4-11.

-8	itate	1
	🞗 Critical 📃	
	🕱 Fatal	1
	🗵 Critical	
	🔨 Minor	
	🕂 Warning	
	🛃 Harmless	_
-	Informational	
1	🚱 Unknown	

Figure 4-11 Situation event indicators (states)

4.2.6 IBM Tivoli Monitoring command line

There are a few major commands in IBM Tivoli Monitoring V6.2 that you can use to modify, stop, start, and reconfigure the server or agents. The major commands are:

tacmd	Tivoli Agent Command
itmcmd	IBM Tivoli Monitoring command
cinfo	This command returns a menu to query information, such as installed and running agents

For further information about these commands, refer to *IBM Tivoli Monitoring User's Guide, Version 6.2.0,* SC32-9409, and *IBM Tivoli Monitoring Administrator's Guide, Version 6.2.0,* SC32-9408. This section focuses on providing the essential information about these commands.

Common commands

Basic tacmd options are:

► help

Prints the full help text for the specified command or summary help text for all commands if no command is specified.

► login

Authenticates a user with a server and creates a security token that is used by subsequent **tacmd** commands.

► logout

Invalidates the security token created by the tacmd login command.

refreshTECinfo

Triggers the Event Forwarder to reprocess any updated event destinations, Event Integration Base (EIF) configurations, and custom event mapping files without recycling the hub Tivoli Enterprise Monitoring Server.

Installation commands

The tacmd installation commands are:

▶ createNode

Creates a node by installing an OS agent into a new directory on the local machine and starting that OS agent.

► viewNode

Displays the details of a node, including the components that are installed on it.

Depot commands

The depot tacmd commands are:

▶ viewDepot

Displays the types of agents that can be installed from the (currently logged in) server's agent depot or from the named remote server's depot.

► listBundles

Displays the details of one or more deployment bundles that are available for installation from the specified directory into the local deployment depot.

▶ addBundles

Installs one or more deployment bundles from the specified directory into the local deployment depot. This command must be executed locally on a Tivoli Enterprise Monitoring Server containing a depot.

removeBundles

Removes one or more deployment bundles from the local deployment depot. This command must be executed locally on a Tivoli Enterprise Monitoring Server containing a depot.

Agent commands

The agent tacmd commands are:

▶ startAgent

The **startAgent** command:

- Starts the specific agents or the agents for the specific managed systems if they are not already running.
- OS agents (nodes) can be started on the local system only.
- The agent is marked online in the Tivoli Enterprise Portal client.
- ▶ stopAgent

The **stopAgent** command:

- Stops the specific agents or the agents for the specific managed systems if they are running.
- OS agents (nodes) can be stopped on the local system only.
- The agent is marked offline in the Tivoli Enterprise Portal client within the next heartbeat interval.

restartAgent

The restartAgent command:

- Starts or restarts the specific agents or the agents for the specific managed systems.
- OS agents (nodes) can be restarted on the local system only.
- If the agent is already started, it is stopped before being restarted.

▶ viewAgent

The **viewAgent** command:

- Displays the details of the specific agent or the agent for a specific managed system.
- Details include the agent version, agent status (running or not), and all of the configuration data for the agent.
- ▶ updateAgent

Enables an agent update to a specified node.

System commands

The tacmd system commands are:

describeSystemType

Displays the configuration options that are required for a specific managed system type.

▶ addSystem

The **addSystem** command:

- Enables a user to add managed systems to the monitoring system.
- Deploys an agent and other needed components if they are not already installed on the node.
- ► configureSystem

The configureSystem command:

- Enables the user to change the configuration options of an existing managed system.
- The user also has the option to restart the managed system's monitoring agent in order for the new configuration parameters to take effect.

► listSystems

The listSystems command:

- Displays a list of known managed systems.
- The results can optionally be filtered to display only those results on a specific node, only those results for given product types, or both.

Server command

The server **tacmd** command is **configurePortalServer**. The **configurePortalServer** command:

- Adds, configures, or removes a portal server data source from the portal server configuration.
- ► This command must be executed locally to the portal server.
- ► This command uses NAME=VALUE options.

Situation commands

The situation tacmd commands are:

▶ createSit

Creates a new situation, based on an existing situation.

▶ editSit

The **editSit** command:

- Edits an on-server or exported situation definition.
- If a -force parameter is specified, it disables the message that asks if you are sure that you want to edit the situation.
- ► deleteSit

The **deleteSit** command:

- Deletes a situation from the server.
- If a -force parameter is specified, it disables the message that asks if you are sure that you want to delete the situation.
- ► listSit

Lists the defined situations, optionally filtering for a specific managed system or for a specific managed system type.

▶ viewSit

Allows the configuration of a situation to be displayed or saved in an export file.

Event destination definition commands

The event destination definition tacmd commands are:

createEventDest

Creates a new event destination definition on the server.

b deleteEventDest

Deletes an event destination server definition from the server.

editEventDest

Modifies an existing event destination server definition on the server.

► listEventDest

Displays the server ID, name, and type for every event destination definition on the server.

▶ viewEventDest

Displays all properties for the specified event destination definition on the server.

Import and export commands

The import and export tacmd commands are:

bulkExportPcy

Exports all the available policies from the Tivoli Enterprise Monitoring Server.

bulkExportSit

Exports all the available situations from the Tivoli Enterprise Monitoring Server.

bulkImportPcy

Imports all the available policy objects to the Tivoli Enterprise Monitoring Server from BULK_OBJECT_PATH.

bulkImportSit

Imports all the available objects to the Tivoli Enterprise Monitoring Server from BULK_OBJECT_PATH.

Managed systems list commands

The managed system list tacmd commands are:

▶ createsystemlist

Creates a new managed system list.

► deletesystemlist

Deletes a managed system list.

▶ editsystemlist

Adds or deletes managed systems to or from an existing managed system list on the server.

► listsystemlist

Lists the available managed system lists.

▶ viewsystemlist

Lists the configuration of a managed system list to be displayed or saved in an export file.

Workspace commands

The workspace tacmd commands are:

exportworkspaces

Exports one or more portal server workspaces to a file.

importworkspaces

Imports the workspaces contained in a file into the portal server.

listworkspaces

Lists all of the portal workspaces on the server.

The itmcmd command

The IBM Tivoli Monitoring command or itmcmd has the following format:

```
itmcmd command [option [operand ...]] ...
```

The itmcmd commands are:

► itmcmd agent

The itmcmd agent command:

- Starts and stops most agents.
- You can start or stop one agent, all agents, or multiple agents.
- You can also start the portal server and portal desktop client using this command.
- You must run the **itmcmd agent** command on the architecture for which the agent is installed.

▶ itmcmd audit

Manages log files from the command line. The default logs are in /opt/IBM/ITM/logs.

► itmcmd config

The itmcmd config command:

- Configures or reconfigures the following components:
 - The IP port that the hub monitoring server uses to listen for requests
 - The hosts that can run a product
 - The location of the hub monitoring server in the network
 - The monitoring server to which an agent connects
 - Whether a monitoring server is a hub or a remote server
- You can only configure one product at a time. If you reconfigure a monitoring server, you must stop and restart that monitoring server before the changes take effect.
- ▶ itmcmd dbagent

Starts the IBM Tivoli Monitoring for Sybase and IBM Tivoli Monitoring for Oracle monitoring agents.

► itmcmd dbconfig

Configures the execution environment for a distributed database agent.

► itmcmd execute

The itmcmd execute command:

- Runs a script or command when its execution requires the same environment settings as a particular IBM Tivoli product. The itmcmd execute command runs this script or command by building the necessary environment settings for the intended script or command and then combining them into a temporary shell script before running it.
- You must run the itmcmd execute command. Make sure that you are in the correct directory: cd \$CANDLEHOME/bin, where \$CANDLEHOME is the location where you installed your IBM Tivoli software, generally /opt/IBM/ITM.
- ► itmcmd history

Manages the roll-off of history data into delimited text files.

▶ itmcmd manage

Starts Manage Tivoli Enterprise Monitoring Services on a UNIX or Linux computer. You can start, stop, and configure monitoring components in Manage Tivoli Enterprise Monitoring Services.

► itmcmd server

Starts and stops monitoring servers that are defined in directories under the install_dir/tables subdirectory. You must run the **itmcmd server** command from the host computer.

► itmcmd support

The itmcmd support command:

- Adds agent-specific information to the monitoring server.
- Whenever you add a new monitoring agent type to your monitoring environment, run the itmcmd support command again on the monitoring server to add the new agent information to the monitoring server.

4.2.7 The cinfo command

An administrator can utilize the **cinfo** commands to complete any of the following tasks:

- An inventory of installed IBM Tivoli products
- The configuration settings for products
- ► The installed CD versions in the current \$candlehome directory
- The configuration settings for products in the context of the actual variables that are used by the installation program
- A list of running IBM Tivoli processes (such as agents or monitoring server)
- A validated list of running IBM Tivoli processes, after first performing an update on the tracking database to remove stale PIDs (processes logged as ps but not found when attempting to verify using the ps command)

This command can be menu-driven (run with no flags) or controlled by passing arguments as shown in Example 4-1 on page 183.

Example 4-1 The cinfo command

```
cinfo [-h candle_directory] [-c product] [-i] [-r] [-s product] [-R]
[-v]
  -c <product> Displays configuration prompts and values
  -i Displays an inventory of installed products
  -r Shows running processes
  -s <product> Displays configuration parameters and settings
  -R Shows running processes, after updating a tracking database
  -v Shows the installed CD versions in this CandleHome
  -p <product> Shows associated platform codes for the specified
  product
  -d Dumps an inventory of installed products
```

For example, if you run **cinfo** -**p ms**, you get information about the Tivoli Enterprise Monitoring Server (TEMS) as shown in Example 4-2.

Example 4-2 The cinfo product details for the TEMS

You can view the Tivoli Enterprise Monitoring processes that are running by using **cinfo** -r as shown in Example 4-3 on page 184.

Example 4-3 Running Tivoli Enterprise Monitoring processes

root@nimserver:/opt/IBM/ITM/bin# cinfo -r User: root Groups: system bin sys security cron audit lp Host name : nimserver Installer Lv1:06.20.01.00 CandleHome: /opt/IBM/ITM Host Prod PID Owner Start ID ...Status 512006 itm1 Mar None ...running aix ph aix pk 430296 None 237714 None aix рх

4.2.8 The SetPerm command

You can make use the **SetPerm** command to set file permissions to ensure that the permissions are set to those permissions that appropriate for an applications user. This command can only be run as the root user.

The correct method and usage of the SetPerm command was covered in "Changing the file permissions" on page 92.

4.2.9 Best practices

The best practices for monitoring are:

Planning

Have the monitoring requirement for the entire environment mapped out from what agents will be deployed where and at what level the alert threshold needs to be set, although this setting might require tuning over time, to the basics of application file system creation. Plan the creation of applications users and groups and the file permissions and ownership of the application files.

What sort of diagnostic data do you collect in the environment, or do you simply monitor systems, applications, the health, and the operations of components within the environment? How is any ongoing maintenance to be performed? Does the environment have a centralized point for the management of systems and maintenance?

Installation and Configuration

The AIX Enterprise Edition Launchpad has simplified the installation of IBM Tivoli Enterprise Monitoring in a System p environment as discussed in 3.3, "Installing and configuring IBM Tivoli Monitoring V6.2" on page 50. Following this method helps to greatly reduce the amount of time and complexity around actually getting the tool operational.

After the environment is being actively monitored, further customization of thresholds for alerts and event integration might be required.

4.3 Operating TADDM

This section describes how to operate a TADDM server. With a simple configuration of the scope and the access list, TADDM discovers a lot of components from target servers. It can provide the physical topology of the target servers as well as the software topology. However, customization is necessary if you want to extend the functionality, such as creating Business Applications and Business Services. There are additional features in TADDM, including versioning, showing change history, and reporting. We describe:

- 4.3.1, "Starting and stopping the TADDM server" on page 185
- 4.3.2, "Discover components" on page 186
- 4.3.3, "Customizing TADDM" on page 212
- 4.3.4, "Analytics and reporting" on page 228
- 4.3.5, "Performance considerations" on page 236

4.3.1 Starting and stopping the TADDM server

When you need to stop and start the TADDM server manually for any reason, go to the *TADDM_installed_directory/dist/bin directory and run ./control stop* and ./control start as a TADDM admin user as shown in Example 4-4 on page 186.

Example 4-4 Start or stop TADDM server as a TADDM admin user

```
$ id
uid=205(cmdbadm) gid=3(sys) groups=1(staff)
$ cd /opt/IBM/cmdb/dist/bin
$ ./control stop
$ ./control start
```

4.3.2 Discover components

TADDM discovers and collects configuration information for the entire application infrastructure, identifying deployed software components, physical servers, network devices, virtual LAN, and host data used in a runtime environment.

Discovery is performed using sensors that are currently built and deployed as part of the TADDM product:

1. To get into the product console, bring up your browser and enter a URL with the host name of the TADDM server and port number 9430 as shown in Figure 4-12 on page 187, for example, http://taddm10:9430.

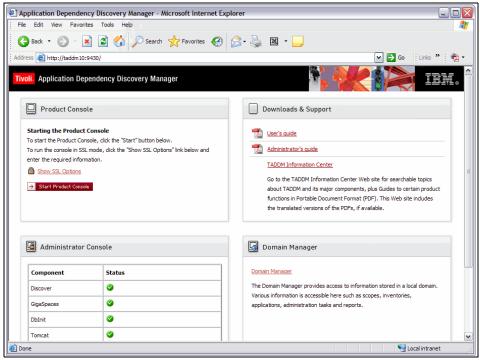


Figure 4-12 TADDM console

2. Clicking **Start Product Console** shows a window that asks you to open or save the configuration file as shown in Figure 4-13.



Figure 4-13 Open or save the configuration file

 Select **Open** unless you want to save the file. If you save the file, it will be saved on your workstation for future use. If you click **Open** or click the previously saved file, it will show you the login panel as shown in Figure 4-14.

E Login		
Tivoli. Application Depen	dency Discovery Manager	IIV.
Username:	administrator]
Password:	*****	
Server:	taddm10	
Port:	9433	
	Establish a secure (SSL) session	
	Login Cancel	

Figure 4-14 Login panel

The default user is administrator and the password is collation.

4. Enter the Username and Password (Figure 4-14). Click **Login** and the Tivoli Application Dependency Discovery Manager panel appears.

Scope

A *discovery scope* identifies the devices, computer systems, and other components in your infrastructure that you want the server to access. You specify scopes using IP addresses, ranges of IP addresses, or subnets to define the boundary of the networks that can be accessed during discovery. A scope can be as small as a single IP address or as large as a range of IP addresses or a Class C network. You can also exclude specific devices from the scope.

Before running discovery, you need to configure a discovery scope:

- On the left pane, click the **Discovery** tab → **Scope**. The Scope pane is displayed.
- 2. To define a new discovery scope set, click **Add Set**. The Scope Set Name window is displayed as shown in Figure 4-15.

File Edit Display Discovery Topology Analytics Windows Help Image: Constraint of the second secon	Tivoli Application Dependency Disc	overy Manager -	Version: Current						
Scope Scope Overview Scope Name: Topology Analytics Discovered Components Application Infrastructure Overview	File Edit Display Discovery Topology A	nalytics Windows	Help						
Scope Sets Method Type Value Description/Host Overview Scope Scope Scope Sets Method Type Value Description/Host Scope Scope Scope Set Name Name: ISS Scope Set Name Name: ISS Scope Access List Name: ITSO scope OK Cancel OK Cancel Discovered Components Image: OK Cancel OK Cancel Image:									
Overview Scope Scope Access List Topology Analytics Discovered Components Application Infrastructure Image: Component Structure Image: Component Structure Image: Component Structure	Discovery	Scope							
Overview Scope Scope Access List Topology Analytics Discovered Components Application Infrastructure Image: Component Simple	<u>^</u>	Scop	e Sets	Method	Туре	Value	Description/Host		
Overview Scope Scope Access List Topology Analytics Discovered Components Application Infrastructure Image: TSO scope OK: Cancel	800								
Access List Topology Analytics Discovered Components Application Infrastructure Image: Component service Image: Component service									
Access List Topology Analytics Discovered Components Application Infrastructure Image: Component service Image: Component service	 A≺								
Access List Topology Analytics Discovered Components Application Infrastructure Image: Component service Image: Component service	°Ø								
Access List Topology Analytics Discovered Components Application Infrastructure Image: Component Section Infrastructure Overview	Scope								
Access List Topology Analytics Discovered Components Application Infrastructure	A 1								
Topology Analytics Discovered Components Application Infrastructure	w		Scope Set Na	me					
Analytics Application Infrastructure Application Infrastructure Overview Cancel	Access List								
Discovered Components OK Cancel Application Infrastructure Image: Component Sector Sec	Topology		Name: ITSO sco	ipe					
Discovered Components Application Infrastructure	Analytics			Г	OK	Cancel			
Application Infrastructure Overview	Discovered Components			L					
	Application Infrastructure								
	Application Infrastructure Overview								
Add Set Delete Set Add Edit Delete		Add Set	Delete Set		Add	Edit	Delete		
Username: administrator Server: taddm10:9433				Liearne	ame: administ	ator Serve	r. taddm10-9.422		

Figure 4-15 Scope Set Name

- 3. In the Name field, type the name for the new scope set.
- 4. Click **OK**. The new scope set appears in the Scope Sets list.

