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Getting Started with IBM Tivoli Performance Analyzer Version 6.1

- Learn performance analytics for Tivoli Performance Analyzer
- Experiment with deployment scenarios and case studies
- Learn IBM capacity management offerings

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Getting Started with IBM Tivoli Performance Analyzer Version 6.1

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Note: Before using this information and the product it supports, read the information in “Notices” on page ix.

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Preface

Capacity management is the discipline that ensures that IT infrastructure is provided at the right time in the right volume at the right price. IBM® Tivoli® Performance Analyzer is a strategic capacity management solution from IBM that adds value to IBM Tivoli Monitoring, IBM Tivoli Service Management, and OMEGAMON® products.

This IBM Redbooks® publication provides a practical guide to implementing, using, and optimizing IBM Tivoli Performance Analyzer Version 6.1, which includes planning and deployment scenarios, troubleshooting, and so forth.

We position IBM Tivoli Performance Analyzer against two other IBM capacity management solutions, IBM Tivoli Capacity Process Manager and HyPerformix IPS Capacity Manager. We also provide some best practice guidelines on when to use each solution.

To better explain the product functionality, we included several case studies that will help you understand the capabilities of IBM Tivoli Performance Analyzer.

This book is a reference for IT professionals who implement and use IBM Tivoli Performance Analyzer in small, medium, and large-scale environments.

The team that wrote this book

A team of specialists from around the world working at the International Technical Support Organization (ITSO), Austin Center produced this book.

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Harshad Moghe is a Senior IT Specialist, working with Global Technology Services in India. He has more than eight years of experience with IBM. In the last four years, he worked with the Tivoli products, specializing on Tivoli products, such as IBM Tivoli Monitoring, Tivoli Enterprise Console®, Tivoli Data Warehouse, Tivoli Service Level Advisor, Tivoli Provisioning Manager, Tivoli Confirguration Manager, and so on. He has extensive experience with shell programming. He is an IBM Certified Deployment Professional TEC 3.9 and is ITIL® Foundation Certified.

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1

Introduction to capacity and performance management

In this chapter, we discuss the concept of capacity and performance management. We also point out how IBM Tivoli Performance Analyzer V6.1 can assist in this management process.

We designed the following sections to provide an introduction of specific topics that are essential for understanding the capacity and performance management process. This chapter has the following sections:

- "What is capacity management" on page 2
- "Benefits and value of IBM Tivoli Performance Analyzer V6.1" on page 3
- "IBM offerings in capacity management" on page 4
  - IBM Tivoli Capacity Process Manager V1.1
  - IBM Tivoli Performance Analyzer V6.1
  - Hyperformix IPS Capacity Manager
- "Lab architecture" on page 11

IBM recently renamed the IBM Tivoli Performance Analyzer V6.1 product. The former name was IBM Tivoli Performance Analytics.

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1.1 What is capacity management

Capacity management is the discipline that ensures that IT infrastructure is provided at the right time in the right volume at the right price. The primary goal of capacity management is to provide adequate capacity to meet the service level agreements in a cost effective manner. To reach this goal it is important to avoid overspending on capacity that goes unused, avoid guessing on what will meet the service needs, and plan for upcoming needs to enable better purchase decisions.

The high-level activities are:

- Application sizing
- Workload management
- Demand management
- Modeling
- Capacity planning
- Component management

The Information Technology Infrastructure Library (ITIL) framework describes one common interpretation of capacity management. Figure 1-1 shows you the ITIL process definition for capacity management.

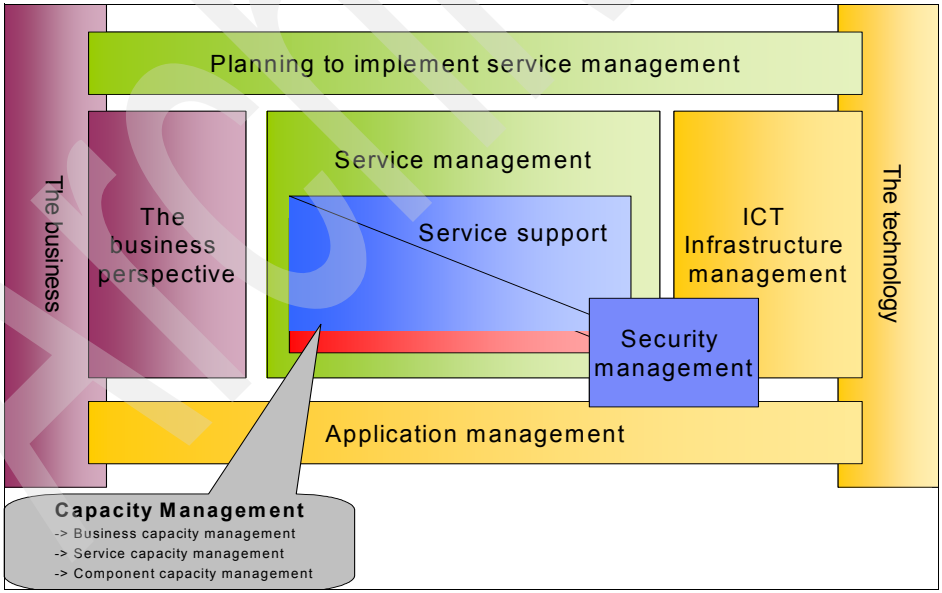

Figure 1-1 ITIL process definition for capacity management

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The activities in Figure 1-1 on page 2 are intended to optimize performance and efficiency and to help you plan for and justify financial investments. Capacity management is concerned with:

- Performance and throughput monitoring on a load, server, server farm, or on property.
- Performance analysis of measurement data, which includes analyzing the impact of new releases on capacity.
- Performance tuning activities to ensure the most efficient use of existing infrastructure.
- Understanding the demands on the service and future plans for workload growth (or shrinkage).
- Influences on demand for computing resources.
- Capacity planning – developing a plan for the service.

1.2 Benefits and value of IBM Tivoli Performance Analyzer V6.1

The strategic value of IBM Tivoli Performance Analyzer V6.1 is to:

- Address the gap in availability segment for performance and capacity management.
- Add value to IBM Tivoli Monitoring V6.1, IBM Service Management (ISM), and OMEGAMON products.

IBM Tivoli Performance Analyzer V6.1 is for IT operations managers and IT service management specialists who need to make rapid, actionable, planning decisions for the effective provisioning of resources for new applications, workloads, or for the remediation of performance problems.

IBM Tivoli Performance Analyzer V6.1 is the solution, which IBM provides, that:

- Enables performance management activities to be embedded in all systems management processes.
- Enables performance and capacity management activities to be undertaken where needed in the service management life cycle, especially in real-time response to service level and availability problems in IT operations.
- Enables a simpler approach to performance and capacity management modeling for non-specialist users and faster response to resolving performance problems caused by capacity bottlenecks.

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IBM Tivoli Performance Analyzer V6.1 is a simple tool for performance and capacity management without requiring specialists, long set-up times, and extensive data gathering. It provides clear, actionable, answers to critical planning and operational questions and covers not just the modeling aspects of performance planning but the whole infrastructure management life style, which includes modeling, planning, resource tuning, demand management, and evaluation.

IBM Tivoli Performance Analyzer V6.1 supports IT Leaders in answering the following questions to optimize the IT capacity:

- When will my application fail to meet service levels?
- What will happen if application use grows 25% or more?
- How will application performance change if I modify the infrastructure?
- What is the best hardware solution to meet my performance and cost goals?
- Where are my under utilized servers and networks?
- Can I meet service level agreements without overbuilding my infrastructure?
- Which servers and network components really need an upgrade?
- Which application will experience the next performance issue? when?

Providing accurate IT forecasts and appropriate IT capacity to meet business needs are two major critical success factors in the capacity management area. You can use the following *Key Performance Indicators* (KPIs) to measure the critical success factors:

- Total dollars in unplanned and unused capacity expenditures.
- Percent of capacity forecasts that were accurate.
- Number of inaccurate business forecast inputs provided.
- Number of incidents related to capacity/performance issues.
- Number of service level agreements targets missed due to capacity.

1.3 IBM offerings in capacity management

Capacity management is comprised of three sub-processes: *business capacity management*, *service capacity management*, and *resource capacity management*.

- Business capacity management

  Ensures process discipline with a capacity management process in the business. Using models and simulations, business capacity management takes the customers' business plans into account to predict future capacity needs and to determine the requirements and capacity that is required to support new or modified applications.

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- Service capacity management

  Ensures that you can meet service level agreements based on current and peak loads on the infrastructure. Service capacity management also makes performance analysis an ongoing operational activity through monitoring and analyzing the performance of the operation environment and comparing that to the resource load that is determined in resource capacity management.

- Resource capacity management

  Performs service and application-centric capacity management to understand the use of the IT infrastructure by monitoring trends on the resources that are needed to provide the services. On this trend information, these processes are responsible for tuning the infrastructure to best meet the capacity needs.

For all of the capacity management sub-processes, IBM provides a solution. Figure 1-2 provides all of the IBM offerings in the capacity management area.

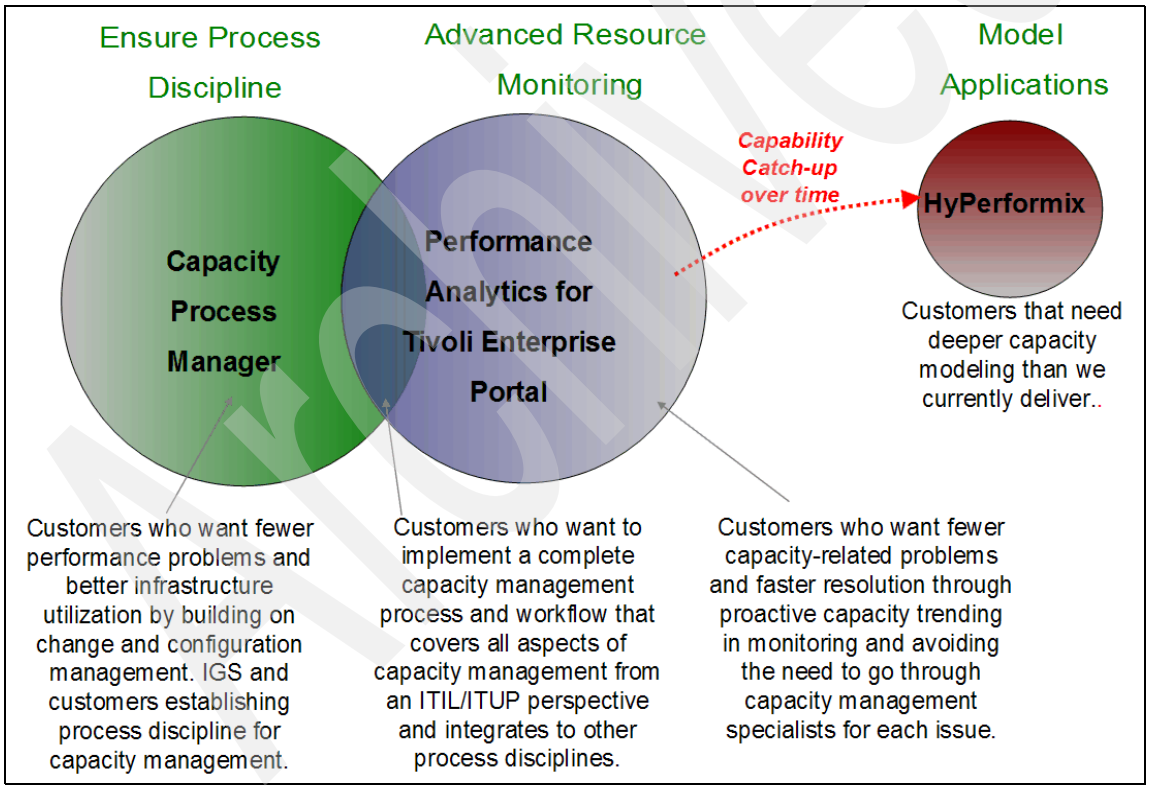

Figure 1-2 IBM capacity management sub-process offerings

Table 1-1provides information to help you decide which product to choose.

Table 1-1 Solution decision table

Environment	Problem	Solution
Rapidly changing business environment with formal change control process	Need to establish capacity management as part of a change/release process	IBM Tivoli Capacity Process Manager V1.1
Business-critical technical environment supporting varying and growing workloads	Need to spot resource trends before they become business-impacting bottlenecks	IBM Tivoli Performance Analyzer V6.1
Complex application environment or services components interconnected	Need to plan and predict performance and size applications accurately	HyPerformix IPS Capacity Manager

1.3.1 IBM Tivoli Capacity Process Manager V1.1

IBM Tivoli Capacity Process Manager V1.1 provides a comprehensive range of features that help you manage and monitor the capacity of your IT infrastructure resources. You can fully customize the activities in a capacity workflow to ensure that tasks are completed in the correct order by the right people.

IBM Tivoli Capacity Process Manager V1.1 is an IBM service management process manager, which is fully integrated into the change and configuration management database to ensure that the correct capacity management process is followed. It takes full advantage of a range of powerful, dynamic-flow capabilities. It is based on best practices and supports processes based on ITIL.

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Figure 1-3 provides a graphical overview of the IBM Tivoli Capacity Process Manager V1.1.

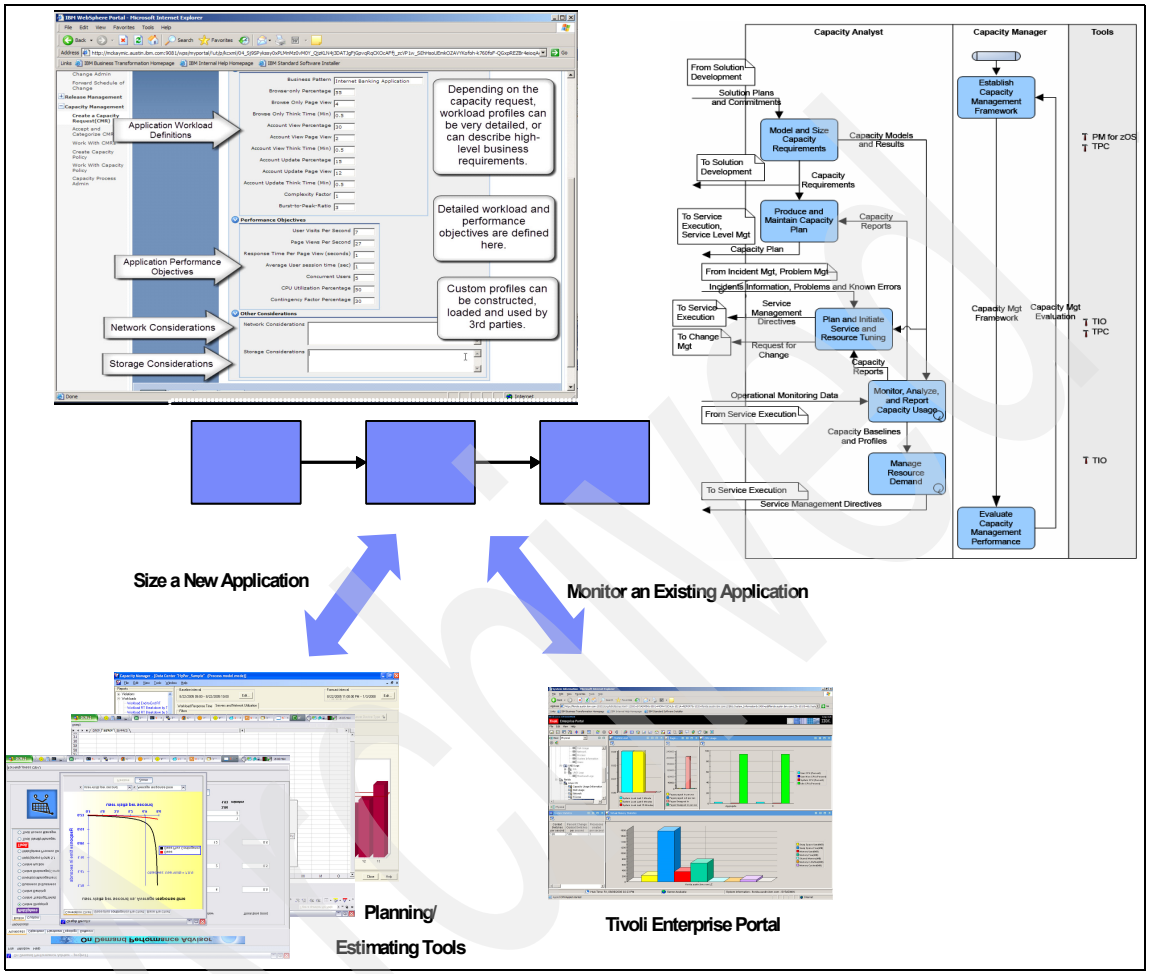

Figure 1-3 IBM Tivoli Capacity Process Manager V1.1 overview

IBM Tivoli Capacity Process Manager V1.1 has the following features:

- A set of new customizable process templates that support common capacity management scenarios, such as sizing a new application, tuning an existing deployment, and monitoring a deployed infrastructure.
- A library of customizable, best-practice workload profiles for capturing and modeling common applications, such as online shopping and batch operations.

- A library of task-specific expert advice that guides non-specialist staff through the capacity management process.
- All work requests that can potentially lead to an infrastructure upgrade are captured.
- Data related to both business requirements and IT metrics are gathered, based on policies and best practices, which speeds overall processes and frees capacity specialists to concentrate on analysis and modeling rather than data collection.
- Multiple tools are integrated into one management process flow to enable effective, productive handling of all capacity management requests.

Best of all, this product enables you to achieve incremental value by adopting a process, growing and adapting the process at your own pace, and adding task automation to further reduce labor costs around defined capacity management pains.

1.3.2 IBM Tivoli Performance Analyzer V6.1

IBM Tivoli Performance Analyzer V6.1 extends IBM Tivoli Monitoring V6.1 to provide additional performance and capacity monitoring capabilities and advanced resource monitoring. It enables proactive analysis of performance and resource utilization trends, predicts application bottlenecks, and creates alerts for potential service threats.

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Figure 1-4 is an overview of the IBM Tivoli Performance Analyzer V6.1.

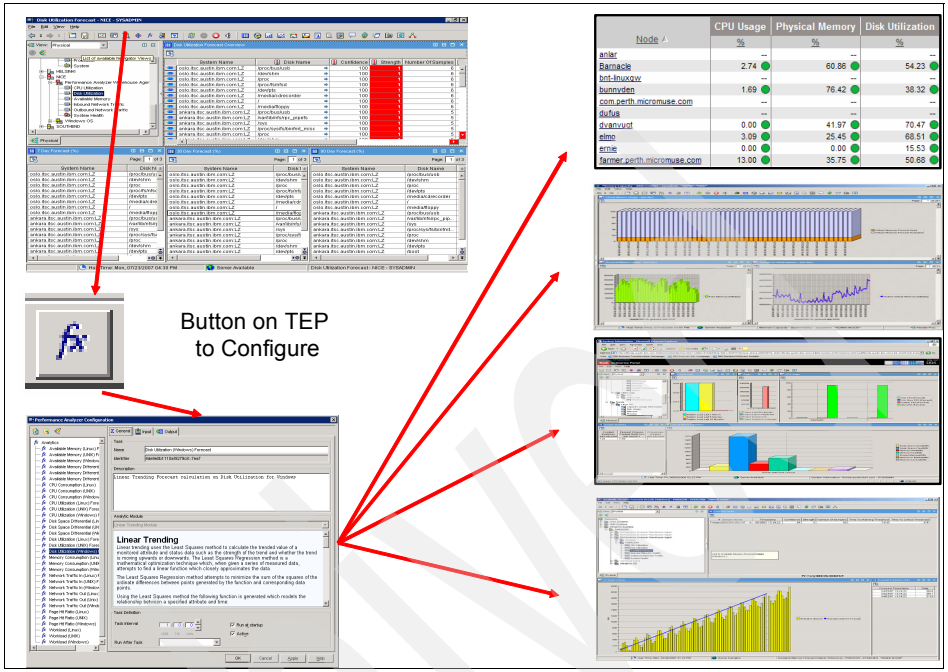

Figure 1-4 IBM Tivoli Performance Analyzer V6.1 overview

IBM Tivoli Performance Analyzer V6.1 has the following features:

- Adds capacity and performance management capabilities to IBM Tivoli Monitoring V6.1.
  - Uses existing agents and leverage of data warehouse database.
  - Out of the box value for distributed systems.
  - Supports Universal Agent.
  - New capacity metrics, predictive trending, and targeted reports.
- Derived metrics.
  - Takes the existing attributes and creates new ones using arithmetic expression.
- Predictive trending on key operational metrics.
  - Integrates trending reports and fires situations when trends are detected.
- Targeted reports for performance management.
  - Includes forecast reports with icons and overlay charts for rich content.
  - Has out of the box support for distributed operating systems.

1.3.3 HyPerformix IPS Capacity Manager

In this section, we discuss the HyPerformix IPS Capacity Manager, which:

- Enables you to model applications and services.
- Creates “What-if” scenarios to answer business questions related to the end-to-end management of complex production environments.
- Provides risk free, prescriptive capacity management, which leverages the performance monitoring tools that you already have in place.

Figure 1-5 provides an overview of the HyPerformix Capacity Manager.

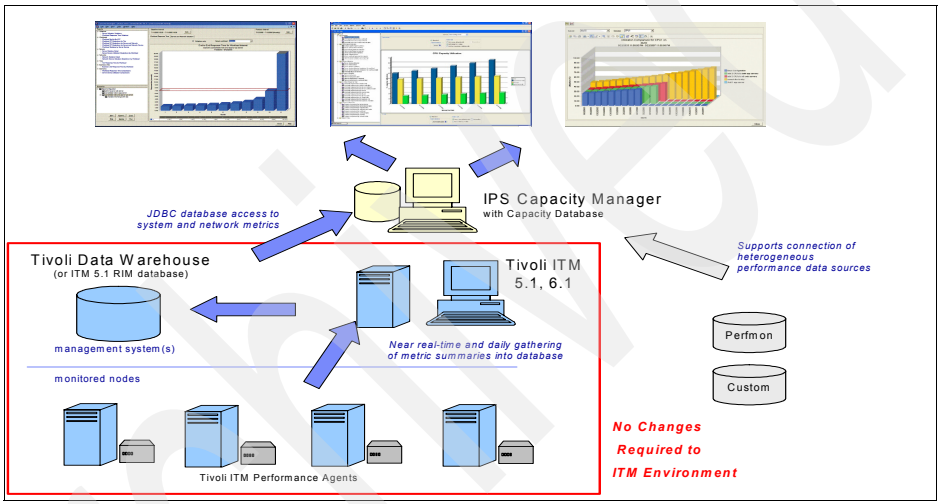

Figure 1-5 HyPerformix IPS Capacity Manager overview

With HyPerformix IPS Capacity Manager, you do not need to install a proprietary data collection agent; instead, HyPerformix IPS Capacity Manager can leverage data from the performance management tools that you already have in place, which includes BMC Patrol, HP OpenView, and IBM Tivoli Monitoring V6.1.

The HyPerformix IPS Capacity Manager gives you the ability to determine the best way to:

- Find under-utilized servers and consolidate them without disturbing the production environment.
- Know when and where the next application performance bottleneck will occur.

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- Understand when you need to buy additional hardware, when you can wait, and which hardware model offers the best end-to-end performance.
- Determine the impact of single or multiple changes in workload, server configuration, or user volume over time.

IBM Tivoli Monitoring V6.1 and HyPerformix IPS Capacity Manager are highly complementary solutions that together:

- Minimize business disruption by reducing mean time to problem resolution and by reducing the incidence of incorrect upgrades when solving capacity problems.
- Maximize productivity by avoiding service level agreement problems by proactively predicting performance bottlenecks based on detailed enterprise monitoring data.
- Reduce costs by enabling you to identify workload consolidation opportunities and the formulation of changes.

1.4 Lab architecture

Figure 1-6 describes the architecture, on the lab environment, that we used to implement IBM Tivoli Performance Analyzer V6.1.

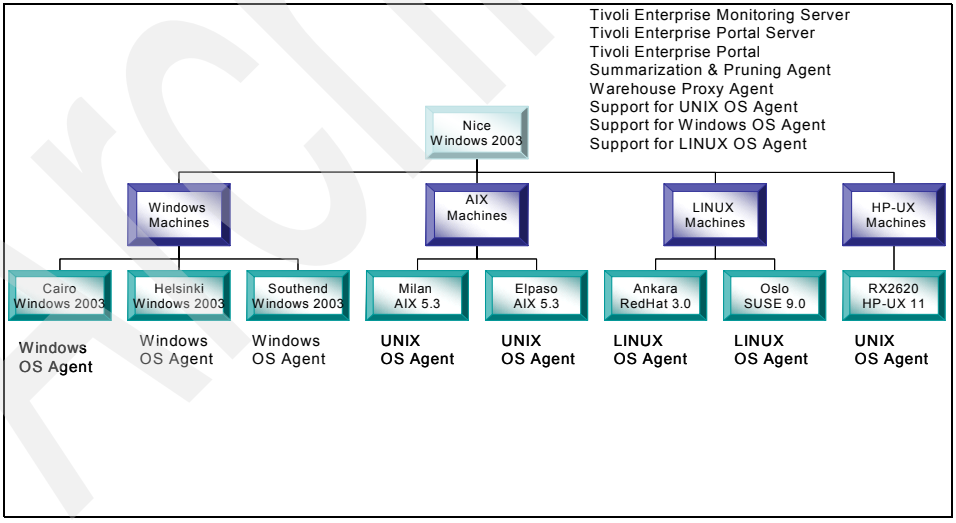

Figure 1-6 Lab architecture

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Important: You must have a properly functioning IBM Tivoli Monitoring V6.1 Fix Pack 5 environment before you start installing and configuring the IBM Tivoli Performance Analyzer V6.1.

1.5 Upcoming features of IBM Tivoli Performance Analyzer

Tivoli Performance Analyzer V6.1.1 will be available in 2008. In this section, we list some of the planned features for this release.

Important: Note that all planned features about unannounced products are subject to change.

- New domains

  Tivoli Performance Analyzer V6.1.1 will introduce several new domains as follows:

  - DB2
  - Oracle
  - P Series Virtualization - LPAR (logical partition)
  - Tivoli Composite Application Manager - Response Time

  For all of these domains, there will be new analytical tasks, new situations, including expert advises and new workspaces.

- BIRT reporting

  With this release, you can view the results, not only in workspaces, but also in HTML and PDF reports.

  Note: Business Intelligence and Reporting Tools (BIRT) is an open source Eclipse-based reporting system that integrates with Java/J2EE applications to produce reports. For more details on BIRT and how it integrates with IBM Tivoli Monitoring, refer to "Chapter 11 Reporting" of *IBM Tivoli Monitoring Deep Dive and Optimization for Large Scale Environments*, SG24-7443 IBM Redbooks.

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- Improved task scheduling

  The task scheduling function is improved in Tivoli Performance Analyzer V6.1.1, in terms of performance and usability.

- Support for IBM Tivoli Monitoring V6.2

  Tivoli Performance Analyzer V6.1.1 will support the new version of IBM Tivoli Monitoring, Version 6.2.

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IBM Tivoli Performance Analyzer V6.1 architecture and deployment scenarios

In this chapter, we explain the IBM Tivoli Performance Analyzer V6.1 architecture. We also discuss how each component operates within an IBM Tivoli Performance Analyzer V6.1 installation. Additionally, we cover IBM Tivoli Performance Analyzer V6.1 deployment scenarios and V6.1 Warehouse Agent architecture. This chapter has the following sections:

- "IBM Tivoli Performance Analyzer V6.1 components" on page 16
- "IBM Tivoli Performance Analyzer V6.1 architecture" on page 17
  - High-level architecture
  - Detailed architecture
  - Data flows
  - IBM Tivoli Monitoring V6.1 integration

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- "IBM Tivoli Performance Analyzer V6.1 deployment scenarios" on page 28
  - Demo Installation
  - Small-to-medium installation
  - Large installation
- "IBM Tivoli Performance Analyzer V6.1 warehouse agent architecture" on page 36

2.1 IBM Tivoli Performance Analyzer V6.1 components

IBM Tivoli Performance Analyzer V6.1 is an add-on to your existing IBM Tivoli Monitoring V6.1 deployment. It enables you to manage your systems more effectively by analyzing the data that IBM Tivoli Monitoring V6.1 agents collect and by providing meaningful reports about the performance and capacity management of your systems.