5. To add contents to the scope set, select the scope set that you have just created and click **Add**. The Add Scope window is displayed as shown in Figure 4-16.

Add Scope			×
IP Туре	IP Addresses	Description	
Specify a range of ip ad	dresses, and optionally a description		
Include Range 💌	9.12.5.7 ^{to} 9.12.5	. 36	Add Exclusion
Exclude Range	9 . 12 . 5 . 11 ^{to} 9	. 12 . 5 . 31	
Exclude Range 💌	9 . 12 . 5 . 34 to 9	. 12 . 5 . 35	
٤]	m		>
			OK Cancel

Figure 4-16 Adding scope

To add the settings for the scope, complete one of the following steps:

- Select Subnet from the IP Type list and type the IP address of the subnet in the IP Address field.
- Select Range from the IP Type list and type the starting IP address and the ending IP address in the IP Addresses field.
- Select Host from the IP Type list and type the IP address of the host in the IP Address field or type the host name in the Hostname field.

To exclude devices from your scope, click Add Exclusion and complete one of the following steps:

- From the IP Type list, select Subnet and type the IP address of the subnet in the IP Address field.
- From the IP Type list, select Range and type the starting IP address and the ending IP address in the IP Address field.

To save the scope, click **OK**. The new scope appears in the list.

Access List

The *Access List* is a collection of all user names, passwords, and Simple Network Management Protocol (SNMP) community strings that the server uses when accessing entities, which are stored as configuration items in the database, in your infrastructure. You have to set up this list for the configuration items that you want to discover.

To add a new Access List entry, complete the following steps from the product console:

- On the left, click the **Discovery** tab → **Access List**. The Access List pane is displayed.
- 2. To add a new computer system into the Access List, click **Add**. The Access Details panel is displayed as shown in Figure 4-17.

Tivoli Application Dependency Disc	overy l	Aanager - Versi	on: Current		
File Edit Display Discovery Topology A	nalytics	Windows Help			
• • •	6	🌺 🔮 🤮			
Discovery	Acce	ss List			
		Туре	Name	Usemame	Scope Set Restriction
	Sybase	•	default	sa	
Overview	Oracle		default	system	
	Networ	k Element (SNMP)			
*	WebLo	Second Access Deta	ails		
Scope		Access Infor	mation Scope Limita	tions	
¢.		Component Ty	pe: Computer System		~
Access List		Name:	itm10		
Topology		User name:	cmdbadm		
Analytics		Password:	*****		
Discovered Components		Confirm Passv	/ord: ********		
Application Infrastructure		Authentication	Type: Default		
⊕ — California Application Infrastructure Overview			Default		
			Password	isture (BKD)	
			Public Key Infrastri		Cancel
				UK	
		Add	Edit Delete		Move Up Move
			U	sername: administrator	Server: taddm10:9433

Figure 4-17 Adding a computer system

3. From the Component Type list, select the component type that you want to discover.

- 4. For all component types other than Network Element (SNMP), complete the following steps:
 - In the Name field, type the name of the Access List entry.
 - In the User name field, type the user name to log in to the component that you want to discover. Notice that we already added cmdbadm user in all the target servers for discovery before adding computer systems here.
 - In the Password field, type the password to log in to the component that you want to discover.
 - In the Confirm Password field, retype the password for confirmation.

Additional steps might be required based on the component type that you have selected. We selected password as an authentication type for computer systems type.

Note: TADDM attempts to use the credentials in the order that they appear in the access list. To speed up discovery, make sure that you have the credentials in the order that makes the most sense for your environment. Order the credentials from the most general to the most specific. Use the list order in combination with limiting scope. If a credential only applies to a particular scope set, be sure to limit its use to that scope set.

5. In the next window, we added a database in the Access List as shown in Figure 4-18.

Tivoli Application Dependency Disc			on: Current				- 🗆 🛛
File Edit Display Discovery Topology A	thaiytics	Vindows Help					
Discovery	Access	List					
<u>^</u>		Туре	Nam	e	Usemame	: S	cope Set Restriction
Suo .	Sybase		default		sa		
Overview	Oracle		default		system		
\sim	Network	Element (SNMP)	default				
V	WebLogic		default		weblogic		
Scope	Compu	Access Deta	nils				
Access List Topology Analytics Discovered Components Application Infrastructure C Application Infrastructure Overview		Access Infon Component Tyg Vendor: Name: User name: Password: Confirm Passw	be: Database DB2 db2 usi db2inst	er	lions	ОК	Cancel
		Add	Edit	Delete		L N	Nove Up Move
				U	sername: adminis	strator Ser	rver: taddm10:9433

Figure 4-18 Adding a database

6. We took the same steps to add two HMCs and four more servers. Figure 4-19 shows the list of computer systems and the database that we have created.

File Edit Display Discovery			·		
· · · 🖬 🗄		8 🔹 隆 😫			
Discovery		Access List			
	<u>^</u>	Туре	Name	Usemame	Scope Set Restriction
800		Computer System	hmc1	hscroot	
Overview		Computer System	hmc2	hscroot	
~		Computer System	taddm10	cmdbadm	
Marine and Anna and A		Computer System	itm10	cmdbadm	
Scope		Computer System	tuam10	cmdbadm	
A /		Computer System	aix10	cmdbadm	
		Computer System	nimserver	root	
Access List		DB2	db2 user	db2inst1	
a		Sybase	default	sa	
		Oracle	default	system	
Custom Servers		Network Element (SNMP)	default		
\cap	~	WebLogic	default	weblogic	
Topology					
Analytics					
Discovered Components	\times				
List/Search	~	Add	Edit Delete	Mov	e Up Move Down

Figure 4-19 The list of computer systems and the database

Discovery profile

A *discovery profile* is a set of rules that controls how discoveries run. Using discovery profiles, you can control what TADDM discovers. For example, you can configure individual discovery sensors, manage various configurations for the same sensor, select the appropriate sensor based on a set of criteria, and control sets of different sensor configurations to be applied on a single discovery run.

By default, there are three levels of discovery profiles, which are described in Table 4-2 on page 195.

Table 4-2	Discovery profiles by default in TADDM
-----------	----------------------------------------

Level	Type of discovery	What is discovered
Level 1	Credential-less	Basic information about active computer systems: host name, fully qualified domain name (FQDN), OS release level, IP address, and open ports. Network operating systems are also discovered.
Level 2	OS credentials only	Detailed information about all of the operating systems.
Level 3	Full credential	Entire application infrastructure: deployed software components, physical servers, network devices, virtual LANs, and hosts.

In order to run discovery:

- 1. Click the **Discovery** tab \rightarrow **Overview**, and click **Run Discovery**.
- 2. Check **ITSO scope** under Scopes, and select **Level 3 Discovery** from the Profile list box. Click **OK** as shown in Figure 4-20 on page 196.

Tivoli Application Dependency Disco	, ,	on: Current
File Edit Display Discovery Topology An	alytics Windows Help	
	•	
Discovery	Overview	
5°	Discovery Information Status:	Idle
Overview	Components Found:	0
₩ j	Sensors Running: Progress:	0 Run Discovery
Scope	Show only items of statu	
Access List		Image: Weight of the second secon
Topology Analytics		
Discovered Components		
Application Infrastructure		Select All Clear All
	Information:	
	Run Discovery	Scope Details Discovery Log
		Username: administrator Server: taddm10:943

Figure 4-20 Running discovery

3. While running discovery, click **Discovery Log** to see Discovery Log Details as shown in Figure 4-21.

Tivoli /	Application Dependency [)isco	very Manager - Version:	Current			
File Edit	Display Discovery Topology	Ana	alytics Windows Help				
•		80)				
Discover	у		Overview				
	Overview	^	Discovery Information Status: Components Found:	Running 11			
			Sensors Running:	5			
	1		Progress:				
	Scope		Show only items of status:	All status lev 💙			
	P2			Sensor		Host Name/IP	
	Access List		🗄 🛅 StackScanSensor(9	9.12.5.7 ~ 9.12.5.32)		9.12.5.7 ~ 9.12.5.32	3/9/0:
		~		7 ~ 9.12.5.32)		9.12.5.7 ~ 9.12.5.32	3/9/0! =
	Discovery Log Details					aix10	3/9/0
Analytic	Search for:			Find Next		aix10	3/9/0
Discover	the following: PortListResult, [23.22	1			itm10	3/9/05
Applicati	[3/9/09 10:25 EDT] Discovered	I - The	PortSensor(9.12.5.8) sensor			nimserver	3/9/0: 🗸
	the following: PortListResult, [[3/9/09 10:25 EDT] Complete -						>
	SessionSensor(9.12.5.7).		5		pout the ser	nsor, select a row.	
				Close			~
			Stop Discovery S	cope Details E)iscovery Lo	g	
Discovery	Status: Running 米 🧘 Error	s: 1		ι	Jsername: a	dministrator Server:	taddm10:9433

Figure 4-21 Discovery Log Details

When the discovery finishes, a line of information appears in red on the bottom of the window (Figure 4-22 on page 198): "Changes have occurred. Reload the view."

4. Click **Display** \rightarrow **Reload** in the product console to apply the changes as shown in Figure 4-22.

📑 Tivoli App	lication Deper	ndency Di	scovery	Manager	- Version	: Current	_ 🗆 🔀
File Edit Dis	olay Discovery	Topology	Analytics	Windows	s Help		
	Back			Alt+Left			
	forward			Alt+Right			
Discover	Reload			Ctrl+R			
	Clear Topology Da	ta			mation	Idle	
	Show Sidebar				ound:	0	
	Show Details Wind				ng:	0	
•	Show Discovered	Component	s Window				
	N		Shov	v only items	of status:	All status lev 💌	
	Scope		Inforr	nation:			
Å	Access List	~		n Discovery	/Sc	ope Details Discovery Log	
Topology			Detail	s			7 X
Analytics			•	▶ Item:	s: Click S	how Details to view data. 💌 🛛 🗙 📩	6 ‡
Discovered C	omponents	\times					
Application Inf	rastructure	~]				
	lion Infractructura III						
0	Changes have o	ccurred. Rel	oad the vie	w.		Username: administrator Server	: taddm10:9433

Figure 4-22 Reload the view

Now, you are ready to see the components that TADDM has just discovered or the *topology* of the components. In order to search the components, click **Discovered Components** in the left pane as shown in Figure 4-23.

E Tivoli Application Dependency Disc	covery Manager - Version: Current	_ 🗆 🗙
File Edit Display Discovery Topology A	Analytics Windows Help	
	ا ا ا ا	
Discovery	Overview	
570	Components Found: 0 Sensors Running: 0	
Overview	Progress:	
Topology Analytics Discovered Components	Show only items of status: All status lev	
List/Search 💌	Run Discovery Scope Details Discovery Log	
Application Infrastructure	Details	a 기 🗆
Physical Infrastructure Business Applications Business Services Composites Collections List/Search InfrastructureApplicationComposit Infrastru	Items: Click Show Details to view data. V	
	Username: administrator Server: t	taddm10:9433

Figure 4-23 List search

5. Click List/Search and move down to select component.

6. Select **IBM AIX Computer System** to show the list of servers as shown in Figure 4-24.

Tivoli Application Dependency D		on: Current						
	Analytics Windows Help	nalytics Windows Help						
Business Service	8 🜒 🏝 🚉 😪							
Discover 🗐 Other Computer System	Access List							
DB2 DB2 Instance	Туре	Name	Usemame	Scope Set Restriction				
Herdware Management Co	Computer System	hmc1	hscroot					
IBM AIX Computer System	Computer System	hmc2	hscroot					
IP Subnet	Computer System	taddm10	cmdbadm					
SavaServer	Computer System	itm10	cmdbadm					
NFS Service SSHServer	Computer System	tuam10	cmdbadm					
Topology	Computer System	aix10	cmdbadm					
Analytics 💮 Tomcat	Computer System	nimserver	root					
Discovere	DB2	db2 user	db2inst1					
List/Searc	Sybase	default	sa					
WS WebSphere Node	Oracle	default	system					
Keyword: WS WebSphere Server	Network Element (SNMP)	default						
Component: 📃 Composite 🛛 🖌	WebLogic	default	weblogic					
ApplicationComposite_ITM ager								
ApplicationComposite_TADDM								
InfrastructureApplicationCompc								
	Add	Edit Delete	Mov					
			Username: administrato	r Server: taddm10:9433				

Figure 4-24 Selecting IBM AIX Computer System

7. We have five logical partitions on AIX as shown in Figure 4-25. Note that if you have a logical partition and you do not see the LPAR symbol to the left of the component name, verify with the HMC that the LPAR is connected and has been added properly.

Tivoli Application Dependence	y Disc	overy Manager - Versi	on: Current		
File Edit Display Discovery Topol	ogy A	nalytics Windows Help			
< > 🗘 🖺 🔚	1	6 🜒 🍇 🔮 🚔			
Discovery		Access List			
 €		Туре	Name	Usemame	Scope Set Restriction
	C = 0	omputer System	hmc1	hscroot	
Scope	c	omputer System	hmc2	hscroot	
<u> </u>	v c	omputer System	taddm10	cmdbadm	
Topology	c	omputer System	itm10	cmdbadm	
Analytics	c	omputer System	tuam10	cmdbadm	
Discovered Components	X	omputer System	aix10	cmdbadm	
List/Search	v 0	omputer System	nimserver	root	
Keyword:	D	B2	db2 user	db2inst1	
	s	ybase	default	sa	
Component: BM AIX Computer Sy	¥ c	racle	default	system	
I I I I I I I I I I I I I I I I I I I	N	etwork Element (SNMP)	default		
English Itm10	v	/ebLogic	default	weblogic	
LPAR taddm10 Show Details					
Edit					
Merge		Add	idit Delete	Mov	e Up Move Down
Change History					[고 [고 [고
Compare Components.				Username: administrato	
Compare Across Versi	ons				

Figure 4-25 Show Details

8. Right-click one of the servers, and then click **Show Details**.

You see the details of the server as shown in Figure 4-26. The details include general information about the hardware, OS, storage, file systems, IP, installed filesets, patch level, and the contents of major configuration files.

Tivoli Application Dependency D	iscov	very Manager - Vers	sion: Current			_	
File Edit Display Discovery Topology	Ana	lytics Windows Hel	p				
< • • E E	80	•					
Discovery		Access List					
	^	Туре	Name		Usemame	Scope Set Restr	iction
Access List	=	Add	Edit	Delete		Move L	I ql
		Details				[7 7 ×
Topology	~	• • ttems:	addm10 🗸	X X ⁺	Q Q		
Analytics Discovered Components]	General	os	Storage		IP	••
List/Search]	Local File Systems	Network File	Systems	Storage Vol	lumes Disk	
Keyword:	11	Mount Point 🔽	File System	Туре	Capacity	Available Space	Inhe
Component: BM AIX Computer Syst	5	1	/dev/hd4	ifs2	96 Mbytes	62 Mbytes	
Component: IBM AIX Computer Syst		/admin	/dev/hd11admin	jfs2	128 Mbytes	127 Mbytes	
PAR aix10	וו ר	/home	/dev/hd1	jfs2 jfs2 jfs2	224 Mbytes	217 Mbytes	
		/home/db2inst1	/dev/fslv00	jfs2	1024 Mbytes	596 Mbytes	
		Aogs	/dev/fslv01	ifs2		2047 Mbytes	
taddm10		/opt	/dev/hd10opt	jfs2	1104 Mbytes		
LPAR tuam10		/opt/IBM/cmdb	/dev/fslv03	ifs2	· ·	1722 Mbytes	
PAR nimserver		/opt/IBM/db2	/dev/fslv02	ifs2	· · ·	546 Mbytes	
Catal		/tmp	/dev/hd3	ifs2	1088 Mbytes	1057 Mbytes	
		<]					>
				Username	: administrat	tor Server: tadd	m10:9433

Figure 4-26 Details of a computer system

9. In the same manner, we selected **DB2 Instance** to see the details of a database as shown in Figure 4-27.

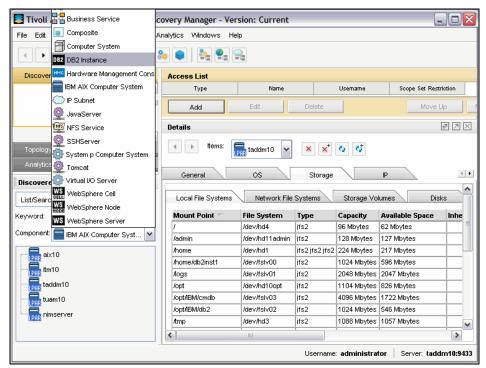


Figure 4-27 Selecting a DB2 instance

10. Right-click one of the DB2 instances and click **Show Details** as shown in Figure 4-28. The details include database information as well as the database instance itself.

🗄 Tivoli Application Dependency Discovery Manager - Version: Current							
File Edit Display Dis	File Edit Display Discovery Topology Analytics Windows Help						
••							
Discovery		Access List					
0.	<u>^</u>	Туре	Name	Usemame	Scope Set Restriction		
Access Lis		Add	Edit De	elete	Move Up Move Down		
Access Lr	51	Details			@ 7 ×		
Topology tems: DI taddm10.db2inst1 V X X & C							
Analytics Discovered Compone	ents 🖂	General		nfiguration Profile Registr			
List/Search	~	Name 🔽		Value	Description		
		AGENTPRI		SYSTEM	Priority of agents		
Keyword:							
		ASLHEAPSZ		15	Application support layer heap s		
Component: DB2 DB2 Inst	tance 💌	AUDIT_BUF_SZ		0	Audit buffer size (4KB)		
Component: DB2 DB2 Inst		AUDIT_BUF_SZ AUTHENTICATION		0 SERVER	Audit buffer size (4KB) Database manager authenticatic		
		AUDIT_BUF_SZ AUTHENTICATION BACKBUFSZ		0 SERVER 1024	Audit buffer size (4KB) Database manager authenticatic Backup buffer default size (4KE		
Component: DB2 DB2 Inst		AUDIT_BUF_SZ AUTHENTICATION BACKBUFSZ CATALOG_NOAUTH		0 SERVER	Audit buffer size (4KB) Database manager authenticatic Backup buffer default size (4KE Cataloging allowed without auth		
Component: DB2 DB2 Inst	st1	AUDIT_BUF_SZ AUTHENTICATION BACKBUFSZ		0 SERVER 1024	Audit buffer size (4KB) Database manager authenticatic Backup buffer default size (4KE		
Component: DB2 DB2 Inst	st1 Show Details	AUDIT_BUF_SZ AUTHENTICATION BACKBUFSZ CATALOG_NOAUTH B_PLUGIN		0 SERVER 1024	Audit buffer size (4KB) Database manager authenticatic Backup buffer default size (4KE Cataloging allowed without auth Client Kerberos Plugin		
Component: DB2 DB2 Inst	st1 Show Details Edit	AUDIT_BUF_SZ AUTHENTICATION BACKBUFSZ CATALOG_NOAUTH B_PLUGIN /_PLUGIN		0 SERVER 1024 NO	Audit buffer size (4KB) Database manager authenticatic Backup buffer default size (4KE Cataloging allowed without auth Client Kerberos Plugin Client Userid-Password Plugin		
Component: DB2 DB2 Inst	st1 Show Details Edit Delete	AUDIT_BUF_SZ AUTHENTICATION BACKBUFSZ CATALOG_NOAUTH B_PLUGIN ANDWIDTH		0 SERVER 1024 NO 1.000000e+02	Audit buffer size (4KB) Database manager authenticatic Backup buffer default size (4KE Cataloging allowed without auth Client Kerberos Plugin Client Userid-Password Plugin Communications bandwidth (MB		
Component: DB2 DB2 Inst	st1 Show Details Edit Delete Merge	AUDIT_BUF_SZ AUTHENTICATION BACKBUFSZ CATALOG_NOAUTH B_PLUGIN AND/WDTH APSE D		0 SERVER 1024 NO 1.000000e+02 10	Audit buffer size (4KB) Database manager authenticatic Backup buffer default size (4KE Cataloging allowed without auth Client Kerberos Plugin Client Userid-Password Plugin Communications bandwidth (MB Node connection elapse time (se		
Component: DB2 DB2 Inst	st1 Show Details Edit Delete Merge Change History	AUDIT_BUF_SZ AUTHENTICATION BACKBUFSZ CATALOG_NOAUTH /_PLUGIN ANDVMDTH APSE D		0 SERVER 1024 NO 1.000000e+02 10 2.912789e-07	Audit buffer size (4KB) Database manager authenticatic Backup buffer default size (4KE Cataloging allowed without auth Client Kerberos Plugin Client Userid-Password Plugin Communications bandwidth (MB Node connection elapse time (se CPU speed (millisec/instruction) ✓		

Figure 4-28 Details of a database instance

11.Now, click the **Topology** tab in the left pane to check the relationship between components. Click **Application Infrastructure** to see how the applications are related as shown in Figure 4-29.

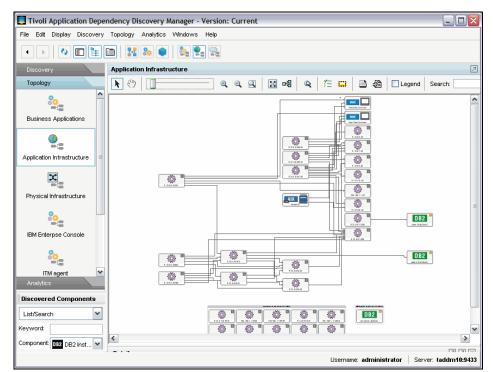


Figure 4-29 Topology for Application Infrastructure

You can zoom in or out on the Topology window Application Infrastructure by sliding the zoom indicator (see the cursor in Figure 4-30). Or, just click the zoom slider and use the arrow keys for sizing the window.

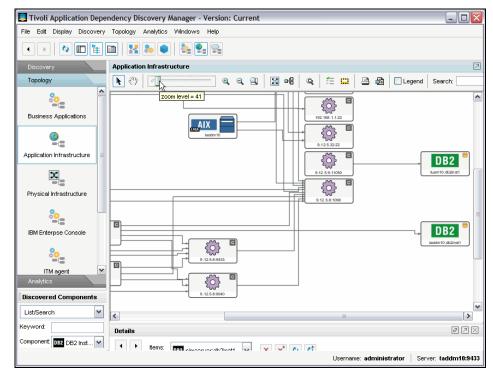


Figure 4-30 Zooming in on topology

Another view provided in the Topology tab is the Physical Infrastructure. Click **Physical Infrastructure** to see how the components are physically associated.

12. Choose a network and right-click Show Details as shown in Figure 4-31.

Even though the IP addresses of our servers are in the network of 9.12.5.x, they are shown in the network of 9.12.4.0, because our subnet mask is 255.255.252.0.

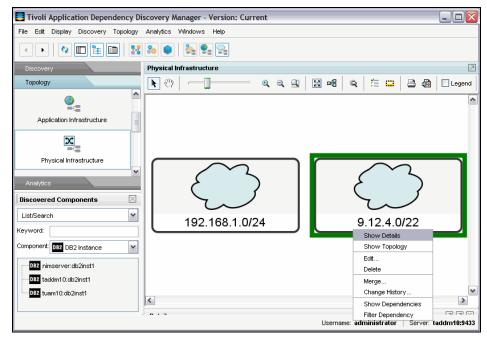


Figure 4-31 Physical Infrastructure

13. The servers and HMCs in the network are displayed. Right-click one of the servers to show details as shown in Figure 4-32.

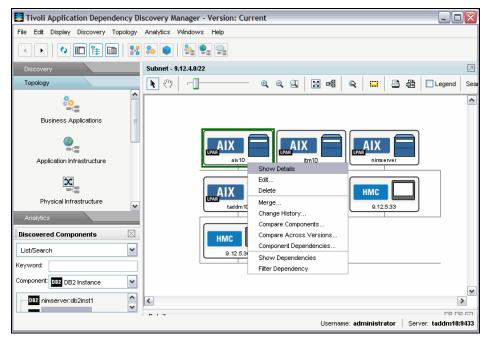


Figure 4-32 Showing the details of a server

Schedule discovery

You can initiate TADDM discoveries on demand based on a schedule. Scheduling is a methodical way to keep the TADDM database up-to-date. You can schedule discoveries to start during periods of low activity, such as on weekends, during times when batch jobs are likely to run, such as late at night, or during periods of high activity, such as mid-morning or mid-afternoon. You can schedule discoveries before and after normal maintenance windows, enabling you to quickly check what changes were made during that interval. To create a new discovery schedule, complete the following steps:

- 1. On the Discovery tab, click **Schedule**.
- 2. Select **Add** to define a new discovery schedule. The Discovery Schedule window opens as shown in Figure 4-33. The date and time that are shown in the window reflect the date and time on the TADDM server.

Tivoli Application Dependence	y Di	scovery Manager - Vers	sion: Current				
File Edit Display Discovery Topol	ogy	Analytics Windows Help	р				
Discovery		Schedule					
10		Name	Next Discovery	Repeat Cycle	Profile Used		
800 C							
Application Templates		(
_			Discovery Schedule				
Ľ.			Details	Scope			
Anchors and Gateways							
			Name:	ITSO Level 2 discovery v			
			Start Time (server time):	03 /15 /2009 -00	0 :00 - CDT -		
Schedule			Repeat	Daily	~		
Scriedule	=	Add Delete		_			
				Every: 1 day(s			
		Details					
History		ttems:					
	~	LPAF					
Topology		General					
Analytics							
Discovered Components	\times	Name: Fully qualified domain					
List/Search	~	Last Modified Time:		C	K Cancel		
Keyword:		Object Type:	IBM AIX Computer				
Neyword:			System		~		
				sername: administrator	Server: taddm10:9433		

Figure 4-33 Schedule discovery

3. Provide a name, starting time, and repeat interval. And then, click **Scope** to specify a scope and the level of discovery as shown in Figure 4-34.

🗧 Tivoli Application Dependency Discovery Manager - Version: Current						
File Edit Display Discovery Topo	logy	Analytics Windows Help)			
Discovery		Schedule				
10 ¹		Name	Next Dis	scovery	Repeat Cycle	Profile Used
8.00 × 10						
Application Templates		í	-			
.0			Discove	ry Schedul	e	
X			Deta	ils	Scope	
Anchors and Gateways			Scope:	Colocted Co	cope Elements	
			Scope.			
				🔽 🧰 Sci	opes ITSO scope	
Schedule					inso scope	
		Add Delete				
<u>(</u>)		Details				
History		▲ ▶ ttems:				
	~	▲ ► Items:				
Topology	r	General		Select A	II Clear All	
Analytics			Profile:	Level 2 Disc	covery	~
Discovered Components	\times	Name:				
List/Search	~	Fully qualified domain Last Modified Time:				OK Cancel
		Object Type:	IBM /	AIX Computer		
Keyword:			Syst			~
					Username: administrate	or Server: taddm10:943
					Jan Martin Strat	

Figure 4-34 Defining the scope in the discovery schedule

History of discovery

If you want to see the previous discoveries, click **History** in the Discovery tab shown in Figure 4-35.

File Edit Display Discovery To	pology	Analytics V	Vindows He	lp					
		8	🌺 🔮						
Discovery		History							
	^	Start	Time	Completion Time		Completion Code	P	rofile Used	
		3/9/09 13:27:	35 CDT	3/9/09 13:29:35 CDT	Norma	al Completion	Level 2 D	liscovery	1
Application Templates		3/9/09 12:16:	50 CDT	3/9/09 12:19:31 CDT	Norma	al Completion	Level 3 D	iscovery	
		3/9/09 11:40:	31 CDT	3/9/09 11:43:09 CDT	Norma	al Completion	Level 3 D	iscovery	ſ
L.		3/9/09 9:25:0	2 CDT	3/9/09 9:27:41 CDT	Norma	al Completion	Level 3 D	iscovery	=
Anchors and Gateways		3/8/09 18:31:	46 CDT	3/8/09 18:37:05 CDT	Norma	al Completion	Level 3 D	iscovery	Ľ
		3/8/09 18:21	28 CDT	3/8/09 18:23:30 CDT	Norma	al Completion	Level 2 D)iscoverv	
<u>-</u>		Scope D	etails						
Schedule	=			Sensor		Host Nar	ne/IP	Da	at
0		🕀 🚞 lpDev	iceSensor(9.1	2.5.8)		taddm10		3/8/09 18:05:39	1
5			iceSensor(9.1	2.5.36)		hmc1		3/8/09 18:05:39	9
History		🗄 🛅 IpDev	iceSensor(9.1	2.5.32)		nimserver		3/8/09 18:05:39	a
Topology	~				3/8/09 18:05:39				
Analytics	_				•				
		Information:	9.12.5.7						
Discovered Components	\times		3/8/09 18:05:	:38 CDT					
List/Search	~		in progress Discovered:	9.12.5.7					

Figure 4-35 History of discovery

Versions

Versions are snapshots of the current infrastructure. Versions are read-only views of the entire topology. Analytic reports support comparisons between versions.

To create a new version, click **Versions** in the Discovery tab, and select **Create**. Enter a version name, and click **OK** as shown in Figure 4-36 on page 212.

Note: We suggest that you have naming rules for version names to avoid possible confusion later. For example, you can use the date as part of the version name. A version ID is generated in TADDM whenever a new version is created. The current version has an ID value of 0.

Tivoli Application Dependency Di	🗧 Tivoli Application Dependency Discovery Manager - Version: Current					
File Edit Display Discovery Topology	Analytics Windows Help					
• • • •	80 🜒 🍇 🔮 😪					
Discovery	Versions					
<u>^</u>	Name	Created By	Created			
Schedule						
History	Create Version					
V1 V2	Name: ITSO scope V1.0)				
Versions	ОК	Cancel				
		Cancer				
Discovery Profiles						
Topology						
Analytics						
Discovered Components						
List/Search 🔽	Create Remove	View				
Keyword:	Details		a 7 ×			
		Username: admin	istrator Server: taddm10:9433			

Figure 4-36 Creating a version

4.3.3 Customizing TADDM

In this section, we describe how to add a custom server and a Business Application.

Custom server

You can create custom servers to discover and categorize servers that are not, by default, supported by TADDM. Your infrastructure might contain software applications and server types, such as custom Java servers, that are not automatically categorized by TADDM. Any server process with a TCP listening port that is not recognized is categorized into an Unknown Server category. Unknown servers are not displayed in the Topology tab and cannot take advantage of most of the functions. You do, however, receive basic information, such as the name and the runtime data of the unknown server.

You can define a custom server to create a template that sets up the membership rules for the custom server. During a discovery, any unknown server is automatically categorized as a custom server of this type if the runtime information matches the criteria that you have defined in the template. Custom servers are displayed in the topology, and you can view details about them. Although these details are not as complete as the details that are provided for supported servers, defining custom servers allows all of the components in your infrastructure to participate in the topology view and comparisons. You can manage custom servers by selecting the **Discovery** tab \rightarrow **Custom Servers**:

- 1. Before adding a server, run a basic discovery to check for unknown servers. You can run a report on unknown servers to help you identify patterns to use in the custom server template.
- 2. To identify patterns in unknown servers, click the **Analytics** tab \rightarrow **Inventory**, and the Inventory pane is displayed in the workspace. Then, select **Unknown Servers**, and click **Run Report** as shown in Figure 4-37.