The three main components of the IBM Tivoli Performance Analyzer V6.1 are:

- IBM Tivoli Performance Analyzer V6.1 warehouse agent graphical user interface (sometimes called the IBM Tivoli Performance Analyzer V6.1 warehouse agent configuration tool)

  IBM Tivoli Performance Analyzer V6.1 is a single point for configuring the data to be analyzed and the type of analytical calculations to be performed on the data. In this graphical user interface, you can create a new task from scratch, use the existing tasks, or take the predefined tasks as a template and modify the template to suit your requirements.

- IBM Tivoli Performance Analyzer V6.1 warehouse agent

  The IBM Tivoli Performance Analyzer V6.1 warehouse agent performs the analytical calculations on the data stored in the data warehouse database. The results of the calculations are stored in output tables on Tivoli Enterprise Monitoring Server (monitoring server). The agent provides the Tivoli Enterprise Management Agent (monitoring agent) with an interface to deliver results to the monitoring server, which is the framework to run analytic modules with the following two types of analytic that is currently provided with IBM Tivoli Performance Analyzer V6.1:

  - Linear trending

    Trending enables you to predict and build the future value of collected data.

  - General arithmetic

    Arithmetic provides the ability to create new metrics out of existing collected data.

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- Predefined content includes *workspaces*, *tasks*, and *situations*. Workspaces contain charts or tables that show analyzed data. Tasks specify the data to be analyzed and the analytic calculation method to be used. Situations are tests that check the analyzed data against a threshold and display an alert icon when that threshold is exceeded or a value is matched. Using the predefined content, you can immediately start common performance and capacity planning tasks. You can modify the predefined content to create reports specific to your organization.

Note: There is a deployment configuration for initialization of the IBM Tivoli Performance Analyzer V6.1 warehouse agent. The IBM Tivoli Performance Analyzer V6.1 warehouse agent runs as a Manage Tivoli Monitoring Service (MTMS).

2.2 IBM Tivoli Performance Analyzer V6.1 architecture

In this section, we describe the architecture of Tivoli Performance Analyzer V6.1, which includes IBM Tivoli Monitoring V6.1 that forms the foundation for any capacity and performance monitoring activity and ships with an integrated data warehouse database for long term data storage. IBM Tivoli Monitoring V6.1 has broad support for hundreds of management domains, user specific reports using the Tivoli Enterprise Portal (portal), and automated problem identification, which makes it the ideal consolidation point for all monitoring data.

2.2.1 High-level architecture

You need to gain visibility of your resources, and IBM Tivoli Monitoring V6.1 provides agent and agent less monitoring solutions for your key IT systems and applications.

The IBM Tivoli Monitoring V6.1 foundation is divided into four levels:

- Real-time system monitoring
- Performance management
- Capacity planning
- Service level management

IBM Tivoli Monitoring V6.1 builds the foundation of the real-time system monitoring layer and gathers data across all the systems. Resource, application, and user-experience data are gathered from all kinds of systems by IBM Tivoli Monitoring V6.1 agents, other IBM Tivoli products, or external tools that are directly connected to the IBM Tivoli Monitoring V6.1 product.

IBM Tivoli Performance Analyzer V6.1 supports any IBM Tivoli Monitoring V6.1 data source including IBM Tivoli Composite Application Manager (ITCAM) and the Universal Agent. It is important to build a historical picture of your systems, which allows you to understand the typical performance of your infrastructure. Through the data warehouse database, IBM provides the capabilities to store long term performance and capacity information. IBM Tivoli Performance Analyzer V6.1 is then layered on top of IBM Tivoli Monitoring V6.1 to provide the targeted performance and capacity management capabilities and advanced resource monitoring.

IBM Tivoli Performance Analyzer V6.1 helps to increase your organization's ability to effectively and proactively execute infrastructure management. As a seamless, integrated part of the Tivoli infrastructure management platform, it enhances the value of performance management products by adding forward-looking predictive capabilities to IBM Tivoli Monitoring V6.1, that in turn provide strong real-time, near-time, and historical data management capabilities.

IBM Tivoli Performance Analyzer V6.1 enables resource management to focus on future performance issues, providing for proactive operational management, which allows customers to take a more proactive approach to performance and capacity management. This resource also enables you to:

- Check how your future resources look: tomorrow, next week, and next month.
- Identify future IT resources.
- Answer the question: Is there enough capacity to get me through next week?

IBM Tivoli Performance Analyzer V6.1 builds a performance baseline and analyzes historical performance by using the data warehouse database. After you build up a historical baseline for your systems, start creating forecasts on future capacity. IBM Tivoli Performance Analyzer V6.1 provides predictive trending and forecasting capabilities that help you to identify performance and capacity problems before they affect the business. See Figure 2-1 on page 19 for more details.

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Figure 2-1is an overview of the IBM Tivoli Monitoring V6.1 foundation.

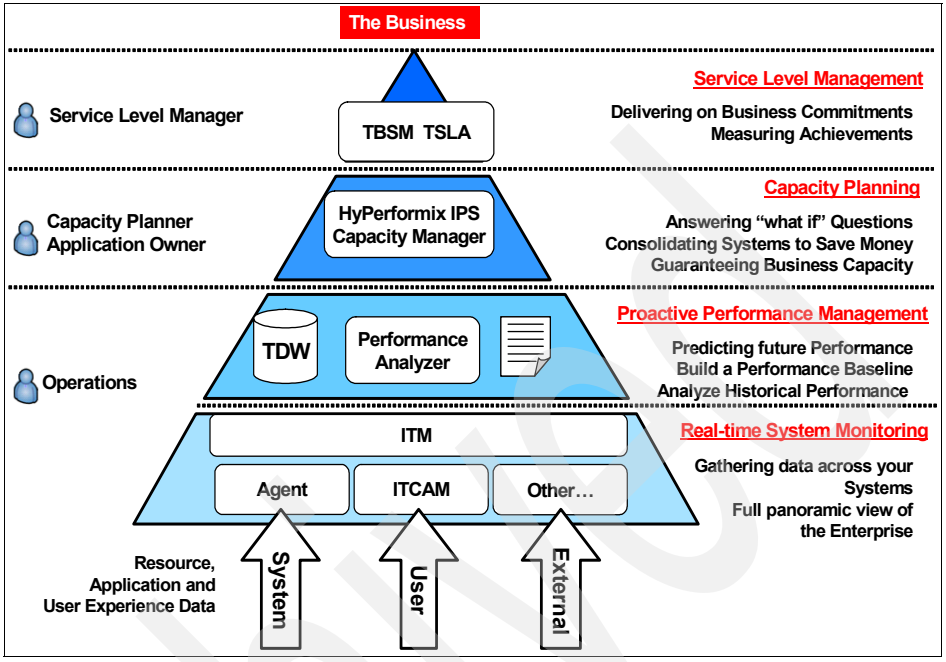

Figure 2-1 IBM Tivoli Monitoring V6.1 foundation

As with all IT management activities these tools fit into a broader people and process-driven framework. Indeed, no approach is successful without the correct process discipline, and many capacity management activities break down due to the poorly coordinated use of tools and people. IBM process managers, and specifically the IBM Tivoli Capacity Process Manager V1.1, enables organizations to establish best practices around capacity management and is the next level of our IBM Tivoli Monitoring V6.1 foundation layers. Maybe in future releases of the IBM Tivoli Capacity Process Manager and the IBM Tivoli Performance Analyzer come together.

To gain deeper insight, consider modeling your most important applications to ask "what-if questions". IBM has a partnership with HyPerformix to provide capacity modeling capabilities. *Capacity modeling* is a powerful tool for understanding how an application will scale; however, due to the effort involved, use it on your most important applications and services.

All of these activities should take place in the broader context of Service Management. It is important that you take a service-centric approach using tools, such as the portal and IBM Tivoli Business Systems Manager (TBSM), to view the system capacity in the context of the business services they support, which is

the last level, the service management level, of the IBM Tivoli Monitoring V6.1 foundation layers.

With IBM Tivoli Performance Analyzer V6.1, you can use a single agent for availability, performance, and capacity monitoring, where the IBM Tivoli Monitoring V6.1 agent becomes the agent for data collection. Historical capacity reports, out of the box for distributed systems with no extra effort, are involved and provide reports in the form of performance summaries and capacity forecasts. These reports are built in portal workspaces and can be fully integrated with existing workspaces.

IBM Tivoli Performance Analyzer V6.1 can identify performance and capacity problems before they become an issue, but also provide intelligent warnings about future capacity problems in the form of forecast reports and proactive alerts. It fires situations, alert service, and capacity violations to the central operation console. So, IBM Tivoli Performance Analyzer V6.1 drives operator decisions.

In traditional real-time monitoring, simple thresholds provide insight into current problems and enable status of systems to be clearly divided into OK and not-OK indicators. It is even more difficult to create warning thresholds. Many users might set a warning threshold below a critical threshold, but this is of limited use, especially when resource consumption is rising relatively slowly or quickly. IBM Tivoli Performance Analyzer V6.1 allows you to set intelligent thresholds based on time-to-problem criteria, which removes unwanted spurious events and enables spotting of fast moving and potentially dangerous trends earlier.

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Figure 2-2 shows the high-level performance and capacity architecture.

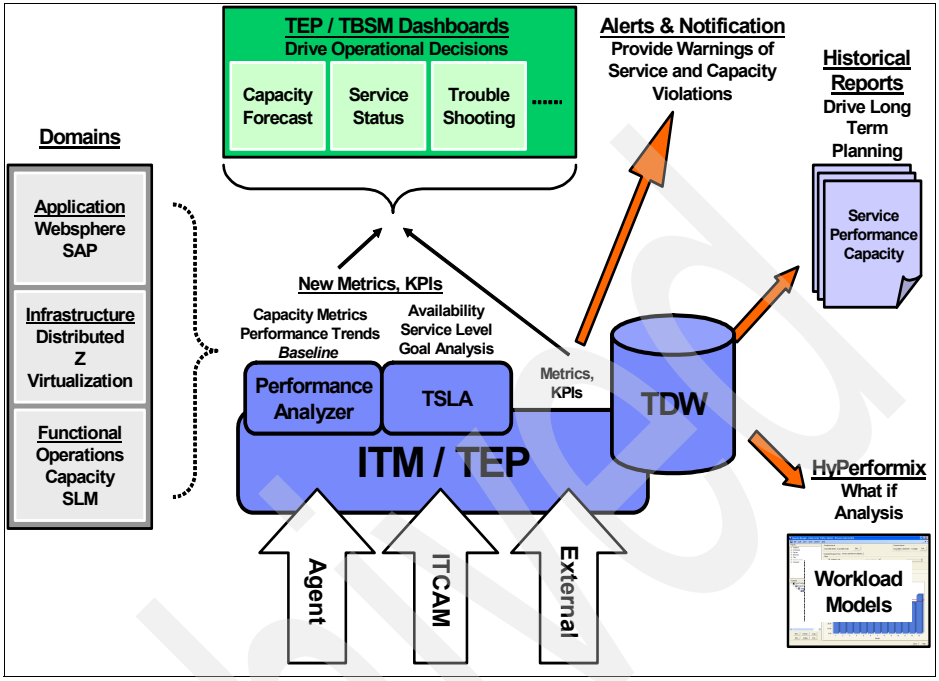

Figure 2-2 Performance and capacity management architecture

IBM Tivoli Performance Analyzer V6.1 gives you the ability to simulate situations and events based on predicted behavior, so that you can bring either operator intervention or automation into play to resolve problems before they start impacting operational level agreements or service level agreements.

You can extend IBM Tivoli Performance Analyzer V6.1 to include additional metrics that stem from any data that IBM Tivoli Monitoring V6.1 gathers, which enables you to select key operational metrics that provide the best indication of your customers' operational performance and capacity. IBM Tivoli Performance Analyzer V6.1 also supports the Universal Agent for customized monitoring.

2.2.2 Detailed architecture

In this section, we take a deeper look into the components of the IBM Tivoli Performance Analyzer V6.1 solution.

One of the exciting aspects of IBM Tivoli Performance Analyzer V6.1 is that it allows you to move to a single agent solution to collect availability, performance, and capacity information. This means that you can begin to consider replacing

your existing capacity and performance management tools with a single IBM Tivoli Monitoring V6.1 agent, which can already be installed alongside them. By using a single agent, you can move to a single monitoring vendor solution that reduces both licensing and maintenance costs.

From an IBM Tivoli Monitoring V6.1 perspective, the IBM Tivoli Performance Analyzer V6.1 warehouse agent is just another Tivoli Enterprise Management Agent (monitoring agent) like all the other agents (OS Agents or the DB2® Agent). The IBM Tivoli Performance Analyzer V6.1 warehouse agent retrieves data through the monitoring agent interface. Using IBM Tivoli Monitoring V6.1 you can view IBM Tivoli Performance Analyzer V6.1 results in a similar manner as data collected by any other IBM Tivoli Monitoring V6.1 agents.

Interactions with the monitoring server are streamlined through a separate ssmira_agent process. There are two main configuration categories:

- IBM Tivoli Performance Analyzer V6.1 warehouse agent configuration defines the connection parameters to the monitoring server, Tivoli Enterprise Portal Server (portal server), and the data warehouse database.
- Analytic tasks configuration determines what the analytics are going to do (analytic tasks) after the agent connects to the data warehouse database.

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Figure 2-3 shows you the detailed architecture of the IBM Tivoli Performance Analyzer V6.1 product and how it interacts with an existing IBM Tivoli Monitoring V6.1 environment.

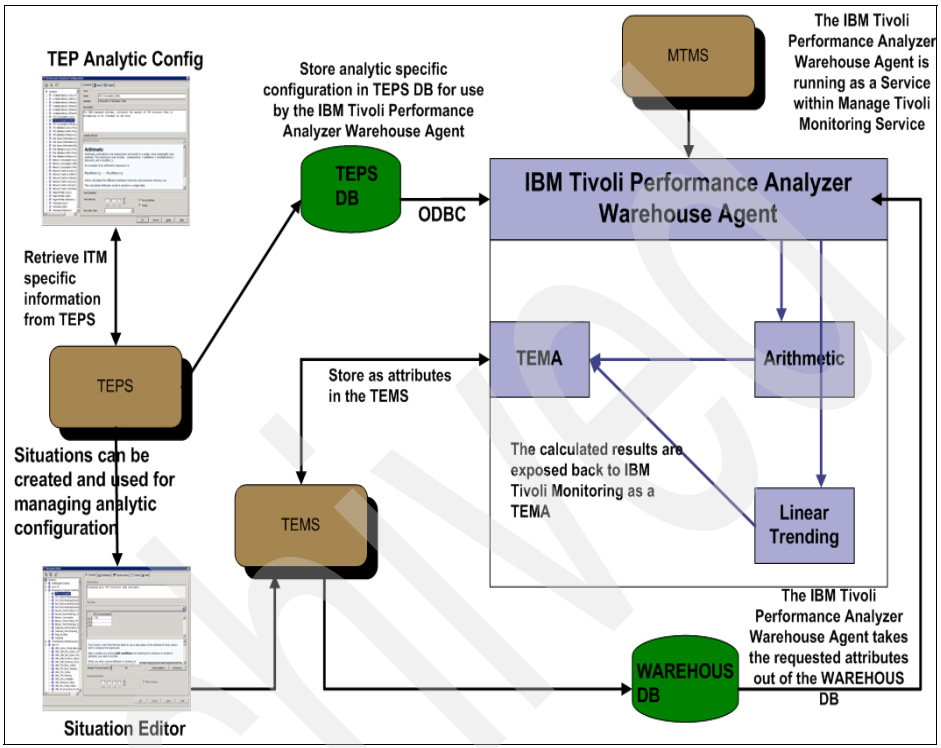

Figure 2-3 Detailed architecture

The Tivoli Enterprise Portal analytic configuration, located in the top-left corner of Figure 2-3, provides an interface where you can edit analytic tasks. The analytic configuration dialog, which is spawned from the portal, alters and creates analytic tasks. All IBM Tivoli Performance Analyzer V6.1 configuration data goes through the portal server into the portal server database, where IBM Tivoli Performance Analyzer V6.1 stores analytic- specific configuration:

- The IBM Tivoli Performance Analyzer V6.1 warehouse agent retrieves analytic task information from the portal server database to determine what kind of analytic to perform.
- The IBM Tivoli Performance Analyzer V6.1 warehouse agent needs to interact with the monitoring server to resolve the managed system lists.

- As a result of resolving the managed system list, IBM Tivoli Performance Analyzer V6.1 forms queries to pull data from the data warehouse database.
- The IBM Tivoli Performance Analyzer V6.1 warehouse agent takes the requested attributes out of the data warehouse database and exposes the calculated results to the monitoring server. Any results of the analytical flows through to the monitoring server upon requests through the monitoring agent interface.

The IBM Tivoli Performance Analyzer V6.1 warehouse agent is implemented as a monitoring agent; therefore, you can create *situations* based on the results produced by the analytical on the lower-left corner of the diagram in Figure 2-3 on page 23. You can create situations using the situation editor. Situations are d used for managing analytic configuration. You can also configure your Warehouse Proxy agent to persist results from the IBM Tivoli Performance Analyzer V6.1 warehouse agent in the data warehouse database in a similar manner as configuring history collection for other agents.

Note: The IBM Tivoli Performance Analyzer V6.1 warehouse agent is slightly different because it does not perform data collection like other IBM Tivoli Monitoring V6.1 agents; instead, IBM Tivoli Performance Analyzer V6.1 uses data from the data warehouse database that is summarized from the data collected by other agents, analyzes the data, and presents the results back to the monitoring server.

2.2.3 Data flows

In this section, we discuss the flow of data and provide the actors for each phase of the data flow. The data flows are as follows:

- The IBM Tivoli Performance Analyzer V6.1 analytic configuration dialog is used to alter/create analytic tasks. Tasks information is stored in the portal server database through the portal server itself.
- The IBM Tivoli Performance Analyzer V6.1 warehouse agent retrieves analytic tasks from the portal server database to determine what kind of analytics to perform.
- The IBM Tivoli Performance Analyzer V6.1 warehouse agent takes the requested attributes out of the data warehouse database.
- The IBM Tivoli Performance Analyzer V6.1 warehouse agent interacts with the monitoring server to resolve the managed system lists, and then uses the managed systems list to form queries to pull data from the data warehouse database.

- The IBM Tivoli Performance Analyzer V6.1 warehouse agent exposes the results of the analytic through to the monitoring server.
- The Warehouse Proxy agent pulls data collected by other agents through the monitoring server and stores them in the data warehouse database.
- The IBM Tivoli Performance Analyzer V6.1 warehouse agent runs as a Service within the Manage Tivoli Monitoring Service.
- The Summarization and Pruning agent summarizes data from the data warehouse database. Currently, the analytic modules that are shipped with the IBM Tivoli Performance Analyzer V6.1 product only use summarized data from the data warehouse database. In future versions, detailed historical data will also be supported.
- The Tivoli Enterprise Portal situation editor alters or creates situations and can manage analytic configuration. The situations are stored in the monitoring server for downloading to the monitoring agent for execution.

Note: The workspaces, not the IBM Tivoli Performance Analyzer V6.1 warehouse agent, use the data flows from the data warehouse database straight to the portal server; therefore, we did not indicate that data flow.

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Figure 2-4 shows the IBM Tivoli Performance Analyzer V6.1 agent as the actor and all of its interactions with other IBM Tivoli Monitoring V6.1 components.

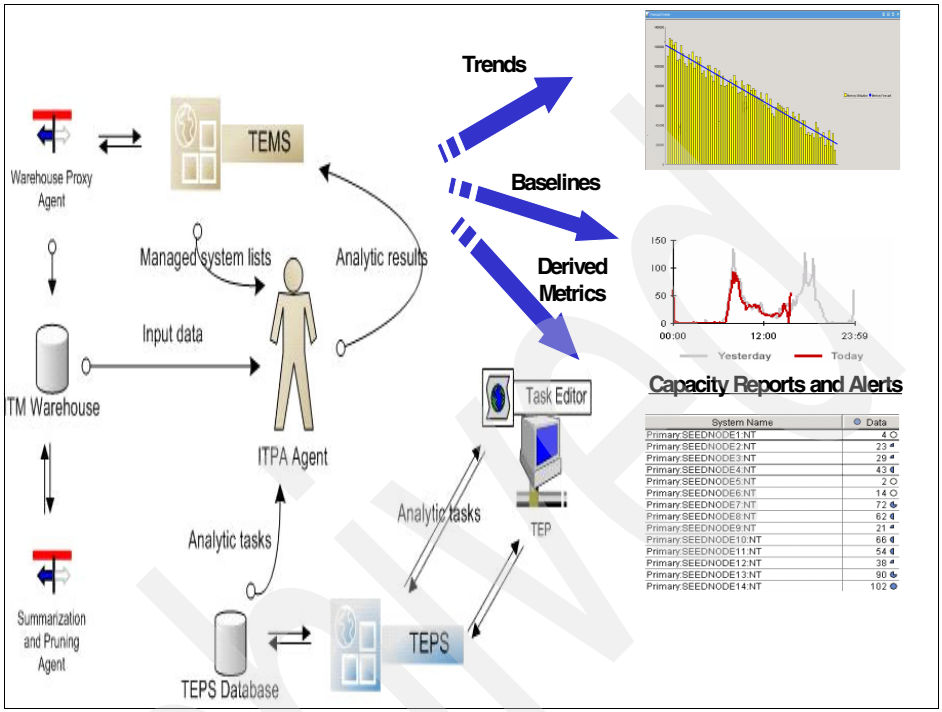

Figure 2-4 Data flows in IBM Tivoli Performance Analyzer V6.1

2.2.4 IBM Tivoli Monitoring V6.1 integration

The IBM Tivoli Performance Analyzer V6.1 subsystem is integrated with IBM Tivoli Monitoring V6.1. The subsystem configuration is carried out using the IBM Tivoli Performance Analyzer V6.1 graphics user interface tool, which is accessible from the portal. The reports, which show analyzed data, are displayed in workspaces.

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Figure 2-5 shows how the IBM Tivoli Performance Analyzer V6.1 subsystem fits within the IBM Tivoli Monitoring V6.1 system.

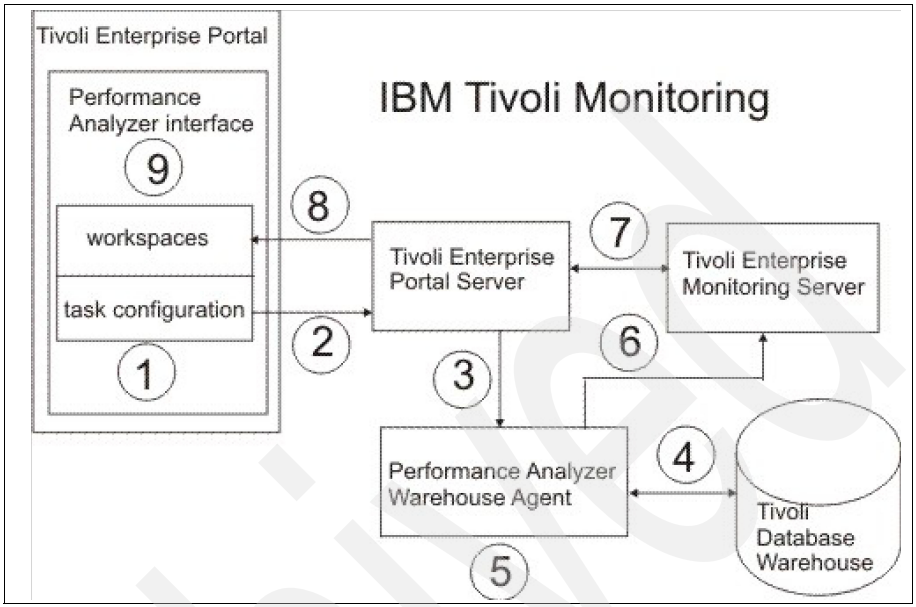

Figure 2-5 IBM Tivoli Monitoring V6.1 integration

The following steps are used for the IBM Tivoli Monitoring V6.1 integration:

1. An analytical task is defined using the IBM Tivoli Performance Analyzer V6.1 interface on portal.
2. The task is stored in the portal server.
3. The IBM Tivoli Performance Analyzer V6.1 warehouse agent receives instructions to perform an analytical task at either startup of the IBM Tivoli Performance Analyzer V6.1 or at the task interval, based on the task definition.
4. The IBM Tivoli Performance Analyzer V6.1 warehouse agent collects the data from the data warehouse database.
5. The IBM Tivoli Performance Analyzer V6.1 warehouse agent performs the analytical calculations, as specified in the task definition.
6. The results of the calculations are stored in the monitoring server as new sets of attributes.
7. A query, which is created in the Tivoli Enterprise Portal query editor and stored in the Tivoli Enterprise Portal Server, extracts the required attributes from the monitoring server.

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8. Tivoli Enterprise Portal Server sends the results of the query to the Tivoli Enterprise Portal.
9. Tivoli Enterprise Portal Server displays the results in a table or graph format whenever you select the appropriate IBM Tivoli Performance Analyzer V6.1 workspace.

2.3 IBM Tivoli Performance Analyzer V6.1 deployment scenarios

In this section, we explore the possible deployment scenarios for IBM Tivoli Performance Analyzer V6.1. We also provide best practices for deploying and configuring IBM Tivoli Performance Analyzer V6.1 to work efficiently in the scenarios.

Our intentions are to provide deployment scenarios that provide a realistic understanding of architecture design. Use these scenarios, mainly for guidance, to assist in the planning and deployment strategy that you plan to use for a production installation. Every deployment strategy is unique, and only proper planning can guarantee a successful implementation.

We cover three types of scenarios:

- Demo Installation
- Small-to-medium installation
- Large installation

The current supported platforms for the IBM Tivoli Performance Analyzer V6.1 warehouse agent include:

- Windows® 2003 Server (32-bit x86)
- RedHat Enterprise Linux® 4.0 (32-bit x86)
- AIX® 5.1 (PPC)

Note: The list of officially supported platforms for IBM Tivoli Performance Analyzer V6.1 are in the Tivoli platform and database support matrix. This matrix is updated monthly at the following Web site:

http://www-1.ibm.com/support/docview.wss?uid=swg21067036

2.3.1 Demo installation on a single machine

The scenario we provide in this section covers a simple-monitoring environment, where you install all of the components of IBM Tivoli Monitoring V6.1 on a single

machine. This is not a realistic deployment scenario in a production environment. Normally, we recommend that you install IBM Tivoli Performance Analyzer V6.1 components and IBM Tivoli Monitoring V6.1 components on separate machines.

For demonstration purposes only, we recommend that you install IBM Tivoli Monitoring V6.1 and IBM Tivoli Performance Analyzer V6.1 onto a single machine. Figure 2-6 depicts the small topology with one server for IBM Tivoli Monitoring V6.1 and IBM Tivoli Performance Analyzer V6.1 and a number of systems with monitoring agents installed.

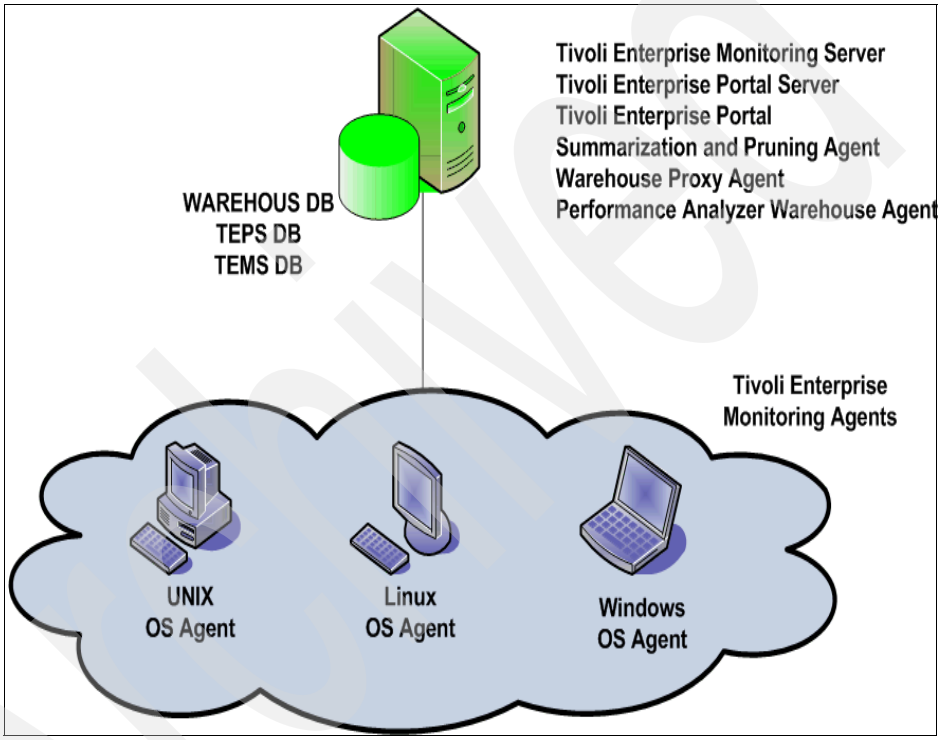

Figure 2-6 Demo installation scenario

The minimum required components on the machine are:

- Tivoli Enterprise Monitoring Server (monitoring server)
- Tivoli Enterprise Portal Server (portal server)
- Tivoli Enterprise Portal (portal)
- Warehouse Proxy agent
- Summarization and Pruning agent
- IBM Tivoli Performance Analyzer V6.1 warehouse agent

Note: We do not recommend that you run all components of IBM Tivoli Monitoring V6.1 on a single machine for a production system; instead, install all components on a single machine only for demonstration purposes.

The system should meet the minimum system requirements to run all components of IBM Tivoli Monitoring V6.1. We recommend that the system has at least 128 MB of physical memory available to the IBM Tivoli Performance Analyzer V6.1 warehouse agent. The single-system installation can support analytic on approximately 100 managed systems. The approximation is based on profiled performance tests using out-of-the-box analytic. Use the values that we state here only as a guideline. The actual number of managed systems that IBM Tivoli Performance Analyzer V6.1 supports depends on a number of factors, which include available storage capacity, system memory, the types and number of analytic tasks, and the amount of input data for the analytic. We advise you to monitor the memory usage on the IBM Tivoli Performance Analyzer V6.1 system to ensure that there is sufficient memory available.

2.3.2 Small-to-medium installation (400 agents maximum)

Figure 2-7 on page 31 depicts the recommended deployment scenario for a typical medium size monitoring environment supporting approximately 500 monitoring agents. Each of the machines in the monitoring environment must be powerful enough to run the various IBM Tivoli Monitoring V6.1 components.

For a medium size installation, it can be sufficient to have the Warehouse Proxy agent and the data warehouse database repository on the same system.

The IBM Tivoli Performance Analyzer V6.1 warehouse agent and the Summarization and Pruning agent rely heavily on sending and receiving data to and from the data warehouse database; therefore, we always recommend that you keep these components together. However, the system can take a performance hit when the two agents are processing data concurrently. Although there is no absolute way to ensure that summarization and pruning of data does not occur at the same time as analytic tasks are executed, it is possible to carefully schedule analytic tasks to minimize this occurrence. Follow these practices:

- Perform summarization and pruning at a one day interval where possible to reduce the frequency.
- Linear trending tasks are data intensive, so do not perform these tasks more frequent than one day intervals.

- Arithmetic tasks are less data intensive; therefore, you can perform these tasks more frequently.
- Start the performance analytic agent at different times to the historical data collection to prevent an overlap.

The memory requirements for the IBM Tivoli Performance Analyzer V6.1 warehouse agent depends on the amount of data that the agent has to process and the type of analytic it has to perform. As a rough guide, ensure that there is at least 512 MB of available memory for up to 500 monitoring agents that run the out-of-the-box analytic.

Figure 2-7 is an example of a small or medium installation scenario.

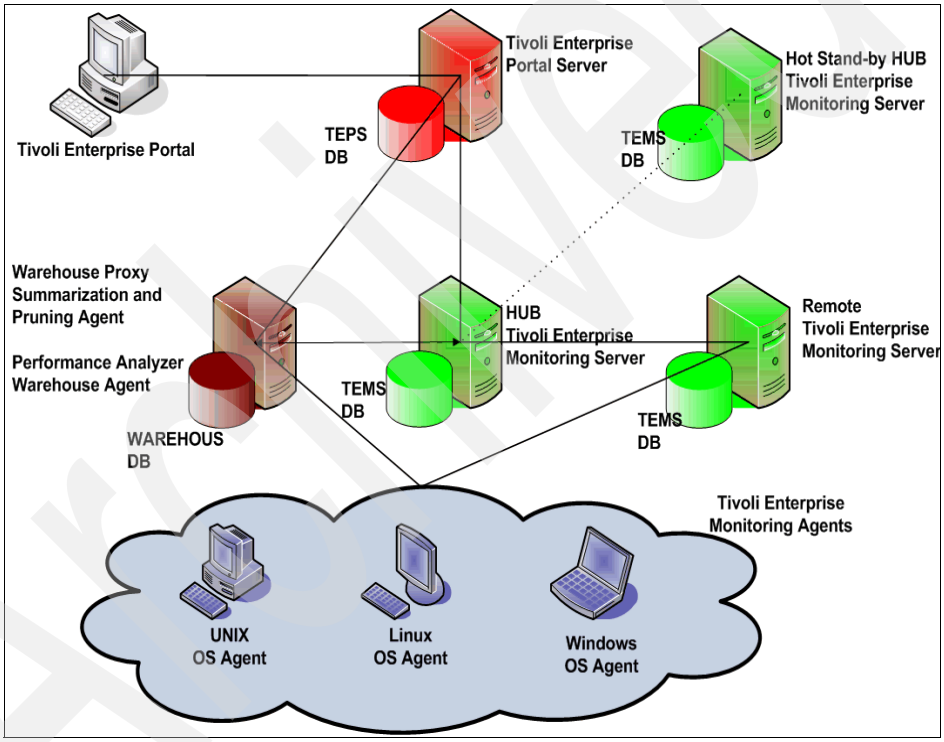

Figure 2-7 Small or medium installation scenario

2.3.3 Large installation (2000 agents maximum)

Figure 2-8 on page 32 depicts the recommended deployment scenario for a large size monitoring environment supporting up to 2,000 monitoring agents.

Note: Future versions of the IBM Tivoli Performance Analyzer will support more agents.

As with the medium-size installation, we recommend that you install the IBM Tivoli Performance Analyzer V6.1 warehouse agent on the same machine that the warehouse database is on.

Figure 2-8 is an example of a large installation scenario.

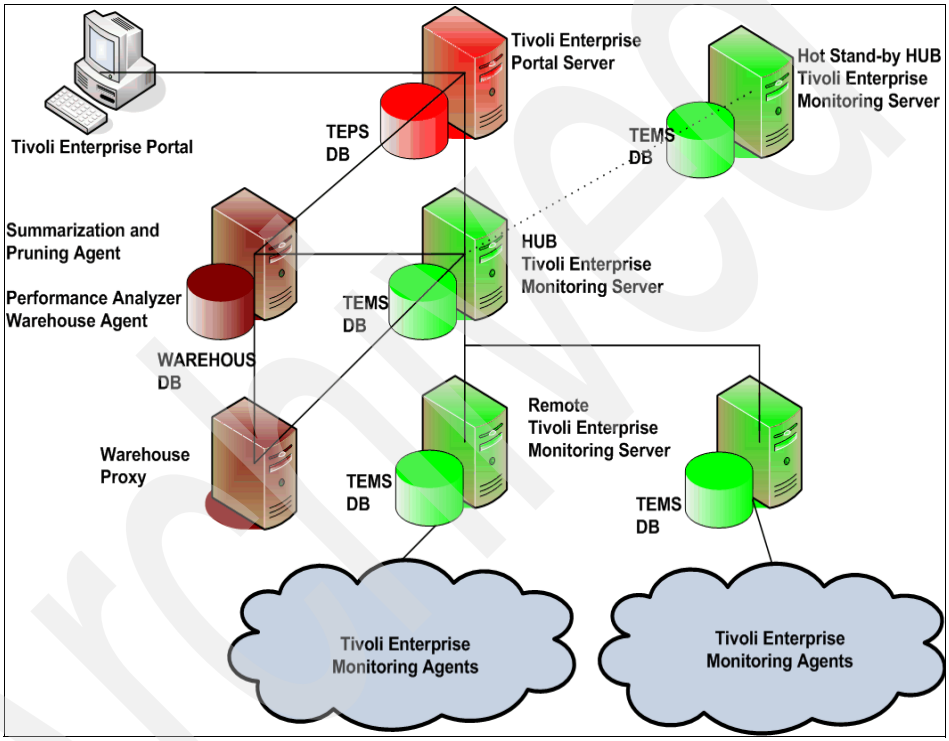

Figure 2-8 Large installation scenario

Use the following practices:

- Set the “run at startup” property to NO on all situations, and selectively turn on the desired situations. This helps the performance throughput of IBM Tivoli Monitoring V6.1.
- Turn off historical collection on all attribute groups, and selectively turn on the attribute groups that are required for data analysis. This significantly reduces the amount of load on the system by the Summarization and Pruning agent.

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- Set the “run at startup and active property” on all performance analytic tasks in the IBM Tivoli Performance Analyzer V6.1 configuration graphical user interface, and selectively activate desired tasks.
- Follow the recommended post-install configuration in 3.3, “Installing and configuring the product” on page 42.

2.3.4 Large data warehouse database

A data warehouse database is considered large if it contains a large number of managed systems or data points. Large-data warehouse databases can severely affect the performance of the IBM Tivoli Performance Analyzer V6.1 warehouse agent. To some extent, large-data warehouse databases can even cause the execution of the analytic tasks to fail.

There are three recommended parts of configurations that you can perform to avoid issues with large-data warehouse database deployments:

- Increase the log level to obtain more detailed log messages in the event that database issues occur.

  The supported log level from the lowest severity to the highest severity is debug, information, warning, and fatal. The log level of the IBM Tivoli Performance Analyzer V6.1 warehouse agent controls the severity of messages that it logs, particularly the agent log messages with a severity that is greater than or equal to the configured log level. The default log level is set to warning, which is the minimum recommended log level.

- Tune the data warehouse database to avoid SQL issues.

  A data warehouse database that contains a large number of managed systems can cause SQL queries to fail when there is insufficient heap space to create and process large SQL statements. Large SQL statements can also lead to large log files. If the log file size is too small, then excessive roll-over of these log files can occur.

- Tune the agents to handle the heavy data processing that is obtained from the data warehouse database.

  Depending on the platform, IBM Tivoli Performance Analyzer V6.1 ships with preconfigured minimum and maximum Java™ heap sizes for the java virtual machine that is within the IBM Tivoli Performance Analyzer V6.1 warehouse agent. The Java heap size requirement for the IBM Tivoli Performance Analyzer V6.1 warehouse agent depends on the amount of data in the data warehouse database and the amount of IBM Tivoli Performance Analyzer V6.1 tasks that are configured to run. For large amounts of data, it might be necessary to change the Java heap size to prevent the Java Virtual Machine, which is within the IBM Tivoli Performance Analyzer V6.1 warehouse agent,

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from running out of memory. The following sections provide some best practices for tuning the Java Virtual Machine, especially for large-data warehouse databases.

Agent Java heap size tuning

IBM Tivoli Performance Analyzer V6.1 ships preconfigured minimum and maximum Java heap sizes for the Java Virtual Machine (JVM™) that is within the IBM Tivoli Performance Analyzer V6.1 warehouse agent. The Java heap size requirement for the IBM Tivoli Performance Analyzer V6.1 warehouse agent depends on the amount of data in the data warehouse database and the amount of analytical tasks that are configured to run. For large amounts of data, you might need to change the Java heap size to prevent the JVM from running out of memory.

The minimum and maximum heap size allocated to the JVM is defined by the -Xms and -Xmx parameter that are passed to the JRE™, which you can configure using the KPA_JAVA_ARGS parameter that is located in the IBM Tivoli Performance Analyzer V6.1 warehouse agent configuration file. An example is as follows:

```
KPA_JAVA_ARGS=-Xms16m –Xmx1024m
```

In the above example, the IBM Tivoli Performance Analyzer V6.1 warehouse agent is allocated a Java heap size of 16 MB, and it is allowed to grow to a maximum of 1GB. If the –Xms and –Xmx is not defined, then the default value from the JRE implementation is used.

Modify the heap size only when necessary. Observe the physical memory usage of the IBM Tivoli Performance Analyzer V6.1 warehouse agent (kpacma). If the amount of memory starts to approach the max heap size, then increase the value.

Windows environment

In a Windows environment, the 32-bit architecture imposes a fundamental limit on an address range of 4 GB. The Windows NT kernel splits this in half (– 2 GB) for the application and 2 GB for the operating system, which means that the theoretical limit for the Java heap size is 2 GB.

IBM Tivoli Performance Analyzer V6.1 is shipped without the KPA_JAVA_ARGS parameter specified. The default physical memory that is initially allocated to the heap for the IBM Java 142 for Windows is 4 MB. The default maximum physical memory is half of the available physical memory with a minimum of 16 MB and a maximum of 2 GB.

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To set the default value:

1. Start the Manage Tivoli Enterprise Monitoring Services application.
2. Select the Performance Analyzer from the list of services/applications.
3. Click the **Advance** submenu from the **Actions** menu, and select **Edit ENV File**.

   The notepad application is displayed with the IBM Tivoli Performance Analyzer V6.1 warehouse agent environment settings file.
4. Add or modify the KPA_JAVA_ARGS line (see the example in the previous section).
5. Save and close the KPAENV file.
6. Recycle the Performance Analyzer service.

Linux environment

If the -Xms parameter is not specified, the IBM Java142 on Linux allocates 4 MB to the Java heap. If the –Xmx parameter is not specified, the default value is half of the available physical memory up to 512 MB.

A maximum heap size of 512 MB is probably too small for a monitoring environment with approximately 1000 nodes and using the default analytic tasks. IBM Tivoli Performance Analyzer V6.1 is shipped with a minimum heap size of 16 MB and a maximum of 1024 MB. To modify this value:

1. Edit the <itm_installdir>/config/pa.ini file.
2. Modify the KPA_JAVA_ARGS line as per example above.
3. Save and close the file.
4. Recycle the IBM Tivoli Performance Analyzer V6.1 warehouse agent.

AIX environment

The Java heap size for the 32-bit AIX is configured in the same way as the IBM Tivoli Performance Analyzer V6.1 warehouse agent on Linux. However, the way the JVM interacts with the AIX virtual memory is different. The default “Small Memory Model” for 32-bit AIX applications only allocates one 256 MB data segment in which it can malloc() data. The 32-bit AIX memory model does have 11 segments of shared memory into which it can mmap() or shmap() data. This limits the maximum size of the Java heap size to 256 MB.

You can move the boundary between private memory and shared memory to give more private memory to the application at the expense of reduced shared memory. The number of data segments that are allocated to a process is determined by the LDR_CNTRL=MAXDATA=0xn0000000 (n segments) environment variable.

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IBM Tivoli Performance Analyzer V6.1 is shipped with the default LDR_CNTRL=MAXDATA=0x80000000, giving a maximum of 2 GB to the IBM Tivoli Performance Analyzer V6.1 warehouse agent. Set this value at least as big as the max Java heap size setting.

2.4 IBM Tivoli Performance Analyzer V6.1 warehouse agent architecture

IBM Tivoli Performance Analyzer V6.1 is shipped with an analytic configuration tool, so that you can add, edit, or remove any analytic tasks. An analytical task determines which monitored data, stored in the data warehouse database, you want to analyze, how to analyze it, where to store the results, and how often the analysis can take place. You can spawn this editor from the portal. Using the predefined content, you can immediately start common performance and capacity planning tasks.

The IBM Tivoli Performance Analyzer V6.1 specific workspaces on the portal contain charts or tables that show analyzed data. A workspace is the working area of the portal application window. IBM Tivoli Performance Analyzer V6.1 provides predefined workspaces. You are prevented from overwriting or deleting the predefined workspaces. However, you can use a predefined workspace to create a new workspace by editing the predefined workspace and then saving it under a different name.

IBM Tivoli Performance Analyzer V6.1 specific situations are tests that check the analyzed data against a threshold and display an alert icon when that threshold is exceeded or when a value is matched. Predefined situations for the IBM Tivoli Performance Analyzer V6.1 describe system conditions that you might want to monitor at your site. Use these situations to begin monitoring any managed object quickly or as models for customizing your own situations. In some cases, the values assigned to the predefined situations are only examples; therefore, you must modify the predefined situations to reflect the conditions of your distributed system.

You can spawn the query editor from the portal as well. Each table view or chart you see in a workspace shows the result of data that a query requests. A query is the means by which tables and charts request data from attributes or from an ODBC-compliant database (for Windows) or a JDBC™-compliant database (for UNIX and Linux) or through a direct connection from a Tivoli Data Warehouse database.

Figure 2-9 shows more information about what is installed with the IBM Tivoli Performance Analyzer V6.1 warehouse agent.

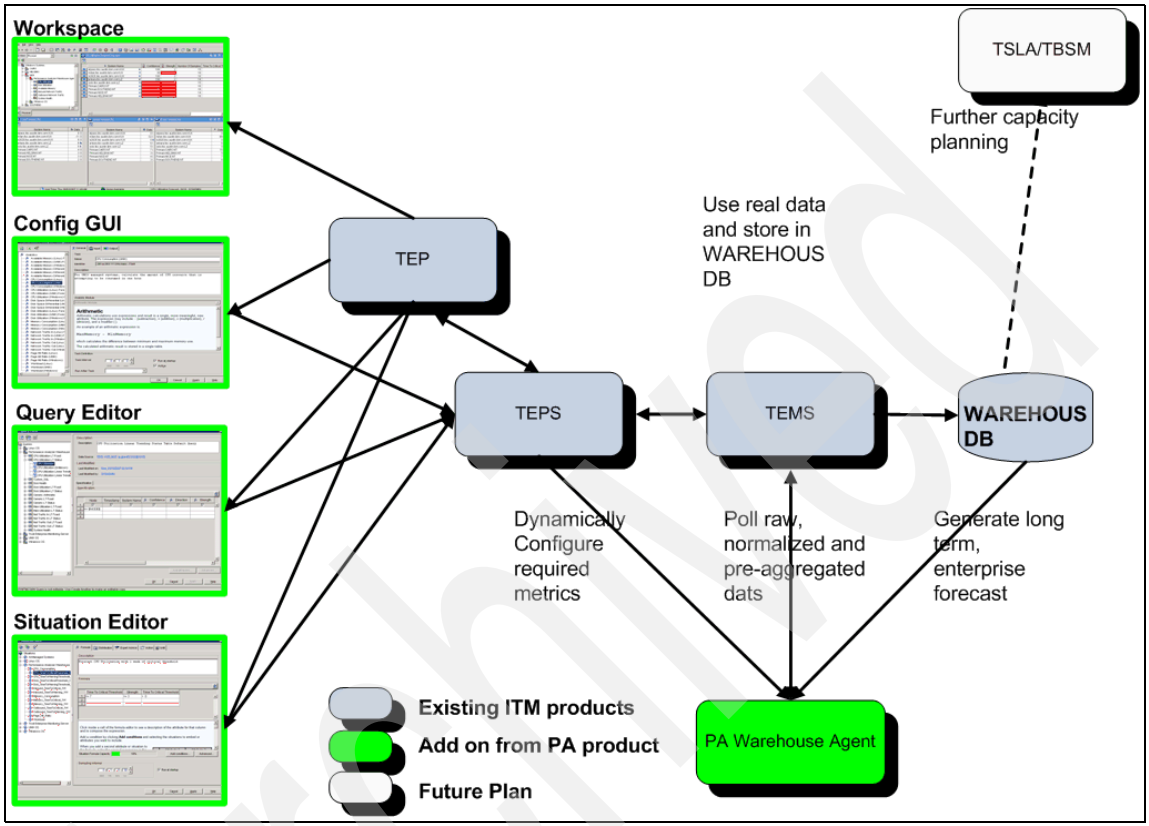

Figure 2-9 IBM Tivoli Performance Analyzer V6.1 warehouse agent architecture

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3

Installation and configuration

In this chapter, we give you steps for installing and configuring the IBM Tivoli Performance Analyzer V6.1 components into your preexisting IBM Tivoli Monitoring V6.1 environment.

We discuss the following topics in this chapter:

- "IBM Tivoli Performance Analyzer V6.1 components" on page 40
- "System requirements and prerequisites" on page 40
- "Installing and configuring the product" on page 42
- "Starting the IBM Tivoli Performance Analyzer V6.1 components" on page 55
- "Uninstalling the IBM Tivoli Performance Analyzer V6.1" on page 56
- "Default workspaces, situations, and tasks" on page 71

Note: The procedures that we describe in this chapter are restricted to IBM Tivoli Performance Analyzer V6.1 installation and configuration and does not cover any installation or configuration procedures for the IBM Tivoli Monitoring V6.1 components. You can refer back to the base IBM Tivoli Monitoring V6.1 guides and ensure that the necessary IBM Tivoli Monitoring V6.1 components are installed and functional.

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3.1 IBM Tivoli Performance Analyzer V6.1 components

The IBM Tivoli Performance Analyzer V6.1 consists of the following components:

- Performance Analyzer support for IBM Tivoli Monitoring V6.1 components, such as Tivoli Enterprise Monitoring Server (monitoring server), Tivoli Enterprise Portal Server (portal server), and the IBM Tivoli Monitoring desktop clients.

  The IBM Tivoli Performance Analyzer V6.1 support component adds the following components to the IBM Tivoli Monitoring environment:

  - Workspaces—provide different views on the Tivoli Enterprise Portal for presenting the analyzed data to the user.
  - Tasks—define the metrics and the data that is to be analyzed along with the calculation method to use.
  - Situations—define the thresholds that are compared with the analyzed data to raise an alert when the data exceeds the defined threshold.
  - Graphical User Interface—a tool that you can use to configure the IBM Tivoli Performance Analyzer V6.1 Analytical Tasks. The tasks consist of analytical methods, calculations, frequency, input and output data, and so forth. The Graphical User Interface tool is available as a toolbar button for you within the Tivoli Enterprise Portal console.
- IBM Tivoli Performance Analyzer V6.1 warehouse agent is the component that fetches the summarized data from the warehouse database for performing analytical calculations. The agent then stores the data into the Performance Analyzer tables within the Tivoli Enterprise Portal server database, which is then presented on the portal server workspaces.

3.2 System requirements and prerequisites

In this section, we describe the system requirements and other software prerequisites for installing IBM Tivoli Performance Analyzer V6.1.

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3.2.1 Supported operating systems

IBM Tivoli Performance Analyzer V6.1 is currently available on Windows, Linux, and AIX operating systems.

The supported operating system versions are:

- Red Hat Linux ES / AS, 4.0
- Microsoft® Windows 2003 server edition
- IBM AIX 5 L version 3

3.2.2 Software pre-requisites

Because IBM Tivoli Performance Analyzer V6.1 is an add-on product to the base IBM Tivoli Monitoring V6.1 Fix Pack 5, you must ensure that the components described in the following bulleted list are installed, configured, and functional before installing IBM Tivoli Performance Analyzer V6.1:

- Tivoli Enterprise Monitoring Server
- Tivoli Enterprise Portal Server
- Warehouse database
- Summarization and Pruning agent

The IBM Tivoli Performance Analyzer V6.1 agent uses the summarized data from the WAREHOUS database; therefore, you need to ensure that the IBM Tivoli Monitoring V6.1 Summarization and Pruning Agent is active and that data from the managed systems are getting logged and summarized into the WAREHOUS database.

Important:

- If the existing IBM Tivoli Monitoring V6.1 portal server uses MS-SQL, create a new SQL DB user PA, and assign the person user, public, and db_owner privileges for the TEPS database.
- If you plan to install IBM Tivoli Performance Analyzer V6.1 warehouse agent on a separate machine, ensure that an ODBC connection exists between the WAREHOUS database and the IBM Tivoli Performance Analyzer V6.1 agent machine. You can refer to the *IBM Tivoli Monitoring User's Guide Version 6.1.0*, SC32-9409, for more information about configuring the ODBC.

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3.3 Installing and configuring the product

In this section, we describe the procedures for installing and configuring IBM Tivoli Performance Analyzer V6.1 onto a single Windows Server® deployment of IBM Tivoli Monitoring V6.1.

Installing IBM Tivoli Performance Analyzer V6.1 is similar to the other IBM Tivoli Monitoring V6.1 modules, which consists of a wizard-based installation procedure.

3.3.1 Installing IBM Tivoli Performance Analyzer V6.1

Use the following steps to install the IBM Tivoli Performance Analyzer V6.1:

1. Logon to the IBM Tivoli Monitoring V6.1 server using an administrator privileged user ID.
2. Launch the Installation Wizard by double-clicking the **setup.exe** file, which is located on the IBM Tivoli Monitoring Performance Analyzer V6.1 product CD.
3. On the Welcome window, click **Next** . The Install Prerequisites window is displayed, as shown in Figure 3-1.

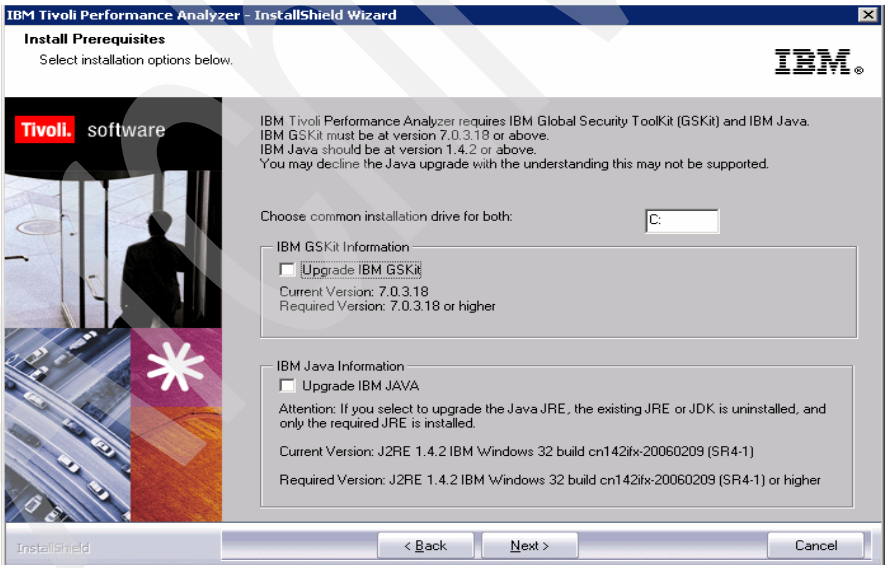

Figure 3-1 IBM Tivoli Performance Analyzer - Installshield Wizard

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4. The current and required versions are displayed on the Install Prerequisites window (Figure 3-1 on page 42), ensure that the current versions are at the required level. If they are not, select the required check box next to the component that requires an upgrade, and then click **Next**.
5. In the Software License Agreement window, click **Next**, and accept the license terms that are displayed.
6. On the Select Features window, as shown in Figure 3-2, select the components that are applicable to the server on which the setup is being run. Click **Next**.

> **Important:** In this setup, because all of the IBM Tivoli Monitoring V6.1 components are installed on a single machine, all of the IBM Tivoli Performance Analyzer V6.1 components are selected for installation.