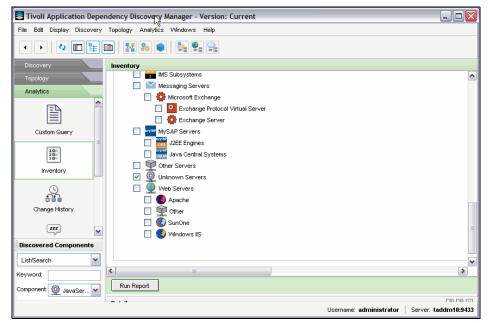


Figure 4-37 Collecting unknown servers

You can identify a pattern in the configuration of the unknown server, such as the program name, arguments, environment, and port. Use this pattern to create the identifying criteria for the custom server template. 3. In our environment, we use sendmail to create a new custom server. We highlight **sendmail** and click **Create Custom Server** as shown in Figure 4-38.

Tivoli Application Dependency Discovery Manager - Version: Current								
• • •		i 🔢 🕹 📦	🍇 🔮 🚔					
Discovery	<u> </u>	Inventory: Results	,					
Topology		• 🔒 🗎						
Analytics		Component Type:	Unknown Servers 🔽					
ΞЪ	^	запи.	cmabaam@notry	Term-aamo Aor	44	J	anno.	
		sshd:	cmdbadm [priv]		22		tuam10	
Custom Query		sshd:	root@notty	TERM=dumb AUT	22		nimserver	
	-12	sshd:	cmdbadm@notty	TERM=dumb AUT	22		tuam10	
10= 20= 30=		sendmail:	accepting conne	TZ=CST6CDT AG	25		nimserver	
Inventory		sendmail:	accepting conne		25		TADDM10	
,		sendmail:	accepting conne		25		itm10	
Q		sendmail:	accepting conne		25		tuam10	
Change History		sendmail:	accepting conne		25		aix10	
Change history		db2tcpcm	0		50000		tuam10	
ZZZ	~	db2tcpcm	0	[50010		TADDM10	
Discovered Componen	ts	Criteria:		1	1			
List/Search v tems per page: 99 v Go to page: 1 of 1 refresh <<< previous next >>								
Keyword:								
Component DavaSer								

Figure 4-38 Identifying unknown server patterns

The Custom Server Details panel General Info & Criteria tab is displayed (Figure 4-39). In the Name field, type the name of the custom server. In this example, we used Sendmail - email server.

4. To enable the custom server definition, select **Enabled**. And then, we changed the icon for sendmail. Define the criteria for the custom server. If you are creating a custom server from an unknown server, you will see at least one criterion that is set up. Figure 4-39 shows our example.

E Custom Server Details
General Info & Criteria Config Files
General Server Information
Name: Sendmail - email server
Type: AppServer
Action: Discover Ignore
Enabled
Icon: Browse
Identifying Criteria
⊙ All Criteria 🔘 Any Criteria
Program Name 🗸 contains 🗸 sendmail Remove
Add Criterion
OK Cancel

Figure 4-39 Creating a custom server

5. To add configuration files, click the **Config Files** tab. The Config Files page is displayed. On the Config Files page, click **Add**. The Search Path for Capture File window (Figure 4-40 on page 216) is displayed. From the Search Path list, provide a directory path for the configuration file.

To capture the contents of the configuration file, click **Capture file contents**, and optionally, specify the maximum number of bytes of the captured configuration file. To recursively explore through the directory structure to search for the specified file, click **Recurse Directory Content**.

To save the settings for your custom server, click **OK**. Refer to Figure 4-40.

Ustom Server Details				
Filename				
Search Path for Capture File Type: Config File Search Path: /etc/mail /etc/mail	Add Edit Remove			
OK Cancel				

Figure 4-40 Selecting config files

6. To reposition entries in the Custom Servers pane, select **sendmail** and move it up to your desired position as shown in Figure 4-41. Note that you can also choose to enable or disable discovery for specific applications in the Custom Server pane. Click **Save** to save the changes to be applied.

Tivoli Application Dependency Discovery Manager - Version: Current								
• • •		80 🌒 🍇	e					
Discovery		Custom Server	s					
ച	^	Enabled	lcon	Name	Туре	Action	Config Files	
		true	\geq	Sendmail - email	AppServer	Discover	/etc/mail/sendma	. 1
Custom Servers		true	<u>ې</u>	InetDaemon	AppServer	Ignore	/etc/inetd.conf,/	
0		true	8	MySql	DatabaseServer	Ignore		
0	=	true	8	PostgreSQL	DatabaseServer	Discover		
Computer Systems		true	()	SSHServer	AppServer	Ignore	/usr/local/etc/ss	
		true	Ö	Tomcat	J2EEServer	Discover	\$CATALINA_HO	
		true	<u>نې</u>	Broad∀ision	AppServer	Discover		
Application Templates		true		Quadstone	AppServer	Discover		
و	~	true	@	JavaServer	AppServer	Discover		
Topology		true	8	Microsoft BizTalk	AppServer	Ignore		
Analytics		true	Q	OracleStrayProc	AppServer	Ignore		
Discovered Components	X	true	Ö	Netegrity-Sitemi	AppServer	Ignore		-
-	_	true	0	HTTP Server	WebServer	Discover		-
List/Search	*	true	Ö	Remedy ARS	AppServer	Discover		
Keyword:		true	À	RIM BlackBerry	AppServer	Discover		
Component: 🔳 Composite	~	Save	Add	Edit	Сору	Delete		
()	۲							
					Lisername: a	dministrator	Server: taddm10:9	

Figure 4-41 Repositioning a custom server



Now, we can run a new discovery and check our new custom server that we have just created. Run discovery and check the results by clicking the **Topology** tab \rightarrow **Application Infrastructure** as shown in Figure 4-42 on page 218. The applications with port number 25 are sendmails. The sendmail applications are marked with the graphic that is shown here to the left.

Tivoli Application Dependency Dis	
	8 • • • • • • • • • • • • • • • • • • •
Discovery	Application Infrastructure
Topology	🖹 🖑 🗐 💼 🔍 🔍 🔍 🔛 🖼 📲 🕰 🖓 🗆 Legend 😒
<u>e</u>	
Business Applications	
e	L
Application Infrastructure	
	Ap Sever (to dearder its)
Physical Infrastructure	9.12.5.32:14080 9.12.5.118.9510 9.12.5.32.9999 9.12.5.9.9510 9.12.5.7.25
Analytics	
Discovered Components	
List/Search 👻	9.12.5.8.25 9.12.5.8.295 9.12.5.3.29510 9.12.5.79510
Keyword:	WebSphere 🚳
Component: Composite	tuam10Node01server1
InfrastructureApplicationCompos	
InfrastructureApplicationCompos	
Infracts at so 8 policationCompare	
	জা জ

Figure 4-42 Sendmail custom server discovered

If you want to see more details, right-click the discovered component and click **Show Details**. You can see all of the information related to the component, including the configuration file.

Business Applications and Business Services

A *Business Application* is the way to group the various kinds of IT resources into a logical group, and this logical group acts together as one unit to provide a type of service. You can treat Business Applications as units for discovery and analytics. The top level in the component hierarchy of TADDM is the *Business Service*. Business Services can contain any number of the lower level resources, from Business Applications to modules in a WebSphere server or specific configuration files on systems. The purpose of the Business Service is to consolidate multiple lower level objects and their relationships in order to perform reporting and analysis, considering all related resources.

 To create Business Applications, click Edit → Create Business Application. Enter a name (we entered ITM agent) and description (we entered IBM Tivoli Monitoring) as shown in Figure 4-43.

📑 Create B	usiness Application Wizard
60	Create Component : General Information General information about the Component
Name:	ITM agent
Description	IBM Tivoli Monitoring
URL:	
	Next >> Cancel

Figure 4-43 Creating a Business Application

2. Click **Next** to select the components. We selected a DB2 instance and one Java server to show you an example of a Business Application as shown in Figure 4-44. You can choose applications that are appropriate for your environment.

When you manually add a component to a Business Application, you need to choose a functional group. The *functional group* defines what components are compared when a comparison is performed between two Business Applications. We selected the default functional group in this example.

Create Business Application	Wizard 🛛 🔀
Create Business Applic	cation Components
Select the components the	at comprise this application
Available	Included
🗁 Custom Servers 📃 🔺	⊜~ Combine DB2 Instance
🖃 🗁 JavaServer	DB2 nimserver:db2inst1
	🚊 🗁 🗁 JavaServer
	9.12.5.7:9510
192.168.1.1:9510	Add >>
192.168.1.1:9511	Default Functional Group
192.168.1.1:9999	Add Functional Group
9.12.5.118:9510	Functional Groups
9.12.5.7:9510	
9.12.5.8:1098	
	< Back Next >> Cancel
	< Back Next >> Cancel

Figure 4-44 Assigning components for the Business Application

In the next window, which is shown in Figure 4-45, you can provide administrative information. We skipped this page, because it is optional.

Create Business Application Wizard							
60	e Business Application:Admin Information usiness application administrative information, if applicable						
Admin Contact:		(Optional)					
Escalation Contact:		(Optional)					
Tracking Number:		(Optional)					
Site:		(Optional)					
Group Name:		(Optional)					
Notes:		(Optional)					
	< Back Finish	Cancel					

Figure 4-45 Administrative information

3. In the same manner, we created the second Business Application, which is named TADDM, as shown in Figure 4-46.

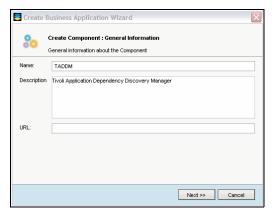


Figure 4-46 Creating a second Business Application

4. For the second Business Application, we assigned one DB2 instance and three Java servers to this application as shown in Figure 4-47.

Create Business Application Wizard						
80	Create Business Application Components Select the components that comprise this application					
Available	Included					
	JavaServer					
	<< Back Next >> Cancel					

Figure 4-47 Assigning components for the second Business Application

5. After creating two Business Applications, go to the **Topology** tab and click **Business Applications**. You will see the two Business Applications that you have just created as shown in Figure 4-48.

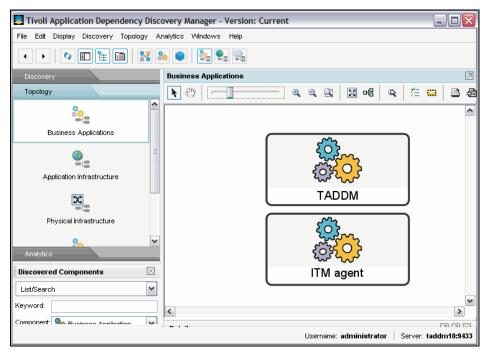


Figure 4-48 Showing Business Applications

Now, we create a Business Service that includes the two Business Applications that we have just created.

6. Click Edit \rightarrow Create Business Service as shown in Figure 4-49.

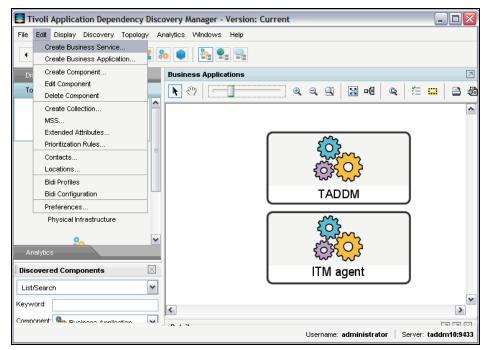


Figure 4-49 Creating a Business Service

7. Enter a Business Service Name and Description as shown in Figure 4-50. Click **Next**.

Create Business Service Wizard						
4¥4	Create Business Service : General Information General information about the Component					
Name:	Tivoli Service					
Description						
URL:						
	Next >> Cancel					

Figure 4-50 Creating Business Service Wizard

8. In the next window, you can add Business Applications into the Business Service. We selected **ITM agent** and **TADDM** as shown in Figure 4-51. Click **Next**.

Create Business Service Wizard							
Create Business Service Components Select the components that comprise this service							
Available			Included				
Business Applications Business Applications TADDM Custers Web Servers Dem J2EE Servers SMS		Add >> < Remove	Business Applications Business Applications Th agent Bo TADDM Clusters Web Servers D2EE Servers D2EE Servers SMS				
🕀 🗁 Citrix	~		🖮 🦳 Citrix	~			
<< Back Next >> Cancel							

Figure 4-51 Assigning Business Applications to the Business Service

9. Notice that the name of Tivoli Service is added in the Topology tab as a Business Service. Click **Tivoli Service**, and you will see the Business Applications that comprise this service in the right pane as shown in Figure 4-52.

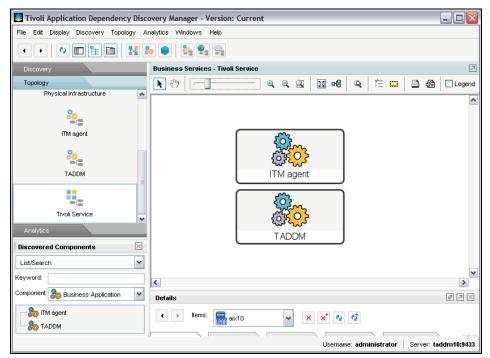


Figure 4-52 Showing the Business Service

10. If you want to see the physical topology of ITM agent, right-click **ITM agent** and select **Show Physical Topology** from the drop-down menu as shown in Figure 4-53.

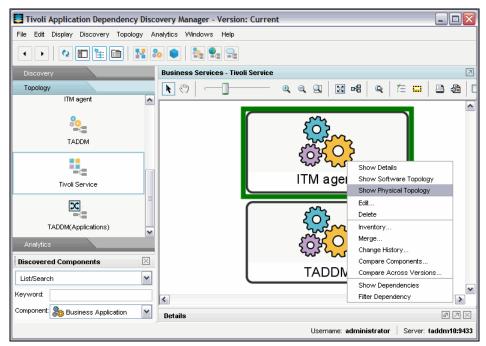
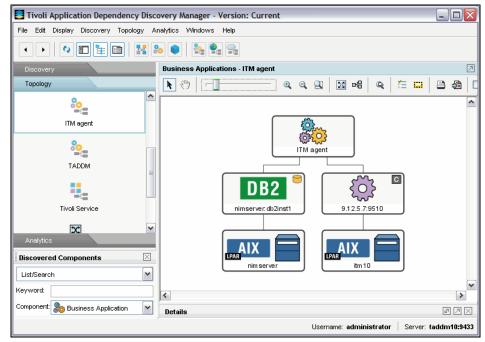


Figure 4-53 Selecting Physical Topology



11. In the next window, the physical topology appears as shown in Figure 4-54.

Figure 4-54 Showing the physical topology

4.3.4 Analytics and reporting

You can generate reports and perform analytics to monitor and troubleshoot configuration changes in your environment. You can produce a consolidated summary of changes for a specific Business Application or throughout your entire environment. You can also use the product console to generate an inventory of components that are in your organization.

Change history

If you want to check whether any changes have been made on your applications or servers in a certain period of time, there is a Change History menu under the Analytics tab menu as shown in Figure 4-55 on page 229.

We intentionally add a host, 100.100.100.1 test1 (see the last line), into the /etc/hosts file, so that the change can be discovered in TADDM.

100.100.100.1	test1	
9.12.5.33	hmc2	hmc2.itso.ibm.com
9.12.5.36	hmc1	hmc1.itso.ibm.com
9.12.5.119	wpar02	wpar02.itso.ibm.com
9.12.5.118	wpar01	wpar01.itso.ibm.com
9.12.5.32	nimserver	nimserver.itso.ibm.com
9.12.5.38	vio1_110	
taddm10:/] vi	/etc/hosts	
Example 4-5 Editi	ing /etc/hosts	

1. Go to the **Discovery** tab menu and click **Run Discover**. When the discovery finishes, come back to the **Change History** menu and click **Run Report**. We set Date Range to 1 hour as shown in Figure 4-55.

Cucovery Concovery Concovery Concovery Cuctor Ouery Set Date by: Relative Timeframe Analytics Cuctor Ouery Set Date by: Relative Timeframe Analytics Include Components Set Date by: Components Components Components Components Components Components Components Components Components Select By: Components Select By: Components Select By: Components Select By: Components Select By: Components Select By: Components Select By: Components Select By: Components Select By: Components Select By: Components Select By: Components Select By: Components Name Add>>> Name Add>>> Name Cutoe Name Select By: Components Name Add>>> <t< th=""></t<>		
File Edit Display Discovery Topology A	nalytics Windows Help	
< > • E E E M S		
Discovery	Change History	
Topology	Date Range	
Analytics		
<u>^</u>	Set Date by.	
	From: 1 Hours ago, until present	
Custom Query		
19	ogy Analytics Windows Help	
20-	Select BV: Commonweater	
Inventory	Componenta -	
0	Components	
at a	Component Type: FM &IX Computer System	
Change History		
Discovered Components		
List/Search	Production of the second	
	ax10 << Remove Tadom10 Current	
Component: IBM AIX Computer Syst Y		
	Run Report	
	Details	a 🛛 🗙
	4 b Tems: Circl Show Datale to view data w X x ⁺ b 6	
LPAR		
Delete Merge		
Change History		
Compare Components		
Compare Across Versions	University administration Communication	
Component Dependencies	Username: administrator Server.	taddm10:9433

Figure 4-55 Change History

The report shows all the changes that have been made on the server for the past one hour, and you can see the /etc/hosts file in the list as shown in Figure 4-56.