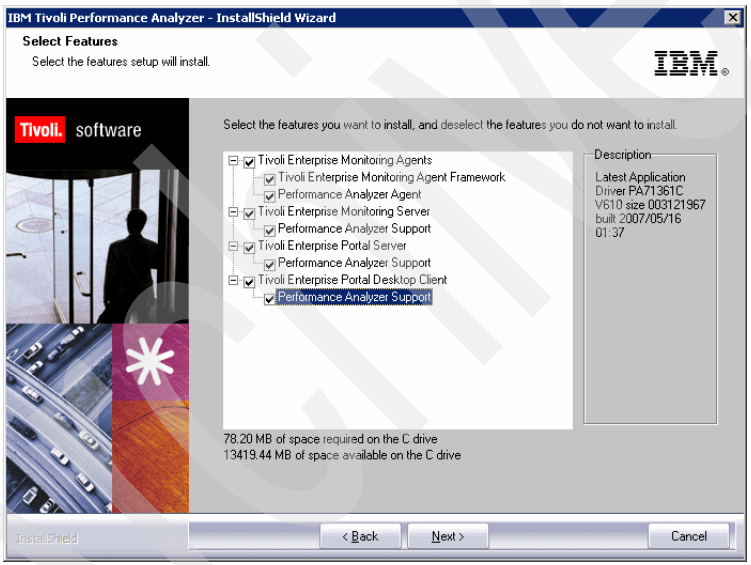

Figure 3-2 IBM Tivoli Performance Analyzer - Installshield Wizard

7. On the Start Copying Files window, click **Next** to begin the installation.
8. On the Setup Type window, ensure that all the check boxes are selected, and click **Next**.

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9. On the TEPS Host name window, as shown in Figure 3-3, leave the detected host name to the default, and click **Next**.

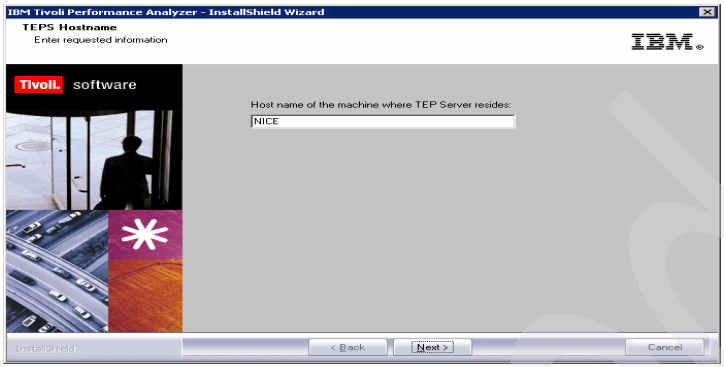

Figure 3-3 IBM Tivoli Performance Analyzer - Installshield Wizard

10. On the Tivoli Enterprise Monitoring Server Configuration window, as shown in Figure 3-4, leave the detected configurations at the defaults, and click **Next**.

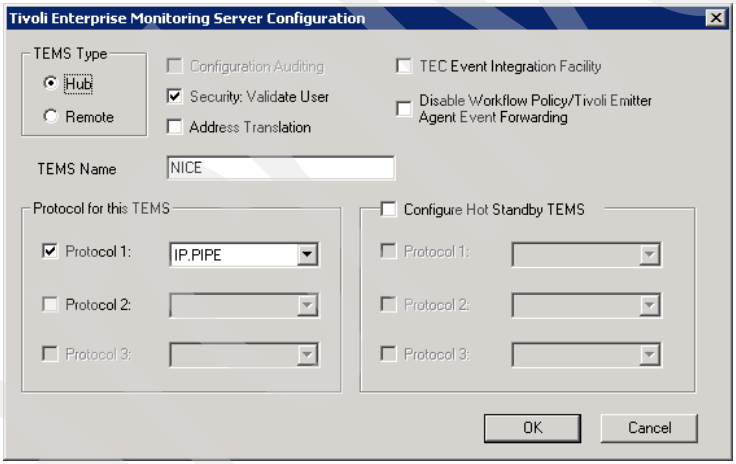

Figure 3-4 Tivoli Enterprise Monitoring Server Configuration

11. On the Hub TEMS Configuration window (Figure 3-5), keep the default selections, and click **OK**.

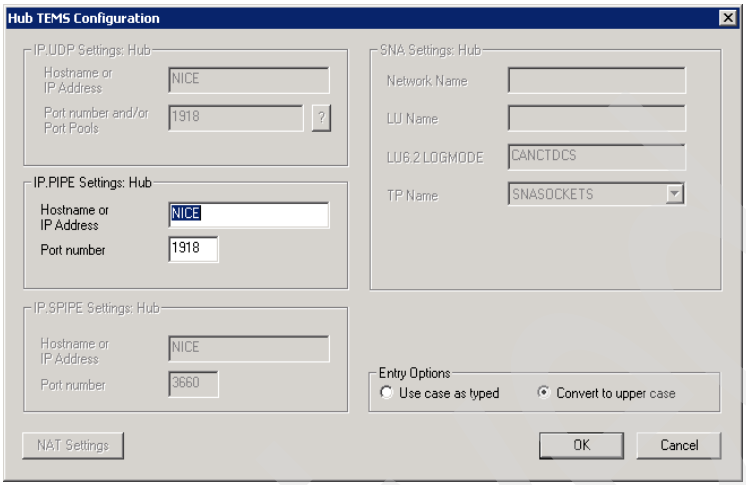

Figure 3-5 Hub TEMS configuration

12. On the Add Application Support to the TEMS window (Figure 3-6), select the location of the monitoring server, and click **OK**.

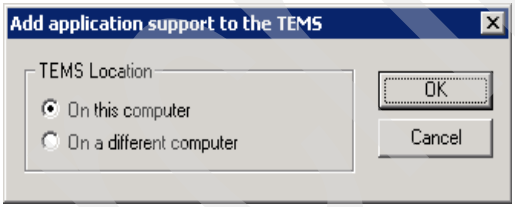

Figure 3-6 Add application support to the TEMS

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13. On the Application Support to Add window (Figure 3-7), select the Performance Analyzer Support option, and then click **OK**.

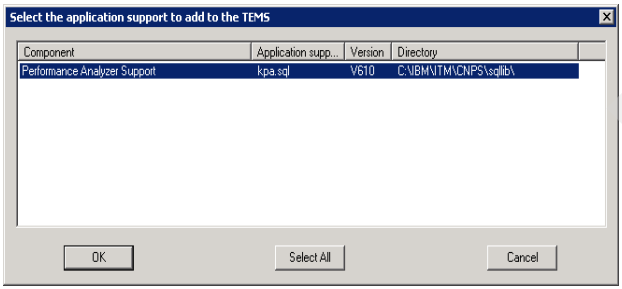

Figure 3-7 Select the application support to add to the TEMS

14. On the Application Support Completion status window (Figure 3-8), ensure that the addition of support completed with a return code of zero. Click **Next**.

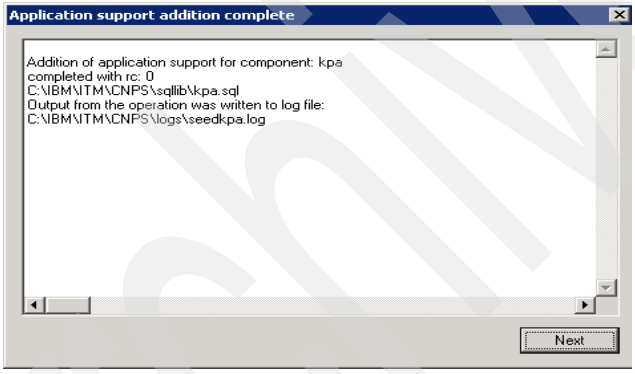

Figure 3-8 Application support addition complete

Installation of IBM Tivoli Performance Analyzer V6.1 is complete. The next windows are for configuring the IBM Tivoli Performance Analyzer V6.1. See 3.3.2, “Configuring the IBM Tivoli Performance Analyzer V6.1 agent” on page 46 for instructions.

3.3.2 Configuring the IBM Tivoli Performance Analyzer V6.1 agent

In this section, we provide instructions for setting up the IBM Tivoli Performance Analyzer V6.1 agent.

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Configuration prerequisites

You must complete step 8 on page 43 in 3.3.1, “Installing IBM Tivoli Performance Analyzer V6.1” on page 42, where you configure the agents default connection to Tivoli Enterprise Monitoring Server. Step 7 has the Installation Wizard take you directly to the configuration windows, after you click **Next** on the Application Support Completion status window. Otherwise, if you did not perform the step, you must invoke the configuration window through the Reconfigure option, which is located on the right-click menu of the Tivoli Performance Analyzer agent that is displayed in the Tivoli Enterprise Monitoring Services window.

Tip: For each configuration, a log file is generated that you can use to diagnose any problems that arise. The file is located at:

```
%CANDHELHOME%\InstallITM\plugin\executionEvents\logs\install_plugin_
comp_pa_n
```

In the directory, *n* is a number that increases by one for each configuration.

Use the following instructions to configure the IBM Tivoli Performance Analyzer V6.1 agent:

1. On the Configuration Defaults for Connecting to a TEMS window (Figure 3-9), do not change the detected settings. Click **OK**.

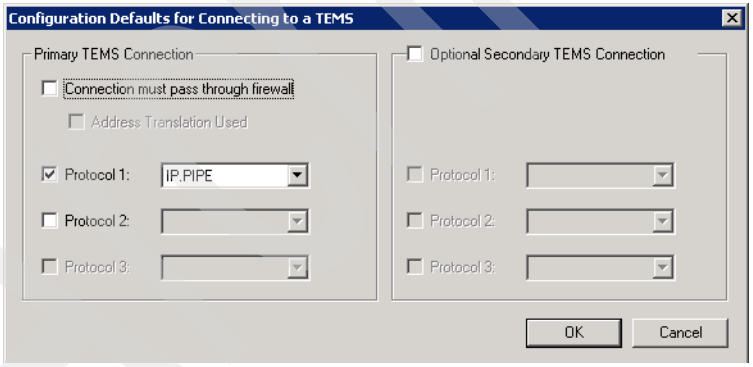

Figure 3-9 Configuration Defaults for Connecting to a TEMS

2. On the subsequent Configuration Defaults for connecting to a TEMS windows, do not change the detected values, as shown in Figure 3-10. Click **OK**.

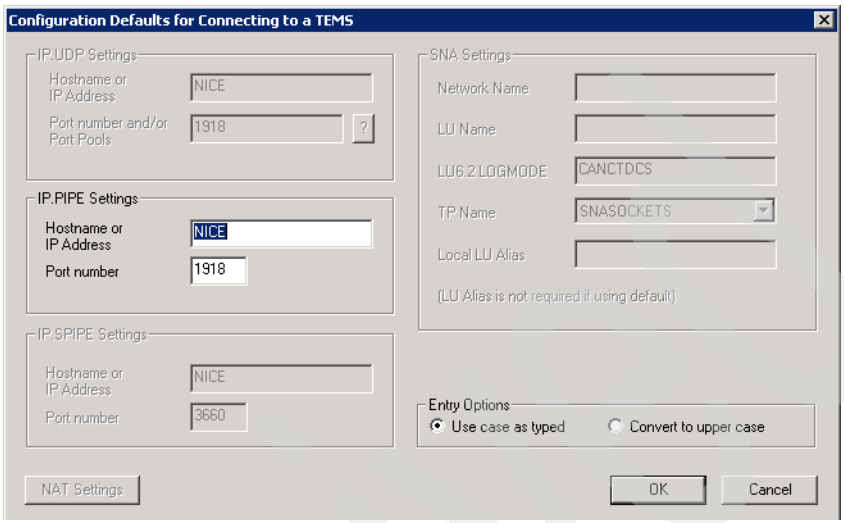

Figure 3-10 Configuration Defaults for Connecting to a TEMS

3. After the installation process configures the agent and recycles the related IBM Tivoli Monitoring V6.1 processes, if required, click **OK**.
4. The Agent configuration window (Figure 3-11 on page 49), is displayed with the following two configuration tabs:
   - TEPS Server
   - Data Warehouse

   a. Click the **TEP Server** tab, and specify the following information:
      - TEPS database user ID
      - Password for the user ID specified

   b. Ensure that the Initialize PA tables field is set to **Yes**, so that the Tivoli Performance Analyzer tables are created in the TEPS database. Leave the rest of the fields to the default values, as detected, and review the default values before you proceed.

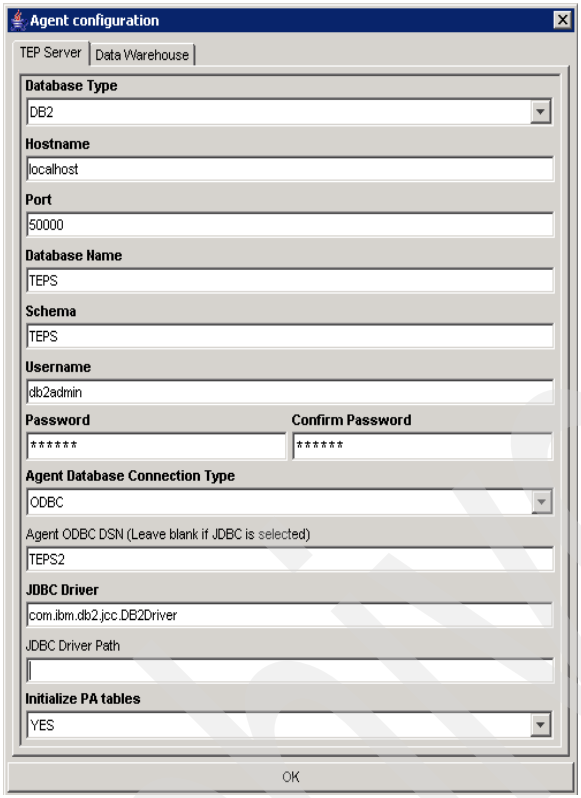

Figure 3-11 Agent configuration - TEP Server

c. Click the **Data Warehouse** tab (Figure 3-12 on page 50), and type the user name and password in their respective fields. This user ID and password are used to connect to the WAREHOUS database to fetch the summarized historical data for analysis. Confirm the password by repeating the password in the Confirm Password field, and then click **OK**.

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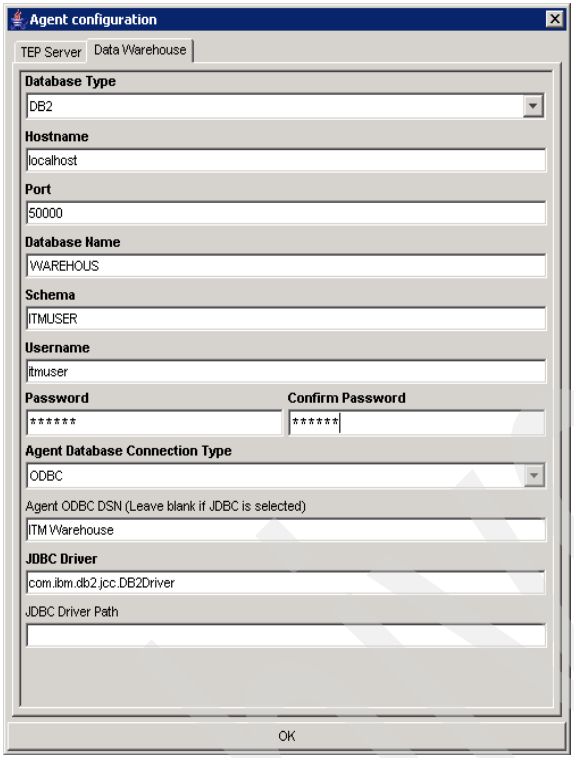

Figure 3-12 Agent Configuration - Data Warehouse

The system continues with the agent configuration, and when it finishes, the Installation Wizard Complete status window is displayed. In case you have not invoked the configuration of the agent during the installation process, return to the Manage Tivoli Monitoring Services window.

This completes the IBM Tivoli Performance Analyzer V6.1 agent configuration.

3.3.3 Configuring the IBM Tivoli Performance Analyzer V6.1 tasks

In this section, we provide steps for configuring the IBM Tivoli Performance Analyzer V6.1 tasks.

1. To invoke the configuration window for the IBM Tivoli Performance Analyzer V6.1 tasks, click the icon that we circled in Figure 3-13 on page 51. You can also press Ctrl+F to launch the configuration window.

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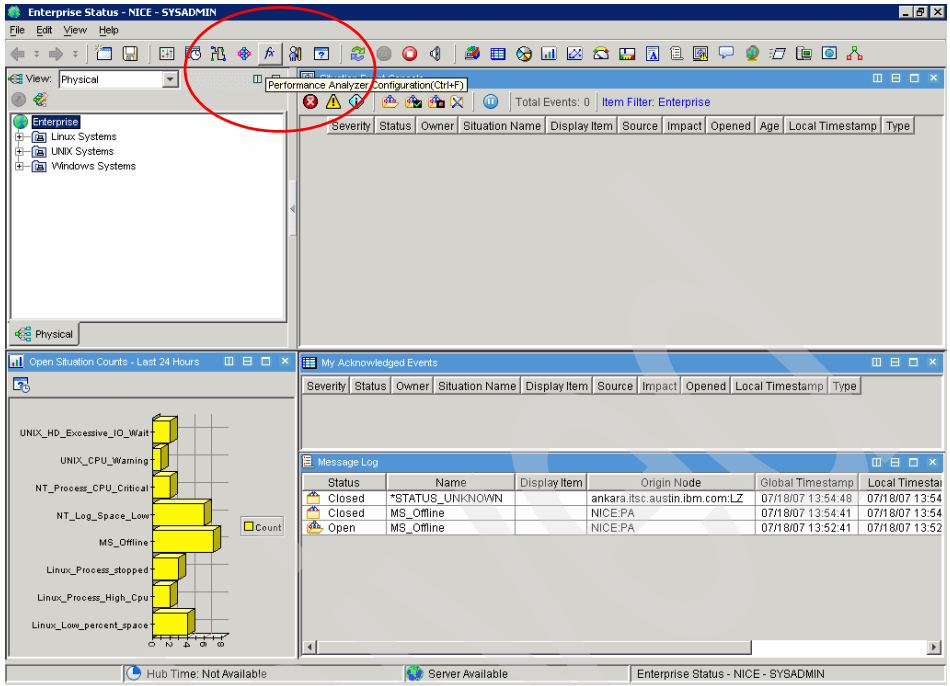

Figure 3-13 IBM Tivoli Enterprise Portal window

2. On the IBM Tivoli Performance Analyzer V6.1 configuration window, (Figure 3-14 on page 52), you can modify the predefined tasks and create new tasks, as required. You can find a detailed description of each tasks in 3.6, “Default workspaces, situations, and tasks” on page 71.

3. You can enable or disable each of the tasks based on your requirements by selecting or clearing the **Run** at startup option, which is located in the lower-right corner of the configuration window. Clearing any of the predefined settings means that you do not want to perform and store the analysis that the task performs on the data collected in your environment.

   Similarly, you can also change the frequency of the task by modifying the Task Interval setting on the task window, as shown in Figure 3-14 on page 52.

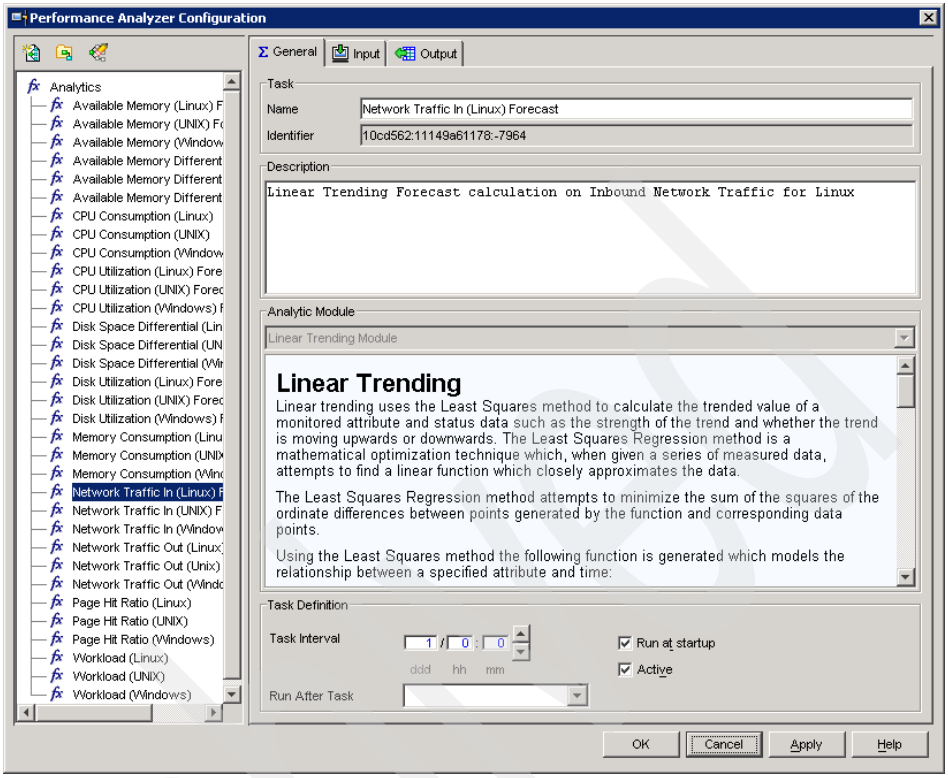

Figure 3-14 Performance Analyzer Configuration

4. After you complete the changes, as required, in your environment, recycle the IBM Tivoli Performance Analyzer V6.1 agent for the changes to be effective.

The predefined analytical tasks, which the IBM Tivoli Performance Analyzer V6.1 installs, require certain attributes to be enabled for each OS agent that you install within your IBM Tivoli Monitoring V6.1 environment.

Table 3-1 contains attributes that the predefined tasks use for performance trending.

Table 3-1 Attribute groups that the predefined tasks use

UNIX OS	Linux OS	Windows OS
Disk	Linux_CPU_Averages	Network_Interface
Network	Linux_Disk	NT_Logical_Disk
System	Linux_Network	NT_Memory
----------	Linux_System_Statistics	NT_Processor
----------	Linux_VM_Statistics	NT_System

3.3.4 Configuring the historical data collection and summarization

You can configure the historical data collection and summarization settings for the analytical data that the IBM Tivoli Performance Analyzer V6.1 analytical tasks generate. The data that these tasks generate is stored back into the WAREHOUS database. The history configuration and the retention settings of this data depends on the configurations you set for the IBM Tivoli Performance Analyzer V6.1 agent in the History configuration window of the Tivoli Enterprise Portal.

The steps required for configuring the historical data and the summarization settings are exactly the same as for any other type of IBM Tivoli Monitoring V6.1 agent:

1. Login to Tivoli Enterprise Portal and open the **History Configuration** tool. This will bring up the History Collection Configuration window, see Figure 3-15 on page 54.

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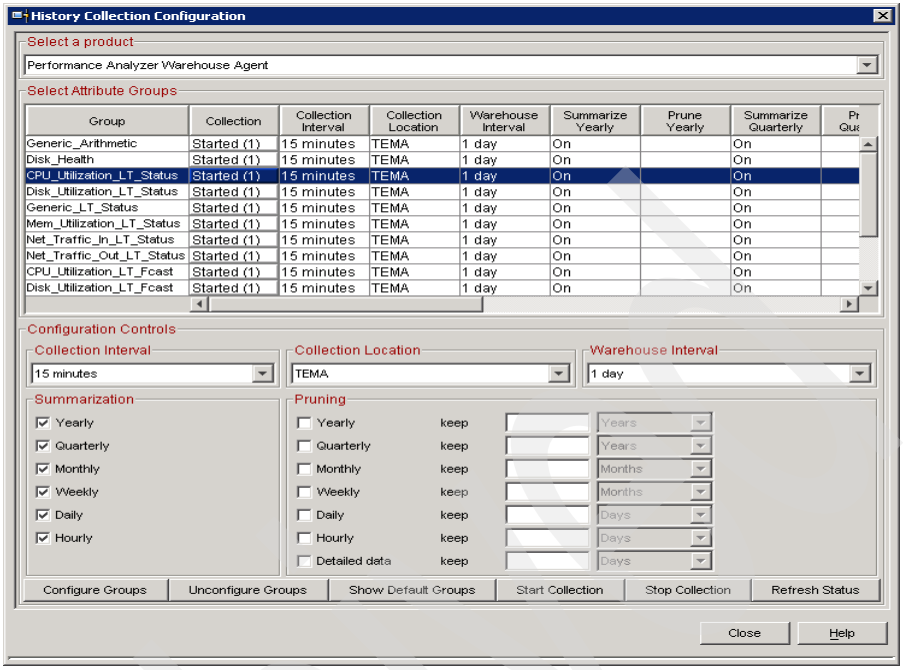

Figure 3-15 History Collection Configuration

2. Select **Performance Analyzer Warehouse Agent** as the product in the product pull-down menu.
3. Select the required input attribute groups.
4. Set the required **Collection Interval**, **Collection Location** and **Warehouse Interval**.
5. Select **Yearly** for Summarization. This automatically selects the smaller periods.
6. Select the required Pruning time.
7. Click **Configure Groups**.
8. Select the attribute groups again, and click **Start Collection**.
9. Click **Close** when you finish configuring the historical and summarization settings for the IBM Tivoli Performance Analyzer V6.1 warehouse agent.

Important: Ensure that you properly configure the historical collection and the summarization for the Windows, UNIX, and Linux agents. Also, make sure that the summarized performance data is available.

3.3.5 Configuring Tivoli Enterprise Console server for IBM Tivoli Performance Analyzer V6.1 events

You must import the Tivoli Enterprise Console classes definition file (.baroc) onto the current rule base of the Tivoli Enterprise Console server. This allows the IBM Tivoli Performance Analyzer V6.1 situation events to be processed on the Tivoli Enterprise Console.

The following path and name are for the .baroc file, which you need to copy on the existing Tivoli Enterprise Console server, and then import the file into the active rule base.

- Baroc file name: kpa.baroc
- File path: <itm_installdir>\tmaitm6\TECLIB\kpa.baroc

Tip: For information about importing the baroc file into the Tivoli Enterprise Console rule base, refer to the *IBM Tivoli Enterprise Console V3.9 User's Guide Version 3.9*, SC32-1235.

3.4 Starting the IBM Tivoli Performance Analyzer V6.1 components

In this section, we describe how to start the IBM Tivoli Performance Analyzer V6.1 components.

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The two main components of the IBM Tivoli Performance Analyzer V6.1are the Application and the Agent, which you can start in the following ways:

- Agent

  a. Invoke the Manage Tivoli Enterprise Monitoring Services window. See Figure 3-16.

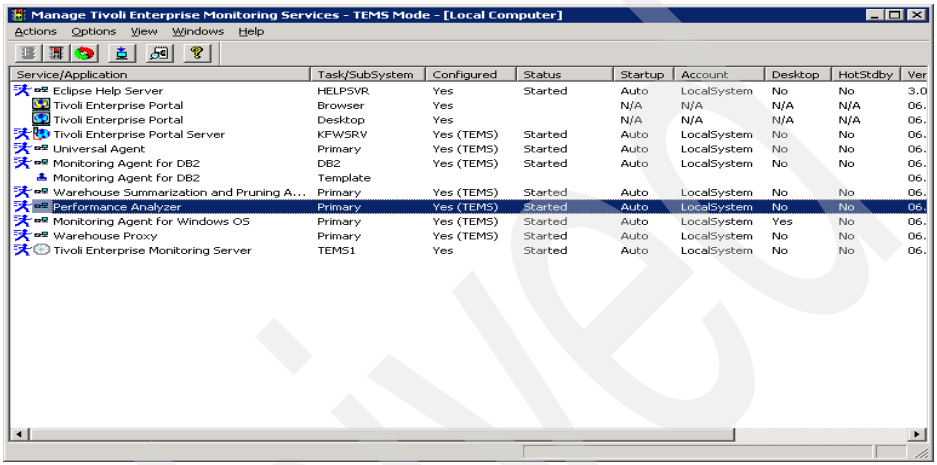

Figure 3-16 Manage Tivoli Enterprise Monitoring Services window

  b. Select the **Performance Analyzer agent**, and use the right-click menu options or the toolbar buttons to start the agent.

- Application

  The IBM Tivoli Performance Analyzer V6.1 is a component that is integrated into the Tivoli Enterprise Portal; therefore, the application starts or stops when the Tivoli Enterprise Portal starts or stops respectively.

3.5 Uninstalling the IBM Tivoli Performance Analyzer V6.1

The following product uninstallation steps are based on a white paper written by Samuel Seow from IBM Australia.

To remove the Performance Analyzer Warehouse Agent, you must remove the Performance Analyzer (PA) tables in the TEPS database, uninstall the Performance Analyzer Warehouse Agent component, and remove the support files.

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Perform the steps in the following sections to remove IBM Tivoli Performance Analyzer V6.1 from your environment (Windows and UNIX or Linux).

3.5.1 Removing the PA tables in the TEPS database

To remove the PA tables in the TEPS database, the Performance Analyzer Warehouse Agent component must be present, which means that you need to remove the PA tables before you remove the agent component.

On Windows

The steps for removing the PA tables under Windows are as follows:

1. Open a command prompt console.
2. Set the JAVA_HOME environment variable to the home directory of the IBM JRE v1.4.2, for example:

   ```
   set JAVA_HOME=C:\PROGRA~1\IBM\Java142\jre
   ```

3. Change the current working directory to the following ITM agent directory <itm_installdir>\tmaitm6.
4. Issue the following command:

   ```
   java -cp paconf.jar;kjrall.jar com.ibm.tivoli.pa.config.PAConfigMain
   -destroyDB
   ```

On UNIX or Linux

The steps for removing the PA tables under UNIX or Linux are as follows:

1. Open a shell console, and change the current working directory to <itm_installdir>/<arch>/pa/bin.
2. Set the JAVA_HOME environment variable to <itm_installdir>/JRE/<arch>.
3. Issue the following command:

   ```
   java –cp paconf.jar:<itm_installdir>/classes/kjrall.jar
   com.ibm.tivoli.pa.config.PAConfigMain -destroyDB
   ```

3.5.2 Removing the IBM Tivoli Performance Analyzer V6.1 components

The procedure to uninstall the IBM Tivoli Performance Analyzer V6.1 components is the same as any other IBM Tivoli Monitoring components, which are add-ons to the IBM Tivoli Monitoring V6.1 environment. You can remove the IBM Tivoli Performance Analyzer V6.1 without affecting the other IBM Tivoli Monitoring V6.1 components or the agent data.

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On Windows

Perform the following steps on Windows:

1. Select **Start** → **Settings** → **Control Panel** → **Add and Remove Programs**.
2. Scroll through the installed programs list to find the IBM Tivoli Performance Analyzer V6.1 component, and click the **Change/Remove** button.
3. In the welcome page of the IBM Tivoli Performance Analyzer InstallShield Wizard, select **Modify**, and click the **Next** button.
4. In the Add or Remove Features dialog, expand the Tivoli Enterprise Monitoring Agents component, and clear the check boxes for the **Performance Analyzer Agent**. Click the **Next** button, as shown in Figure 3-17.

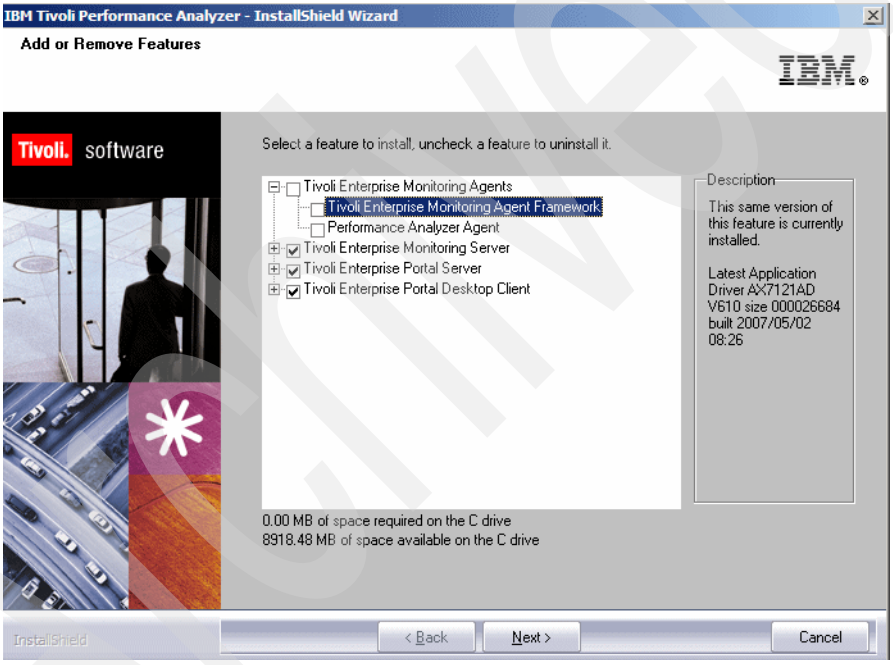

Figure 3-17 Removing Tivoli Performance Analyzer component

5. Follow the prompts to complete the uninstall process. Click the **Finish** button when the uninstall completes.

Archive

On UNIX or Linux

Perform the following steps on UNIX or Linux:

1. Stop all running IBM Tivoli Monitoring services.
2. Execute the following command, where <arch> is the UNIX® platform. For example, li6243 for Linux, aix513 for AIX, and sol286 for Solaris™:

   ```
   <itm_installdir>/bin/uninstall.sh pa <arch>
   ```

Configuration file settings: The installer does not remove the configuration file for the IBM Tivoli Performance Analyzer. This file contains the portal server and Tivoli Data Warehouse database settings that the Performance Analyzer Warehouse Agent uses.

If you no longer need the configuration file settings, remove the configuration file manually:

- On Windows, the configuration file is located at <itm_installdir>\tmaitm6\<hostname>_pa.cfg.
- On the UNIX platform, the configuration file is located at <itm_installdir>/config/<hostname>_pa.cfg.

3.5.3 Removing IBM Tivoli Performance Analyzer Support for Tivoli Enterprise Monitoring Server

To remove Tivoli Enterprise Monitoring Server support for IBM Tivoli Performance Analyzer, remove the application support, and uninstall the Tivoli Enterprise Monitoring Server support component.

On Windows

To remove Tivoli Enterprise Monitoring Server application support under Windows, perform the following steps:

1. Open the Manage Tivoli Enterprise Monitoring Services application on the host where Tivoli Enterprise Monitoring Server is installed.
2. Select the **Tivoli Enterprise Monitoring Server** application.
3. Select **Remove Application Support** from the Advance submenu under the Actions menu.

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4. Select **On This Computer** on the Tivoli Enterprise Monitoring Server location dialog box, and click **OK**.
5. Select **Performance Analyzer Warehouse Agent** on the Select the application support to remove from the Tivoli Enterprise Monitoring Server dialog box, and click **OK**.

After you remove the application support, you can remove the Tivoli Enterprise Monitoring Server Support component. To remove the TEMS support for IBM Tivoli Performance Analyzer under Windows:

1. Select **Start** → **Settings** → **Control Panel** → **Add and Remove Programs**.
2. Scroll through the installed programs list to find the IBM Tivoli Performance Analyzer V6.1 component, and click the **Change/Remove** button.
3. In the welcome page of the IBM Tivoli Performance Analyzer InstallShield Wizard, select **Modify**, and click the **Next** button.
4. In the Add or Remove Features dialog, expand the Tivoli Enterprise Monitoring component, and clear the **Performance Analyzer Support** option. Click the **Next** button, as shown in Figure 3-18.

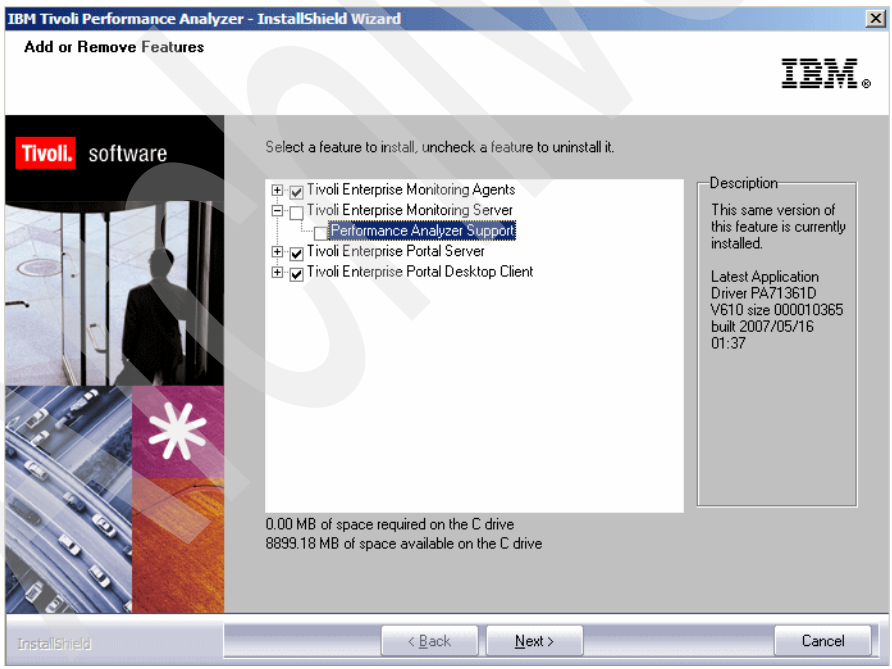

Figure 3-18 Clear the Performance Analyzer Support option

5. Follow the prompts to complete the uninstall process, and click the **Finish** button when the uninstall completes.

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On UNIX Linux

There is no option for removing application support for Tivoli Enterprise Monitoring Server running on UNIX platforms. To uninstall the Tivoli Enterprise Monitoring Server Support component under UNIX, issue the following command:

```
<itm_installdir>/bin/uninstall.sh pa tms
```

The current uninstaller for IBM Tivoli Performance Analyzer does not successfully remove all support files; instead, you must manually remove the support files after you run the uninstall command. “UNIX or Linux Tivoli Enterprise Monitoring Server Support files” on page 70 contains a list of files that you need to remove.

Note: If you have IBM Tivoli Monitoring V6.1 components distributed across different servers, uninstall the IBM Tivoli Monitoring Performance Analyzer V6.1 support components from each of the distributed IBM Tivoli Monitoring V6.1 servers by repeating the steps in 3.5.3, “Removing IBM Tivoli Performance Analyzer Support for Tivoli Enterprise Monitoring Server” on page 59.

3.5.4 Removing IBM Tivoli Performance Analyzer Support for Tivoli Enterprise Portal Server

In this section, we provide steps for removing IBM Tivoli Analyzer Support for Tivoli Enterprise Portal Server (Windows, UNIX, and Linux).

On Windows

To remove Tivoli Enterprise Portal Server application support under Windows, perform the following steps:

1. Select **Start** → **Settings** → **Control Panel** → **Add and Remove Programs**.
2. Scroll through the installed programs list to find the IBM Tivoli Performance Analyzer V6.1 component, and click the **Change/Remove** button.
3. In the welcome page of the IBM Tivoli Performance Analyzer InstallShield Wizard, select **Modify**, and click the **Next** button.
4. In the Add or Remove Features dialog, expand the Tivoli Enterprise Portal Server component, and clear the **Performance Analyzer Support** option. Click the **Next** button, as shown in Figure 3-19 on page 62.

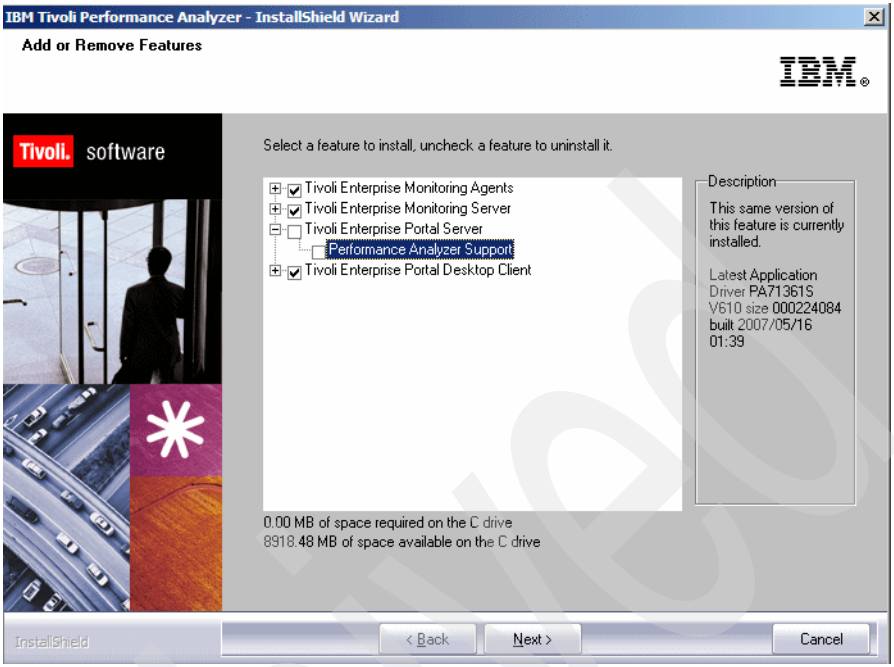

Figure 3-19 Clear the Performance Analyzer Support option

5. Follow the prompts to complete the uninstall process, and click the **Finish** button when the uninstall completes.

On UNIX or Linux

To uninstall the Tivoli Enterprise Portal Server Support component under UNIX, issue the following command:

```
<itm_installdir>/bin/uninstall.sh pa tps
```

The current uninstaller for IBM Tivoli Performance Analyzer does not successfully remove all support files; instead, you must manually remove the support files after you run the uninstall command. “UNIX or Linux Tivoli Enterprise Portal Server Support files” on page 70 contains the list of files that you need to remove.

3.5.5 Removing IBM Tivoli Performance Analyzer Support for Tivoli Enterprise Portal Browser Client

In this section, we provide instructions for removing the IBM Tivoli Performance Analyzer Support for Tivoli Enterprise Portal Browser Client.

On Windows

On the Windows platform, the Tivoli Enterprise Portal Server Browser Client support component is bundled with the Tivoli Enterprise Portal Server support component. It is not necessary for you to uninstall the Tivoli Enterprise Portal Browser Client support.

On UNIX or Linux

To uninstall the Tivoli Enterprise Portal Browser Client support component under UNIX or Linux, issue the following command:

```
<itm_installdir>/bin/uninstall.sh pa tpw
```

The current uninstaller for IBM Tivoli Performance Analyzer does not successfully remove all support files; instead, you must manually remove the support files after you run the uninstall command. “UNIX or Linux Tivoli Enterprise Portal Browser Client Support files” on page 71 contains the list of files that you need to remove.

3.5.6 Removing IBM Tivoli Performance Analyzer Support for Tivoli Enterprise Portal Desktop Client

In this section, we provide instructions for removing IBM Tivoli Performance Analyzer Support for the Tivoli Enterprise Portal Desktop Client.

On Windows

To uninstall Tivoli Enterprise Portal support for IBM Tivoli Performance Analyzer under Windows:

1. Select **Start** → **Settings** → **Control Panel** → **Add and Remove Programs**.
2. Scroll through the installed programs list to find the IBM Tivoli Performance Analyzer V6.1 component, and click the **Change/Remove** button.
3. On the Welcome page of the IBM Tivoli Performance Analyzer InstallShield Wizard, select **Modify**, and click the **Next** button.
4. In the Add or Remove Features dialog, expand the Tivoli Enterprise Portal Desktop Client component, and clear the check box for the **Performance Analyzer Support**. Click the **Next** button, as shown in Figure 3-20 on page 64.

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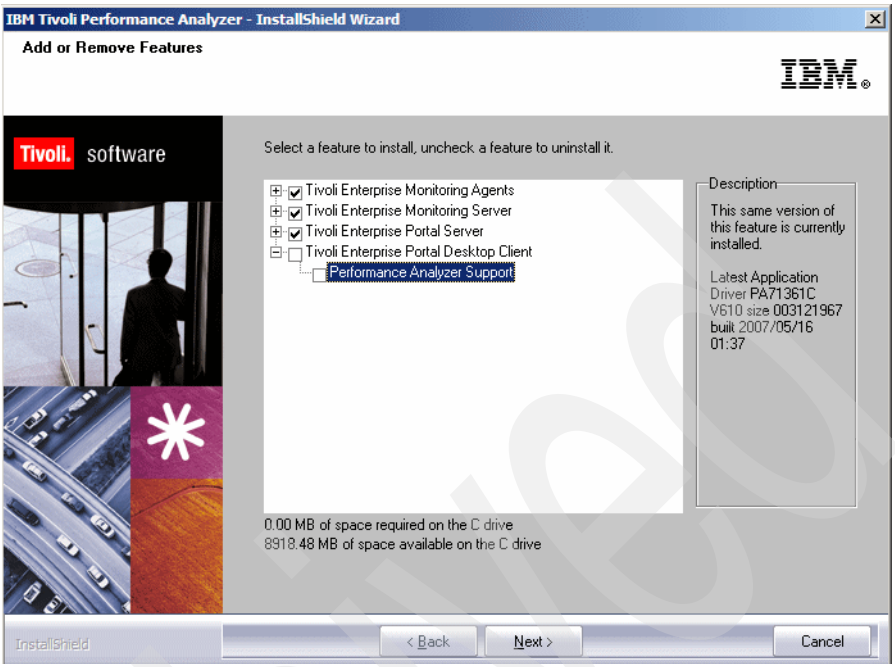

Figure 3-20 Clear the check box for the Performance Analyzer Support

5. Follow the prompts to complete the uninstall process, and click the **Finish** button when the uninstall completes.

On UNIX or Linux

There is no Tivoli Enterprise Portal Desktop Client support under AIX. To uninstall the Tivoli Enterprise Portal Desktop Client support component under Linux, issue the following command:

```
<itm_installdir>/bin/uninstall.sh pa tpd
```

The current uninstaller for IBM Tivoli Performance Analyzer Support does not successfully remove all support files; instead, you must manually remove the support files after you run the uninstall command. “UNIX or Linux Tivoli Enterprise Portal Desktop Client Support files” on page 70 contains the list of files that you need to remove.

3.5.7 Installed files

In this section, we list the files that are installed for the Performance Analyzer Warehouse Agent and each of the four support components. On Windows, look

in the <itm_installdir> directory for the files. On UNIX and Linux, look in the <itm_installdir> directory for the files listed in the following sections.

Windows Performance Analyzer Warehouse Agent files

The following list contains the files that are installed for the Performance Analyzer Warehouse Agent on Windows:

- InstallITM\plugin\KPACOINS.LVL
- InstallITM\plugin\plugins\plugin_pa_comp_pa_all_1.jar
- InstallITM\ver\KPAWICMA.ver
- License\PAV610\
- tmaitm6\
  - kpacma.exe
  - ssmira_agent_exe
  - analytic.dll
  - arithmetic.dll
  - eventman.dll
  - hipe.dll
  - irasupp.dll
  - libeay32.dll
  - master.dll
  - nhipc.dll
  - nhrt.dll
  - pa_arithmetic.dll
  - psi.dll
  - pthread.dll
  - rex.dll
  - sac.dll
  - scratch.dll
  - simib.dll
  - snmp.dll
  - ssleay32.dll
  - trend.dll
  - trunk.dll
  - KPAWICMA.LVL
  - KPA.ref
  - KPAENV
  - kpacma.ini
  - kpaxjdbc.jar
  - paconf.jar
  - pa_dd.06100500.xml
  - pa_dd.properties
  - <hostname>_pa.cfg
  - PAfTepDBConfig.properties
- tmaitm6\ATTRLIB\kpa.atr

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- tmaitm6\config\
  - agent.cfg
  - init.cfg
  - kpa.cfg
  - kpa_tables.cfg
  - kpa_tasks_template
  - local.cfg
  - pdesc.cfg
  - pdir.cfg
- tmaitm6\config\oid\
  - analytic.oid
  - arithmetic.oid
  - irasupp.oid
  - master.oid
  - pa_arithmetic.oid
  - scratch.oid
  - trend.oid
- tmaitm6\RKDSCATL\kpa.cat
- tmaitm6\SQLLIB\
  - kpa.his
  - kpa.sql
  - kpa_del.sql
- tmaitm6\TECLIB\kpa.baroc

Windows Tivoli Enterprise Monitoring Server Support files

The following list contains the files that are installed for the Tivoli Enterprise Monitoring Server on Windows:

- InstallITM\plugin\KPACOINS.LVL
- InstallITM\plugin\plugins\plugin_pa_comp_pa_all_1.jar
- InstallITM\ver\KPAWICMS.ver
- License\PAV610\
- cms\ATTRLIB\kpa.atr
- cms\RKDSCATL\kpa.cat
- cms\SQLLIB\
  - kpa.his
  - kpa.sql
  - kpa_del.sql
- cms\TECLIB\kpa.baroc

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Windows Tivoli Enterprise Portal Server Support files

The following list contains the files that are installed for the Tivoli Enterprise Portal Server and Tivoli Enterprise Portal Browser Client Support on Windows:

- InstallITM\plugin\KPACOINS.LVL
- InstallITM\plugin\plugins\plugin_pa_comp_pa_all_1.jar
- InstallITM\ver\
  - KPAWICNS.ver
  - KPAWIXEB.ver
- License\PAV610\
- CNB\KPAWIXEB.LVL
- CNB\classes\
  - jvmcore.jar
  - kpa.inf
  - kpa_resources.jar
  - paconf.jar
- CNB\classes\candle\fw\resources\icons\user\
  - pa_arrow_down4.gif
  - pa_arrow_down5.gif
  - pa_arrow_fwd3.gif
  - pa_arrow_fwd6.gif
  - pa_arrow_up2.gif
  - pa_arrow_up7.gif
  - pa_bad10.gif
  - pa_empty11.gif
  - pa_full16.gif
  - pa_good8.gif
  - pa_half13.gif
  - pa_marginal9.gif
  - pa_quarter12.gif
  - pa_threequarter14.gif
- CNB\classes\candle\kpa\
- CNPS\
  - dockpa
  - KPAWICNS.LVL
- CNPS\SQLLIB\
  - kpa_kcj.sql
  - kpa_links.sql
  - kpa_pres.sql
  - KpaPackage.xml

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Windows Tivoli Enterprise Portal Desktop Support files

The following list contains the files that are installed for Tivoli Enterprise Portal Desktop Support on Windows:

- InstallITM\plugin\KPACOINS.LVL
- InstallITM\plugin\plugins\plugin_pa_comp_pa_all_1.jar
- InstallITM\ver\KPAWIXEW.ver
- License\PAV610\
- CNP\
  - jvmcore.jar
  - kpa.inf
  - kpa_resources.jar
  - KPAWIXEW.LVL
  - paconf.jar

UNIX or Linux Performance Analyzer Warehouse Agent files

The following list contains the files that are installed for the Performance Analyzer Warehouse Agent on UNIX or Linux:

- InstallITM/plugin/plugins/plugin_pa_comp-pa_all_1.jar
- registry/pa<architecture>.ver
- license/pav610
- config/
  - pa.ini
  - pa.config
  - pa_dd_061005000.xml
  - pa_dd.properties
  - kpa_config.ini
  - <hostname>_pa.cfg
- <architecture>/pa/bin
  - kpacma
  - kpa.ref
  - kpaxjdbc.jar
  - paconf.jar

  PAfTepDBConfig.properties

  ssmira_agent
- <architecture>/pa/config
  - agent.cfg
  - init.cfg
  - kpa.cfg
  - kpa_tables.cfg
  - kpa_tasks_template
  - local.cfg
  - pdesc.cfg
  - pdir.cfg

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- <architecture>/pa/config/oid
  - analytic.oid
  - arithmetic.oid
  - irasupp.oid
  - master.oid
  - pa_arithmetic.oid
  - scratch.oid
  - trend.oid
- <architecture>/pa\lib
  - libagentbase.so
  - libagentconfig.so
  - libanalytic.so
  - libarithmetic.so
  - libcprts.so.5
  - libcrypto.so
  - libcrypto.so.0.9.7
  - libcxa.so.5
  - libeventman.so
  - libhipe.so
  - libimf.so
  - libirasupp.so
  - libirc.so
  - libmaster.so
  - libnhipc.so
  - libnhrt.so
  - libpa_arithmetic.so
  - libplib.so
  - libpsi.so
  - librex.so
  - librex.so.0
  - librmonc.so
  - libsac.so
  - libscratch.so
  - libsimib.so
  - libsnmp.so
  - libtrend.so
  - libtrunk.so
  - libunwind.so.5

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UNIX or Linux Tivoli Enterprise Monitoring Server Support files

The following list contains the files that are installed for Tivoli Enterprise Monitoring Server on UNIX or Linux:

- InstallITM/plugin/plugins/plugin_pa_comp-pa_all_1.jar
- registry/patms.ver
- license/pav610/
- tables/cicatrsq/ATTRLIB/kpa.atr
- tables/cicatrsq/RKDSCATL/kpa.cat
- tables/cicatrsq/SQLLIB/
  - kpa.his
  - kpa.sql
  - kpa_del.sql
- tables/cicatrsq/TECLIB/kpa.baroc

UNIX or Linux Tivoli Enterprise Portal Server Support files

The following list contains the files that are installed for Tivoli Enterprise Portal Serveron UNIX or Linux:

- InstallITM/plugin/plugins/plugin_pa_comp-pa_all_1.jar
- registry/patps.ver
- license/pav610/
- <architecture>/cq/data/dockpa
- <architecture>/cq/sqllib/
  - kpa_kcj.sql
  - kpa_pres.sql
  - kpa_links.sql
  - kpapackage.xml

UNIX or Linux Tivoli Enterprise Portal Desktop Client Support files

The following list contains the files that are installed for Tivoli Enterprise Portal on UNIX or Linux:

- InstallITM/plugin/plugins/plugin_pa_comp_pa_all_1.jar
- registry/patpd.ver
- license/pav610/
- <architecture>/cj/kpa.inf
- <architecture>/cj/lib/
  - jvmcore.jar
  - kpa_resou
  - rces.jar
  - paconf.jar

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UNIX or Linux Tivoli Enterprise Portal Browser Client Support files

The following list contains the files that are installed for Tivoli Enterprise Portal on UNIX or Linux:

- <architecture>/cw/classes/candle/fw/resources/icons/user/
  - pa_arrow_down4.gif
  - pa_arrow_down5.gif
  - pa_arrow_fwd3.gif
  - pa_arrow_fwd6.gif
  - pa_arrow_up2.gif
  - pa_arrow_up7.gif
  - pa_bad10.gif
  - pa_empty11.gif
  - pa_full16.gif
  - pa_good8.gif
  - pa_half13.gif
  - pa_marginal9.gif
  - pa_quarter12.gif
  - pa_threequarter14.gif
- <architecture>/cq/kpa.inf
- <architecture>/cq/classes/
  - jvmcore.jar
  - kpa_resources.jar
  - paconf.jar

3.6 Default workspaces, situations, and tasks

When the IBM Tivoli Performance Analyzer V6.1 support component is installed, a set of default tasks, workspaces, and situations are added to the IBM Tivoli Monitoring V6.1 environment.

In this section, we outline the default support components and provide a few examples of each of the components. Refer to *IBM Tivoli Performance Analyzer Version 1.0 User's Guide for Windows and Linux*, SC23-6308, for a more detailed description of each of the components.

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3.6.1 Output attribute definitions

In this section, we define the terms that are used in the workspaces that present the data analyzed by the IBM Tivoli Performance Analyzer V6.1 agent on the Tivoli Enterprise Portal:

Confidence Indicates the accuracy of the predicated trend for the data being analyzed. This is indicated by a numeric value between 0 and 100, with a value of 0 being no confidence and 100 means a perfectly approximated function.

Direction Indicates if the direction of the trend is upward or downward. An upward trend is indicated with a value greater than 0; whereas, a downward trend is indicated with a value less than 0. A flat line has a value of 0.

Number of Samples Indicates the number of readings or data points that are used for establishing a trend. The more number of data points used the more accurate the trend is.

Strength Calculates the strength of the trend using the confidence value and the number of samples for a given set of data. The strength is represented in three ways, as shown in Table 3-2.

Table 3-2 Output attribute definitions

Strength value	Categorization	Co-relation used
1	Weak	If confidence is less than 50%, or the number of samples are less than 10.
2	Moderate	If the confidence is greater than or equal to 50%, and the number of samples are at least 10.
3	Strong	Confidence greater than or equal to 65%, and number of samples are greater then or equal to 25.

Time to threshold Indicates predicted time in future when that a given threshold, for the monitored attribute, will reach.

Tip: For more information about IBM Tivoli Performance Analyzer V6.1, refer to the Attribute Reference chapter of the *IBM Tivoli Performance Analyzer Version 1.0 User's Guide for Windows and Linux*, SC23-6308.