Tivoli Application Dependency D	isco	overy Manager - Version: Current			
File Edit Display Discovery Topology	Ar	nalytics Windows Help			
< > 🗘 🗊 🔚 🚺	8	•			
Discovery		Change History: Results			
Topology		• 🛛 🖹			
Analytics					
	^	Component	Туре	Change	D
		🖃 🚞 taddm10	AIX Computer System	Updated	3/10/09 16:3
Custom Query	=	🗉 🛅 /etc/hosts	ConfigFile	Updated	3/10/09 16:3
,		🕀 🛅 AixComputerSystemTemplate/Isusers	DataFile	Updated	3/10/09 16:3
10= 20= 30=		🗉 🚞 AixComputerSystemTemplate/sysAttributes	DataFile	Updated	3/10/09 16:3
Inventory		🗄 🚞 AixComputerSystemTemplate/logonMessage	DataFile	Updated	3/10/09 16:3
Change History	~				
Discovered Components	<				
List/Search	-				
Keyword:	5				
Component: BM AIX Computer Syst	-	Diff Show Details			
taddm10	•				
tuam10	-	Details			7 7 X
			Username: administrat	ar Conver	taddm10:9433

Figure 4-56 Results of Change History

However, note that TADDM does not collect all the files in a server for Change History by default. You might need to check the list in a component and add additional files to be collected.

The next two windows show how to add those files into a computer system.

2. Go to the **Discovery** tab, and then click **Computer Systems**.

3. In the right pane, click **AixComputerSystemTemplate** and then click **Edit** as shown in Figure 4-57.

Tivoli Application Dependen File Edit Display Discovery Top		nalytics Window					
•••••••••••••••••••••••••••••••••••••••	1	s 🔹 😫	·				
Discovery		Computer Sys	tems				
	^	Enabled	lcon	Name	Туре	Action	Config Files
		true	<u></u>	AixComputerSy	UnitaryCompute	Discover	/etc/motd,/etc/nt
Custom Servers		false	Ô	LinuxComputerS	UnitaryCompute	Discover	
0		false	<u>ې</u>	SunOSComputer	UnitaryCompute	Discover	
0	=	false	<u>©</u>	HpUxComputerS	UnitaryCompute	Discover	
Computer Systems		false		WindowsCompu	UnitaryCompute	Discover	
M		false	<u>©</u>	OpenVmsComp	UnitaryCompute	Discover	
õ.		false	Ø	VMwareComput	UnitaryCompute	Discover	
Application Templates	~	false	<u>ې</u>	Tru64Computer	UnitaryCompute	Discover	
Topology							
Analytics							
Discovered Components	\times						
List/Search	~						
Keyword:							
Component: 🔚 IBM AIX Computer Sys	:t 🕶	Save		5-13	0	Delete	
PAR aix10	^	Save	Add	Edit	Сору	Delete	
	~	Details					22
					Username: admi		rver: taddm10:943

Figure 4-57 Editing Computer Systems

4. In the next window as shown in Figure 4-58, click the **Config Files** tab and add your desired files into the list.

Computer System Details	×
General Info & Criteria Config Files	
Filename	
/etc/motd	
/etc/ntp.conf	
/etc/profile	
/etc/environment	
/etc/hosts	
/etc/inittab	
/etc/inetd.conf	Add
/etc/rc.tcpip	Edit
	Remove
	OK Cancel

Figure 4-58 Adding Config Files

Inventory reporting

The Inventory report lists components of a specific type with important attributes, for example, it lists all of the AIX Computer systems and their installed OSs and all of the database servers and their versions. It is a comprehensive infrastructure asset report. After you run the inventory report, you can save the data to various formats. If you select multiple types of IT components, after you select the target and file name, multiple files are created.

In order to create a inventory report:

 Click the Analytics tab → Inventory, and then select the component type for which you want to create a report as shown in Figure 4-59. We selected DB2 and AIX in this example. Click Run Report to create reports.

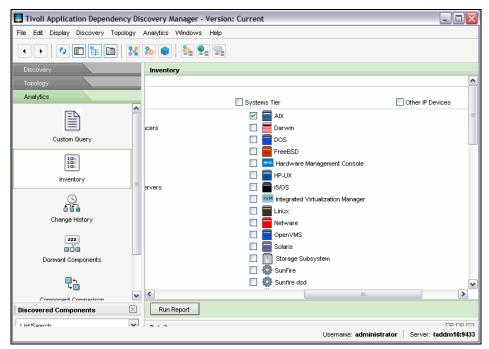


Figure 4-59 Selecting component type for Inventory report

2. Figure 4-60 is an example of a report that includes AIX Servers and the DB2 database. Click the **Save** icon (see cursor) to save the report to your local workstation.

File Edit Display Discovery Te	opology	Analytics Window:	s Help					
• • 0]	80 📦 🌺						
Discovery		Inventory: Resul	ts					
Topology		• 🖳 🖴						
Analytics		Compo <mark>Save</mark> pe:	AIX Unitary Computer	System(s) 🔽				
E	^	Name 🗁	AIX Unitary Computer	System(s)	Manufacturer	OS Name	OS Versi	
		aix10	DB2 Databases		IBM	AIX	6.1	
Custom Query		itm10	9.12.5.7 127.0.0.1	9117-MMA	IBM	AIX	6.1	
18=		nimserver	9.12.5.32 127.0.0	9113-550	IBM	AIX	6.1	
10= 20= 30=		taddm10	9.12.5.8 127.0.0.1	9117-MMA	IBM	AIX	6.1	
Inventory	=	tuam10	9.12.5.9 127.0.0.1	9117-MMA	IBM	AIX	6.1	
Change History								
222								
		Criteria: tems per page: 5		to page: 1 o	f 1 refresh	<< previous	next >>	
		Criteria: Items per page: 5	Go		f 1 refresh	<< previous		
ZZZ Components		Criteria:	Go		t 1 retresh	<< previous		

Figure 4-60 Inventory report by component type

 Provide a file name and select the file type. You can choose various types of files, including portable document format (PDF) or comma-separated values (CSV), as shown in Figure 4-61.

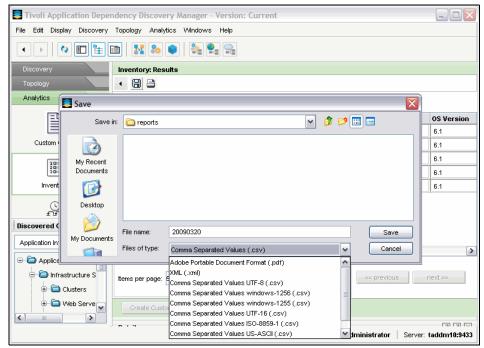


Figure 4-61 File name and type for the inventory report

4. Figure 4-62 shows the sample output of our inventory reports.

	<u>File E</u> dit	<u>V</u> iew <u>I</u> ns	ert F <u>o</u> rmat	<u>T</u> ools	s <u>D</u> a	ta	<u>W</u> indov	v <u>H</u> elp /	Ado <u>b</u> e PDF	Ту	pe a quest	ion for help	é	5 3
ß	🛩 🖬 💡	2)	Arial		-	10	- B	ΙU	F = ∃	\$	% 📳	🔄 🗸 🕭	• <u>A</u> •	
	SnagIt 🛃			-										
7	12 も 🗸													
	A1		<i>f</i> ∡ Name											
	A	В	С	D			E	F	G	H		J		_
		IP Addres					Name		Tracking	NSite	Туре			_
2	aix10		9117-MM			AIX		6.1						
	itm10		29117-MM/			AIX		6.1						
4	tuam10		29117-MM/	IBM		AIX		6.1						
5	nimserver	9.12.5.32	9113-550	IBM		AIX		6.1	1					
6	taddm10	9.12.5.8 1	29117-MM/	IBM		AIX		6.1	1					
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														

Figure 4-62 Sample output of inventory report

If you want to produce reports with Business Intelligence and Reporting Tools (BIRT), refer to Chapter 7, "Reporting Scenarios," in *Deployment Guide Series: IBM Tivoli Application Dependency Discovery Manager V7.1*, SG24-7616, for more details.

4.3.5 Performance considerations

Deploying TADDM in a production environment is an iterative process that involves initial discovery, the refinement of access lists, the refinement of scopes, the refinement of custom servers, the deployment of application descriptors, and rediscovery.

During this process, it might be necessary to review and refine the various settings that impact performance. Although the default settings generally provide adequate performance immediately, you can substantially increase TADDM performance by tailoring the configuration of TADDM to the environment that it manages.

There are several aspects regarding performance with TADDM, including:

- Discovery tuning
- Storage tuning
- Java Virtual Machine tuning
- Database tuning
- Operating system tuning

If you need further information for performance tuning, refer to *Workload Partition Management in IBM AIX Version 6.1*, SG24-7656.

4.4 Operating IBM Tivoli Usage and Accounting Manager

This section describes the basics of operating Tivoli Usage and Accounting Manager:

- ▶ "IBM Tivoli Usage and Accounting Manager collectors" on page 237
- "Collecting AIX and VIOS accounting data" on page 241
- "Loading AIX accounting data into the database" on page 242
- "Installing Business Intelligence and Reporting Tools (BIRT)" on page 250
- ► "Troubleshooting IBM Tivoli Usage and Accounting Manager" on page 266

4.4.1 IBM Tivoli Usage and Accounting Manager collectors

IBM Tivoli Usage and Accounting Manager ships with three major processing scripts as shown in Table 4-3.

Script name	Function
/opt/ibm/tivoli/ituam/collectors/Unix/script s/aacct/ituam_format_aacct	Generates usage logs from data files in the history directory
/opt/ibm/tivoli/ituam/collectors/Unix/script s/aacct/ituam_get_aacct	Retrieves the <i>Active</i> data file and copies it to the history directory; you can run this script multiple times a day if needed
/opt/ibm/tivoli/ituam/collectors/Unix/script s/aacct/ituam_send_aacct	Sends data files from collector client system to IBM Tivoli Usage and Accounting Manager server

 Table 4-3
 IBM Tivoli Usage and Accounting Manager processing scripts

Each of these scripts uses common variables that are set in the A_config.par file, which is located in the /opt/ibm/tivoli/ituam/collectors/Unix/data directory. The ituam_format_aacct and ituam_get_aacct scripts do not require special variables to be set up, but in order to use the ituam_send_aacct to push the data to the IBM Tivoli Usage and Accounting Manager server, you must set the following variables in the A_config.par file:

► CS_METHOD

Method for transferring the data to the IBM Tivoli Usage and Accounting Manager server. This method can be FTP, secure copy protocol (**scp**), or Secure File Transfer Protocol (SFTP).

► CS_PLATFORM

Name of IBM Tivoli Usage and Accounting Manager server.

CS_USER

Name of user on IBM Tivoli Usage and Accounting Manager server for transfer. We recommend that you set up a specific user for the transfer and that you do *not* use the root user.

CS_KEY

Password for the user to perform the transfer. If you use **scp**, you can set up keys so that you are not required to have the password in the file in clear text.

► CS_COLL_PATH

Path on the server for the files to be transferred.

► CS_PROC_PATH

Path for processing the data files.

The two processing scripts for gathering the accounting data and formatting the accounting data can be combined into one process. We have included a sample script that runs both of these jobs and that can be used in crontab as a timed process. Example 4-6 shows this script.

Example 4-6 IBM Tivoli Usage and Accounting Manager processing script: tuam-getdata.sh

#!/usr/bin/ksh

ITUAMHOME=/opt/ibm/tuam/collectors/unix/scripts/aacct ITUAMGET=\${ITUAMHOME}/ituam_get_aacct ITUAMFORMAT=\${ITUAMHOME}/ituam_format_aacct

#get current date
START=\$(date +%Y%m%d)

```
#call ITUAMGET
${ITUAMGET}
#wait for 2 minutes
sleep 120
#check if date has changed
if [ ${START} -eq $(date +%Y%m%d) ]; then
echo same date - no processing needed
else
#date changed, run format script for the previous day
${ITUAMFORMAT} ${START}
fi
```

There are several cronjobs that you add that have been predefined to run the IBM Tivoli Usage and Accounting Manager processing jobs on the IBM Tivoli Usage and Accounting Manager server. Example 4-7 lists these jobs.

Example 4-7 IBM Tivoli Usage and Accounting Manager cron jobs

```
# TUAM UNIX/Linux Data Collector scripts
#
5 1 * * * (/opt/ibm/tuam/collectors/Unix/etc/ituam_uc_nightly 1>
/opt/ibm/tuam/collectors/Unix/log/ituam_uc_nightly.log 2>&1)
3,13,23,33,43,53 * * * * /opt/ibm/tuam/collectors/Unix/etc/check_pacct
5 3 * * *
(/opt/ibm/tuam/collectors/Unix/scripts/enterprise/CS_nightly_consolidat
ion 1> /opt/ibm/tuam/collectors/Unix/log/CS_nightly_consolidation.log
2>&1)
#45 3 * * * (/opt/ibm/tuam/collectors/Unix/scripts/enterprise/CS_send
1> /opt/ibm/tuam/collectors/Unix/log/CS_send.log 2>&1)
```

Table 4-4 on page 240 describes each of these jobs.

Script name	Default execution	Description
ituam_uc_nightly	01:05 a.m.	Collects raw AIX accounting data and file system usage.
check_pacct	Every 10 minutes	Manages pacct file.
CS_nightly_consolidation	03:05 a.m.	Consolidates the nightly accounting and storage files into the common source format (CSR) file.
CS_send (optional)	03:45 a.m.	Transfers the consolidated CSR file to the IBM Tivoli Usage and Accounting Manager server.

Table 4-4 IBM Tivoli Usage and Accounting Manager cron job descriptions

The scheduled job produce log files that contain information about the execution of each task. The scripts also produce data files that contain accounting and file system information.

Table 4-5 shows the name of the output log and the data file for each of the scheduled cron jobs. The output log directory is /opt/ibm/tuam/collectors/unix/log.

Table 4-5 IBM Tivoli Usage and Accounting Manager cron job log files

Script name	Output log file	Output data directory
ituam_uc_nightly	ituam_uc_nightly.log	/collectors/unix/accountin g/ <host name=""></host>
check_pacct	-	-
CS_nightly_consolidation	CS_nightly_consolidation.l og	/collectors/unix/CS_input _source
CS_send(optional)	CS_send.log	-

4.4.2 Collecting AIX and VIOS accounting data

After the collectors have been installed on all the systems, you need to set up a method to gather the data back to the Tivoli Usage and Accounting Manager server. The two methods of transferring the accounting data to the IBM Tivoli Usage and Accounting Manager server are:

- Push mode, where the client systems are responsible for copying the data to the Tivoli Usage and Accounting Manager server
- Pull mode, where the Tivoli Usage and Accounting Manager server is responsible for copying the data from all the clients

For security reasons, we chose the pull mode for our example. We also chose to implement the pull method using the **scp** command.

We have written a sample script for collecting the AIX accounting data from the nodes, which is shown in Example 4-8.