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3.6.2 Analytical calculation methods

The IBM Tivoli Performance Analyzer V6.1 agent can perform two kinds of analysis on the data of any given monitored attribute. The analytical calculation methods that the IBM Tivoli Performance Analyzer V6.1 agent uses are:

Arithmetic Derives a value using simple arithmetic calculations on attribute data, which is more meaningful data.

Linear trending Uses trending calculations using the *Least Square Regression* method for forecasting particular attribute data. You can use this output data for capacity or preactive planning purposes.

3.6.3 Default workspaces

The IBM Tivoli Monitoring V6.1 workspace is a set of views or multiple sets of views within the Tivoli Enterprise Portal that displays the data related to an item you select on the Navigator tree, which is located on the left of the window. For every additional support that is added to the existing IBM Tivoli Monitoring V6.1 environment, a new set of related workspaces is added.

Tip: For more information about workspaces, refer to the *IBM Tivoli Monitoring User's Guide Version 6.1.0*, SC32-9409.

The IBM Tivoli Performance Analyzer V6.1 support component also installs a set of default workspaces that are visible when you navigate and expand the IBM Tivoli Performance Analyzer V6.1 agent within the Navigator view. You cannot modify the predefined workspaces; however, you can save the predefined workspaces under different names to create a new workspace that is based on an existing one.

The IBM Tivoli Performance Analyzer V6.1 workspaces are categorized into two categories: Utilization and System health.

The Utilization workspaces provide reports on:

- CPU utilization forecast
- Memory utilization forecast
- Disk utilization forecast
- Network traffic - inbound and outbound forecast

The System Health workspaces provide reports on:

- System health overview
- Disk health overview
- Top CPU consumers
- Top disk space consumers
- Top memory consumers

Table 3-3 gives the default workspaces and the associated views of IBM Tivoli Performance Analyzer V6.1.

Table 3-3 Default IBM Tivoli Performance Analyzer V6.1 workspaces

Workspace	View
CPU Utilization Forecast	CPU Utilization Forecast Overview
	7 Day Forecast
	30 Day Forecast
	90Day Forecast
Disk Utilization Forecast	Disk Utilization Forecast Overview
	7 Day Forecast
	30 Day Forecast
	90Day Forecast
Available Memory Forecast	Available Memory Forecast Overview
	7 Day Forecast
	30 Day Forecast
	90 Day Forecast
Inbound Network Traffic Forecast	Inbound Network Traffic Forecast Overview
	7 Day Forecast
	30 Day Forecast
	90Day Forecast

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Workspace	View
Outbound Network Traffic Forecast	Outbound Network Traffic Forecast Overview
	7 Day Forecast
	30 Day Forecast
	90Day Forecast
System Health	System Health Overview
	Disk Health Overview
	Top 10 CPU Consumers
	Top 10 Memory Consumers
	Top 10 Daily Disk Space Details

Default workspace description

In this section, we use an example to describes the default *Available Memory Forecast* workspace of IBM Tivoli Performance Analyzer V6.1.

Available Memory Forecast

The Available Memory Forecast workspace provides information about the memory utilizations on the various monitored systems, and helps you to determine:

- Utilization trends
- If utilization is upward or downward
- Forecasts violations
- Threshold violations
- Current and near future violations

You can set the WARNING and CRITICAL thresholds for the monitored attribute using this workspace based upon which application generates alerts and forecasts alerts, which helps you to identify the systems that require attention now or in the near future.

The predefined Available Memory workspace provides different table views that you can use to view warning and critical threshold levels and forecasts for every monitored system. Each column in each table displays output attribute information.

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The Available Memory Forecast Overview table view displays forecast summary information for the monitored systems. It contains the following columns:

System Name Indicates the system to which the forecast applies.

Confidence Indicates the confidence in the predicted trend. This is a percentage of 0-100%. Systems for which the Confidence is less than 20% are displayed in red.

Strength Indicates the strength of the trend based on a combination of the Confidence and Number of Samples. It is a value of 1 (weak), 2 (moderate), or 3 (strong). Systems for which the Strength equals 1 (weak) are displayed in red.

Number of Samples Indicates the number of data points that are used as input for the *Least Squares Regression calculation* to predict the trend of the data.

Time To Critical Threshold
Displays the number of days until the critical threshold for the monitored system is reached. Systems with less than seven days until the critical threshold is reached are displayed in red. If a threshold is zero, either the threshold was passed, or it is beyond the scope of the calculation. Thresholds with a value of zero are not highlighted. The threshold value is determined by the associated task, and the notification period is determined by the associated situation.

Time To Warning Threshold
Displays the number of days until the warning threshold for the monitored system is reached. Systems with less than seven days until the warning threshold is reached are displayed in yellow. If a threshold is zero, either the threshold was passed, or it is beyond the scope of the calculation. Thresholds with a value of zero are not highlighted. The threshold value is determined by the associated task, and the notification period is determined by the associated situation.

An arrow pointing up indicates an rising trend. An arrow pointing down indicates a falling trend. A straight arrow indicates that the trend is neither rising nor falling.

The following list contains the additional views of the Available Memory Forecast workspace:

7 Day Forecast The 7 Day Forecast table contains the following columns: System name, which indicates the system to which the

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forecast applies, and Data, which displays the predicted value after seven days. The data in the Data column is displayed in megabytes (MB).

30 Day Forecast The 30 Day Forecast table contains the following columns: System name, which indicates the system to which the forecast applies, and Data, which displays the predicted value after 30 days. The data in the Data column is displayed in megabytes (MB).

90 Day Forecast The 90 Day Forecast table contains the following columns: System name, which indicates the system to which the forecast applies, and Data, which displays the predicted value after 90 days. The data in the Data column is displayed in megabytes (MB).

As the monitoring agent collects an increasing amount of data from a system, the tables display an increasingly accurate prediction of impending problems on this system.

From the Available Memory Forecast workspace, you can link to the Available Memory Forecast Details workspace, which displays more detailed forecast information for a particular system.

Available Memory Forecast Details

The Available Memory Forecast Details workspace shows the historic memory use of individual nodes, or a system as a whole, and predicts the future memory use. When you need to update your resources to avoid overloading your system, use this workspace to help plan.

Forecasts help you to identify the systems that require attention and when they require attention. The predefined Available Memory Forecast Details workspace provides the following views that predict memory use:

Forecast Details A table that provides summary information about the selected node, which includes System Name, Timestamp, Confidence, Strength, Number of Samples, Time to Warning Threshold, and Time to Critical Threshold.

- Strength is 1 (weak), and the information is highlighted in red.
- Confidence is weak (less than 20%), and the information is highlighted in red.
- It is between one and seven days until the warning threshold is reached, and the information is highlighted in yellow.

– It is between one and seven days until the critical threshold is reached, and the information is highlighted in red.

– A threshold is zero when either the threshold was passed, or it is beyond the scope of the calculation. Thresholds with a value of zero are not highlighted.

– An arrow pointing up indicates a rising trend. An arrow pointing down indicates a failing trend. A straight arrow indicates that the trend is neither rising nor falling.

Forecast Overlay Historical data
This *is* used for the trend calculation that is overlaid with a linear trend of the predicted forecast. The graph plots the memory use in kilobytes (x axis) against samples.

Forecast Predictions The predicted memory use expressed as megabytes (MB) at 7, 30, and 90 days in the future. The predicted values are listed using a Forecast Timestamp.

The accuracy of any forecast depends on the Number of Samples, Confidence, Strength, and Forecast Interval.

For information about workspaces:

- For information about each of the default workspaces available with this product, refer to the *IBM Tivoli Performance Analyzer Version 1.0 User's Guide for Windows and Linux*, SC23-6308.
- For information about modifying the workspaces or creating new workspaces, refer to the *IBM Tivoli Monitoring User's Guide Version 6.1.0*, SC32-9409.

3.6.4 Default situations

You can use the default situations that are provided with IBM Tivoli Performance Analyzer V6.1 to define thresholds for the analyzed output data that the IBM Tivoli Performance Analyzer V6.1 agent returns. This can help identify and alert potential violations that can occur in the near future for an attribute data.

Situations are logical expressions within the IBM Tivoli Monitoring V6.1 environment that evaluate TRUE or FALSE based on a given condition. You can edit and manage the situations from the Tivoli Enterprise Portal using the Situation Editor tool.

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To view the default situations that are bundled with IBM Tivoli Performance Analyzer V6.1:

Within the Tivoli Enterprise Portal, on the navigator tree, select the **Tivoli Performance Analyzer Warehouse Agent** that is displayed under the managed system on which the agent is installed. Right-click, and select the **Manage Situations** option from the menu. The Manage Situation window, shown in Figure 3-21, contains all of the default IBM Tivoli Performance Analyzer V6.1 situations.

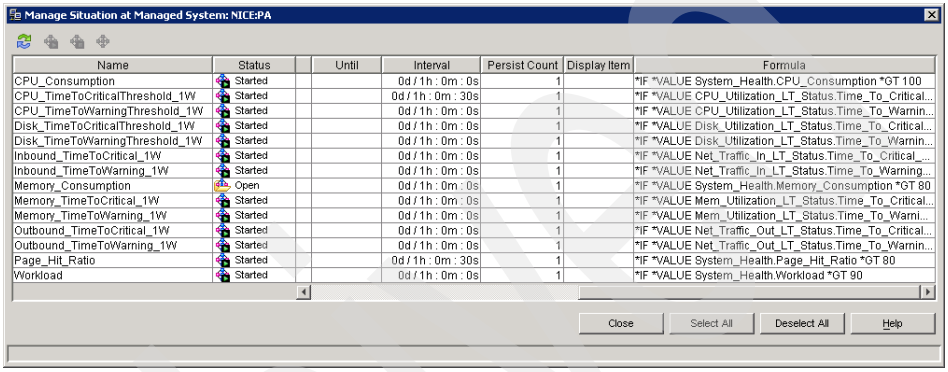

Figure 3-21 Manage Situations

Table 3-4 gives an overview of the default situations that are available with IBM Tivoli Performance Analyzer V6.1. All of the default situations are enabled for auto start and are started after the IBM Tivoli Performance Analyzer V6.1 agent starts.

Table 3-4 Default situations within IBM Tivoli Performance Analyzer V6.1

Situation name	Description
CPU_Consumption	Generates an alert when more CPU resources are consumed than are available.
CPU_TimeToCriticalThreshold_1W	Predicts if a monitored CPU will reach the defined critical CPU use within the next seven days, and the prediction is strong (Strength = 3).
CPU_TimeToWarningThreshold_1W	Predicts if a monitored CPU will reach the defined warning limit within the next seven days, and the prediction is moderate (Strength = 2).

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Situation name	Description
Disk_TimeToCriticalThreshold_1W	Predicts if a monitored disk will reach the defined critical limit within the next seven days, and the prediction is strong (Strength = 3).
Disk_TimeToWarningThreshold_1W	Predicts if a monitored disk will reach the defined warning limit within the next seven days, and the prediction is moderate (Strength = 2).
Inbound_TimeToCritical_1W	Predicts if monitored inbound traffic will reach the defined warning limit within the next seven days, and the prediction is moderate (Strength = 2).
Memory_Consumption	Generates an alert when more than 80% of all memory resources are being consumed.
Memory_TimeToCritical_1W	Predicts if monitored memory will reach the defined critical limit within the next seven days, and the prediction is strong (Strength = 3).
Memory_TimeToWarning_1W	Predicts if monitored memory will reach the defined warning limit within the next seven days, and the prediction is moderate (Strength = 2).
Outbound_TimeToCritical_1W	Predicts if monitored outbound traffic will reach the defined critical limit within the next seven days, and the prediction is strong (Strength = 3).
Outbound_TimeToWarning_1W	Predicts if monitored outbound traffic will reach the defined warning limit within the next seven days, and the prediction is moderate (Strength = 2).
Page_Hit_Ratio	Generates an alert when the memory paging ratio exceeds 80%.
Workload	Generates an alert when the combined CPU and Memory Utilization exceeds 90%.

Situations: For information about creating a new situation or editing an existing one, refer to the *IBM Tivoli Monitoring User's Guide Version 6.1.0*, SC32-9409.

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3.6.5 Default tasks

Analytical tasks are predefined functions that determine the actions you want to perform on the summarized warehouse data, from the monitored systems. The actions include:

- The attributes to process
- The calculation to perform
- The frequency of the analysis
- How to store and present the analyzed data.

For each calculation performed, there is an output group to select and a set of output attributes to use based upon the nature of the analysis performed. The analyzed data is stored back into the PA tables within the Tivoli Enterprise Portal Server database, instead of in the WAREHOUS database.

Use the application shortcut on the Tivoli Enterprise Portal toolbar to invoke the IBM Tivoli Performance Analyzer V6.1 task configuration window, shown in Figure 3-22.

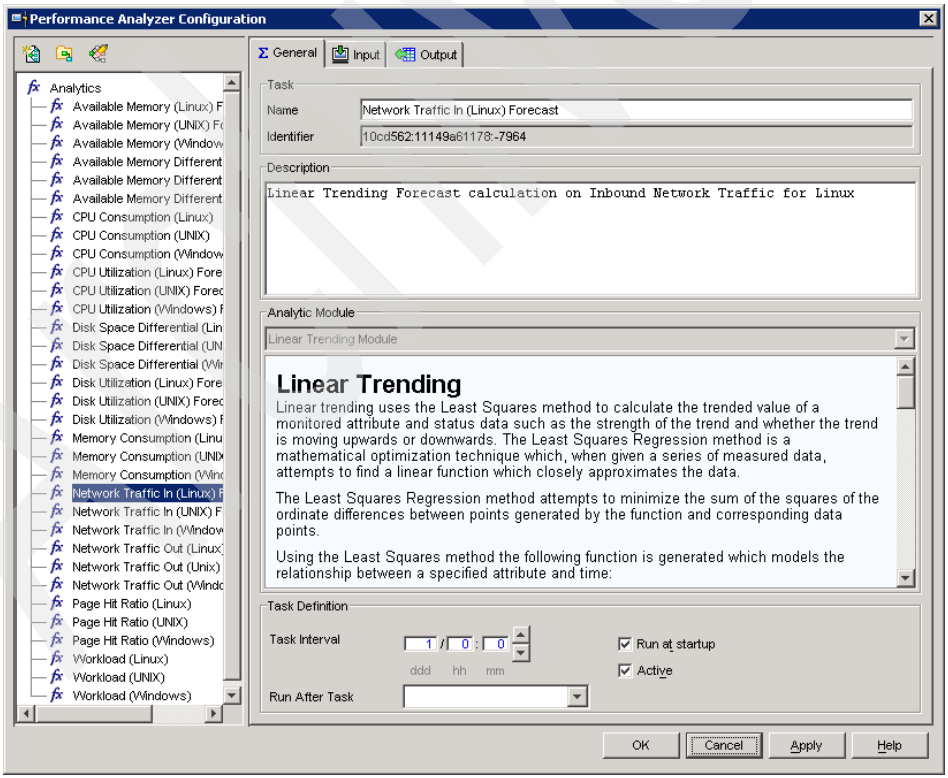

Figure 3-22 Performance Analyzer Configuration window

Table 3-5 lists the default tasks that are installed when the IBM Tivoli Performance Analyzer V6.1 support component is installed.

Table 3-5 Default analytical tasks within IBM Tivoli Performance Analyzer V6.1

Task name	Description	Calculation used
Available Memory Forecast	This task creates 7, 30, and 90 day forecasts for memory availability. The task uses the linear trending calculation method.	lsr(data, time stamp)
Available Memory Differential	This task calculates the difference between the minimum and maximum memory use during a 24 hour period.	MaxMemory - MinMemory
CPU Consumption	This task calculates how much CPU resource is being consumed, per hour, by combining the CPU Utilization and the Run Queue Length.	CPUUtilization + (CPUUtilization x RunQueue)
CPU Utilization Forecast	This task creates 7, 30, and 90 day forecasts for CPU use.	lsr(data, time stamp)
Disk Space Differential	This task calculates the difference between the minimum and maximum available disk space during a 24-hour period.	MaxDiskSpace - MinDiskSpace
Disk Utilization Forecast	This task creates 7, 30, and 90 day forecasts for disk usage.	lsr(data, time stamp)
Memory Consumption	This task calculates memory consumption by combining the amount of virtual memory that is allocated and used. The task uses the general arithmetic calculation method.	CommittedMemory x 100 / CommittedLimit
Network Traffic In Forecast	This task creates 7, 30, and 90 day forecasts for inbound traffic. The task uses the linear trending calculation method.	lsr(data, time stamp)
Network Traffic Out Forecast	This task creates 7, 30, and 90 day forecasts for outbound traffic. The task uses the linear trending calculation method.	lsr(data, time stamp)

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Task name	Description	Calculation used
Page Hit Ratio	This task calculates the ratio of pages that are requested to the pages that are read from disk. A high-hit ratio indicates that the disk is used more than memory is used. The task uses the general arithmetic calculation method.	(PagesRead x 100) / PagesFaulted
Workload	This task calculates how hard a machine is working by combining CPU memory resource statistics. The task uses the general arithmetic calculation method.	((CPUUtil x 6)/10) + ((CommitBytes x 40) / CommitLimit

Default analytical tasks: For detailed information about the default analytical tasks that IBM Tivoli Performance Analyzer V6.1 installs, refer to the *IBM Tivoli Performance Analyzer Version 1.0 User's Guide for Windows and Linux*, SC23-6308.

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Proof of concept scenarios

In this chapter, we provide guidelines for a *proof of concept* of the IBM Tivoli Performance Analyzer V6.1 product in a simple IBM Tivoli Monitoring V6.1 environment to demonstrate the value of the product. We also discuss the configurations that are necessary to produce sufficient data in the data warehouse database for the predefined analytic tasks to produce analytic results.

This chapter has the following sections:

- "Proof of concept objectives" on page 86
- "Proof of concept scope" on page 86
- "Proof of concept hardware and software configuration" on page 86
- "Proof of concept installation requirements" on page 88
- "Setting up the proof of concept environment" on page 89
- "Configuring the proof of concept historical data collection" on page 90
- "Proof of concept solutions" on page 92
  - When is my Web server not able to handle the inbound traffic any more?
  - When do I need to add additional resources to my Web server?
  - When do I run out of disk space on my database server?
  - Where are the pain points regarding system health in my environment?

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4.1 Proof of concept objectives

The objectives of the proof of concept demonstration of IBM Tivoli Performance Analyzer V6.1 is to show the functionality of the IBM Tivoli Performance Analyzer V6.1 product, which includes the IBM Tivoli Performance Analyzer V6.1 configuration tool. The products that we demonstrate as part of this scope are IBM Tivoli Monitoring V6.1 Fix Pack 5 and IBM Tivoli Performance Analyzer V6.1. The solution applies to the test and development environment in our lab only.

4.2 Proof of concept scope

The scope of this proof of concept is to validate the basic functionality of IBM Tivoli Performance Analyzer V6.1, specifically those described in the following list:

- IBM Tivoli Performance Analyzer V6.1 required hardware and software
- IBM Tivoli Performance Analyzer V6.1 tasks
- IBM Tivoli Performance Analyzer V6.1 workspaces
- IBM Tivoli Performance Analyzer V6.1 situations
- IBM Tivoli Performance Analyzer V6.1 out of the box reports

4.3 Proof of concept hardware and software configuration

In our proof of concept environment, we have a mixture of Windows operating systems (OS), AIX 5.3, and UNIX (RedHat 3.0, SUSE 9.0, HP-UX 11) agents.

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Figure 4-1 shows how our proof of concept environment looks.

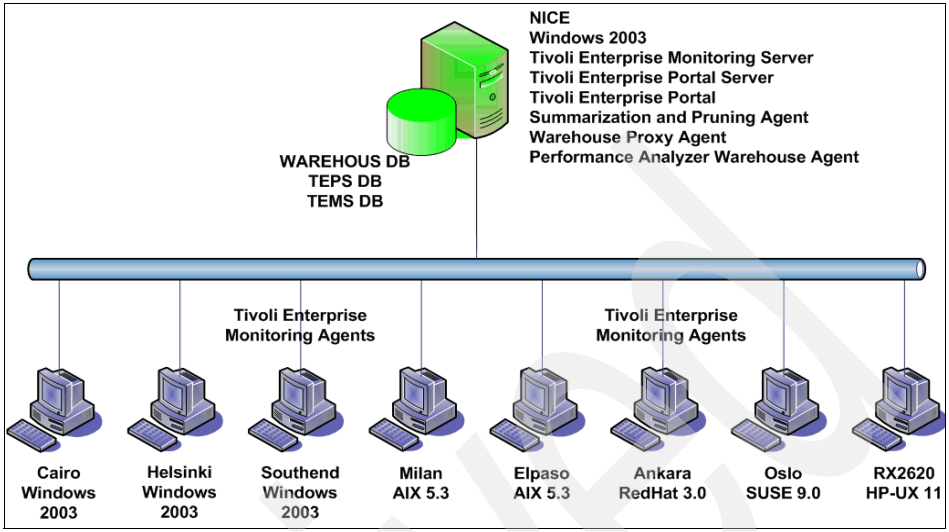

Figure 4-1 Proof of concept environment

Table 4-1 provides information about the hardware setup of the machines.

Table 4-1 Proof of concept hardware configuration

Host name	OS	IP	CPU (GHz)	Memory (GB)
NICE	Windows 2003	9.3.5.88	3	1.45
Helsinki	Windows 2003	9.3.5.52	3.07	3.62
Southend	Windows 2003	9.3.5.131	2.4	1.0
Milan	AIX 5.3	9.3.5.57	450 (MHz)	
Elpaso	AIX 5.3	9.3.5.73	450 (MHz)	0.5
Ankara	RedHat 3.0	9.3.5.55	1.86	2.0
Oslo	SUSE 9.0	9.3.5.49	2.4	1.0
RX2620	HP-UX 11	9.3.5.77		1.0

Ensure that the systems listed in Table 4-1 are fully installed, configured, and available for the proof of concept. These systems must have full network

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connectivity and proven links to each other. Apply all required service packs and fix packs to Operating Systems. Perform all system backups before you start installing any additional package out of the OS installation.

Excluded from the OS installation are:

- IBM DB2 Enterprise server edition
- IBM Tivoli Monitoring V6.1 fix pack 5 components
- IBM Tivoli Performance Analyzer V6.1 components
- All specified Tivoli Agents and software.

4.4 Proof of concept installation requirements

In this section, we describe the components that you must install in the environment.

4.4.1 Installing required components on the monitoring server NICE

In this section, we provide the components that you must install on the monitoring server NICE for the following products:

- IBM Tivoli Monitoring V6.1 Fix Pack 5
- IBM Tivoli Performance Analyzer V6.1

IBM Tivoli Monitoring V6.1 Fix Pack 5

The following list contains the IBM Tivoli Monitoring V6.1 Fix Pack 5 components that you must install on the monitoring server NICE for the proof of concept installation:

- IBM DB2 Enterprise server edition
- Tivoli Enterprise Monitoring Agent Framework
- Warehouse Proxy agent
- Monitoring Agent for Windows OS
- Summarization and Pruning Agent
- Tivoli Enterprise Monitoring Server
- Windows OS Support for Tivoli Enterprise Portal Server
- Summarization and Pruning Agent Support for Tivoli Enterprise Portal Server
- Tivoli Enterprise Portal Server (portal server)
- Windows OS Support for Tivoli Enterprise Portal Server
- Tivoli Enterprise Portal Desktop Client)
- Windows OS Support for Tivoli Enterprise Portal
- IBM 32-bit Runtime Environment for Java 2, v1.4.2
- IBM GSKit v7

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IBM Tivoli Performance Analyzer V6.1

The following list contains the IBM Tivoli Performance Analyzer V6.1 components that you must install on the monitoring server NICE for the proof of concept installation:

- Performance Analyzer Warehouse Agent
- Performance Analyzer Support for TEMS
- Performance Analyzer Support for TEPS
- Performance Analyzer Support for TEP

Additional installations

You must install the IBM DB2 Enterprise Server Edition v8.1 Fix Pack 11 or later on the monitoring server NICE.

Install the Tivoli Enterprise Monitoring Agent Framework on all other systems except the monitoring server NICE

4.5 Setting up the proof of concept environment

In this section, we provide the high-level procedure for setting up the proof of concept environment.

To set up the proof of concept environment:

1. Install the IBM DB2 Enterprise server edition.

   For detailed instructions for installing IBM DB2, refer to the *Deployment Guide Series: IBM Tivoli Monitoring 6.1,* SG24-7188.

2. Install IBM Tivoli Monitoring v6.1 Fix Pack 5 with the components listed in 4.4.1, “Installing required components on the monitoring server NICE” on page 88.

   For detailed instructions for installing IBM Tivoli Monitoring V6.1, refer to the *Deployment Guide Series: IBM Tivoli Monitoring 6.1*, SG24-7188.

   For detailed instructions for installing fix pack 5, see the fix pack 005 readme file and *IBM Tivoli Monitoring Fix Pack 005 Readme and Documentation Addendum,* SC23-5960. This readme file is included in the zip/tar file with the fix pack. You can download the fix pack from:

   `http://www.ibm.com/support/us/en/`

3. Configure the Warehouse Summarization and Pruning agent using Manage Tivoli Enterprise Monitoring Services. Test the connection to the data

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warehouse database. If the connection is successful, save the configuration, and start the agent.

Refer to the *Deployment Guide Series: IBM Tivoli Monitoring 6.1*, SG24-7188 for a detailed check procedure for the Managing Tivoli Enterprise Monitoring Services, the Warehouse Summarization and Pruning agent, and the connection to the data warehouse database.

4. Check that the Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server, Warehouse Proxy Agent, and Monitoring Agent for Windows OS agent are running.

   For a detailed procedure to check if everything is running correctly for the products mentioned in step 4, refer to the *Deployment Guide Series: IBM Tivoli Monitoring 6.1* SG24-7188.

5. Install IBM Tivoli Performance Analyzer V6.1 with the components listed in 4.4.1, “Installing required components on the monitoring server NICE” on page 88. During installation, you are presented with a configuration page for the IBM Tivoli Performance Analyzer V6.1 warehouse agent. Enter the correct Tivoli Enterprise Portal Server and data warehouse database settings, and click **OK**. After installation, the agent should be started up. Check the Manage Tivoli Enterprise Monitoring Services window to confirm that the IBM Tivoli Performance Analyzer V6.1 warehouse agent is running, and start it if necessary.

   For a detailed installation procedure for IBM Tivoli Performance Analyzer V6.1, refer to Chapter 3, “Installation and configuration” on page 39.

4.6 Configuring the proof of concept historical data collection

You now have the required components for the proof of concept environment installed. Next, use the following steps to configure the historical data collection for the monitoring agent for Windows OS and the IBM Tivoli Performance Analyzer V6.1 warehouse agent:

1. Start the Tivoli Enterprise Portal Desktop Client from the Manage Tivoli Enterprise Monitoring Services.

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2. Open the **Historical Collection Configuration** GUI.
   a. From the list of products, select **Windows OS**, select the Network_Interface, NT_Processor, NT_Logical_Disk, NT_Memory, and NT_System attribute groups, and configure them with the following values:

      Collection Interval: 5 minutes
      Collection Location: TEMA
      Warehouse Interval: 1 hour
      Summarization: Daily and Hourly
      Pruning: Daily (1 month), Hourly (2 Days), Detailed data (1 Day)

   b. Start collection for each of the Windows OS attribute groups.
   c. From the list of products, select **Performance Analyzer Warehouse Agent**, select the **Disk Health and System Health** attribute groups, and configure them with the following values:

      Collection Interval: 1 hour
      Collection Location: TEMA
      Warehouse Interval: 1 hour
      Summarization: none
      Pruning: Detailed data (1 Day)

   d. Select all **LT_Status and LT_Fcast** attribute groups and configure them with the following values:

      Collection Interval: 1 hour
      Collection Location: TEMA
      Warehouse Interval: 1 day
      Summarization: none
      Pruning: Detailed data (1 Day)

   e. Start collection for all of the attribute groups for the Performance Analyzer Warehouse Agent.
3. Close the Historical Collection Configuration GUI.
4. Open the Performance Analyzer Configuration GUI.
   a. Select each Linux and UNIX analytics from the list, and clear the Active flag in the Task Definition section.
   b. Select each Windows analytics from the list, and go to the Input section. Confirm that the granularity field contains either daily for linear trending tasks, or hourly for arithmetic tasks.
   c. Click **OK** to close.

The Warehouse Proxy agent begins to sample data from the Windows OS agent every five minutes and stores the data in a short-term (24 hour) data file. Data

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samples over 24 hours old are warehoused into the detailed table of the data warehouse database every hour, which means that there is no detailed data in the data warehouse database for the first 24 hours. Summarization only occurs once a day. To reduce the amount of time before the first detailed data is summarized, we recommend that you configure the summarization time to approximately one hour after the Warehouse Proxy agent and Windows OS agent starts running.

After one day, you should see data in each of the forecast overview tables for the CPU Utilization, Disk Utilization, Available Memory, Inbound Network Traffic, and Outbound Network Traffic workspaces, and in the System Health Overview and Disk Health Overview tables of the System Health workspace. The strength value in the forecast overview is relatively low (usually 1) for the first day because there are few samples. This improves over time as more samples are gathered. The forecast overlay charts might not have any value even after the first day because analytic results have not yet been warehoused into the data warehouse database. Analytic results must be more than one day old before the forecast overlay charts have values. Therefore, the typical turn-around time for all data to appear is approximately two days.

4.7 Proof of concept solutions

In the following sections, we show the functionality of the IBM Tivoli Performance Analyzer V6.1 product. We also cover three examples out-of-practice. We discuss questions, such as how to identify performance and capacity problems before they become an issue and allow operation staff, data center managers, and customers to reduce down time and make better capacity planning decisions. All of the following capacity reports are out-of-the box for distributed systems that come with the IBM Tivoli Performance Analyzer V6.1 product and with no extra effort involved.

4.7.1 Example one

In the first example, we answer the questions: When can my Web server not handle the inbound traffic anymore, and when do I need to add additional resources to it?

The show case, in this first example, is an environment were we have an internet setup with a Web server. We show the functionality of the IBM Tivoli Performance Analyzer V6.1 product to provide out-of-the box targeted reports

that enable the operations or data center manager to quickly identify capacity problems on the Web server. To set up example one:

1. To invoke the Manage Tivoli Enterprise Monitoring Services window, click **Start → All Programs → IBM Tivoli Monitoring → Manage Tivoli Monitoring Services**

   A window similar to Figure 4-2 is displayed.

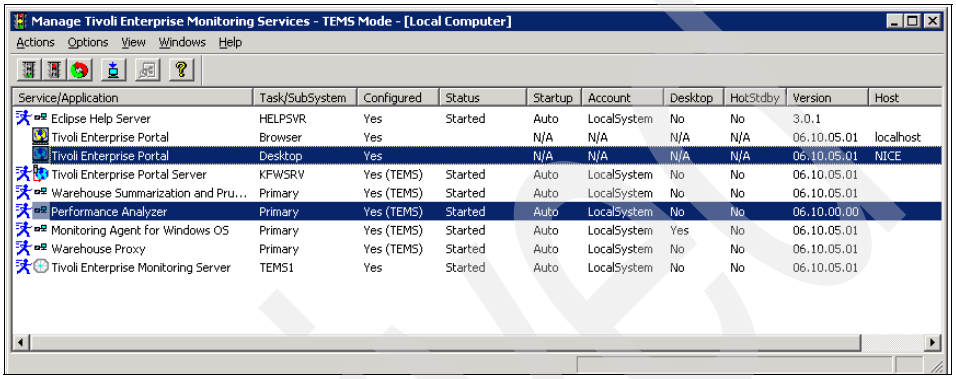

Figure 4-2 The Manage Tivoli Enterprise Monitoring Services

2. In the Manage Tivoli Enterprise Monitoring Services window, locate the status column, and make sure that the status is “Started” for all services and applications.
3. Double-click the **Tivoli Enterprise Portal** icon to open the desktop of the Tivoli Enterprise Portal.
4. Login to the Tivoli Enterprise Portal using sysadmin or an equivalent user ID. In the physical navigator view, go to **Windows Systems → NICE → Performance Analyzer Warehouse Agent → Inbound Network Traffic.**

   Figure 4-3 on page 94 is displayed. In our case, NICE is the host where we installed the IBM Tivoli Performance Analyzer V6.1 warehouse agent.

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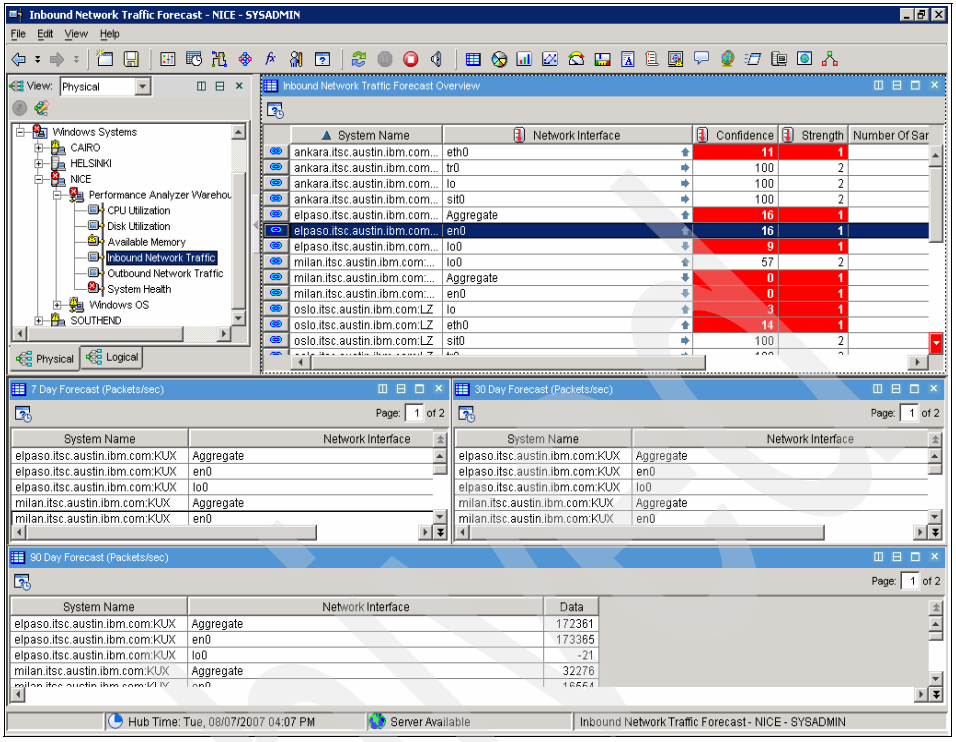


Figure 4-3 Inbound Network Traffic Forecast workspace

The Inbound Network Traffic workspace, Figure 4-3, provides information about the inbound network traffic of all your systems. After you gather sufficient information, you can use the forecast table views to accurately create warning threshold levels to avoid overloading your system, which creates 7, 30, and 90 day forecasts for inbound traffic in packets/sec. The task uses the linear trending calculation method.

All tables in the network traffic workspaces also contain a column called Network Interface that lists the name of the network interface from which data is collected and for which trends and forecasts are made. As the monitoring agent collects an increasing amount of data from a system, the tables display an increasingly accurate prediction of impending problems on this system. From the Inbound Network Traffic Forecast workspace, you can link to the Inbound Network Traffic Forecast Details workspace (Figure 4-4 on page 95). This workspace displays more detailed forecast information for a particular system.

5. As shown in Figure 4-3, highlight the Web server system name “elpaso” that has the “en0” Network Interface.

6. Click the **Capacity Chain** icon, which is located on the left of the system name. Select **Inbound Network Traffic Forecast Details** on the pop-up window, and Figure 4-4 is displayed.

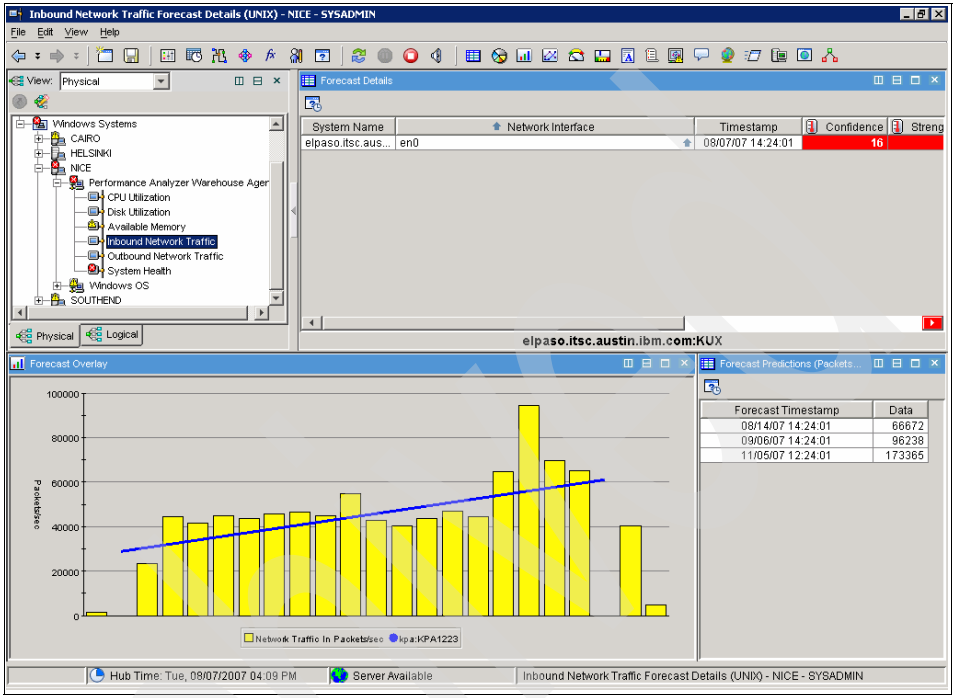


Figure 4-4 Inbound Network Traffic Forecast Details workspace (for host Elpaso)

Use the Predefined Inbound Network Traffic Forecast Details workspace to plan when you need to update your resources to avoid overloading your system. Forecasts help you to identify the systems that require attention and when the systems need attention.

The predefined Inbound Network Traffic Forecast Details workspace provides the following views, which predict the volume of inbound traffic:

– Forecast Details

  The Forecast Details view, which is shown in the upper-left area of Figure 4-4, contains a table that provides summary information about the selected node. The arrow pointing up indicates a rising trend.

– Forecast Overlay historical data

  The Forecast Overlay view (Figure 4-5) is a graph that shows the trend calculation overlaid with a linear trend of the predicted forecast.

– Forecast Predictions

  The Forecast Predictions view (Figure 4-6 on page 97) predicts the volume of inbound traffic in packets per second at 7, 30, and 90 days in the future.

Figure 4-5 is the Forecast Overlay historical data view, which shows trend calculation overlaid with a linear trend of the predicted forecast. The graph plots the number of packets per second (x axis) against samples. The accuracy of any forecast depends on the number of samples, confidence, strength, and forecast intervals.

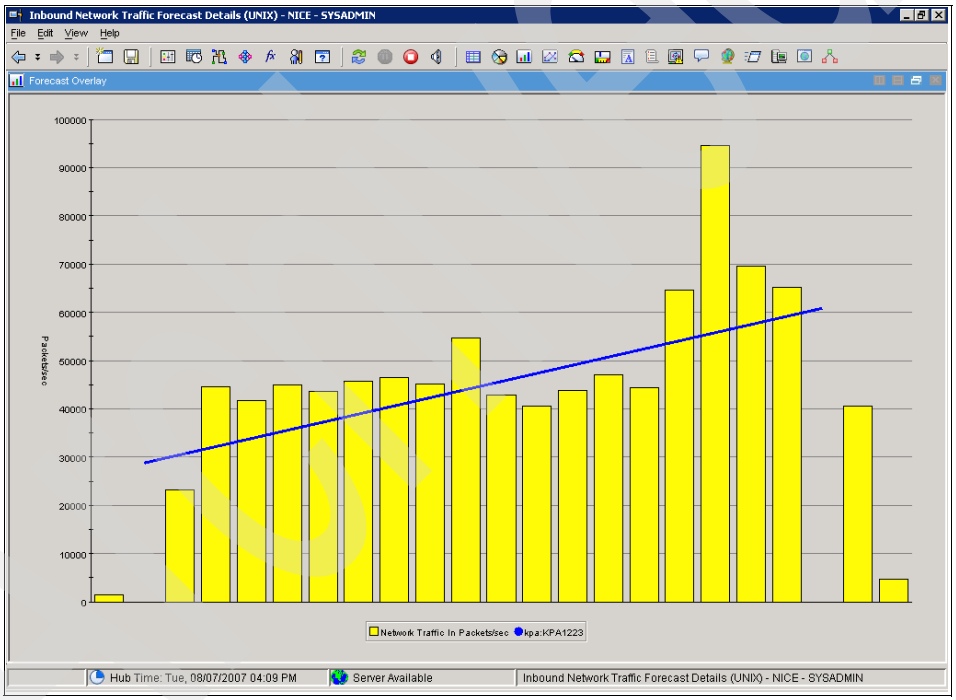
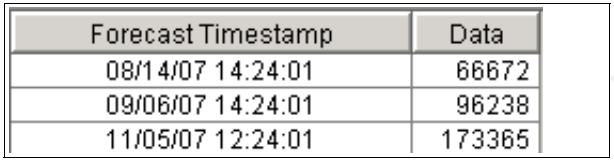


Figure 4-5 Forecast overlay historical data

In our example, the forecast and the blue line that point up indicate a rising trend for the inbound network traffic for our Web server, which means that there is an rising trend in using our Web server; therefore, we know that soon our server will have a performance problem.

Figure 4-6 is the Forecast Predictions workspace, which shows the predicted volume of inbound traffic in packets per second at 7, 30, and 90 days in the future are shown. The predicted values are listed using a forecast time stamp.



Forecast Timestamp	Data
08/14/07 14:24:01	66672
09/06/07 14:24:01	96238
11/05/07 12:24:01	173365

Figure 4-6 Forecast predictions for inbound network traffic

Example one conclusion

The forecast indicates a rising trend for the inbound network traffic for our Web server; therefore, we can assume that soon our Web server will have performance problems. There are two possible solutions to this problem:

- Add a load balancer in front of the Web server and add an additional Web server. Next, split the load between all of the Web servers.
- Add an additional network interface card. Ensure that the CPU and Memory consumption is still OK on the machine and did not run into problems after you added the new network interface card. If there were problems, consider adding extra CPU or Memory as needed.

4.7.2 Example two

In the second example, we answer the question: When do I run out of diskspace on my database server?

The show case, in the second example, is an environment were we have a main database server. We show the functionality of the IBM Tivoli Performance Analyzer V6.1 product to provide out-of-the box targeted reports that enable the operations or data center manager to quickly identify capacity problems on this main database server and identify when the main database server is running out of disk space. To set up example two:

1. To invoke the Manage Tivoli Enterprise Monitoring Services window, click **Start → All Programs → IBM Tivoli Monitoring → Manage Tivoli Monitoring Services**
2. In the Manage Tivoli Enterprise Monitoring Services window, locate the status column, and make sure that the status is “Started” for all services and applications.

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3. Open the desktop of the Tivoli Enterprise Portal, and login to Tivoli Enterprise Portal using sysadmin or an equivalent user ID. In the physical navigator view go to **Windows Systems** → **NICE** → **Performance Analyzer Warehouse Agent** → **Disk Utilization**. The disk utilization overview workspace, shown in Figure 4-7, is displayed. In our case, NICE is the host where we installed the IBM Tivoli Performance Analyzer V6.1 warehouse agent, and Helsinki is the main database host.

   Figure 4-7 is the Disk Utilization workspace, which provides overview information about the disk usage of all your systems. Use this information to monitor individual nodes or the system as a whole.

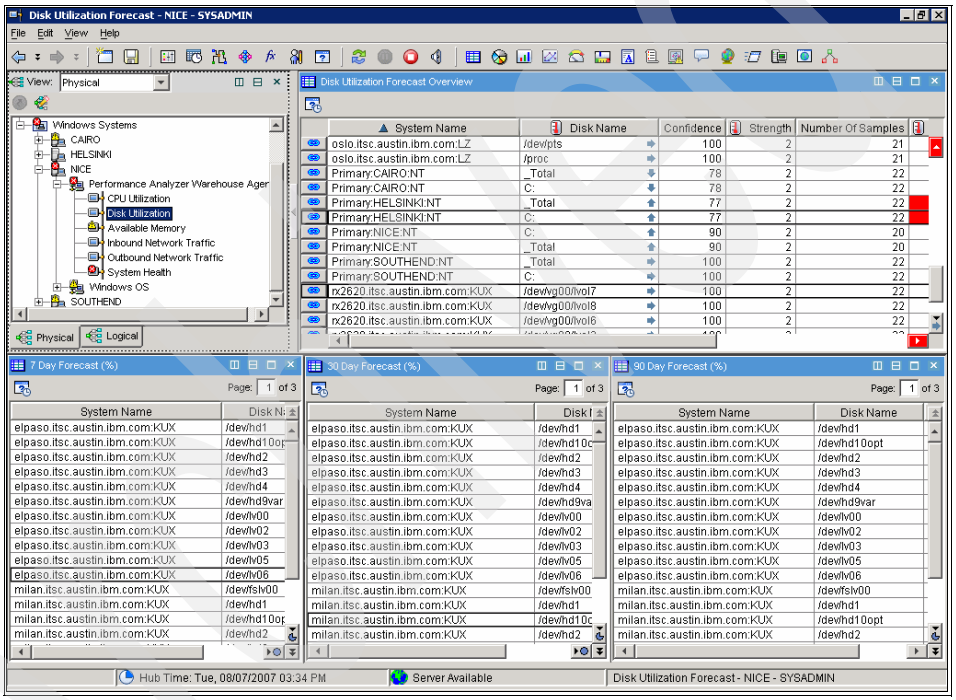

Figure 4-7 Disk utilization overview

Using the Disk Utilization workspace, you can:

- Determine whether disk usage is trending up or down
- View forecasts

– Predict when warning or critical thresholds are reached
– Set warning and critical threshold levels to monitor your system's disk usage
– Use the data that the monitoring agent gathers from a system to create forecasts for 7, 30, and 90 days to help you identify which systems require attention and when systems are likely to reach a threshold.

After you gather sufficient information, you can use the forecast table views to accurately create warning threshold levels to avoid overloading your system's storage capacity.

The predefined Disk Utilization workspace provides different table views that enable you to view warning and critical threshold levels and forecasts for every monitored system. Each column in each table displays output attribute information:

– Disk Utilization Forecast Overview

  The Disk Utilization Forecast Overview workspace, which is shown in the upper portion of Figure 4-7 on page 98, is a table that displays forecast summary information for the monitored systems.

– 7 Day Forecast

  The 7 Day Forecast workspace, which is the first table in the lower portion of Figure 4-7 on page 98, uses a table to indicate the system to which the forecast applies and the data that displays the predicted value after seven days.

– 30 Day Forecast

  The 30 Day Forecast workspace, which is the middle table in the lower portion of Figure 4-7 on page 98, uses a table to indicate the system to which the forecast applies and the data that displays the predicted value after 30 days.

– 90 Day Forecast

  The 90 Day Forecast workspace, which is the last table in the lower portion of Figure 4-7 on page 98, indicates the system to which the forecast applies and the data that displays the predicted value after 90 days.

Disk usage is measured as a percentage. If the disk usage on a system is above 90 percent of the total disk capacity, you will soon run out of disk space.

From this workspace, you can link to the Disk Utilization Forecast details workspace, which displays more detailed forecast information for a particular system.

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4. As shown in Figure 4-7 on page 98, highlight the main database server system name “Helsinki” by clicking the C: disk name.
5. Click the **Capacity Chain** icon, which is located on the left of the system name. Select **Disk Utilization Forecast Details** on the pop-up window, and Figure 4-8 is displayed.

   Figure 4-8 is the Disk Utilization Forecast Details workspace, which shows the historic disk usage of individual nodes and predicts the future disk usage. Use this workspace to plan when you need to update your resources to avoid overloading your system. Forecasts help you to identify the systems that require attention and identify when the systems require attention.

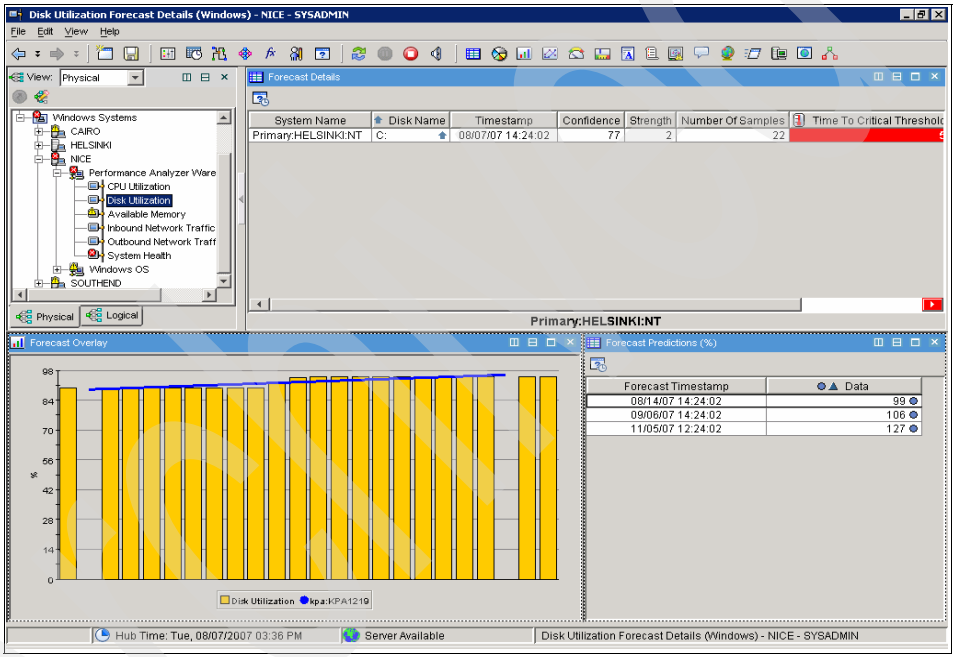


Figure 4-8 Detailed disk utilization forecast

The Predefined Disk Utilization Forecast Details workspace provides the following views that predict disk use:

– Forecast Details

  The Forecast Details view, which is shown in the upper portion of Figure 4-8, is a table that provides summary information about the selected node.

– Forecast Overlay

  The Forecast Overlay view (Figure 4-9) is a graph that presents historical data that is used for the trend calculation overlaid with a linear trend of the predicted forecast.

– Forecast Predictions

  The Forecast Predictions view, which is shown in Figure 4-10 on page 102, is a graph that shows predicted disk use that is expressed as a percentage at 7, 30, and 90 days in the future.

Figure 4-9 shows the Forecast Overlay view of the Detailed Disk Utilization workspace, which shows the trend calculation overlaid with a linear trend of the predicted forecast. The graph plots the percentage disk use (x axis) against samples.

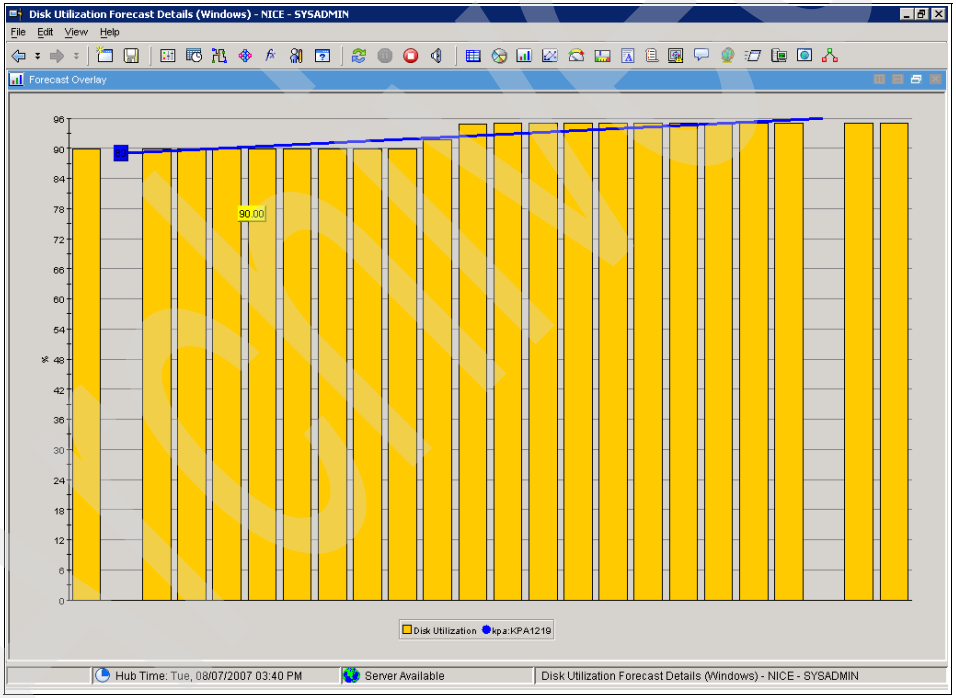
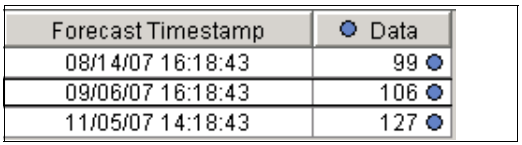


Figure 4-9 Detailed disk utilization forecast overlay

In our example, the forecast and the blue line that point up indicate a rising trend for the disk usage and utilization for our main database server, which means that there is a rising trend in diskspace using our main database server; therefore, we can predict that soon our server will have performance and diskspace problems.

Figure 4-10 shows the Forecasts Predictions view of the Disk Utilization Forecast Details workspace, where the predicted disk use is expressed as a percentage at 7, 30, and 90 days in the future.



Forecast Timestamp	Data
08/14/07 16:18:43	99
09/06/07 16:18:43	106
11/05/07 14:18:43	127

Figure 4-10 Forecast prediction for disk utilization

The predicted values are listed using a forecast time stamp. The icons in the data column indicate the status of the usage and are defined in the following areas:

- Less than 15% use
- Between 15% and 40% use
- Between 41% and 70% use
- Between 71% and 90% use
- Greater than 90% use

Example two conclusion

The forecast prediction for the disk utilization workspace indicates an upward trend for the disk usage for our main database server. The forecast also indicates that our main database server will soon have a disk capacity problem. In the forecast prediction table, the 7 day forecast reaches 99%, and between the 7 day and 30 day forecasts, the disk is full on our main database server. To solve our problem, we must add more disk space to our main database server. We can use either internal disks, or if this is not possible, we can connect our system to a Storage Area Network (SAN) disk space.

4.7.3 Example three

In our third example, we answer the questions: Where are the pain points regarding system health in my environment? What IT resources should I worry about next? What will my resources look like next week, next month, and next quarter.

The show case, in the third example, is an environment were we have a server farm with a mixture of servers. We show that IBM Tivoli Performance Analyzer V6.1 provides out-of-the box targeted reports that enable the operations or data center manager to quickly identify capacity problems in this server farm and

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identify where the major pain points are. We also identify the area with the biggest capacity problems. To set up example three:

1. To invoke the Manage Tivoli Enterprise Monitoring Services window, click **Start → All Programs → IBM Tivoli Monitoring → Manage Tivoli Monitoring Services**
2. In the Manage Tivoli Enterprise Monitoring Services window, locate the status column, and make sure that the status is “Started” for all services and applications.
3. Open the desktop of the Tivoli Enterprise Portal, and login to Tivoli Enterprise Portal using sysadmin or an equivalent user ID.
4. In the physical navigator view, go to **Windows Systems → NICE → Performance Analyzer Warehouse Agent → System Health**. The System Health Overview workspace, shown in Figure 4-11, is displayed.

   In our case, NICE is the host where we installed the IBM Tivoli Performance Analyzer V6.1 warehouse agent, and RX2620 is the host with a major memory problem as well as being our main pin point on the server farm.

   Figure 4-11 shows the System Health Overview workspace, which provides information about the health of all of our systems.