Example 4-8 Data collection: tuam-getdata.sh

```
#!/bin/ksh
#This script is supposed to be started just before midnight on the TUAM
server
DATETOGET=$(date +%Y%m%d)
TUAMHOSTS=/usr/local/bin/ituam hosts
TUAMJOBS=/opt/ibm/tuam/jobfiles
JOBRUNNER=/opt/ibm/tuam/bin/startJobRunner.sh
CLIENTUSER=tuam
CLIENTPATH=/opt/ibm/tuam/collectors/unix/CS_input_source
SERVERPATH=/opt/ibm/tuam/logs/collectors
RECORDTYPES="1 4 6 7 8 11 36 38 39"
# Wait for the clock to roll over and the daily collection scripts
# on the clients to finish
sleep 600
# Get data from all the clients
cat ${TUAMHOSTS} while read CLIENT
do
   echo Getting data from ${CLIENT}
   for TYPE in ${RECORDTYPES}
   do
     if [ ! -d ${SERVERPATH}/AACCT ${TYPE}/${CLIENT} ]
```

```
then
        mkdir -p ${SERVERPATH}/AACCT ${TYPE}/${CLIENT}
     fi
     scp
     ${CLIENTUSER}@${CLIENT}:${CLIENTPATH}/aacct${TYPE} ${DATETOGET}.t
     xt ${SERVERPATH}/AACCT ${TYPE}/${CLIENT}/
   done
done
# Load data from all the clients
cat $TUAMHOSTS while read CLIENT
do
echo Loading data from ${CLIENT}
cat ${TUAMHOSTS}/AIXAA.xml sed "s/sample/${CLIENT}/g" sed
"s/\"AIXAA\"/\"AIXAA -${CLIENT}\"/g" > ${TUAMJOBS}/AIXAA-${CLIENT}.xm]
chmod 755 ${TUAMJOBS}/AIXAA-${CLIENT}.xm]
${JOBRUNNER} ${TUAMJOBS}/AIXAA-${CLIENT}.xm]
done
```

Note: You will need to modify the AIXAA- $\{CLIENT\}.xm1$ job files that are created by the script in Example 4-8 to contain the directories for processing your data that is being transferred. The files can be edited by using the Integrated Solutions Console (ISC) under **Chargeback Maintenance** \rightarrow **Job Runner** \rightarrow **Job Files**.

4.4.3 Loading AIX accounting data into the database

Tivoli Usage and Accounting Manager jobs process the AIX accounting data after it has been collected and load it into the Tivoli Usage and Accounting Manager database.

You can copy the sample job for processing the AIX data and then edit it for your environment:

 First, create a new job in the ISC. To create a new job, click Usage and Accounting Manager → Chargeback Maintenance → Job Runner → Job Files → New. Enter the name of your new job file and click OK. We want to create a job named AIXAA.xml. Refer to Figure 4-63. After the job is created, you will see a message stating, "Successfully copied file." This message indicates that the file is created and contains a skeleton job file template.

Tivoli Usage and Accounting Manager provides a sample job to load AIX data named SampleAIXAA.xml. We will use the contents of the SampleAIXAA.xml to overwrite the contents of the new AIXAA.xml file that we have created.

	All tasks cone Startup Pages urity rs and Groups bleshooting ge and Accounting Manager hargeback Maintenance 3 bb Files is Sample Job Files usaf Tacking ystem Maintenance	
Integrated Solutions Console	- Microsoft Internet Explorer	. 7
File Edit View Favorites Tool	s Help	<u></u>
🌀 Back 🝷 🐑 🖌 🛃	🎸 🔎 Search 🤺 Favorites 🔣 😥 - چ 📓 - 📃	
Address Address Address Address	console/login.do	💌 🋃 Go 🔋 Links 🎽 👘 🔻
Integrated Solutions Console we	elcome root	Help Logout
View: All tasks	Job Files X	Select Action
= Welcome = My Startup Pages	Job Runner Job Files	
Gecurity		2 - 0
Users and Groups ■		
Troubleshooting		
🖯 Usage and Accounting Manager		
= Log Files = Sample Job Files = Load Tracking El System Maintenance		
🗶 📖	>	Q Local intranet
E Done		S Local Intranet

Figure 4-63 Creating a new job by using the ISC

- From the ISC, click Sample Job Files → SampleAIXAA.xml. Highlight the contents of SampleAIXAA.xml, then right-click to select the contents of the xml file and click Copy. Figure 4-64 on page 244 shows the SampleAIXAA.xml file.
- From the ISC, click Usage and Accounting Manager → Chargeback Maintenance → Job Runner → Job Files. Select AIXAA.xml from the menu. Replace AIXAA.xml with the contents that you copied from SampleAIXAA.xml.

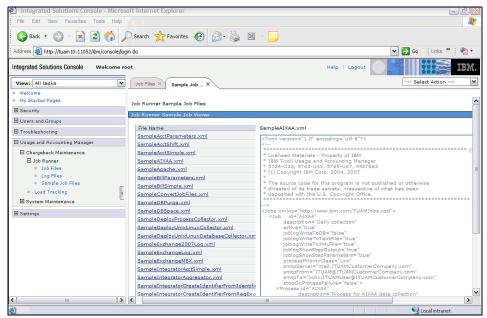


Figure 4-64 SampleAIXAA.xml

The AIXAA.xml file is listed in Example 4-9. After moving over the content of the SampleAIXAA.xml file to the AIXAA.xml file, you need to edit the file to customize it for your environment.

Example 4-9 AIXAA.xml

```
* The source code for this program is not published or otherwise
 * divested of its trade secrets, irrespective of what has been
 * deposited with the U.S. Copyright Office.
 {COPYRIGHT-END}
-->
<Jobs xmlns="http://www.ibm.com/TUAMJobs.xsd">
           id="AIXAA"
   <Job
           description="Daily collection"
           active="true"
           _ioblogWriteToDB="false"
           joblogWriteToTextFile="true"
           joblogWriteToXMLFile="true"
           joblogShowStepOutput="true"
           .joblogShowStepParameters="true"
           processPriorityClass="Low"
           smtpServer="mail.ITUAMCustomerCompany.com"
           smtpFrom="ITUAM@ITUAMCustomerCompany.com"
           smtpTo="John.ITUAMUser@ITUAMCustomerCompany.com"
           stopOnProcessFailure="false">
       <Process id="AIXAA"
                   description="Process for AIXAA data collection"
                   joblogShowStepOutput="true"
                   _ioblogShowStepParameters="true"
                   active="true">
     <Steps stopOnStepFailure="true">
       <Step id="Integrator"</pre>
           type="ConvertToCSR"
                       programName="integrator"
                       programType="java"
                       active="true">
       <Integrator>
         <Input name="AIXAAInput" active="true">
           <Files>
             <File
name="/usr/ituam/CS input source/aacct1 %LogDate End%.txt" />
             <File
name="/usr/ituam/CS_input_source/aacct4 %LogDate End%.txt" />
             <File
name="/usr/ituam/CS input source/aacct6 %LogDate End%.txt" />
             <File
name="/usr/ituam/CS input source/aacct7 %LogDate End%.txt" />
             <File
name="/usr/ituam/CS_input_source/aacct8 %LogDate End%.txt" />
```

```
<File
name="/opt/ibm/tuam/samples/processes/exception.txt" type="exception"
/>
            </Files>
          </Input>
          <Stage name="CreateIdentifierFromIdentifiers" active="true"</pre>
trace="false" stopOnStageFailure="true" >
                      <Identifiers>
                             <Identifier name="Account Code">
                                  <FromIdentifiers>
                                     <FromIdentifier name="SYSTEM ID"</pre>
offset="1" length="12"/>
                <FromIdentifier name="UserName" offset="1"</pre>
length="12"/>
                                  </FromIdentifiers>
                              </Identifier>
                      </Identifiers>
                             <Parameters>
                                <Parameter keepLength="true"/>
                                <Parameter modifyIfExists="true"/>
                             </Parameters>
          </Stage>
          <Stage name="DropFields" active="true">
            <Fields>
              <Field name="AAID0101"/>
              <Field name="AAID0102"/>
              <Field name="AAID0103"/>
              <Field name="AAID0403"/>
            </Fields>
          </Stage>
          <Stage name="CSRPlusOutput" active="true">
            <Files>
              <File
name="/opt/ibm/tuam/samples/processes/AIXAA/server1/%LogDate End%.txt"
/>
            </Files>
          </Stage>
        </Integrator>
        </Step>
        <Step
                id="Scan"
                description="Scan AIXAA"
                type="Process"
```

```
programName="Scan"
        programType="java"
        active="true">
        <Parameters>
           <Parameter retainFileDate="false"/>
           <Parameter allowMissingFiles="false"/>
           <Parameter allowEmptyFiles="false"/>
           <Parameter useStepFiles="false"/>
        </Parameters>
</Step>
<Step
        id="Process"
                description="Standard Processing for AIXAA"
                type="Process"
                programName="Bill"
                programType="java"
                active="true">
    <Bill>
      <Parameters>
               <Parameter inputFile="CurrentCSR.txt"/>
      </Parameters>
   </Bill>
</Step>
<Step
        id="DatabaseLoad"
        description="Database Load for AIXAA"
        type="Process"
        programName="DBLoad"
        programType="java"
        active="true">
        <DBLoad>
          <Parameters>
          </Parameters>
        </DBLoad>
</Step>
        id="Cleanup"
<Step
        description="Cleanup AIXAA"
        type="Process"
        programName="Cleanup"
        programType="java"
        active="false">
        <Parameters>
            <Parameter DavsToRetainFiles="45"/>
            <Parameter cleanSubfolders="true"/>
        </Parameters>
</Step>
```

```
</Steps>
</Process>
```

</Jobs>

Run the AIXAA.xml job by using the Job Runner in either the ISC or from the command line. In the ISC, click Usage and Accounting Manager →
 Chargeback Maintenance → Job Runner → Job Files. Click AIXAA.xml from the list of jobs and select Run Job from the pull-down menu, which is shown in Figure 4-65.

Integrated Solutions Conso	le - Microsoft Inter	rnet Explorer					Ð
File Edit View Favorites To	ools Help						
🚱 Back 🔹 🕥 🕤 💌 🙎	🛾 🏠 🔎 Search	Favorites 🚱 🔗 嫨 📧	*				
Address 🗃 http://tuam10:11052/ib	m/console/login.do				🛩 🄁 Go	Links »	1
intogratou oonanono oonoono	Welcome root			Help Logout			C) (
Usage and Accounting Manager Chargeback Maintenance	Job Fi	iles X Log Files X Initialize X			Sele	ct Action	[
Job Runner Job Runner Job Files Log Files Log Files Log Files Load Tracking Jota Sources Users Users User Groups Calendar Account Code Structure COU Vormalization Identifiers Rapt Charling Reports Report Groups Report Groups Report Groups Report Groups Initialize Database Upgrade Database Upgrade Database Upgrade Database Upgrade Database Upgrade Database Upgrade Database Table Manager Table Manager		Runner Job Maintenance	Refresh New	/aldate, Run Job. S	ava Job	7 -	
⊞ Settings	~			~			
<]	>						
<u>n</u>					🤤 Lo	ocal intranet	

Figure 4-65 IBM Tivoli Usage and Accounting Manager Job Runner

5. When the Job Runner completes, you will be presented with an informational window similar to Figure 4-66. Job Runner can take a few minutes to complete, so wait until this message or a completion message appears.

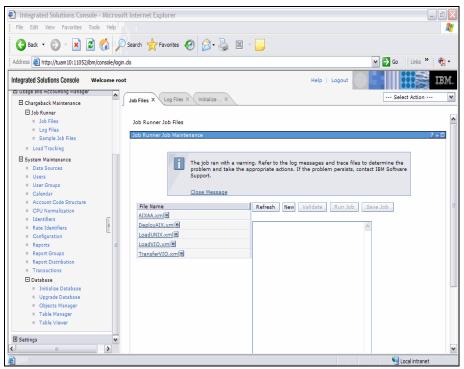


Figure 4-66 IBM Tivoli Usage and Accounting Manager Job Runner complete message

6. Verify that the database has loaded successfully by checking the log files. In the ISC, click Usage and Accounting Manager → Chargeback Maintenance → Log Files. Figure 4-67 shows an example of the log files from the AIXAA.xml file. Any errors that occur during the processing will appear in these log files and will be separated into the processing steps. The error messages all begin with AUC. You can search for and read the messages on the following Web site:

http://www-01.ibm.com/software/sysmgmt/products/support/IBMTivoliUsa
geandAccountingManager.html

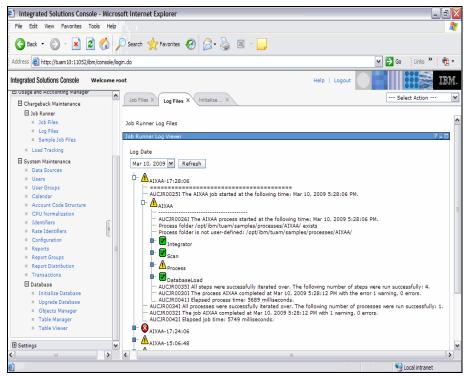


Figure 4-67 Log files

4.4.4 Installing Business Intelligence and Reporting Tools (BIRT)

BIRT is an open source reporting tool that runs in the Eclipse environment. You can choose to download and install BIRT on the Windows, AIX, or Linux platform. BIRT must be run from a graphical user interface (GUI). In our example, we install BIRT on a Windows workstation. Prior to installing and configuring BIRT on a Windows workstation, you must copy the files from the Tivoli Usage and Accounting Manager server that you need to use with BIRT.

These files are located in multiple directories on your IBM Tivoli Usage and Accounting Manager server. The required files are:

- /opt/IBM/db2/V9.1/java/db2jcc_license_cu.jar
- /opt/IBM/db2/V9.1/java/db2jcc.jar
- > /opt/ibm/tuam/server/reportsbirt/db2/standard/*.rptdesign
- > /opt/ibm/tuam/server/reportsbirt/resources/*

You must copy these files and place them into a temporary folder for use later. In our example, these files were placed in the temp folder:

1. Go to the BIRT Web site at:

http://www.eclipse.org/birt/phoenix/

- 2. Click Download BIRT 2.3.2 to go to the BIRT download page.
- 3. On the BIRT 2.3.2 download page, click **All-in-One for the BIRT Report Engine**. Install Eclipse by unzipping the file.

Note: If you already have Eclipse installed on your system, you can download the Runtime and Remote Copy (RCP) Designer portions only. These parts are also installed by unzipping the files.

4. Move to the folder that contains the files that you unzipped and look for a folder named *eclipse*. The eclipse.exe executable is in the eclipse folder as shown in Figure 4-68. Double-click **eclipse.exe** to start the eclipse environment.

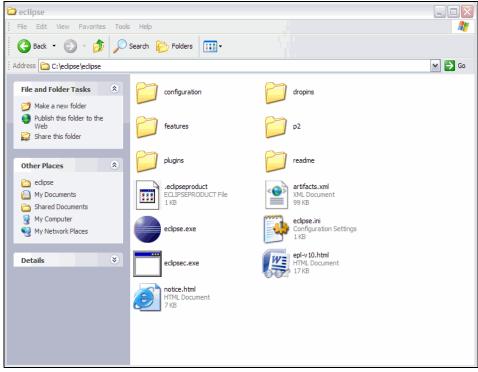


Figure 4-68 Eclipse folder

5. The first time that you execute eclipse.exe, you will see a warning message as shown in Figure 4-69. Click **Run** to continue, and also clear the check mark from "Always ask before opening this file."

Open Fi	e - Security Warning	
	blisher could not be verified. Are you sure you want software?	to
	Name: eclipse.exe	
	Publisher: Unknown Publisher	
	Type: Application	
	From: C:\eclipse\eclipse	
	Run Cance	el
🗹 Alwa	rs ask before opening this file	
8	This file does not have a valid digital signature that verifies its publisher. You should only run software from publishers you tru <u>How can I decide what software to run?</u>	ust.

Figure 4-69 Eclipse security warning

6. The Eclipse Workspace Launcher will start and prompt you to enter the path to use for projects as shown in Figure 4-70. Select the path that you will use to save your BIRT projects and select **OK** to continue.

Workspace Launcher	
Select a workspace	
Eclipse Platform stores your projects in a folder called a workspace. Choose a workspace folder to use for this session.	
Workspace: C:\Documents and Settings\RESIDENT\workspace	Browse
Use this as the default and do not ask again	
	OK Cancel

Figure 4-70 BIRT Workspace Launcher

 BIRT will open up to the main workspace window as shown in Figure Figure 4-71. You need to create a new project by selecting File → New → Project. A pop-up window appears as in Figure 4-71. Expand Business Intelligence and Reporting Tools, select Report Project, and click Next.

New Project	🛛
Select a wizard	
Create a new Report Project.	
Wizards:	
type filter text	
⊕ - → General ⊕ - → Business Intelligence and Reporting Tools → ☆ ODA Designer Plug-in Project → ☆ ODA Runtime Driver Plug-in Project ⊕ - → CVS ⊕ - → Eclipse Modeling Framework ⊕ - → Dava ⊕ - → Java EE ⊕ - → Java Script ⊕ - → PPA ⊕ - → PPA ⊕ - → Pug-in Development ⊕ - → Web	() III ()
? < Back Next > Finish	Cancel

Figure 4-71 New project window

8. You will be prompted for a name for the new project as in Figure 4-72. Enter the new project name, and click **Finish** to continue.

New Report Project	t	
Report Project Create a new report proje	ct.	
Project name: ITUAM2		
✓ Use default location		
Choose file syst	and Settings (RESIDENT (workspace (JTUAM2 .em: default	v
0	< Back Next > Fi	nish Cancel

Figure 4-72 New Report Project

9. You will be presented with a blank Report Design workspace similar to the one in Figure 4-73.

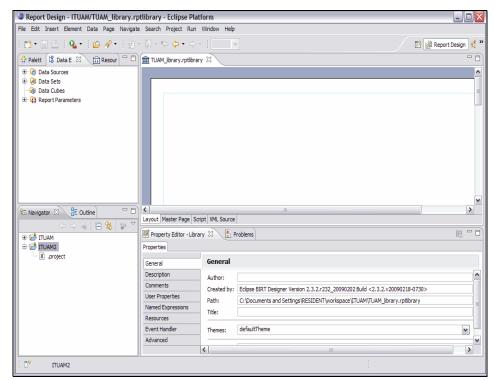


Figure 4-73 BIRT main window

Configuring BIRT

In order for BIRT to connect to the DB2 server on the Tivoli Usage and Accounting Manager server, we need to configure Java Database Connectivity (JDBC) drivers and ensure that the data sets are defined with the correct user name and password. To configure BIRT:

 From the BIRT main window, click the Data Explorer tab → Data Sources. Right-click DB2, and select Edit from the pull-down menu. The menu in Figure 4-74 on page 257 appears.

Edit Data Source - DB2			- 🗆 🗙
BIRT JDBC Data Source	Edit the s	elected data source.	
Connection Profile	Driver Class: Driver URL: User Name: Password: JNDI URL:	com.ibm.db2.jcc.DB2Driver (v3.6) jdbc:db2://tuam10:50000/ituamdb db2inst1 	
0		ок	Cancel

Figure 4-74 Edit data Source

2. Change the Driver URL to jdbc:db2://yourserver:50000/yourdbname, change the user name to db2inst1, and change the password to the password that you set for db2inst1 on your system. Click **Manage Drivers**. The Manage JDBC Drivers window appears as in Figure 4-75.

File Name	Original Location	
	in the ODA JDBC drivers directory.	
 This file does not exist This file has been rest 		
Add Re	estore Delete	

Figure 4-75 Manage JDBC Drivers

 From this window, you need to add the JDBC drivers to connect to the database.Click Add and navigate to the Temp folder where you stored the driver files earlier. Select the db2jcc.jar file and click Open, and repeat for the db2jcc_license_cu.jar file. When both files appear as in Figure 4-76 on page 258, click OK to continue.

R Files Drivers			
File Name	Original Location		
db2jcc_license_cu.jar db2jcc.jar	C:\temp\db2jcc_license_cu.jar C:\temp\db2jcc.jar		
x - This file does not exist in the * - This file does not exist in the + - This file has been restored. Add Restore	original location.		
)		OK Can	ce

Figure 4-76 Manage JDBC Drivers completion

4. Test the connection to the database as shown in Figure 4-77.

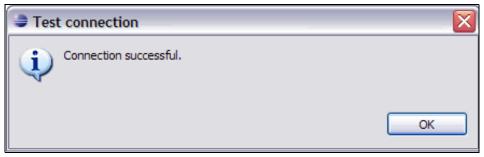


Figure 4-77 Database connection test

Edit SQL statements

The SQL statements that are included in the BIRT reporting methods are written using dbadmin as a user ID. We need to edit the statements and put in the correct user ID of db2inst1 for the statements to work correctly with the DB2 environment. We also need to ensure that the Data Source type for all the data sets is set to DB2. To edit the data sets in BIRT:

- 1. From the main window in the Data Explorer Tab, click **Data Sets**. Right-click the name of the Data Set (for example, DB2_GET_CLIENT), and select **EDIT** from the drop-down menu.
- 2. The window in Figure 4-78 appears.
- 3. Change the Data Set type to DB2.

Edit Data Set - DB2_GET_CL	JENT	
Data Source	Data Source	<p< th=""></p<>
Output Columns Computed Columns	Select Data Source: DB2	~
Parameters Filters Property Binding		
Settings Preview Output Parameters		
Preview Results		
0		OK Cancel

Figure 4-78 Edit Data Set

4. Next, click the Query line to edit the Data Set query. Change the user name that is in the query to db2inst1. The line that contains the user name is {call DBADMIN.GET_CLIENT(?,?)}. Change DBADMIN to DB2INST1 as shown in Figure 4-79. Click **OK** to continue. Complete the same process for all the data sets, including the SQL data sets, and change the user name in the SQL data sets from DB0 to DB2INST1.

🖨 Edit Data Set - DB2_GET_Cl	LIENT	
Data Source	Define a sql query text using available items.	$\Leftrightarrow \star \Rightarrow \star$
Output Columns - Computed Columns - Parameters - Filters - Property Binding - Settings - Preview Output Parameters - Preview Results	Available Items: DB2 DB2 DB2 DB2 DB2 DB2 DB2 DB2	
	Use identifier quoting	×
0	OK	Cancel

Figure 4-79 Edit SQL Query

Included BIRT reports

Tivoli Usage and Accounting Manager includes five templates for BIRT reporting. The templates are in the /opt/ibm/tuam/server/reportsbirt/db2/standard directory. The templates are:

RCFGX001.rptdesignConfiguration ReportRCLTX001.rptdesignClient ReportRINVC007.rptdesignInvoiceRIVTC001.rptdesignRun Total InvoiceRRATX001.rptdesignRate Report

Sample reports

You can use the BIRT templates to generate reports for date ranges from your IBM Tivoli Usage and Accounting Manager database:

 To run a report in the eclipse project Navigator window, right-click the report type that you want from the list. Select **Report** → **Run Report**. Figure 4-80 shows the parameters that you enter for a Run Total Invoice report.

BIRT Report Viewer				
Showing page 1 of 1			√l √ ▶ I⊁ Go to page: [
Tivoli				ΈN
	Parameter	X	=	
	Account Code End:			
Account Co	⊙ ZZ		2000-01-01	
Account Co			2007-12-31	
Account Account L	() Account Start:		admin	
Account	I Null Value			
	Account Length:			
	 Account Longan 4 			
	Null Value	=		
	A Date Start:			
	 2009-01-01 			
	Null Value			
	Date End:			
	2009-03-20	=		
	O Null Value			
Report Total	UserID:			
Mar 20, 2009 4:32 PM			1	
	O Null Value			
		×		
		OK Cancel		
			1	

Figure 4-80 Setting report parameters

2. After you set the report parameters, you will see your data on the report for the dates that you have selected. Figure 4-81 shows a sample Run Total Invoice report from our test environment.

🖻 🗟 🚔 🍰 📕 🐉			
Showing page 1 of 1			📢 🔮 🕪 🛛 Go to page:
Tivoli			IBM
	Run Total I	nvoice	
Account Code Start		Date Start	2009-01-01
Account Code End	ZZ	Date End	2009-03-20
Account Start	1	User ID	admin
Account Length	4		
The Bi	g Time Company		
Corpor	ate Headquarters		
3013	Douglas Rivd	Kate	Charg
AIX Process CPU Time (seconds)	11825.00	0.00200000	23.
AIX Elapsed Page Seconds Disk Pages (in thousands)	104255224.55	0.0000000	0.
AIX Elapsed Page Seconds Virtual Memory (in thousands)	102857492.20	0.0000000	0.
AIX Process Local File I/O (MB)	227339.60	0.0000000	0.
AIX Process Other File I/O (MB)	7899.80	0.0000000	0.
AIX Process Local Sockets I/O (MB)	15.20	0.0000000	0.
AIX Process Remote Sockets I/O (MB)	9257.80	0.0000000	0.
AIX System Number of CPUs (interval)	5728.00	0.0000000	0.
AIX System Idle Time (seconds)	2208.66	0.0000000	0.
AIX System User Process Time (seconds)	11849.41	0.0000000	0.
AIX System Interrupt Time (seconds)	1212.93	0.0000000	0.
NIX System Memory Size MB (interval aggregate)	20529152.00	0.0000000	0.
AIX System Pages Out	1106.00	0.01000000	11
AIX System Number Start I/O	2940450.00	0.0000000	0.

Figure 4-81 Run Total Invoice BIRT report

 BIRT reports can be exported into several formats, including Microsoft® Excel®, postscript, Microsoft Word, Microsoft PowerPoint®, and PDF. Figure 4-82 on page 264 shows the PDF of the Run Total Invoice report. You can use these formats to present reports to customers about system usage and relate the system usage back to actual accounting charges.

Tivoli

IBM.

Account Code Start		Date Start	2000-01-01
Account Code End zz		Date End	2009-12-31
Account Start 1		User ID	admin
Account Length 4			
Your Organization Corporate Headquarters 100 Your Address Roseville, CA 95661 United States of America			
	Units	<u>Rate</u>	Charges
AIX Process CPU Time (seconds)	825.80	0.00200000	1.65
AIX Elapsed Page Seconds Disk Pages (in thousands)	10576599.54	0.0000000	0.00
AIX Elapsed Page Seconds Virtual Memory (in thousands)	10259376.16	0.0000000	0.00
AIX Process Local File I/O (MB)	4064.00	0.00000000	0.00
AIX Process Other File I/O (MB)	10.60	0.0000000	0.00
AIX Process Local Sockets I/O (MB)	3.20	0.0000000	0.00
AIX Process Remote Sockets I/ O (MB)	221.00	0.0000000	0.00
AIX System Number of CPUs (interval)	64.00	0.0000000	0.00
AIX System Idle Time seconds)	400.73	0.0000000	0.00
AIX System User Process Fime (seconds)	1709.71	0.0000000	0.00
AIX System Interrupt Time (seconds)	216.73	0.0000000	0.00
AIX System Memory Size MB (interval aggregate)	229376.00	0.0000000	0.00
AIX System Pages Out	88.00	0.01000000	0.88
AIX System Number Start I/O	300666.00	0.00000000	0.00
AIX FS Bytes Transferred (MB)	41091.02	0.0000000	0.00
AIX FS Read/Write Requests	13579958.00	0.0000000	0.00
AIX FS Number Opens	3657202.00	0.00010000	365.72
AIX FS Number Creates	21022.00	0.00500000	105.11
AIX FS Number Locks	764730.00	0.0000000	0.00
AIX Network Number I/O	1002866.00	0.00010000	100.29
AIX Network Bytes Transferred (MB)	118.52	0.0000000	0.00
AIX Disk Transfers	3395793704.00	0.0000000	0.00
AIX Disk Block Reads	5937366.00	0.0000000	0.00
AIX Disk Block Writes	7659070.00	0.0000000	0.00
AIX Disk Transfer Block Size (interval aggregate)	69632.00	0.0000000	0.00
AIX Advanced Accounting			573.65

Figure 4-82 BIRT Run Total Invoice report PDF

An invoice report can be seen in Figure 4-82 on page 264.

Showing page 1 of 2			📢 🖣 🕨 🛛 Go to page: 🗌
Tivoli			IBM
	INVOI	CE	
Account Code Start		Date Start	2000-01-01
Account Code End	ZZ	Date End	2009-12-31
Account Start	1	User ID	admin
Account Length	4		
3013	Douglas Blvd.		
United S	ville, CA 95661 States of America		
United S	· · · · · · · · · · · · · · · · · · ·	Rate	Charge
United S Jam	States of America	<u>Rate</u> 0.00200000	
United S Jam IX Process CPU Time (seconds) IX Elapsed Page Seconds Disk Pages (in	States of America <u>Units</u>		1.6
United S Jam IX Process CPU Time (seconds) IX Elapsed Page Seconds Disk Pages (in Jousands) IX Elapsed Page Seconds Virtual	States of America <u>Units</u> 825.80	0.00200000	1.d 0.d
United S Jam IX Process CPU Time (seconds) IX Elapsed Page Seconds Disk Pages (in nousands) IX Elapsed Page Seconds Virtual Jemory (in thousands)	States of America <u>Units</u> 825.80 10576599.54	0.00200000	1.4 0.0
United S AIX Process CPU Time (seconds) AIX Elapsed Page Seconds Disk Pages (in chousands) AIX Elapsed Page Seconds Virtual Memory (in thousands) AIX Process Local File I/O (MB)	States of America <u>Units</u> 825.80 10576599.54 10259376.16	0.00200000 0.00000000	1.6 0.0 0.0
United S tuam AIX Process CPU Time (seconds) AIX Elapsed Page Seconds Disk Pages (in thousands) AIX Elapsed Page Seconds Virtual Memory (in thousands) AIX Process Local File I/O (MB) AIX Process Other File I/O (MB)	States of America <u>Units</u> 825.80 10576599.54 10259376.16 4064.00	0.00200000 0.00000000 0.00000000 0.00000000	1.6 0.0 0.6 0.0
	States of America Units 825.80 10576599.54 10259376.16 4064.00 10.60	0.00200000 0.00000000 0.00000000 0.00000000	<u>Charge</u> 1.6 0.0 0.0 0.0 0.0 0.0 0.0

Figure 4-83 BIRT Invoice

Figure 4-84 shows the BIRT Rate Report that is available in the templates.

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Tivoli						IBM.
			_			*** ******
	Description	Delect	Rate Value	te Report Per Resource Zero Resource Flat Disc	count CDU	
		Order		Thousand Conversion Cost Decimal Fees Positions	Value	
ate Table: STAN						
Rate Group: 41	L - AIX Advanced Acc	ounting	I			
AAID0401	AIX System Number of CPUs (interval)	12	0.0000000	2	Ν	
AAID0402	AIX System Entitled Capacity (interval)	13	0.00000000	2	Ν	
AAID0403	AIX System Pad Length (interval)	14	0.00000000	2	Ν	
AAID0404	AIX System Idle Time (seconds)	15	0.00000000	2	Ν	
AAID0405	AIX System User Process Time (seconds)	16	0.00000000	2	Y	
AAID0406	AIX System Interrupt Time (seconds)	17	0.00000000	2	Ν	
AAID0407	AIX System Memory Size MB (interval aggregate)	18	0.00000000	2	Ν	
AAID0408	AIX System Large Page Pool (MB)	19	0.00000000	2	Ν	
AAID0409	AIX System Large	20	0.00100000	2	N	

Figure 4-84 BIRT Rate Report

For additional information about producing reports with BIRT, refer to Chapter 7, "Reporting Scenarios" in the *Deployment Guide Series: IBM Tivoli Application Dependency Discovery Manager V7.1*, SG24-7616.

4.4.5 Troubleshooting IBM Tivoli Usage and Accounting Manager

This section describes basic problems that have been encountered running IBM Tivoli Usage and Accounting Manager.

DB2 transaction logs full

You might get the error message "AUCPE0202E The DBLoad process completed unsuccessfully with the following exception:" when the DB2 transaction logs are full. The solution is shown in Example 4-10 on page 267.

tuam10:]su - db2inst1 \$db2 connect to ituamdb Database Connection Information Database server = DB2/AIX64 9.1.4SQL authorization ID = DB2INST1 Local database alias = ITUAMDB \$db2 get db cfg | grep -i LOGSECOND Number of secondary log files (LOGSECOND) = 4\$db2 update db cfg using logsecond 150 immediate DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully. \$db2 get db cfg show detail | grep -i LOGSECOND Number of secondary log files (LOGSECOND) = 150 150\$db2 get snapshot for db on ITUAMDB | grep -i SEC = 3 Secondary connects total Total buffer pool read time (milliseconds) = Not Collected Total buffer pool write time (milliseconds) = Not Collected Maximum secondary log space used (Bytes) = 208181636 = 50 Secondary logs allocated currently Log read time (sec.ns) = 0.00000004Log write time (sec.ns) = 142.00000004Application section lookups = 3429 Application section inserts = 843 = 0 Total shared section inserts Total shared section lookups = 0 Total private section inserts = 843 Total private section lookups = 903 = 2 Secondary ID Secondary ID = 1 Secondary ID = System 32k buffer pool Secondary ID = System 16k buffer pool = System 8k buffer pool Secondary ID Secondary ID = System 4k buffer pool

File system filling up

Watch the file system sizes for a full condition as shown in Example 4-11 on page 268. Increase the file system size or clean out the old accounting transaction logs. The sample jobs that are set up in this book are set to delete the

accounting files after 45 days. Be aware that the data is stored in multiple locations.