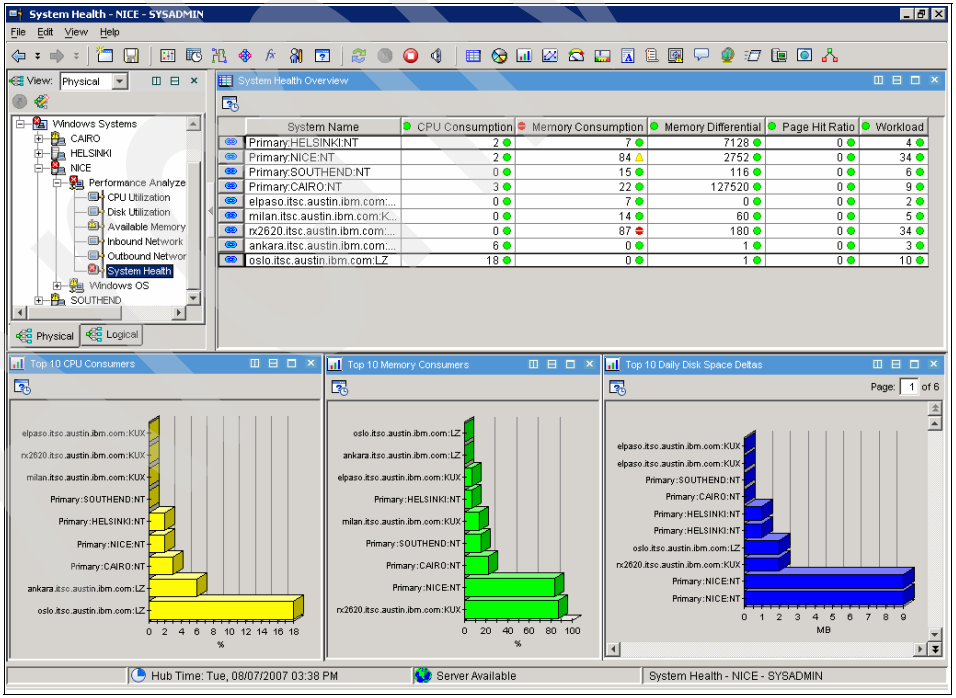

Figure 4-11 System Health overview

Using the System Health Overview workspace, you can:

- Determine how much of a resource is being consumed
- Determine whether consumption fluctuates or is steady
- See how hard the system is working
- Manage the capacity of individual nodes or the system as a whole

The situations that are applied to this workspace highlight whenever a critical or warning threshold is reached.

Knowing when resource consumption is high and whether the consumption is steady or fluctuates enables you to know when to reallocate resources and when to add new resources, for example, if the consumption is continuously high, consider adding resources.

The predefined System Health workspace provides different views that enable you to see the health of monitored systems. These views are:

- System Health Overview

  The System Health Overview view, which is shown in Figure 4-12 on page 105, is a table that summarizes the CPU, memory, paging, and workload information for all systems that you monitor.

- Top 10 CPU Consumers

  The Top 10 CPU Consumers view, which is shown in Figure 4-13 on page 105, is a bar chart that shows the ten systems that are using the most CPU.

- Top 10 Memory Consumers

  The Top 10 Memory Consumers view, which is shown in Figure 4-14 on page 106, is a bar chart that shows the ten systems that are using the most memory.

- Top 10 Daily Disk Space Deltas

  The Top 10 Daily Disk Space Deltas view, which is the last graph in the lower portion of Figure 4-11 on page 103, is a bar chart that shows the ten systems that are using the most disk space.

Figure 4-12 on page 105, is the System Health Overview view of the System Health workspace, which is a table that shows you the health for all of the systems that you are monitoring and summarizes the CPU, memory, paging, and workload information for all systems. This table contains the System Name, CPU Consumption, Memory Consumption, Memory Differential, Page Hit Ratio, and Workload. The icons in each column indicate the health of that attribute.

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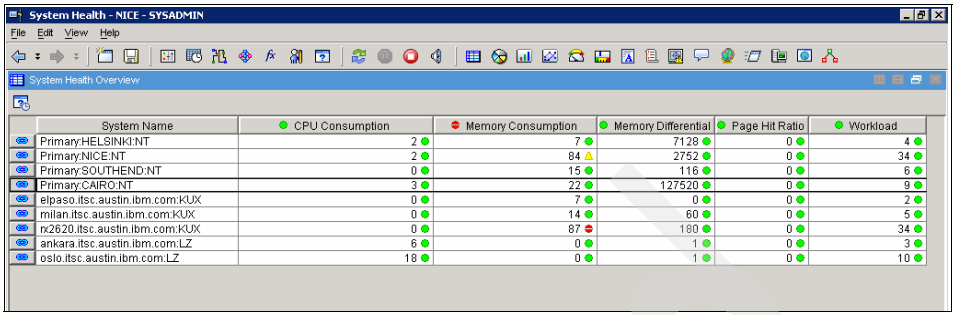

Figure 4-12 System Health overview

In our example, you can see that the memory consumption memory indicator of the RX2620 host is extremely bad, about 87% high. When you double check the memory consumption with the Top CPU consumers, in Figure 4-13, you can see that the RX2620 host is not using a lot of CPU power.

Figure 4-13 shows the Top 10 CPU Consumers view of the System Health workspace. It shows the top 10 CPU consumers in our environment.

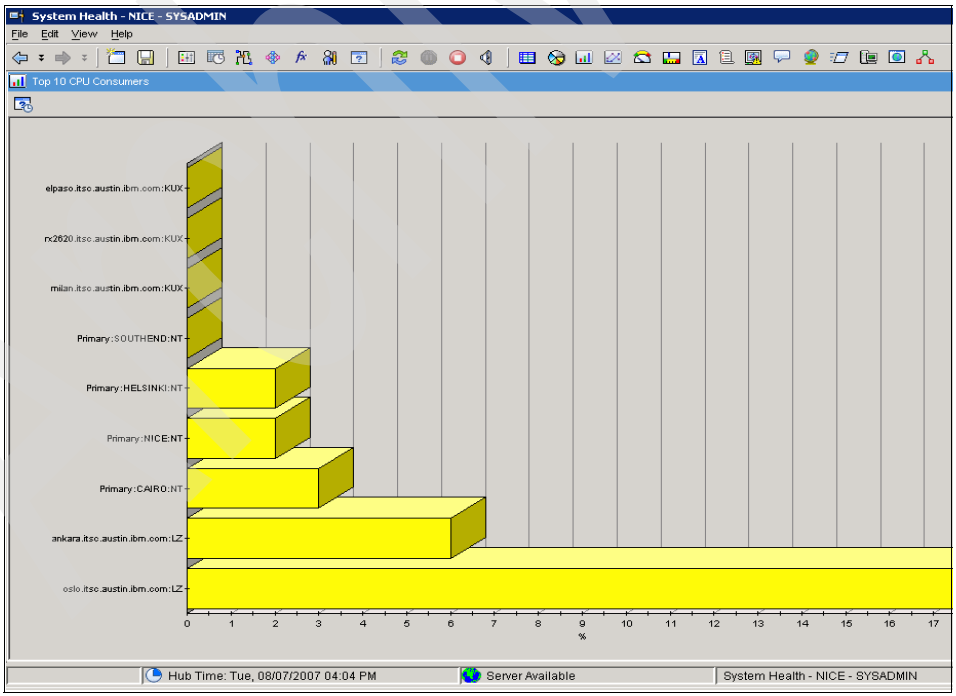

Figure 4-13 Top 10 CPU consumers

When you check the Top 10 Memory consumers view, in Figure 4-14, you can see that the RX2620 host is number one of all the top 10 memory consumers, and it is using a lot of memory.

Figure 4-14 shows the Top 10 Memory consumers in our environment.

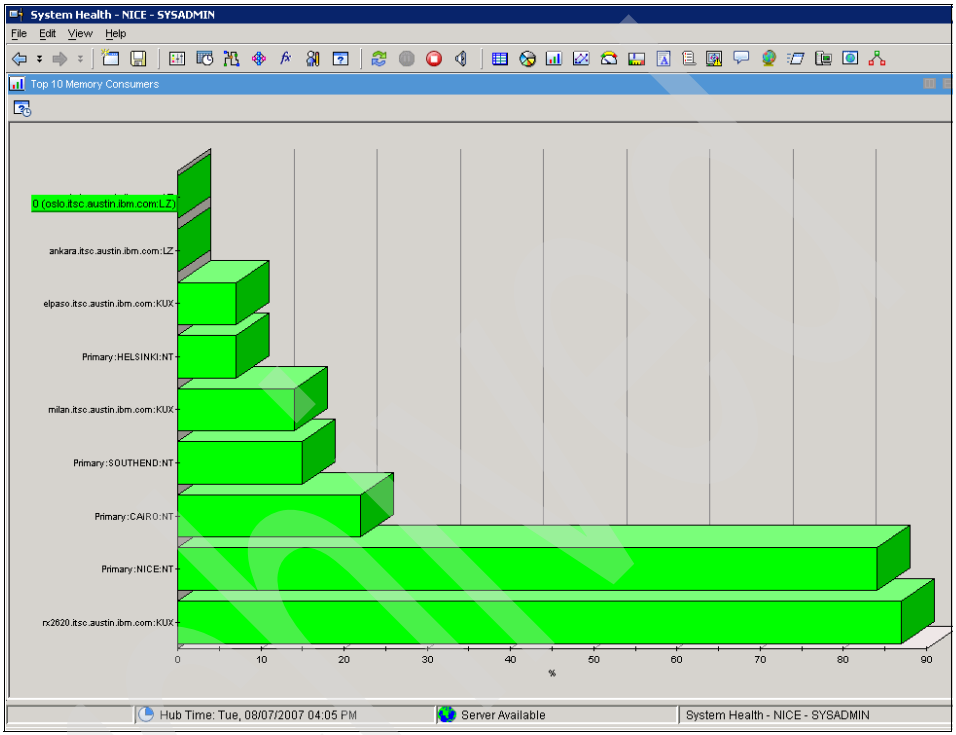

Figure 4-14 Top 10 Memory Consumers view

From the System Health Overview view of the System Health workspace, you can easily link to the System Health Details workspace, shown in Figure 4-15 on page 107, to get details about the RX2620 system. You can also check why the memory consumption is so high. The System Health Details workspace graphically displays the information summarized in the System Health Overview view.

5. In the System Health Overview view, which we show in Figure 4-12 on page 105, highlight the RX2620 server system name (rx2620.itsc.austin.ibm.com: KUX) by clicking the appropriate line of the memory consumption.

6. Click the capacity chain icon, which is located on the left of the system name. Select **System Health Details** on the pop-up window, and Figure 4-15 is displayed.

   Figure 4-15 shows the System Health Detail workspace, which provides detailed, graphical information about the health of a specific system.

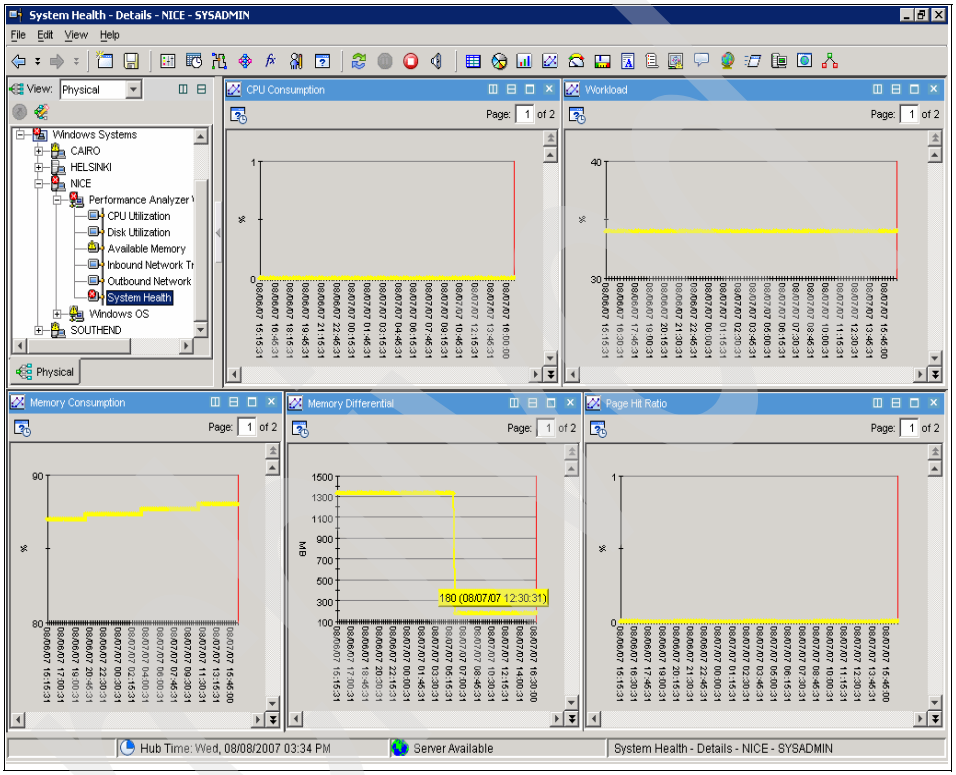

Figure 4-15 System Health Details workspace

In the predefined System Health Detail workspace, you can determine:

- How much CPU and memory the system is consuming
- The page hit ratio
- How hard the system is working
- The difference between the minimum and maximum memory use

The CPU Consumption graph, which is the first graph at the top of Figure 4-15, displays the total CPU consumption of the system against time. This task combines CPU Utilization and Run Queue Length.

The Workload graph, which is the second graph at the top of Figure 4-15, displays the workload of the system against time. This task calculates how hard a machine is working by combining CPU Utilization and the virtual

memory that the system uses and allocates. The higher the value, the harder the system is working.

The Memory Consumption graph, which is shown in Figure 4-16, displays the total memory consumption of the system against time. This task combines the virtual memory that the system uses and allocates.

The Page Ratio graph, which is the middle graph in the lower portion of Figure 4-15 on page 107, displays the ratio of pages read from memory to pages read from disk. This task applies a ratio calculation to Pages Read and Page Faults per second.

The Daily Memory Differential graph, which is the last graph in the lower portion of Figure 4-15 on page 107, displays the system's memory use differential against time. The data is determined by the Available Memory Differential predefined task. This task calculates the difference between the maximum and minimum memory that the system uses during the day.

In Figure 4-16, the yellow line points up, which indicates a rising trend for the memory consumption of our RX2620 server. This means that there is a rising trend in memory usage and that the memory consumption memory indicator of the RX2620 host is extremely bad, about 87% high; therefore, we know that soon our server will have performance and memory usage problems.

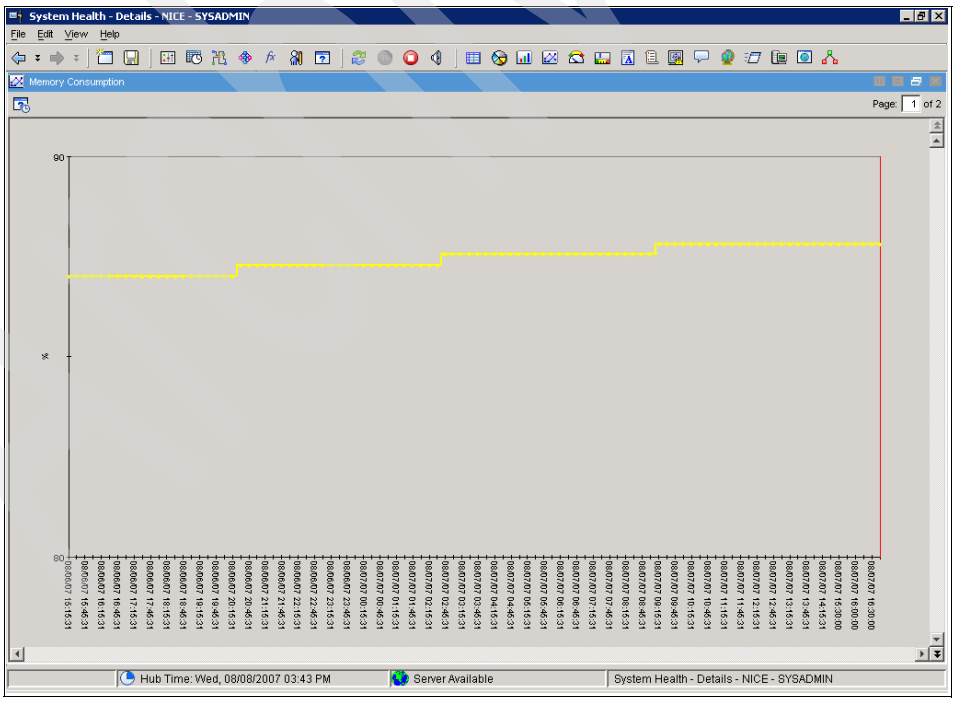

Figure 4-16 Memory Consumption view

Example three conclusion

The memory consumption for our RX2620 server is actually between 80% and 90%. There is a rising trend in memory usage, and the memory consumption memory indicator of the RX2620 host is extremely bad, about 87% high. Soon, the server will have a performance and memory problem.

There are two possible solutions to this problem:

- Identify the servers that have low CPU and Memory Load. Transfer some load and applications from the RX2620 server to the server that has low CPU and Memory Load, which will off load the RX2620 server a bit.
- Check the RX2620 server to see if you can add more memory cards in the server or if you can replace the existing memory cards with memory cards that have more capacity. Add additional memory to the RX2620 server. After you add the new memory cards, check the server to see if the CPU consumption is still OK and is not running into problems.

4.8 Modifying the tasks and creating additional tasks

IBM Tivoli Performance Analyzer V6.1 ships with 33 out-of-the-box tasks that are intended to apply to a broad range of users. However, it is anticipated that you might want to modify some of the existing tasks to better suit your needs, for example, you might want to add more forecast durations or change a numeric so that instead of calculating a value in megabytes, it instead calculates a percentage.

To extract maximum value from IBM Tivoli Performance Analyzer V6.1, and to take advantage of data collected from other agents, you must create custom tasks, for example, you can create custom tasks to analyze data from non-OS Tivoli Enterprise Monitoring Agents.

In this section, we describe the high-level steps to modify an existing task and to create an additional task. Refer to “The IBM Tivoli Performance Analyzer Version 6.1: Best Practices” white paper, which is written by Simon Huband and Samuel Seow from IBM Australia, for examples of modifying and creating tasks. You can download this white paper at:

`http://www.ibm.com/software/tivoli/opal?NavCode=1TW10TM5E`

This document also provides some best practice tips on how to customize the Tivoli Data Warehouse when you work with the IBM Tivoli Performance Analyzer. We incorporated some information from the white paper in this book.

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4.8.1 Modifying the tasks

In this section, we provide the recommended five primary phases for modifying out-of-the-box tasks, which you can also use to modify custom, user-defined tasks. The five primary phases are:

- History Collection configuration

  History collection configuration is modified as required to suit the intended task modification.

- Task modification

  In this phase, you modify the task, as required, using the Performance Analyzer Configuration window.

- Work space changes

  Here, you make changes to any workspace that uses the outputs of the modified task. Changes can range from updating graph axes to adding more views to see additional outputs (for example, additional forecast durations).

- Situation updates

  This phase addresses your need to update any situations that were dependent on the now modified task, for example, if you changed a task calculates megabytes to a task that calculates a percentage, then you must update any dependant situations to avoid misleading results.

- Peripheral updates

  This phase catches any other required updates, namely purging any Tivoli Data Warehouse data that can result in inconsistent outputs. If the task outputs changed, for example from megabytes to percent, then any previous historical data that the Performance Analyzer Warehouse Agent collected might be inconsistent with historical data that is collected from this point forth. This is particularly true for Linear Trending tasks, whether they are user-defined or out-of-the-box, as Linear Trending tasks employ all available records; whereas, Arithmetic tasks only employ the most recent records in the Tivoli Data Warehouse.

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4.8.2 Creating additional tasks

Creating entirely new analytic tasks is much more involved than just editing an existing task because you must not only create the task itself, but you must create entirely new workspaces and situations for maximum benefit. The approach we recommend in this section for the creating new tasks employs four main phases:

- History collection configuration

  Additional attribute groups are configured for history collection if required by the task you create.

- Task creation

  Here, you create the new task using the Performance Analyzer Configuration window.

- Workspace creation

  You must create new workspaces to display the outputs of the new task in a meaningful manner. Until you create the new workspaces, there is no convenient way to view the results of the new task. The Performance Analyzer Warehouse Agent can calculate the task outputs, but no default workspace is configured to actually show those outputs.

- Situation creation

  After you create both tasks and workspaces, you can create new situations based on the outputs of the new task and associate the new situations with the new workspace.

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Troubleshooting

In this chapter, we describe general troubleshooting steps that you can take. We recommend that you use the information in this chapter along with the *IBM Tivoli Monitoring Problem Determination Guide, Version 6.1.0*, GC32-9458 to troubleshoot any problems that arise while you are installing or using IBM Tivoli Performance Analyzer V6.1.

In this chapter, we cover the following topics:

- "Points to remember" on page 114
- "IBM Tivoli Performance Analyzer V6.1 tracing and logging" on page 115
- "Common kpacma.log messages" on page 116

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5.1 Points to remember

In this section, we describe the common points for you to consider to troubleshoot problems related to IBM Tivoli Performance Analyzer V6.1. Following are some points to remember:

- The IBM Tivoli Performance Analyzer V6.1 architecture relies on two back end databases (WAREHOUS and TEPS) and a monitoring server to function.
- For the custom created tasks, determine parameters, such as the input application, attribute groups, and granularity, and then check if those parameters exist in the database.

  The table name in the database is constructed from the *ATTR value in the ODI file that is appended with the aggregation you select (for example, `AVG_`, `SUM_`, `MIN_`, and so on) and appended with `_D`, `_H`, corresponding to the granularity. If the table name, including quotation marks(“ “), is longer than 32 characters, the *COLUMN value is used instead.
- You can export the custom created or modified tasks using the following **`java –jar paconf.jar –export`** command, where the following applies:
  - The paconf.jar file is in the agent directory.
  - The *PAfTepDBConfig.properties* file (automatically generated by IBM Tivoli Performance Analyzer V6.1 Agent configuration) must be in the same directory as paconf.jar or in the classpath.
  - The properties file has the JDBC connection parameters that are required to access the TEPS database directly.
  - If you do not specify the "–export" argument, the default export file is kpa_tasks.sql in the current directory.
- To get the version of the IBM Tivoli Performance Analyzer V6.1configuration tool, hold down the F11 key while the configuration tool editor is in focus. The version number is shown on the lower-left corner of the dialog.
- Other IBM Tivoli Performance Analyzer V6.1 configuration files that provide information about the configuration settings are:
  - pa.ini or pa.config
  - agent.cfg
  - init.cfg
  - kpa.cfg

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5.2 IBM Tivoli Performance Analyzer V6.1 tracing and logging

In this section, we describe the various tracing and logging options of IBM Tivoli Performance Analyzer V6.1. The tracing and logging options are:

- IBM Tivoli Performance Analyzer V6.1 uses the same *RAS1 trace facility* that the IBM Tivoli Monitoring V6.1 components use. It also has additional logging capabilities.
- The RAS1 trace levels do not relatively affect the IBM Tivoli Performance Analyzer warehouse agent's trace levels; however, they do affect the connection traces of the agent with the monitoring server.
- *kpacma.log* is the main log file for the IBM Tivoli Performance Analyzer V6.1 warehouse agent. It is located in the:
  - $ITMinstall_dir\TMAITM6\logs directory on Windows
  - $ITMinstall_dir/logs directory on Linux and UNIX
- Additional IBM Tivoli Performance Analyzer V6.1 trace settings are specified in the following .cfg files:
  - Windows: $ITMinstall_dir\TMAITM6\config\init.cfg
  - Linux: $ITMinstall_dir/li6243/pa/config/init.cfg
  - AIX: $ITMinstall_dir/aix513/pa/config/init.cfg
- *LogSize* is a useful setting for specifying the size of the log file (in bytes), especially when you want to capture a large amount of data:
  - LogSize = 100000 (default 1Mb)
  - LogSize = 1000000 (for 10Mb log file)
- The possible values that you can specify for the *LogLevel* parameter are:
  - Fatal
  - Info
  - Warning
  - Verbose
  - Debug
- By default, the trace level is set to *Warning*, which you can modify, as required, for more detailed messages.
- For additional logging of the Tivoli Enterprise Management Agent, you can modify the following setting:

  ```
  SSMIRALogFile=<file_name>
  ```

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5.3 Common kpacma.log messages

In this section, we provide common kpacma.log messages, and what you can look for. Following are some commonly found messages found in the kpacma.log:

- Failed to connect to TEPS database:
  - The TEPS database connection information might be incorrect.
  - The agent produces no data.
- Failed to connect to TDW database:
  - The warehouse database connection information might be incorrect.
  - The agent produces no data.
- Configuration not complete:
  - The IBM Tivoli Performance Analyzer V6.1 warehouse agent is not configured correctly.
  - The agent produces no data.
- No connection available for SQL1 query to acquire managed system list:
  - The monitoring server host or protocol details are possibly incorrect.
  - The agent produces no data.
- Query failed:
  - The SQL query to the warehouse database or TEPS database failed.
  - The Analytic Task might be at fault.
  - The agent produces no data for that specific task.
- Skipping running task—Reason: Not Sufficient Data-Points:
  - There is no data in the warehouse database. Check that the Summarization and Pruning agent are configured and running.
  - The agent produces no data for that specific task.

For more information about IBM Tivoli Performance Analyzer V6.1 best practices, refer to the “IBM Tivoli Performance Analyzer V6.1: Best Practices White Paper” white paper, which is written by Simon Huband and Samuel Seow from IBM Australia. The white paper is at the following Web location:

http://catalog.lotus.com/topal?NavCode=1TW10TM5E

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Abbreviations and acronyms

CS	cursor stability
IBM	International Business Machines Corporation
ITIL	Information Technology Infrastructure Library
ISM	IBM Service Management
ITSO	International Technical Support Organization
LAN	local area network
MTEMS	Manage Tivoli Enterprise Monitoring Services
PA	Performance Analytics
TEMA	Tivoli Enterprise Monitoring Agent
TEMS	Tivoli Enterprise Monitoring Server
TEP	Tivoli Enterprise Portal
TEPS	Tivoli Enterprise Portal Server

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Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this book.

IBM Redbooks

For information about ordering these publications, see “How to get Redbooks” on page 120. Some of the documents referenced here might be available in softcopy only:

- *Deployment Guide Series: IBM Tivoli Monitoring 6.1*, SG24-7188
- *IBM Tivoli Monitoring Deep Dive and Optimization for Large Scale Environments*, SG24-7443

Other publications

The following publications are also relevant as further information sources:

- *IBM Tivoli Monitoring User's Guide Version 6.1.0*, SC32-9409
- *IBM Tivoli Enterprise Console V3.9 User’s Guide Version 3.9*, SC32-1235
- *IBM Tivoli Performance Analyzer Version 1.0 User’s Guide for Windows and Linux*, SC23-6308
- *IBM Tivoli Monitoring Problem Determination Guide Version 6.1.0 (Updated May 2007)*, GC32-9458
- *IBM Tivoli Monitoring Fix Pack 005 Readme and Documentation Addendum,* SC23-5960

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Online resources

The following Web sites are also relevant as further information sources:

- DB2 manuals

  http://publib.boulder.ibm.com/infocenter/db2luw/v8//index.jsp

- Tivoli platform and database support matrix

  http://www-1.ibm.com/support/docview.wss?uid=swg21067036

- *IBM Tivoli Performance Analyzer V6.1: Best Practices White Paper*, by Simon Huband and Samuel Seow from IBM Australia.

  http://catalog.lotus.com/topal?NavCode=1TW10TM5E

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Getting Started with IBM Tivoli Performance Analyzer Version 6.1

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This IBM Redbooks® publication provides a practical guide to implementing, using, and optimizing IBM Tivoli Performance Analyzer Version 6.1, which includes planning and deployment scenarios, troubleshooting, and so forth.

We position IBM Tivoli Performance Analyzer against two other IBM capacity management solutions, IBM Tivoli Capacity Process Manager and HyPerformix IPS Capacity Manager. We also provide some best practice guidelines on when to use each solution.

To better explain the product functionality, we included several case studies that will help you understand the capabilities of IBM Tivoli Performance Analyzer.

This book is a reference for IT professionals who implement and use IBM Tivoli Performance Analyzer in small, medium, and large-scale environments.

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