The first location where the data is stored is on the client server in /opt/ibm/tuam/collectors/unix/CS_input_source, which holds the daily accounting data that is collected on the client. The data is transferred to the server, but a copy is preserved on the client also. Setting up jobs to remove the accounting files periodically is a good practice to prevent "File system full" conditions (Example 4-11) from occurring in your environment.

The second location that contains the accounting data is on the server. The accounting data from all the Tivoli Usage and Accounting Manager clients is gathered and stored in both the /usr/ituam/CS_input_source directory and then loaded into the database also. Both the database and the file system that contains the raw data for processing will need to be monitored for size.

Note: The /usr/ituam/CS_input_source directory is a link to /opt/ibm/tuam/collectors/unix/CS_input_source. It is good practice to create this path as a file system when you are collecting data from a large number of clients.

\$ df -k							
Filesystem	1024-blocks	Free	%Used	Iused	%Iused	Mounted	on
/dev/hd4	49152	2636	95%	1942	69%	/	
/dev/hd2	2342912	76116	97%	42773	63%	/usr	
/dev/hd9var	262144	122884	54%	2419	9 %	/var	
/dev/hd3	507904	479236	6%	310	1%	/tmp	
/dev/hd1	16384	10740	35%	77	4%	/home	
/dev/hd11admir	n 131072	130708	1%	5	1%	/admin	
/proc	-	-	-	-	-	/proc	
/dev/hd10opt	147456	11324	93%	2544	48%	/opt	
/dev/livedump	262144	261776	1%	4	1%		
/var/adm/ras/1	ivedump						
/dev/fslv00	2097152	1854484	12%	44	1%	/logs	
/dev/fslv01	2097152	1253384	41%	448	1%		
/home/db2inst1	L						
/dev/fslv02	524288	33484	94%	3756	25%	/opt/IBM	1/db2
/dev/fslv03	1114112	7316	100%	11994	73%	/opt/ibm	n/tuam
/dev/itm_lv	4194304	3753964	11%	3288	1%	/opt/IBM	1/ITM

Example 4-11 File system sizes in AIX and file system full condition

Installation problem with JDBC driver

In the process of configuring IBM Tivoli Usage and Accounting Manager 7.1, you might see the following message:

The following information was provided:

[ibm][db2][jcc][10333][11649] No license was found. An appropriate license file db2jcc_license_*.jar must be provided in the CLASSPATH setting. Review the trace log to get detailed information.

To resolve this problem, you need to add the full path pointing to the location for the DB2 JDBC driver license file and then restart the IBM Tivoli Usage and Accounting Manager server.

To avoid the problem, follow the steps listed in the next section.

Adding a JDBC driver

The appropriate JDBC driver must be available to enable the Usage and Accounting Manager Processing Engine to access the DB2 database. If a client needs to connect to the database, you are required to install the driver for that client.

To enable the Usage and Accounting Manager Processing Engine to access the database, the appropriate JDBC driver must be available on the server running Tivoli Usage and Accounting Manager. The DB2 db2jcc.jar and db2jcc_license_cu.jar (license JAR file) drivers are used by Tivoli Usage and Accounting Manager. If you select JDBC support during the installation steps for DB2, the driver and the license file are included in the installation.

To locate the drivers:

- 1. In the ISC, click Usage and Accounting Manager \rightarrow System Maintenance \rightarrow Configuration \rightarrow Drivers.
- 2. On the Configuration Drivers page, click **New**. The Browse button and text box become available.
- 3. Type the path to the driver in the text box or click **Browse** to locate the path to the driver. For DB2 for UNIX, enter the paths to both db2jcc_license_cu.jar and db2jcc.jar.
- 4. Click **OK** to add the driver. The driver is added to the list of drivers.

Debugger trace and log information

Tivoli Usage and Accounting Manager has several log files that it uses for the administration server, processing server, reporting server, and database server, as shown in Table 4-6 on page 270.

Path or filename	function
/opt/ibm/tuam/logs/jobrunner/ <jobid></jobid>	Job runner log files separated per JobID
< <i>time stamp</i> >.txt	Job log output
< <i>time stamp</i> >.xml	Job log for use with ISC
, and a second s	ivoli Usage and Accounting Manager trace and log files
message0.log message< <i>g</i> >.log<#>	Messages from tuam processing, where < <i>g</i> > = generation and < <i>#</i> > = instance
trace0.log trace <g>.log<#></g>	Trace details for tuam processing, where < <i>g</i> > = generation and <#> = instance
*.lck	Lock files for trace and log coordination
/opt/ibm/tuam/ewas/profiles/AppSrv01Syste	emOut.log/logs/server1 WebSphere and ISC files
SystemOut.log	WebSphere messages
SystemErr.log	WebSphere error log
/opt/ibm/tuam/config Tivoli Usage and Accounting Manager config	
logging.properties	Settings for trace and message files
jdk_logging.properties	Not used with version 7.1
/opt/ibm/tivoli/common/AUC/logs/install	Installation and uninstallation log files

Table 4-6 Tivoli Usage and Accounting Manager trace and log file information

IBM Tivoli Usage and Accounting Manager additional resources

Additional resources that are useful for continued reading:

- ► IBM Tivoli Usage Accounting Manager V7.1 Handbook, SG24-7404
- Deployment Guide Series: IBM Tivoli Usage and Accounting Manager V7.1, SG24-7569

Abbreviations and acronyms

AACCT	AIX Advanced Accounting	СІ	Configuration items
ABI	Application Binary Interface	CID	Configuration ID
ACL	Access Control List	CLDR	Common Locale Data Repository
AFPA	Adaptive Fast Path Architecture	CLI	Command-Line Interface
AIO	Asynchronous I/O	CLVM	Concurrent LVM
AIX	Advanced Interactive Executive	CCMDB	Change and Configuration Management Database
APAR	Authorized Program Analysis	CPU	Central Processing Unit
ΑΡΙ	Report Application Programming	CSM	Cluster Systems Management
	Interface	CSR	Common source format
ARP	Address Resolution Protocol	СТ	Component Trace
ASMI	Advanced System Management Interface	DAS	Database Administrator Server
BFF	Backup File Format	DB	Database
BIND	Berkeley Internet Name Domain	DCEM	Distributed Command Execution Manager
BIRT	Business Intelligence Reporting Tools	DCM	Dual Chip Module
BIST	Built-In Self-Test	DES	Data Encryption Standard
BLV	Boot Logical Volume	DGD	Dead Gateway Detection
BOOTP	Boot Protocol	DHCP	Dynamic Host Configuration Protocol
BOS	Base Operating System	DLPAR	Dynamic LPAR
BSD	Berkeley Software Distribution	DMA	Direct Memory Access
CA	Certificate Authority	DNS	Domain Name Server
CATE	Certified Advanced Technical Expert	DR	Dynamic Reconfiguration
CD	Compact Disk	DRM	Dynamic Reconfiguration Manager
CDE	Common Desktop Environment	DST	Daylight Saving Time
CEC	Common Event Console	eCMDB	Enterprise Configuration Management Database
CHRP	Common Hardware Reference Platform	EC	EtherChannel

ECC	Error Checking and	I/O	Input/Output
EGID	Correcting Effective Group ID	IBM	International Business Machines
EJB™	Enterprise Java Bean	ICU	International Components for
EIF	Event Integration Base		Unicode
EPOW	Environmental and Power	ID	Identification
	Warning	IDE	Integrated Device Electronics
EPS	Effective Privilege Set	IEEE	Institute of Electrical and
ERRM	Event Response Resource Manager	IETF	Electronics Engineers Internet Engineering Task
ESE	Enterprise Server Edition		Force
ESS	Enterprise Storage Server®	IP	Internetwork Protocol
EUID	Effective User ID	IPAT	IP Address Takeover
F/C	Feature Code	IPL	Initial Program Load
FC	Fibre Channel	IPMP	IP Multipathing
FCAL	Fibre Channel Arbitrated Loop	IQN	iSCSI Qualified Name
FDX	Full Duplex	ISC	Integrated Solutions Console
FFDC	First Failure Data Capture	ISM	IBM Support Management
FLOP	Floating Point Operation	ISSO	Information System Security Officer
FRU	Field Replaceable Unit	ISV	Independent Software Vendor
FTP	File Transfer Protocol	IT	information technology
GB	Gigabyte	ITM	IBM Tivoli Monitoring
GID	Group ID	ITSO	International Technical
GPFS	General Parallel File System		Support Organization
GSS	General Security Services	ITUAM	IBM Tivoli Usage and
GUI	Graphical User Interface		Accounting Manager
HACMP/PowerHA	High Availability Cluster Multiprocessing	IVM	Integrated Virtualization Manager
HBA	Host Bus Adapters	JDBC	Java Database Connectivity
НМС	Hardware Management	JFS	Journaled File System
	Console	JFS2	Journaled File System2
HPC	High Performance Computing	KAT	Kernel Authorization Table
НРМ	Hardware Performance Monitor	КВ	Kilobytes
HTML	Hypertext Markup Language	КСТ	Kernel Command Table
	Hypertext Transfer Protocol	KDT	Kernel Device Table
Hz	Hertz	KRT	Kernel Role Table
		KST	Kernel Security Table

LA	Link Aggregation	NIM	Network Installation
LACP	Link Aggregation Control Protocol	NIMOL	Management NIM on Linux
LAN	Local Area Network	NIS	Network Information Server
LDAP	Light Weight Directory Access Protocol	NVRAM	Non-Volatile Random Access Memory
LFS	Logical File System	ODBC	Open Database Connectivity
LFT	Low Function Terminal	ODM	Object Data Manager
LMB	Logical Memory Block	OSGi	Open Services Gateway
LOB	Line of Business		Initiative
LPAR	Logical Partition	OSPF	Open Shortest Path First
LPP	Licensed Program Product	PCI	Peripheral Component Interconnect
LPS	Limiting Privilege Set	PID	Process ID
LUN	Logical Unit Number	PIT	Point-in-time
LUNs	Logical Unit Numbers	PKI	Public Key Infrastructure
LV	Logical Volume	PLM	Partition Load Manager
LVCB	Logical Volume Control Block	PM	Performance Monitor
LVM	Logical Volume Manager	POSIX	Portable Operating System
LWI	Lightweight Infrastructure	PUSIA	Interface
MAC	Media Access Control	POST	Power-On Self-test
Mbps	Megabits Per Second	POWER®	Performance Optimization
MBps	Megabytes Per Second		with Enhanced RISC
МСМ	Multichip Module		(Architecture)
ME	Management Edition	PP	Physical Partition
MIBs	Management Information Bases	PPC	Physical Processor Consumption
ML	Maintenance Level	PTF	Program Temporary Fix
MLS	Multi Level Security	ΡΤΧ	Performance Toolbox
MP	Multiprocessor	PV	Physical Volume
ΜΡΙΟ	Multipath I/O	PVID	Physical Volume Identifier
MPS	Maximum Privilege Set	QoS	Quality of Service
МТО	Maximum Transmission Unit	PAC	Proactive Analysis Component
NDAF	Network Data Administration Facility	RAID	Redundant Array of Independent Disks
NFS NIB	Network File System Network Interface Backup	RAM	Random Access Memory
	Notwork interface Dackup		

RAS	Reliability, Availability, and Serviceability	SMTP	Simple Mail Transfer Protocol
RBAC	Role Based Access Control	SNMP	Simple Network Management Protocol
RCP	Remote Copy	SO	System Operator
RDAC	Redundant Disk Array	SP	Service Processor
	Controller	SPOT	Shared Product Object Tree
RIP	Routing Information Protocol	SQL	Structured Query Language
RISC	Reduced Instruction-Set Computer	SRC	System Resource Controller
RMC	Resource Monitoring and	SRN	Service Request Number
	Control	SSA	Serial Storage Architecture
ROI	Return On Investment	SSH	Secure Shell
RPC	Remote Procedure Call	SSL	Secure Sockets Layer
RPL	Remote Program Loader	SUID	Set User ID
RPM	Red Hat Package Manager	SVC	SAN Virtualization Controller
RSA	Rivet, Shamir, Adelman	TADDM	Tivoli
RSCT	Reliable Scalable Cluster	тсв	Trusted Computing Base
	Technology	TCP/IP	Transmission Control
RSH	Remote Shell		Protocol/Internet Protocol
RTE	Runtime Error	TE	Trusted Execution
RUID	Real User ID	TEM	Tivoli Enterprise Monitor
S	System Scope	ТЕМА	Tivoli Enterprise Monitor Agent
SA	System Administrator	TEMS	Tivoli Enterprise Monitoring
SAN	Storage Area Network		Server
SCP	secure copy protocol	TEP	Trusted Execution Path
SCSI	Small Computer System Interface	TEPS	Tivoli Enterprise Portal Server
SDD	Subsystem Device Driver	TERMS	Tivoli Enterprise Remote
SED	Stack Execution Disable		Monitor Server
SLs	Sensitivity Labels	ТРМ	Tivoli Productivity Manager
SMI	-	TSA	Tivoli System Automation
Sivii	Structure of Management Information	TSD	Trusted Signature Database
SMIT	Systems Management	TTL	Time-to-live
	Interface Tool	TUAM	Tivoli Usage and Accounting Manager
SMP	Symmetric Multiprocessor	UCS	Universal-Coded Character
SMS	System Management Services	-	Set
SMT	Simultaneous multi-threading	UDB	Universal Database

UID	User ID
012	
VE	Virtualization Edition
VG	Volume Group
VIO	Virtual I/O
VIPA	Virtual IP Address
VLAN	Virtual Local Area Network
VMM	Virtual Memory Manager
VP	Virtual Processor
VPA	Visual Performance Analyzer
VPD	Vital Product Data
VPN	Virtual Private Network
VPSS	Variable Page Size Support
VRRP	Virtual Router Redundancy Protocol
VSD	Virtual Shared Disk
WAS	WebSphere Application Server
WED	WebSphere Everyplace® Deployment V6.0
WLM	Workload Manager
WPAR	Workload Partitions
WPS	Workload Partition Privilege Set

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 publications

For information about ordering these publications, see "How to get IBM Redbooks publications" on page 278. Note that several of the documents referenced here might be available in softcopy only:

- PowerVM Virtualization on IBM system p: Introduction and Configuration Fourth Edition, SG24-7940
- PowerVM Virtualization on IBM System p: Managing and Monitoring, SG24-7590
- IBM System p Advanced POWER Virtualization (PowerVM) Best Practices, REDP-4194
- ► IBM PowerVM Live Partition Mobility, SG24-7460
- ► Hardware Management Console V7 Handbook, SG24-7491
- ▶ IBM AIX Version 6.1 Differences Guide, SG24-7559
- Introduction to workload Partition Management in IBM AIX Version 6.1, SG24-7431
- ► Workload Partition Management in IBM AIX Version 6.1, SG24-7656
- AIX V6 Advanced Security Features Introduction and Configuration, SG24-7430
- ► Implementing IBM Systems Director 6.1, SG24-7694
- ► Going Green with IBM Systems Director Active Energy Manager, REDP-4361
- Deployment Guide Series: IBM Tivoli Usage and Accounting Manager V7.1, SG24-7569
- ► IBM Tivoli Usage and Accounting Manager V7.1 Handbook, SG24-7404
- Deployment Guide Series: IBM Tivoli Provisioning Manager Version 5.1, SG24-7261
- IBM Tivoli Application Dependency Discovery Manager Capabilities and Best Practices, SG24-7519

Other publications

These publications are also relevant as further information sources:

- Documentation available on the support and services Web site includes:
 - User guides
 - System management guides
 - Application programmer guides
 - All commands reference volumes
 - Files reference
 - Technical reference volumes that are used by application programmers

The support and services Web site is:

http://www.ibm.com/systems/p/support/index.html

 Virtual I/O Server and support for Power Systems (including Advanced PowerVM feature)

http://www14.software.ibm.com/webapp/set2/sas/f/vios/documentation/

Online resources

These Web sites are also relevant as further information sources:

► IBM AIX

http://www.ibm.com/systems/power/software/aix/index.html

AIX Enterprise Edition

http://www.ibm.com/systems/power/software/aix/sysmgmt/enterprise/index.html

Tivoli Provisioning Manager (TPM)

http://www.ibm.com/software/tivoli/products/prov-mgr/features.htm

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IBM Support and downloads

ibm.com/support

IBM Global Services

ibm.com/services

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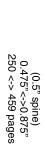
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